2023

Comprehensive WATER & SEWER PLAN *for Charles County Maryland*




CHARLES COUNTY, MARYLAND

Comprehensive

Water & Sewer Plan

2023

Adopted

May 2, 2023

Commissioners of Charles County

Reuben B. Collins, II, Esq., President

Ralph E. Patterson, II, M.A., Vice President

Gilbert O. Bowling, III

Thomasina O. Coates, M.S.

Amanda M. Stewart, M. ED.

Charles County Government Mission Statement

To provide our citizens the highest quality service possible in a timely, efficient, and courteous manner. To achieve this goal, the government must be operated in an open and accessible atmosphere, be based on the comprehensive long and short range planning, and have an appropriate managerial organization tempered by fiscal responsibility. We support and encourage efforts to grow a diverse workplace. Charles County is a place where all people thrive and businesses grow and prosper; where the preservation of our heritage and environment is paramount; where government services to its citizens are provided at the highest level of excellence; and where the quality of life is the best in the nation.

TABLE OF CONTENTS

CHARLES COUNTY PROFILE AND DATA SUMMARY

THE WATER PLAN

THE SEWER PLAN

FINANCIAL IMPLEMENTAITON PLAN

INTRODUCTION

I.1 STATUTORY REQUIREMENTS

Title 9, Subtitle 5 (Environment Article) of the Annotated Code of Maryland requires that the County's Comprehensive Water and Sewer Plan provide for the orderly expansion and extension of community and multi-use water supply systems and community and multi-use sewer systems in a manner consistent with all applicable County and local comprehensive plans. State regulations governing preparation of the plan, Title 26.03.01 of the Code of Maryland Regulations (COMAR), provide the general framework and the minimum requirements for county water and sewer plans. In recent years, these regulations have come to state that a county water and sewer plan may be utilized to develop the water supply and sewer system in a manner consistent with the County comprehensive planning efforts, and, to implement the County's growth management policies. In fact, comprehensive water and sewer planning is an important aspect of State growth management planning.

I.2 PURPOSE AND SCOPE OF PLAN

The purpose of the Comprehensive Water and Sewer Plan is to provide for:

- an understanding of the County's goals, objectives, and policies in relation to water supply and sewer planning;
- orderly expansion of water and sewer service;
- adequate water supply and sewer treatment capacity to meet present and future needs;
- protection of public health through adequate wastewater treatment; and
- capital programming in order to provide water and sewer service.

Recognizing the potential effects of uncontrolled land use patterns now and in the future, Charles County completed a Comprehensive Plan in 1990, which provides for the orderly development of growth within the County. The Plan was last adopted in June 2016. The Comprehensive Water and Sewer Plan can be used as a tool to implement the County's growth management policies and can assure that the rate of growth does not outstrip the County's ability to provide essential public services.

I.3 RELATION OF PLAN TO OTHER COUNTY PLANS AND PROGRAMS

The Comprehensive Water and Sewer Plan has been developed to compliment and implement the goals, objectives and policies for water and sewer service, as outlined in the Charles County Comprehensive Plan. The Comprehensive Water and Sewer Plan relies upon a forecast of future land uses, population projections, and policies for growth management and the provision of public services as provided in the Comprehensive Plan.

The Zoning Ordinance was developed to further the Comprehensive Plan, by providing regulations for land uses occurring within the County. In fact, the Zoning Ordinance implements many of the goals and objectives established in the Comprehensive Plan, through its various programs, including the Water and Sewer Ordinance and the Adequate Public Facilities Ordinance.

The Comprehensive Water and Sewer Plan is another important County plan and is used as a guideline for water and sewer planning. The Water and Sewer Plan and the Zoning Ordinance work in conjunction to fulfill many of the goals and objectives of the Comprehensive Plan. The Water and Sewer Plan is particularly useful in relation to its policies on growth management and the provision of public facilities. The Water and Sewer Plan has a 25-year outlook and is updated every 3 years; however, the County amends the text and maps of the Water and Sewer Plan every year, or as is deemed appropriate.

The 2016 Comprehensive Plan has had profound effects on the County's water and sewer service planning. Since 2011 the County has been in a Comprehensive Planning process that culminated in 2016. One major component of the Plan was the creation of a Watershed Conservation District (WCD) with residential densities of 1 dwelling per 20 acres within the Mattawoman Creek watershed. Large portions of the very low-density conservation area coincided with the Mattawoman Sewer Service Area (MSSA) and the Bryan's Road and Waldorf Water Service areas. To implement this conservation district, the County adopted a Watershed Conservation District Zone (WCD) in 2017. The full effect of the transition provisions for the WCD zone did not take effect until May 2018. As a result, the County water and sewer planning including the mapping of priority areas could not be finalized.

I.4 PLAN DEVELOPMENT PROCESS

The process by which the Comprehensive Water and Sewer Plan was developed has involved discussions of a wide range of issues that formed the basis for framing its policies and objectives. One of the key issues involved in the plan development process was the consideration of how the Comprehensive Water and Sewer Plan would be implemented in concert with the other plans and policies of Charles County. The Comprehensive Water and Sewer Plan document encompasses the key elements of the Comprehensive Plan, the Zoning Ordinance, and other specialized studies regarding the water supply, sewer treatment, and financial policies of the County. For a complete list of related plans, studies and resources see the Bibliography attached to the end of this document. This 2023 update to the Comprehensive Water and Sewer Plan will continue to address current issues related to comprehensive water and sewer planning.

Charles County has committed itself to an open and public process. The draft plan was reviewed by the appropriate state agencies, subsidiary entities, and individual towns in the County for an opportunity to comment. Once reviewed, the public process continues with the posting of the draft plan to the County's website prior to the public hearing. A public hearing was held where issues important to the community were discussed. Another public hearing received public testimony and comments. This was followed up with public work sessions in which the County Commissioners refine the document and make public policy decisions. The final plan and maps are then adopted by the Commissioners. All of these sources, as well as other commenting agencies, have provided important guidance which is reflected in the content of this plan.

I.5 PLAN ORGANIZATION

The Comprehensive Water and Sewer Plan has two major components: the Plan text and the County-wide maps. These components are equally important and work in concert. The text provides an understanding the County's goals, objectives, and policies and the necessary background related to water and sewer planning. The mapping products provide a geographical context for water and sewer services. With this update, the County has refreshed the mapping base information with a digital land parcel layer providing a more accurate level of detail and allow for analysis through the County's GIS program.

There are 62 maps with a scale of 1"=1,000' (exceeding the COMAR-required 1"=2000' minimum) which accompany and reinforce the Comprehensive Water and Sewer Plan; 31 maps for the water systems within the County and 31 maps for the sewer systems within the County. With the new digital base, the County can adjust the scale for the production of special purpose maps. For example, the digital layers can be overlaid over the County's zoning maps for analysis.

The text portion of the Comprehensive Water and Sewer Plan has been divided into five chapters. Chapter One provides the planning framework for the Comprehensive Water and Sewer Plan. The goals, objectives and policies for the Comprehensive Water and Sewer Plan are included in this chapter, as well as the structure of the County government, the inter-relationship of this document with Federal, State and local planning policies and regulations, and the process by which this document can be amended. Policies regarding water and sewer allocations are also included within this chapter.

Chapter Two of the Comprehensive Water and Sewer Plan provides a physical profile of the County, as well as a demographic data summary. Such items as the County's background, resource base, topography, soils, water resources, land use plans and major public institutions are covered in Chapter Two. In addition, this chapter provides the basis for the derivation of the population projections used in subsequent chapters to derive flows for water demand and sewer production.

Chapter Three, "The Water Plan", provides guidelines for water supply to the County's citizens. A description of the County's water resources, existing water supply and distribution facilities, and projected water demands are provided as part of this chapter. Problem areas are also discussed and a process by which residents within problem areas can seek County relief is given. The tables which accompany this chapter inventory, assess, indicate problem areas, and identify potential capital projects.

"The Sewer Plan" is included as Chapter Four. A description of the existing sewer treatment and disposal facilities located within Charles County is provided in this chapter. Existing systems are assessed, and problem areas are identified. A process by which residents within problem areas can seek County relief is identified. This chapter also identifies potential capital projects which can be implemented by the public or private sector.

The Comprehensive Water and Sewer Plan's final chapter, Chapter 5, "The Financial Implementation Plan", provides a link between the County water supply and sewer needs and their implementation. The chapter also describes various funding mechanisms available to the County for financing the improvements discussed in Chapters Three and Four. Another important aspect of this chapter is the discussion of the capital improvements planning strategy in relation to water and sewer planning, and how this Plan can be used to present problem areas for correction. This is particularly important in today's funding environment where public utility improvements can be accomplished either: through County capital funding; public-private partnerships; developer dedications through the Zoning Ordinance's adequate public facilities or development guidance system provisions; the subdivision review process; or other programs.

The pertinent information for each chapter is provided through text, figures, tables, and appendices. The information contained within the text and the maps provides the user with the information required to understand the County's policies for providing water and sewer service for Charles County. Chapters Three and Four provide informative tables related to the County's existing system. Supporting materials appear in the form of appendices.

ADOPTING RESOLUTION

COUNTY COMMISSIONERS OF CHARLES COUNTY, MARYLAND

Resolution No. 2023-10

A Resolution Concerning

2023 UPDATE OF THE COMPREHENSIVE WATER AND SEWER PLAN FOR CHARLES COUNTY, MARYLAND

FOR THE PURPOSE OF updating the 2006 Comprehensive Water and Sewer Plan for Charles County, Maryland

WHEREAS, the County Commissioners of Charles County, Maryland (the "County Commissioners"), by authority of the Environment Article, Title 9, Subtitle 5, Annotated Code of Maryland, are directed to adopt and submit to the Maryland Department of the Environment its updated Comprehensive Water and Sewer Plan ("Plan") that is consistent with land use master planning and provides for both adequate water supply systems and sewer systems throughout Charles County to include all towns, municipal corporations, and sanitary districts; and

WHEREAS, by Resolution No. 2023-10 dated May 2, 2023, the County Commissioners, adopted an updated Comprehensive Water and Sewer Plan for Charles County and it will be submitted to the Maryland Department of the Environment for review and approval; and

WHEREAS, the County Commissioners held a duly advertised public hearing on March 14 & 15, 2023, and a subsequent Work Session on May 2, 2023, to consider the proposed updated Charles County Comprehensive Water and Sewer Plan and corresponding maps; and

WHEREAS, the County Commissioners after serious deliberation and study, are of the opinion that it is in the best interest of the residents of Charles County that the updated Comprehensive Water and Sewer Plan and corresponding maps be adopted and approved.

NOW THEREFORE, BE IT RESOLVED, this 9th day of May, 2023, by the County Commissioners of Charles County, Maryland that the attached 2023 Update of the Charles County Comprehensive Water and Sewer Plan and corresponding maps, are hereby adopted by the County Commissioners of Charles County, Maryland; and

FINALLY, IT IS RESOLVED, that this Resolution **IS HEREBY ADOPTED** and shall take effect on the 9th day of May, 2023.

COUNTY COMMISSIONERS OF
CHARLES COUNTY, MARYLAND

Reuben B. Collins, II, Esq., President

Ralph E. Patterson, II, M.A., Vice President

Gilbert O. Bowling, III

Thomasina O. Coates, M.S.

Amanda M. Stewart, M.Ed.

ATTEST:

Carol DeSoto, Clerk to the Commissioners

Certification by Registered Professional Engineer

Pursuant to Title 9, Subtitle 5, Subsection 04 (B)(3) of the State Department of the Environment Regulations 10.17.01, I hereby certify engineering aspects of water supply and sewer system projects have been prepared and/or reviewed for engineering adequacy.

Alicia K. Afroilan

Alicia Afroilan, P.E.
Department of Planning & Growth Management

Professional Certification: I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland, License No. 39035, Expiration Date: 06/2025.

Certification of Consistency with the Comprehensive Land Use Plan of Charles County

Sections of the Plan covering land use planning issue have been examined and reviewed for consistency with the Comprehensive Land Use Plan of Charles County, in accordance with the Annotated Code of Maryland, Title 9-506.

Charles Rice

Charles Rice
Planning Director, Planning Division
Department of Planning and Growth Management

CHAPTER 1
PLANNING FRAMEWORK

Chapter 1 provides information on the planning framework under which water supply and sewer planning is conducted in Charles County. State laws and regulations require that each county adopt, and update on a triennial basis, plans detailing guidelines for the provision of water and sewer services and facilities. Further, these plans are required to be consistent with the county's adopted comprehensive land use plan.

This Comprehensive Water and Sewer Plan is Charles County's approach to this State directive. This Water and Sewer Plan also considers the unique conditions of Charles County in drafting and implementing an appropriate plan that meets the needs of the County. Toward that end, the Charles County Government adopts the following goals, in regard to comprehensive water supply and sewer services, and the objectives and policies necessary to achieve these goals.

This Chapter also provides information on applicable Federal, State and local plans, laws, and regulations which must be considered, as well as information on the administrative structure of County government as it relates to water and sewer planning.

1.1 GOALS

Goals are long-range, generalized statements which represent the ultimate desires of the County in terms of water and sewer planning. Conditions called for in the goal statements can be achieved through a sustained series of actions over a considerable period of time. Goals are meant to be sufficiently broad to remain valid over time. The five stated goals of the Comprehensive Water and Sewer Plan are listed below:

1. To provide ample supply of safe drinking water that may be collected, treated, and delivered to points of use;

2. To provide for the proper collection and delivery of wastewater to points best suited for waste treatment, disposal, or reuse;

3. To implement the Comprehensive Water and Sewer Plan in such a manner as to be consistent with the Comprehensive Plan of Charles County, which implements the Maryland Economic Growth, Resource Protection and Planning Act of 1992 and incorporates Maryland's "Smart Growth" objectives, and to be consistent with the objectives of the Chesapeake Bay TMDL program;

4. To conduct public facilities planning in a coordinated and cost-effective manner so as to meet current and future needs; and

5. To conduct water and sewer planning in an open and accessible manner, and to afford the public a full opportunity to provide input through a coordinated public participation process for amendments to the Water and Sewer Plan.

1.1.1 Chesapeake Bay Total Maximum Daily Load (TMDL) & Watershed Implementation Plans (WIPs)

The United States Environmental Protection Agency (EPA), in coordination with the Bay watershed jurisdictions of Maryland, Virginia, Pennsylvania, Delaware, West Virginia, New York, and the District of Columbia (DC), developed and, on December 29, 2010, established a nutrient and sediment pollution diet for the Bay, consistent with Clean Water Act requirements, to guide and assist Chesapeake Bay restoration efforts. This pollution diet is known as the Chesapeake Bay Total Maximum Daily Load (TMDL), or Bay TMDL. This multi-jurisdictional TMDL is intended to address nutrient and sediment impairments throughout the entire 64,000 square mile Chesapeake Bay watershed. Concurrent with the development of the Bay TMDL, EPA charged the Bay watershed states and DC with developing three phases of Watershed Implementation Plans (WIPs) in order to provide adequate "reasonable assurance" that the jurisdictions can and will achieve the nutrient and sediment reductions necessary to implement the TMDL within their respective boundaries. To achieve the goals of the Bay TMDL, the Maryland Department of the Environment (MDE) developed the structure for a WIP, which outlines the sub-allocation of major basin loading caps of nutrients and sediment to each of 58 "segment-sheds" in Maryland – the land areas that drain to each impaired Bay water quality segment – and to each pollutant source sector in those areas.

Maryland's Phase I Plan provides a series of proposed statewide strategies that will collectively meet the 2017 target (70% of the total nutrient and sediment reductions needed to meet final 2020 goals). After more than a year of cooperative work, MDE and the Departments of Natural Resources, Agriculture, and Planning released a Draft Phase I Plan for public review in October 2010 and, following extensive consideration of hundreds of public comments, submitted Maryland's Final Phase I Watershed Implementation Plan to EPA on December 3, 2010.

Maryland's Phase II Plan provides a series of proposed locally driven strategies that will collectively meet the 2017 target (60% of the total nutrient and sediment reductions needed to meet final 2025 goals). The completion date was changed from Phase I due to concerns that the implementation was not achievable within the shorter timeframe. Maryland worked with many partners in local jurisdictions to develop Phase II Watershed Implementation Plans with more detailed reduction targets and specific strategies to further ensure that the water quality goals of the Bay TMDL will be met. The Charles County Phase II Watershed Implementation Plan

Strategy was completed in February 2013 and includes alternative stormwater and septic strategies to meet 2025 nutrient reduction goals. The septic strategies are for evaluation and incorporation into the Comprehensive Water and Sewer Plan. The most cost effective septic nitrogen reduction strategy proposed in the County's Watershed Implementation Plan includes implementing a septic system pump-out program, septic connections to waste water treatment plants, installation of nitrogen removal technology on existing septic systems, and managing point source loads at the County's wastewater treatment plants through process optimization, expanded reuse of treated effluent, and targeting growth within the County's Development District. The County is also evaluating its Phase II WIP strategy considering the Maryland Water Quality Trading Program adopted in 2018, which will provide additional opportunities for cost-effective, market-driven strategies to reduce the overall cost of implementation.

Maryland's Phase III Plan assesses progress through 2017, guides the final years of Bay restoration through 2025 with significant margins of safety and plans to sustain restoration into the future. The Plan focuses on the reduction of nitrogen, since phosphorus and sediment reductions are already on track to meet the goals. Each source sector has core strategies to complete by 2025. The wastewater sector's core strategies follow:

- Complete Bay Restoration Fund Enhanced Nutrient Removal (ENR) upgrades to 67 significant municipal wastewater plants,
- Continue funding ENR upgrades for non-significant municipal plants through BRF (11 additional plants by 2025, for a total of 16),
- Provide Operations and Management Grant through the BRF for facilities achieving nitrogen discharge concentrations of 3.0 mg/L,
- Incentivize higher treatment levels (beyond 3.0 mg/L of nitrogen) through water quality trading and the Clean Water Commerce Act (through 2021),
- Complete upgrades to federal significant municipal plant, continue minor industrial reductions, maintain achievement of significant industrial waste load allocations, and
- Implement sewer projects to address combined sewer overflows, sanitary sewer overflows, and inflow and infiltration.

Core strategies for the septic sector are upgrading 6,440 septic systems to best available nitrogen removal technology, connecting 1,600 septic systems to wastewater treatment plants, and development of local Septic Stewardship Plans by 2021. Since much of the on-the-ground implementation occurs at the local government level, challenges include proper installation and ongoing maintenance of practices, as well as ensuring local restoration capacity. While the Phase III Plan is designed to meet the Bay TMDL goals, Maryland is also strongly committed to broader goals outlined in the current 2014 Chesapeake Bay Agreement for sustainable fisheries, vital habitats, reducing toxic contaminants, healthy watersheds, land conservation, stewardship, public access, environmental literacy, and climate resiliency.

Specific Charles County Phase III Watershed Implementation Plan sector goals are included as an appendix to the Plan. Charles County will continue to work with MDE and other partners to implement the Phase III WIP.

1.2 OBJECTIVES AND GENERAL POLICIES

The goal statements of the Water and Sewer Plan are accomplished through the following objectives and general policy statements. Objectives are more specific and immediate in nature and are intended to be intermediate steps toward achieving the goals. General policies are specific guidelines intended to implement the goals of this Water and Sewer Plan and the policies and intent of the Comprehensive Plan. In order to be sufficiently comprehensive, these objectives are broken down into several sections, including: water quality and supply; growth management; public facilities and services; individual water supply and sewer systems; public participation; funding; and implementation. The following are not listed in order of priority.

1.2.1 Water Quality and Supply Objectives

The Annotated Code of Maryland establishes State policies to improve, conserve, and manage the quality of waters of the State and protect, maintain, and improve the domestic, agricultural, industrial, recreational, and other beneficial uses. State public policy provides for the legitimate, beneficial uses of this State's waters, and to provide for prevention, abatement, and control of new or existing water pollution. In addition to these State policies, the Charles County Water and Sewer Plan establishes several water quality and supply objectives and policies. The water quality and supply objectives of the Comprehensive Water and Sewer Plan are:

1) To improve the water quality of Charles County streams by meeting assigned effluent discharge requirements and by identifying and seeking to reduce other sources of pollution.

2) To coordinate with State and Federal agencies and to work cooperatively in improving the quality of waters of the State.

3) To encourage the wise use of groundwater, explore alternative sources for future water supply, and to coordinate with State agencies on water use issues.

4) To encourage greater use of reclaimed wastewater for irrigation and industrial purposes, reducing demands on limited groundwater resources and reducing the discharge of pollutants from the County's wastewater treatment plants.

5) To assure a dependable supply of water for residential, institutional, commercial, and industrial uses, as well as crop irrigation, fire suppression, and stream assimilation for present and future generations.

6) To correct sanitary and water supply problems in existing problem areas through coordinated planning with County, State, and Federal agencies.

7) To implement a water interconnection policy that would require the joining of water systems and ultimately create a unified central water system.

The following general policies will be used to accomplish the stated objectives, and to implement the Water and Sewer Plan:

a) The use of groundwater as the primary source of drinking water will be continued, while alternative sources are evaluated for potable water supply. Efforts will be concentrated in areas that experience the greatest groundwater supply problems.

b) The County will construct a Potable Water Treatment Plant as an alternative source of potable water supply to conserve groundwater. Refer to Chapter 3 for County's Plan for a Potable Water Treatment Plant.

c) Land application of wastewater effluent and/or advanced wastewater treatment, where practical and environmentally safe, will be encouraged over traditional point-source treatment and discharge into waters of the County or State.

d) Tier II streams will be protected by prohibiting future direct point-source discharge of sewage effluent.

e) The County will coordinate with the Maryland Department of the Environment (MDE), the Department of Natural Resources (DNR), and the Department of Health to ensure that marine pump-out facilities are available at all existing and future marinas.

f) Conservation of potable water sources will be encouraged through the implementation of water conservation techniques and programs.

g) River basin coordination with adjoining jurisdictions and State and Federal agencies will be encouraged.

h) The reuse of effluent, where practical and environmentally safe, as a method of reducing effluent volume and permitted discharge amounts into waters of the State, will be encouraged to the extent it is available.

1.2.2 Growth Management Objectives

WATER AND SEWER PLAN / ADOPTION DATE: 5/25/2010

This section provides guidance for water supply and sewer planning activities in relation to the County's land use and growth management policies as expressed in the Charles County Comprehensive Plan. This Water and Sewer Plan is an important means of implementing the Comprehensive Plan and provides specific direction for water supply and sewer facilities. The following objectives of the Water and Sewer Plan thus reinforce and strengthen the Comprehensive Plan:

1) To coordinate the provision of public water supply and sewer systems in areas already served or proposed to be served by public water supply and sewer systems.

2) To provide a framework for scheduling and prioritization of water and sewer projects based on an evaluation of existing facilities usage, public health considerations, and desired growth patterns, and support the County's goals of diversity, equity, and inclusion.

3) To achieve planned densities within the Development District as adopted in the Comprehensive Plan through coordinated extension of public water supply and sewer systems and capacity enhancements.

4) To meet public water and sewer infrastructure needs in existing developed areas, particularly in the Comprehensive Plan's Development District and known failing septics.

5) To assure that adequate public infrastructure and facility improvements are planned and provided for in an effective and efficient manner, and to encourage new development to emanate from the urban core and town centers.

6) To implement the Watershed Conservation District as adopted in the 2016 Comprehensive Plan which provides for low density residential development not consistent with public water and sewer systems while allowing for non-conforming status of existing and planned development projects.

7) To develop a long-term water supply and distribution plan which will address aquifer management strategy and expansion of the WSSC water supply system in Charles County.

8) To replace or to upgrade existing undersized sewer treatment systems with Enhanced Nutrient Removal facilities and other associated infrastructure improvements.

The following general policies will be used to accomplish the stated objectives and to implement the Water and Sewer Plan.

a) To maximize the use of existing infrastructure, limit the proliferation of new discharges to sensitive resources within the County, and leverage continued capital investments in the County's treatment and collection systems, the Mattawoman Sewer Treatment Facility shall continue to be the County's primary regional wastewater treatment facility serving undeveloped areas of the unincorporated Charles County.

b) Satellite treatment facilities serving new residential development are prohibited outside the Mattawoman Sewer Service Area and the established water and sewer service areas associated with Rural Village areas. Satellite treatment facilities may be approved at the discretion of the Charles County Commissioners, as is consistent with the Charles County Comprehensive Plan and permitted only in the following cases:

   i. To address environmental or public health problems created by existing development.

ii. To serve commercial or industrial projects which are approved by the County Commissioners.

c) The County shall minimize pump stations and maximize the usage of gravity systems to serve new development within the Mattawoman Sewer Service Area

d) The County Commissioners shall continue to consider priority classification amendments for both water supply and sewer systems in accordance with established amendment procedures, and may, according to criteria established as part of this Plan, grant water supply and sewer treatment capacity as is consistent with the best interests of the County.

e) The County shall limit the provision of water and sewer facilities or service in rural areas of the County which do not permit the efficient investment of services or which might encourage growth in currently unserved areas of the County outside the Development District or Rural Villages.

f) Extensions of water and sewer will be coordinated so that land development does not exceed the County's ability to finance needed services and capital construction.

g) The County shall continue to utilize a water supply and sewer allocation policy as a means to maintain the target growth rate identified in the Comprehensive Plan.

h) The Mattawoman Sewer Service Area shall not be extended beyond its present limits, unless such expansion is consistent with the Comprehensive Plan, land use, and zoning.

i) Interconnection of water supply systems located within the Waldorf and Bryans Road water interconnection zones as designated on the Water and Sewer Plan maps, shall be required. The County shall continue to implement infrastructure extensions for the ultimate interconnection of the County's water interconnection zones.

j) The County Commissioners, when considering classification amendments for water supply and sewer systems, shall consider land use modifications related to the replacement or upgrade of existing undersized sewer treatment systems, or to upgrade of sewer systems with Enhanced Nutrient Removal facilities and other associated infrastructure improvements.

1.2.3 Public Facilities and Services Objectives

The following provides a framework for the provision of community and public water supply and sewer facilities, and guidance for the County's operations and maintenance activities. Charles County, like many rapidly growing jurisdictions, faces two major challenges regarding the provision of these facilities. The County needs to provide the facilities and services required to meet the needs generated by growth and development. Secondly, the County needs to conduct pro-active planning to assure that facilities are coordinated to meet projected demands and meet the County's overall water quality objectives. The objectives to meet these challenges include:

1) To assure that water and sewer service is provided in a cost-effective and efficient manner.

2) To coordinate the extension of public water supply and sewer systems in areas presently served or proposed to be served by these services.

3) To assure that the County Commissioners operate water supply and/or sewer facilities within their ownership as a responsible and fiscally sound public utility.

The following general policies will be used to accomplish the stated objectives:

a) The County will continue to operate and maintain all existing systems within its ownership.

b) The County will encourage the dedication of privately owned facilities to County ownership and maintenance. The private community water and/or sewer systems desiring system conversion shall be brought into compliance with Federal, State and County standards at the time of dedication.

c) All new community water supply and sewer systems shall be publicly owned.

d) All new facilities must be inspected to assure compliance with Charles County construction and operational specifications.

e) An equitable method shall be established by the County Commissioners to pay for interconnections. Interconnection of water systems will not require property owners to tie into private systems or municipalities.

f) The County will maintain and enhance the fire protection plan, especially focusing on the needs of the rural areas.

g) The County will maintain and update the design criteria for the construction of water and sewer facilities contained in the Water and Sewer Ordinance.

h) The County will develop and maintain a sewer capacity model and a water capacity and pressure monitoring model.

i) Interim water supply and sewer facilities may be allowed, at the discretion of the County Commissioners, within the Development District, subject to the following conditions:

    1) The Comprehensive Water and Sewer Plan maps indicate the location of the infrastructure which is proposed as the general location of the facility to provide service;

    2) The applicant has consented to participate in the program to implement the permanent infrastructure solution;

3) The applicant, or subsequent property owners, shall enter into an agreement with the County Commissioners. This agreement shall specify the timing of construction of permanent infrastructure, financing programs to be used to implement proposed permanent infrastructure, as well as other issues, as determined appropriate by the County Commissioners. This agreement must be executed prior to preliminary subdivision approval; and

4) The applicant is required to discontinue use of such facilities within one year of the availability of public water supply and sewer systems.

j) The extension of water service shall be considered at the same time as sewer service is extended into an area.

k) Central water system interconnection is encouraged as a method to correct failing water supply systems.

l) In coordination with the Maryland Department of the Environment, the County shall continue efforts to meet requirements for nutrient reduction in its sewer treatment program through the implementation of the Biological Nutrient Removal (BNR) and/or the Enhanced Nutrient Removal (ENR) processes.

m) The County will continue to oversee sludge stabilization and distribution from the Mattawoman Wastewater Treatment Plant.

n) The County will continue to implement Enhanced Nutrient Removal (ENR) technology at the Mattawoman Wastewater Treatment Plant.

o) The County will continue to pursue the capacity expansion of the Mattawoman Wastewater Treatment Plant.

p) The hydraulic water supply and sewer model shall be utilized as a growth simulation and infrastructure impact tool. The model shall be revised and updated on a regular basis.

q) The petition process for the orderly and efficient transition of water and/or sewer facilities from private to public ownership, which went into effect on October 1, 1997, shall be utilized.

r) Interconnection with the County's major sewer interceptors at existing stub-outs shall be required, wherever possible.

s) Sewer mini-basin planning shall be encouraged. Sub-interceptors and trunk lines shall be sized for the entire mini-basin or service area at full build-out according to the densities as allowed in the Zoning Ordinance.

t) A mechanism whereby allocations are voided under certain circumstances shall be maintained. These circumstances include the following:

   1) The preliminary plan of subdivision has expired;

   2) The Planning Commission chooses not to extend the preliminary plan of subdivision or the County Commissioners choose not to extend the allocation;

   3) The applicant has failed to pay the necessary fees for the allocation within the specified period; or

1.2.4 Individual Water Supply and Sewer Systems Objectives

AMENDED: 7/7/2009 BY RESOLUTION 2009-126.

Charles County is characterized by a variety of land uses. Formerly rural, the County retains significant concentrations of agricultural land. In an effort to preserve this rural character, the Comprehensive Plan excludes the agricultural lands from the Development District. This section of Chapter One provides guidelines for those agricultural or rural lands outside of the Development District which are to be served by individual and community water supply and sewer systems. Specific objectives include:

1) To provide guidance to homeowners utilizing individual well and septic systems within areas of the County not planned for public service.

2) To provide opportunities for residents in identified failing septic areas or with failing wells to correct existing supply, health, and environmental problems.

3) To encourage residents of identified failing well systems to interconnect with community water supply systems, if available.

4) To educate the users of septic systems regarding the proper maintenance of home septic systems.

5) Where possible, to make provisions for financial assistance or grant opportunities, to homeowners in areas of failing septics or wells.

The following general policies will be used to accomplish the stated objectives, and to implement the Water and Sewer Plan:

a) New individual water supply or individual septic system, for domestic or non-domestic use, shall not be permitted to be installed where an adequate community or public water or sewer facility is available or will be available (Map Categories 1 and 3) within a reasonable time frame, as determined by the Director of Planning and Growth

Management and the Director of Environmental Health, Charles County Department of Health.[1]

b) The Charles County Department of Health shall continue to regulate individual water supply systems, individual sewer systems, the holding tank program, the innovative and alternative septic program.

c) In areas where sanitary sewage and/or water supply problems exist, the best and most economical technologies and methods shall be used to correct sanitary sewage and water supply problems.

d) In order to protect the public health, as is determined by the Director of Environmental Health of Charles County Department of Health, the County shall be allowed to convert private-owned community water supply and sewer systems to public ownership.

e) No new independent community water and/or sewer systems will be permitted within the County with the exception of those systems needed to correct a failed system.

f) Innovative and Alternative Wastewater Systems are only to be used for the replacement of failing septic systems. Undeveloped lots of record prior to September 28, 1994, that will not pass conventional percolation tests, may be eligible to use Alternative wastewater systems. *(See Section 4.2.3.3 for details).*

g) Unimproved properties or existing properties located outside the Development District and in a no-planned service area, to include town centers, failing systems and affordable housing may be served by shared sewage disposal facilities, if deemed appropriate by the Charles County Commissioners. *(See Policy on Shared Facilities in Section 1.3.13).*

h) Existing properties located outside the Development District and in a no-planned service area–may be served by shared well facilities for the sole purpose of correcting existing water supply or water quality problems as identified by the Charles County Department of Health, if approved by the Charles County Commissioners. *(See Policy on Shared Facilities in Section 1.3.13).*

1.2.5 Public Participation Objectives

Public participation in the water and sewer planning process is of primary importance to Charles County Government. The County's mission statement emphasizes openness and accessibility in governance. Toward that end, this Comprehensive Water and Sewer Plan puts forward the following in relation to the review and amendment of the Plan. State regulations require that the Water and Sewer Plan be reviewed on a triennial basis. Additionally, the County Commissioners have established policies for more frequent amendments of the Plan. The objectives for public participation are:

[1] Unless as specifically permitted under a separate policy or amendment.

1) To provide the public with an opportunity for review and comment of the Water and Sewer Plan through public participation processes which are open and accessible.

2) To provide, through amendments of the Water and Sewer Plan, an opportunity for public input.

The following general policies will be used to accomplish the stated objectives:

a) Charles County staff will prepare appropriate materials for public review and will make these publicly available in accordance with the administrative procedures to amend the Water and Sewer Plan.

b) Public meetings will be publicly advertised in newspapers of general circulation in accordance with the administrative procedures to amend the Water and Sewer Plan.

c) The County Commissioners may direct staff to provide additional information to the public as necessary.

1.2.6 Funding and Implementation Objectives

The following objectives will be used to implement the Comprehensive Water and Sewer Plan by assuring that water and sewer service is provided in an efficient and cost-effective manner. The funding and implementation objectives are:

1) To coordinate public water supply and sewer infrastructure needs with the County's Capital Improvements Program (CIP).

2) To actively seek State and Federal funding for water supply and sewer projects, where appropriate.

3) To encourage public-private partnerships as a means to implement water supply and sewer needs through the review and approval of developments for compliance with the Charles County Zoning Ordinance, Subdivision Regulations and the Water and Sewer Ordinances.

4) To provide sources of local funding for water and sewer capital projects.

The following general policies will be used to accomplish the stated objectives:

a) Staff recommendations for water and sewer projects to be included in the County Capital Improvements Program shall be provided to the Director of Planning & Growth Management on an annual basis. If approved for inclusion in Planning and Growth Management's funding requests, these projects are submitted to the Charles County Commissioners for consideration.

b) The rate structure utilized in the public water supply and sewer program shall be periodically re-evaluated to assure that the water and sewer enterprise fund operates in an efficient and cost-effective manner.

c) Developer participation in the County's water supply and sewer capital projects program shall be encouraged.

d) New development will pay for new infrastructure improvements.

e) To prevent leapfrog development and minimize the costs associated with development, water and sewer facilities shall extend outward from the existing urban core. Water and sewer extensions shall be planned so that land development does not exceed the County's ability to finance needed services and capital construction.

f) Developers shall enter into a Development Agreement with the County to ensure the provision of water and sewer service to the development. These agreements shall include provisions for funding, acquisition, rebates, operations, and maintenance for the benefit of the County and the property owner.

g) A rebate program shall be administered to reimburse, through third-party connection fees, developers who size facilities appropriately for the use of adjoining properties. The agreement between the County and the original developer shall be codified in the form of a developer agreement.

h) Surcharges based on water and sewer service areas, shall be utilized wherever possible so that costs are born fairly by those receiving the service.

i) The creation of special taxing districts for water and sewer improvements shall be investigated.

1.3 ADOPTED IMPLEMENTATION POLICIES

The following policies have been adopted by the County Commissioners and are official policies for implementation.

1.3.1 Policy on Individual Well and Septic Systems within the Development District

WATER AND SEWER PLAN / ADOPTION DATE: 10/1/92, 6/28/94
AMENDED BY RESOLUTION 2000-56 ON AUGUST 1, 2000

Properties within the County’s designated Development District that have a sewer category of S5 or a water category of W5 may develop an individual lot with a well and a septic system. No new community or shared wells, nor community or shared septic systems are permitted within the Charles County Development District. Properties with a water and/or sewer category of W3/S3 must develop on public water and sewer systems.

1.3.2 Policy on Water and Sewer Commitments

WATER AND SEWER PLAN / RE-ADOPTED: 6/28/94

In accordance with Title 9-505 of the Annotated Code of Maryland (Environmental Article), the County Commissioners have adopted a Water and Sewer Allocation Policy. The Allocation Policy has been developed to ensure that water and Wastewater Treatment capacity is wisely managed to prevent the depletion of underlying water-bearing aquifers or the over-commitment of available Wastewater Treatment capacity. Allocation amounts may not exceed the allocation targets as established as 'Schedule A' of this policy (See Table 1-1). In addition, the policy provides for a reasonable, fair, and equitable administrative procedure for the allocation of water and Wastewater Treatment capacity. The complete policy is fully contained in the Water and Sewer Ordinance, Section 6.0.

On behalf of the County Commissioners, the Department of Planning & Growth Management is allocating water and sewer capacity for residential projects within the designated service areas (as defined on the Water and Sewer Plan maps) in accordance with applicable water and sewer allocation policies contained in this plan.

TABLE 1-1

Schedule A

Part I Water Supply and Distribution Systems (all Units MGD)

System Name	Rated Capacity (1) or Appropriation Permit	Current Pumpage (3)	Committed Allocations	Available Capacity Target
Waldorf (4)(6)(7)	7.070	5.377	0.829	0.864
Hunters Brooke	0.116	0.044	0.0018	0.069
Bryans Road (4)	0.570(2)	0.386	0.148	0.036
Benedict	0.056(2)	0.018	0	0.038
Bel Alton Estates	0.0290(2)	0.0173	0	0 (5)
Brookwood Estates	0.035	0.018	0	0 (5)
Chapel Pt. Woods	0.080	0.028	0.0014	0.038
Avon Crest	0.0091(2)	0.0053	0	None (5)
Ellenwood	0.0346(2)	0.0113	0	0.0233
Mariellen Park	0.0180(2)	0.0091	0	None (5)
Newtown Village	0.0147(2)	0.0090	0	None (5)
Mt. Carmel Woods	0.015(2)	0.0085	0	0.0065
Oakwood	0.005(2)	0.0018	0	None (5)
Spring Valley	0.0096(2)	0.0047	0	None (5)
Beantown Park	0.014	0.0075	0	None (5)
Clifton-on-the-Potomac	0.085(2)	0.055	0.003	0.027
Swan Point (4)	0.500(2)	0.063	0	0.437

Source: Charles County Department of Planning and Growth Management (PGM) & Department of Public Works, Division of Utilities, 2020.

NOTE: 1,2,3) A quarterly report which supplements this Schedule A is available from the Charles County PGM.
4) A supplemental policy applies to this system.
5) Subdivision served by this system is built out.
6) Bensville, Eutaw Forest, and Dutton's Addition Water Systems have been interconnected to Waldorf.
7) Per the 1987 Agreement with WSSC, Charles County can use up to 1.4 MGD of WSSC water to supplement the Waldorf Water System. This source adds to the overall capacity of the Waldorf System. Current usage of the WSSC allotment is 0.022 mgd.

TABLE 1-2

Schedule A

Part II Sewerage Collection and Treatment Systems (all units are MGD)

System Name	Rated Capacity (1)	Current Flows (1)	Committed Allocations	Available Capacity Target
Mattawoman (2)(5)(7)	20.00	10.047	3.571	6.382
Mt. Carmel Woods (3)	0.0180	0.0058	0.0021	0.0101
Cliffton-on-the-Potomac (8) (2)(4)	0.0700	0.033	0	0
Bel Alton	0.0320	0.0064	0.0071	0.0185
Cobb Island (2)	0.1580	0.060	0	0.098
Swan Point (2) (6)	0.300	0.124	0.017	0.159

Source: Charles County Department of Planning and Growth Management & Department of Public Works, Division of Utilities, 2020.

NOTE:

1) A quarterly report which supplements this Schedule A is available from the Charles County Department of Planning and Growth Management.
2) A supplemental policy applies to this system. Also note that the current flows are higher than actual flows since water is being diverted to the plant from Cobb Island to insure proper operation of the plant.
3) System upgrades are planned. (See Chapter 4 for details.)
4) Upon approval of a percolation test by the Charles County Department of Health, individual lots of record may develop on a private septic system.
5) Current Commitments include 3.0 MGD to WSSC, 0.247 MGD to St. Charles Communities, and other allocated commitments.
6) Per the Swan Point Utility Agreement, 0.070 MGD of the plant capacity is exclusively reserved for the County use.
7) Mattawoman WWTP was re-rated to 20 MGD upon completion of the ENR upgrade and NPDES permit renewal.
8) Cliffton currently has no available capacity due to discharge limitations.

Projects receiving preliminary subdivision approval are available for allocation and are granted allocations in the order of the date approved by the Planning Commission. These projects must be designated as an "S-3" or "W-3" service category. If the property does not have the W3 and/or S3 service category, the property owner or representative must apply for the necessary category change during the next available allocation cycle (see Section 1.4.2) prior to receiving water or sewer allocations.

Commercial and industrial projects are granted allocation on a first-come, first served basis and are committed allocations. It is the County's intention to promote a balanced tax base by allocating as much sewer capacity as is necessary for commercial and industrial projects up to a point of a higher percentage than is presently the case.

New proposed development shall be evaluated taking into consideration matters of residential, commercial, industrial and other land use needs; planning, zoning and subdivision control requirements; population projections; engineering constraints; economic justification and fiscal concerns, federal, state, regional, county, municipal, and sub-area land use related plans; availability and adequacy of public facilities to include water supply and sewer systems; availability and adequacy of storage and treatment capacity; and, the need to alleviate public health and safety problems. Water and/or sewer service should be extended systematically in concert with the capital programming of other public facilities, and in accordance with the County Comprehensive Plan.

1.3.3 Policy on Water or Sewer Community Systems - Plant or Line Installation in Areas Where Services are not available

WATER AND SEWER PLAN / RE-ADOPTED: 6/28/94

Within existing designated water and sewer service areas, it is desirable to provide and utilize public/central water and/or sewer systems. However, community systems may be approved contingent upon a finding by the Charles County Commissioners that a connection to existing public/central facilities is not feasible. If no facilities exist, the property owner/developer may enter into an official agreement with the Charles County Commissioners to provide a community system for water and/or sewer service for the proposed development. If the appeal is granted and the system found satisfactory by the County, then an exception may be granted. Consistent with County policy that all new community water and wastewater systems will be publicly owned, the water and/or sewer system will be designed to County specifications, and dedicated to the County according to the process set forth in Part V of the Water and Sewer Ordinance.

Any property owner/developer seeking to construct a community water and/or sewer system must be granted approval by the County Commissioners. Such an application shall be made in a form similar to a request for an amendment to this Plan and shall be considered in the same manner. Also, appeals to the Maryland Department of the Environment and to the courts are provided for under the law.

In the plan approval/building permit process, there must be an assurance for any subdivision plat and/or building application that it is in conformance with the Water and Sewer Plan, and further that any and all development proposals are in accordance with the Charles County

Comprehensive Plan, the County Zoning Ordinance, the County capital improvements planning efforts, the Housing Plan, and other adopted planning criteria. Information is required to be assembled in the form of amendment request forms, written statements, public testimony, plans, maps and any other material relevant to such a case for the application.

Generally, outside of the limits of proposed service areas, individual wells and individual septic tank/drain field systems will be permitted where approved by the Department of Health of Charles County. Any new community system, treatment plant, or major improvement must be located in or near growth areas as identified in the Charles County Comprehensive Plan. They may be used to serve areas deemed a health problem as established and documented by the Charles County Department of Health.

Any purchase of future reserve capacity in an existing or proposed public water and/or sewer system shall be on a lump sum or a per annum basis, in order to contribute towards the capital, operating and maintenance costs for the duration of time the project development takes from planning to occupancy and use.

1.3.4 Rebate Policy

WATER AND SEWER PLAN / ADOPTION DATE: 12/18/92

A developer, within a fifteen year period from the date of dedication of the off-site improvement, shall be entitled to a payment or credit for constructing a water and/or sewer line which has capacity available to serve other off-site County customers.

The official rebate policy can be found in the Charles County Commissioners Resolution 92-91 and in the Water and Sewer Ordinance, Section 5.7. Any individual, corporation, or developer seeking a rebate for the construction of excess water or sewer capacity must receive the approval of a Developer Agreement by the Charles County Commissioners prior to the rebate of any funds. The Developer Agreement must specify the exact excess capacity subject to the rebate, the terms and requirements of the rebate, the maximum payback of the rebate, and other related terms and conditions.

1.3.5 Clarification of the Policy Regarding Clifton on the Potomac

POLICY ADOPTED BY THE CHARLES COUNTY COMMISSIONERS ON OCTOBER 16, 2000, AMENDED OCTOBER 21, 2003, AMENDED MAY 25, 2010.

The Charles County Commissioners have determined it to be in the best interest of the County to allow lots of record in Clifton as of October 16, 2000, to perform percolation tests. If the property is approved for on-site sewage disposal, an on-site sewage disposal system (OSDS) can be installed on the lot, thereby allowing the development of the lot. The Commissioners are requiring lots with approved OSDS to complete an Interim Sewer Agreement. An interim sewer agreement states that the OSDS will be used on an interim basis and when capacity becomes available in the Wastewater Treatment plant, the lots will be required to connect to the sewer system and abandon the OSDS.

Any newly developed lots will be required to connect to the public water system and will need to obtain allocations. Lot owners will be responsible for connecting to the public water system and providing any necessary road improvements. If the lots front a road that is not owned by the county, there will need to be a signed agreement stating that the road is unimproved and not in the County's Transportation Plan for improvements. All other county, state, and federal regulations still apply to the building permit process.

The County considers the replacement of the current treatment plant with an Enhanced Nutrient Removal plant and other necessary facility upgrades a priority. Plans for replacement of the current treatment plant may include such new users as necessary in order to support the financial integrity of the Enhanced Nutrient Removal facility consistent with requirements of a "financial management plan."

1.3.6 Administrative Exemption to the Priority Classification System Requirements for New Single Family Dwellings on Single Lots

POLICY ADOPTED BY THE CHARLES COUNTY COMMISSIONERS JULY 20, 1995 BY RESOLUTION 95-56

The Charles County Commissioners may administratively amend water and sewer service categories for new single-family lot properties, if certain criteria and conditions are met. These include:

1) The amendment will be consistent with the Comprehensive Plan;

2) The lot is designated as W5, S5 on the Comprehensive Water and Sewer Plan maps;

3) The applicant is the owner of, and intends to reside upon, the property for which service is sought;

4) The water and sewer category amendment fee has been paid;

5) The subject property is a legally recorded lot of five acres or less, as of the effective date of this amendment;

6) The applicant will conform to County policies regarding the sizing of collection and distribution systems, and will submit the design drawings for the systems to be installed to the County for their review. These design drawings will also be submitted to the Maryland Department of the Environment, for their review, as is consistent with State regulations; and

7) Staff has determined that said improvement of the lot will not have an adverse impact on water and sewer capacity (in collection lines, distribution lines, and pump stations) or an adverse impact on water and sewer infrastructure in the area.

8) The applicant obtains a water and/or sewer allocation for the intended use of the property.

1.3.7 Policy for Swan Point Water and Sewer Allocations

WATER AND SEWER PLAN / ADOPTION DATE: 2/11/03
AMENDED OCTOBER 21, 2006

In 2004, the Nation Pollution Discharge Elimination System (NPDES) permit for the Swan Point Wastewater Treatment Plant was expanded from 70,000 gallons per day (gpd) to 600,000 gpd upon the completion of a new Enhanced Nutrient Removal (ENR) treatment facility. Per the zoning indenture known as Docket 250, the original developer, U.S. Steel, was entitled to a bulk water and sewer allocation of 70,000 gpd. Under the 2005 Swan Point Utility Agreement, the new developer, Brookfield Homes, was granted a bulk sewer allocation of 530,000 gpd, with the remaining 70,000 gpd of capacity being retained by the County for use outside of the Swan Point community. A flow factor of 230 gpd has been designated for the swan point sewer system.

The Groundwater Appropriation Permit (GAP) for the Swan Point Community was amended in 2006 to state that the well may pump 600,000 gpd. Applicants seeking capacity in the Swan Point water and sewer system should refer to the Supplemental Allocation Policy for Swan Point located in Section 6.0 of the Charles County Water and Sewer Ordinance.

1.3.8 Policy for the White Plains Economic Development Service Area

WATER AND SEWER PLAN / ADOPTION DATE: 2/11/03

To further the economic development and growth management goals of the 1997 Charles County Comprehensive Plan, the Charles County Commissioners designed and constructed sewer system upgrades in the White Plains Economic Development Service Area to encourage and facilitate the growth and development of targeted industries in the County. These target industries will provide employment and increase the commercial and industrial tax base of the County. This service area is being provided for economic development purposes only to protect and promote the health, safety, and general welfare of the residents of Charles County, Maryland. The infrastructure necessary to provide the limited service area will be financed by the expenditure of public funds to further the important governmental function and purpose.

1) *White Plains Economic Development Sewerage Service Area*

   The White Plains Sewerage Area is shown on Sewerage Service Maps 6 and 10. Service is available only for properties within the service area for economic development. An appropriate fee will be assessed for service connection that will offset the proportionate share of the cost of providing service.

2) *New Sewerage Connections*

   As an incentive, the County Commissioners of Charles County, Maryland will consider a refund in full or in part, of the sewer connection fees associated with water and sewer in the designated White Plains Economic Development Service Area for any targeted industry or business in the Business Park (BP) zone that meets certain criteria as established by the County Commissioners in conjunction with the County's economic development objectives.

1.3.9 Policy for the Pisgah Well Reimbursement Program

WATER AND SEWER PLAN / ADOPTION DATE: 2/11/03

Land owners within ½ mile of the former Pisgah landfill are eligible for partial reimbursement for the installation of a double-encased artesian well. An applicant must contact the Charles County Department of Planning and Growth Management to determine if their property qualifies for the program and to receive a copy of the "*Pisgah Well Reimbursement Program Procedures*." If the applicant does not follow the Reimbursement Program Procedures, the applicant will not be eligible for reimbursement. If the applicant is qualified by the Department of Planning and Growth Management, they are eligible for reimbursement of the costs associated with the additional protective casing installed as part of the artesian well. Once the applicant is determined to be qualified, they must submit at least three bids from qualified well drillers to the Charles County Department of Planning and Growth Management, Planning Division. The applicant must enter into a Reimbursement Agreement and have the well installed to the program requirements as outlined in the Reimbursement Program Procedures.

1.3.10 Policy on Interim Sewer Agreements

WATER AND SEWER PLAN / ADOPTION DATE: 2/11/03

Charles County discourages the use of Interim Sewer Agreements (ISA). The County may enter into an ISA when a property with a water and sewer category of W1, W3, S1, or S3, can demonstrate a hardship due to the connection to public water or sewer facilities is not feasible. Under the ISA, the property would be required to connect into the County water and sewer system within one year of the facilities availability to the property line, and close and abandon the well and septic system. The property owner will be responsible for the cost, engineering, and installation of the water and sewer lines from the improvement to the public facility. The subject agreement will be recorded among the Land Records of Charles County in order to ensure that all subsequent property owners are made aware of the agreement upon land transfers.

1.3.11 Policy on Shared Sewage Disposal Facilities

WATER AND SEWER PLAN/ADOPTION DATE: 5/13/2008. AMENDMENT DATES: 11/19/2008; 1/28/2009; 7/7/2009

Shared sewage disposal facility means a sewerage system which serves more than one parcel or lot of land or more than one use on a single parcel or lot of land with the sewerage disposal system located on either 1) individual parcels or lots; or 2) on parcels or lots owned in common by the users or a controlling authority. These systems may be proposed and constructed by a public or private entity. Shared sewage disposal facilities shall be designed, approved and constructed in accordance with any applicable Federal, State and/or County regulation or law. All shared sewage disposal facilities for major subdivisions must receive approval of a sewer category amendment to the Comprehensive Water and Sewer Plan, as the County Commissioners will be the Controlling Authority of all Shared Sanitary Systems within Charles County. All shared sewage disposal facilities shall be automatically included in subsequent updates of the Plan.

1.3.12 Policy on Shared Well Facilities

WATER AND SEWER PLAN/ADOPTION DATE: 7/7/2009

Shared well facility means a water system which serves more than one parcel or lot of land or more than one use on a single parcel or lot of land with the well facility system located on either 1) individual parcels or lots; or 2) on parcels or lots owned in common by the users or a controlling authority. These systems may be proposed and constructed by a public or private entity. An easement shall be provided from public right of ways to and around shared well facilities to facilitate maintenance. Shared well facilities shall be designed, approved and constructed in accordance with any applicable Federal, State and/or County regulation or law. All shared well facilities receive approval of a water category amendment to the Comprehensive Water and Sewer Plan as the County Commissioners will be the Controlling Authority of all Shared Wells within Charles County. Shared well facilities are intended for the sole purpose of correcting existing water supply or water quality problems as identified by the Charles County Department of Health.

1.3.13 Policy on the Utility Connection to Established Petition Projects

WATER AND SEWER PLAN/ADOPTION DATE: 10/1/2013

As stated in the general policies sections 1.2.3 b) and 1.2.4 d), it is the County's objective to convert privately owned water and sewer systems to public ownership and maintenance. Chapter 97, Article II grants the authority and establishes the rules for assuming responsibility for privately owned utilities. Clarification is needed to establish the financial responsibility of owners of undeveloped or underdeveloped property directly benefitting from the improvements associated with the utility extension and upgrade to existing facilities set forth in the ordinance establishing the original assessment. The responsibilities are established for the various classes of property owner as follows:

1) When an owner of undeveloped or underdeveloped property was party to the original petition agreement, then the property owner or the owners of each lot subdivided will be subject to the full assessment as established in the ordinance that provides for the benefit assessment when the lots are recorded.

2) When an owner of undeveloped or underdeveloped property directly benefitting from all or a portion of the improvements associated with a petition project established under Chapter 97 requests connection to the county system, the property or the subdivided lots will be responsible for all or a portion of the benefit assessment established. Unless it is determined by the Director of Planning and Growth Management that the owner of the undeveloped property is directly benefitting from

only a portion of the improvements, then the owner or the subsequent owners of subdivided lots are responsible for the full assessment for the duration of years established in the ordinance. If the property is determined to benefit directly by only a discrete portion of the improvements in the original petition, then the Director of Planning and Growth Management may apportion the benefit assessment to the subject property and lots resulting from subdivision in the same manner as set forth in Chapter 97, Article II. The Commissioners may by ordinance, as established in Chapter 97-2 Section c, amend the benefit assessment levied on the original petitioners to reflect the payments to be made by the new petitioners. if such an amendment is made, the intent is to keep the same duration of the assessment period as established in the original ordinance.

1.4 ORGANIZATION AND ADMINISTRATIVE RESPONSIBILITIES OF COUNTY GOVERNMENT

WATER AND SEWER PLAN/AMENDMENT DATES: 7/7/2009; 7/24/2012

State regulations, pursuant to Title 9, Subtitle 5 (Environment Article) of the Annotated Code of Maryland, require that County water and sewer plans provide a discussion of the organization of County government as it relates to the management of water supply and sewer services and facilities. The Charles County Government is involved in many aspects of water and sewer planning, including: administration, review, design, project management, construction, operations and maintenance, and financing of infrastructure and facilities. The following discusses the roles of various agencies involved in the management of water supply and sewer facilities.

The Department of Planning and Growth Management is the lead agency concerned with the administration and management of water and sewer services. The Department is also responsible for the maintenance of the Water and Sewer Plan and other related County plans and regulations. This includes both the triennial revisions to this Plan and category amendments, as needed. The Department is also responsible for the administration of the water and sewer capacities to new connections as well as administering the County's capital program to construct new water or wastewater facilities.

Since 1996, the Department of Public Works, Division of Utilities, operates and maintains public water supply and sewer facilities. Utilities manages and operates the Mattawoman Wastewater Treatment Facility, as well as providing maintenance, telemetry, and monitoring systems at its facilities throughout the County. This includes the management of small-scale capital projects and all technology enhancements. The Department of Public Works also assists the Department of Planning and Growth Management with the maintenance of the Water and Sewer Plan and other special projects with its technical input. The two departments work collaboratively on system improvements as well as the capital program. Refer to Appendix 2I for the organization chart of the Operation and Maintenance group under the Department of Public Works, Division of Utilities.

The County Department of Health, Environmental Health Division, regulates individual water supply and sewer facilities in areas of the County not served by public systems. The Department of Health also maintains the County's holding tank program, the innovative and alternative septic systems program, and the marina pump-out facility program. The Department of Health also assists the County with amendments to the Water and Sewer Plan and other special projects, as needed.

The Department of Fiscal Services maintains various funds ear-marked for public water supply and sewer services. These programs include the water and sewer enterprise fund, connection fee programs, and rebate programs. The Enterprise Fund is designed to be self-sufficient.

The County Commissioners are directed by the General Assembly to consider and adopt amendments to the Water and Sewer Plan and to initiate water supply and sewer projects in their capacity as the governing body of Charles County. The Commissioners are authorized to maintain County water and sewer programs to further the health, safety, welfare, and convenience of County residents.

1.4.1 Priority Classification System

The County Commissioners have established a priority classification system in accordance with State law. The priority system is designed to show a rational, timely means to obtain such facilities, while maintaining the integrity of both the County Comprehensive Water and Sewer Plan and the County Comprehensive Land Use Plan. The priority system is designed to show need and intent of the County, its municipalities, and the development community for establishing or extending public, community, or multi-use water and sewer systems. The County Commissioners of Charles County segregate their water and sewer priority classification system as there are fundamental differences in the interpretation of these categories, which affects their implementation. Each category change requires an amendment to the Comprehensive Water and Sewer Plan, as approved by the Charles County Commissioners, except for the change from Category 3 to Category 1. The change from Category 3 to Category 1 will be completed administratively by the Charles County Department of Planning and Growth Management as properties receive an approved Utility Permit and Use and Occupancy Permit. Table 1-3 and 1-4 further detail the interpretation of these priority classification categories.

1. **Water Supply: Priority Classification System**

   a. W-6: **Outside Designated Service Areas - No Planned Service**. This category is assigned to all properties outside municipalities and outside designated water service areas. The establishment of a new water service area or expansion of an existing service area requires amendments to both the Charles County Comprehensive Plan and the Comprehensive Water and Sewer Plan. In cases where, by necessity of efficiency and effectiveness of the operating systems, water mains are located outside the designated service area and the County's designated Development District, a "Denial of Access Area" will be established along water mains located outside service areas and depicted on the Water Category Maps. No property shall be permitted to connect to the water main within the Denial of Access Area. The Commissioners may make an exception for the location of publicly owned, institutional facilities that by public necessity and the nature of the use, are most appropriately located outside the planned water service area. The Commissioners may also make an exception for the connection of existing houses or commercial structures that have been identified by the County Department of Health as a failing well and where no reasonable alternative can be approved.

b. **W-6(WCD): <u>Outside Designated Service Areas - No Planned Service within the Watershed Conservation District</u>**. A category assigned to all properties outside municipalities and outside designated water service areas, but within the Watershed Conservation District (WCD) defined in the County's Comprehensive Plan. The establishment of new sewer service areas to serve new development in these areas is not consistent with the Comprehensive Plan. These areas have been mapped to generally coincide with the Tier 4 Area Designations by the County to comply with the State's Sustainable Growth and Agricultural Preservation Act. Since the WCD was previously part of the Development District or Deferred Development District, it is recognized that water infrastructure exists in the W-6 (WCD) or may be needed to serve existing or planned adjacent development in the Planned Water Service areas. These areas are restricted from development on public water systems unless there are corresponding amendments to the County's Tier Maps and Comprehensive Plan. The method of mapping priority categories in the WCD is described in Appendix 1-B

In cases where, by necessity of efficiency and effectiveness of the operating systems, water mains are located outside the designated service area and the County's designated Development District, a "Denial of Access Area" will be established along water mains located outside service areas and depicted on the Water Category Maps. No property shall be permitted to connect to the water main within the Denial of Access Area. The Commissioners may make an exception for the location of publicly owned, institutional facilities that by public necessity and the nature of the use, are most appropriately located outside the planned water service area. The Commissioners may also make an exception for the connection of existing houses or commercial structures that have been identified by the County Department of Health as a failing septic system and where no reasonable alternative can be approved.

c. **W-5: <u>Water Service Areas or Water Interconnection Zones</u>.** This category is assigned to all properties within designated water service areas or water interconnection zones, unless properties have attained a "W-3" or "W-1" category. Properties within water supply zones may be required to interconnect infrastructure systems in order to assure that adequate contingency water supply, storage and fire suppression capabilities exist. Lots in minor subdivisions or new residential construction on existing lots may be served by individual wells where public water is more than 500 feet away.

d. **W-5 (WCD): Water Service Areas within the WCD.** This category is assigned to portions of the WCD that are surrounded or bounded on 3 sides by W1 or W3 categories and are determined to be readily serviceable. It may also apply to identified problem areas designated "E" that are determined to be readily serviceable. Any connection to a public system would require evaluation by the affected agencies and approval of a Category W-3 by the County Commissioners and MDE.

e. **W-3: Planned Service**. Properties where improvements to, or construction of, new community water supply systems are planned or are under design. All subdivisions and new construction with this designation must be served by public/central water systems. A service category amendment to "W-3" shall precede the approval of preliminary plans of subdivision and site plans utilizing public water supply and sewer services by the Planning Commission.

Properties desiring such a re-classification shall submit an application for amendment to the County Department of Planning and Growth Management. Replacement wells are permitted for properties more than 500 feet from existing distribution lines within an area designated as "W-3" or "W-1". A "W-3" does not require further application, as elevation to a "W-1" is contingent upon developer action or infrastructure status. Priority "3" may be applied for provided that:

(a) Infrastructure is in place or under design to serve the area; and

(b) Rated capacities of facilities which could serve the project are adequate to accommodate the proposed project flows.

Note that Charles County collapsed the W-2, W-3, and W-4 priority categories identified in the Environment Article and COMAR into a single W-3 category. This approach to planning has served the County well since the adoption of the 1994 Comprehensive Water and Sewer Plan. In the case of private developer expansions of the systems, it was found to be not predictable with a level of precision implied in the W-2, W-3 and W4 designations. The County and Town planned service expansions are covered more precisely through the Capital Improvement Program scheduling.

f. **W-1: Existing Service**. Properties served by community or multi-use systems which are either existing or under construction. No private wells are permitted. Priority "1" applies to the following areas:

(a) All requirements for Priority "3" have been met;
(b) All required final approvals have been obtained from the Charles County Planning Commission;
(c) Design drawings and plans for all water supply facilities or extensions

to existing community, public or multi-use systems and facilities have received final approval and a construction permit (MDE) and a State groundwater appropriation permit (MDE) has been issued;

(d) A grant of water supply allocation has been granted by the Director of the Department of Planning and Growth Management; and

(e) All necessary financial agreements and/or developer agreements have been approved by the Charles County Commissioners.

2. Sewer Service: Priority Classification System

a. S-6: **Outside Designated Service Areas - No Planned Service**. A category assigned to all properties outside municipalities and outside designated sewer service areas. The establishment of new sewer service areas to serve new development in these areas is not consistent with the Comprehensive Plan. In cases where, by necessity of efficiency and effectiveness of the operating systems, sewer mains are located outside the designated service area and the County's designated Development District, a "Denial of Access Area" will be established along sewer mains located outside service areas and depicted on the Sewer Category Maps. No property shall be permitted to connect to the sewer main within the Denial of Access Area. The Commissioners may make an exception for the location of publicly owned, institutional facilities that by public necessity and the nature of the use, are most appropriately located outside the planned sewer service area. The Commissioners may also make an exception for the connection of existing houses or commercial structures that have been identified by the County Department of Health as a failing septic system and where no reasonable alternative can be approved.

b. S-6(WCD): **Outside Designated Service Areas - No Planned Service within the Watershed Conservation District**. A category assigned to all properties outside municipalities and outside designated sewer service areas, but within the Watershed Conservation District (WCD) defined in the County's Comprehensive Plan. The establishment of new sewer service areas to serve new development in these areas is not consistent with the Comprehensive Plan. These areas have been mapped to generally coincide with the Tier 4 Area Designations by the County to comply with the State's Sustainable Growth and Agricultural Preservation Act. Since the WCD was previously part of the Development District or Deferred Development District, it is recognized that sewer infrastructure exists in the S-6 (WCD) or may be needed to serve existing or planned adjacent development in the Planned Sewer Service areas. These areas are restricted from development on public sewer systems unless there are corresponding amendments to the County's Tier Maps and Comprehensive Plan.

In cases where, by necessity of efficiency and effectiveness of the operating systems, sewer mains are located outside the designated service area and the County's designated Development District, a "Denial of

Access Area" will be established along sewer mains located outside service areas and depicted on the Sewer Category Maps. No property shall be permitted to connect to the sewer main within the Denial of Access Area. The Commissioners may make an exception for the location of publicly owned, institutional facilities that by public necessity and the nature of the use, are most appropriately located outside the planned sewer service area. The Commissioners may also make an exception for the connection of existing houses or commercial structures that have been identified by the County Department of Health as a failing septic system and where no reasonable alternative can be approved. The method of mapping priority categories in the WCD is described in Appendix 1-B

c. **S-5:** **Future Planned Service**. This category applies to properties located within a designated sewer service area. It is the intention of the County Commissioners to ultimately provide sewer service to areas with said designations. This may be beyond the planning period of this document.

d. **S-5 (WCD):** **Service Service Areas within the WCD.** This category is assigned to portions of the WCD that are surrounded or bounded on 3 sides by S-1 or S3 categories and are determined to be readily serviceable. It may also apply to identified problem areas designated "E" that are determined to be readily serviceable. Any connection to a public system would require evaluation by the affected agencies and approval of a Category S-3 by the County Commissioners and MDE.

e. **S-3:** **Planned Service**. Properties where improvements to, or construction of a new community sewer systems are planned or under design. A service category amendment request for "S-3" may be concurrent with the submission of preliminary plans of subdivision and site plans utilizing public sewer services by the Planning Commission. Properties desiring an "S-3" reclassification shall submit an application for amendment to the County Department of Planning and Growth Management. A preliminary subdivision plan or site plan may be submitted and processed by staff, but not approved by the Charles County Planning Commission, until a "S-3" category is granted by the Commissioners. However, the approval of a Priority "3" classification does not obligate the County to approval of the preliminary subdivision plan or site plan by the Planning Commission; failure by the Planning Commission to approve a preliminary plan of subdivision or site plan constitutes a reversion of the "S-3" category to its original category. An "S-3" category does not require further application, as elevation to "S-1" is contingent on developer action or infrastructure status. Priority "3" may be applied for provided that:

(a) All requirements for Priority "5" have been met;
(b) The use, density, and location of the proposed development complies with the adopted Comprehensive Plan which is coordinated with sewer priorities; and
(c) Rated capacities of facilities which could serve the project are

adequate to accommodate the proposed project flows.

Note that Charles County collapsed the S-2, S-3, and S-4 priority categories identified in the Environment Article and COMAR into a single S-3 category. This approach to planning has served the County well since the adoption of the 1994 Comprehensive Water and Sewer Plan. In the case of private developer expansions of the systems, it was found to be not predictable with a level of precision implied in the S-2, S-3 and S-4 designations. The County and Town planned service expansions are covered more precisely through the Capital Improvement Program scheduling.

f. **S-1:** **Existing Service**. Properties served by centralized sewer systems which are either existing or under construction. Priority "1" applies to the following areas:

(a) All requirements for Priority "3" have been met;

(b) All required final approvals have been obtained from the Charles County Planning Commission;

(c) Design drawings and plans for all sewer facilities or extensions to existing community, public or multi-use systems and facilities have received final approval and a construction permit (MDE);

(d) A grant of sewer capacity allocation has been granted by the Director of the Department of Planning and Growth Management; and

(e) All necessary financial agreements and/or developer agreements have been approved by the Charles County Commissioners.

The following sub-categories further refine the priority classification system. These may be applied to specified categories, and include:

(1) **Conditional (COND)** - Service is conditional on Commissioner-enumerated conditions only. The County Commissioners or County staff may require that additional support materials be submitted to justify this sub-category. Failure by the applicant, or his successors, to meet these conditions reverts the priority classification to its original category. This sub-category may be applied to a "W-3" or "S-3" categories only.

(2) **Require Evaluation (E)** - Identifies areas which are identified to be evaluated by the Charles County Department of Health. These areas may be prone to failing well and septic systems and should be investigated throughout the planning period to determine the extent of the failing conditions. This sub-category may be applied to the "W-6", "S-6", "W-5", "S-5", "W-3", or "S-3" categories.

1.4.2 Review and Amendment Procedures

State regulations, pursuant to Title 9, Subtitle 5 of the Environment Article of the Annotated Code of Maryland, requires that the County Commissioners of Charles County review and adopt a revised County Water and Sewer Plan on a triennial basis. In addition, State regulations permit the County Commissioners to amend the Water and Sewer Plan.

1. Amendment Procedures

   (a) An application for amendment to the County Comprehensive Water and Sewer Plan may be submitted for review not more than once annually.

   (b) The County Commissioners will consider amendments to priority classification, text, and maps of the adopted Comprehensive Water and Sewer Plan. Requests for proposed amendments to the County Water and Sewer Plan shall be submitted to the Charles County Department of Planning and Growth Management, P.O. Box 2150, La Plata, Maryland. The application form may be obtained from the Charles County Department of Planning and Growth Management or County website. Requests for proposed amendments must be received by August 15. Should the County Government be closed on this date, applications will be due on the next business day.

      (1) Service category amendments should be submitted on an "Application for Amendment" form. These requests must be signed by the owners of the property for which service is requested, a qualified principal of a corporation or joint venture, or an agent qualified by a power of attorney. Properties requesting a service category change must be under the same ownership and contiguous to constitute a single application.

      (2) Requests for amendment to the text or maps of the Plan should be made by letter addressed to the President of the County Commissioners. This letter should explicitly state the amendment request and identify an appropriate location in the document.

   (c) The County Commissioners may, at their discretion, begin a semi-annual amendment cycle as is in the best interest of the County. If so, the deadlines for two cycles per year would be February 15 and August 15.

   (d) The County Commissioners may also initiate requests for administrative amendments to the Comprehensive Water and Sewer Plan as the governing body of Charles County, or at the written request of the Town of La Plata, the Town of Indian Head, the Town of Port Tobacco, the Tri-County Council for Southern Maryland, or the Maryland Department of the Environment or other State agencies. There is no fee for administrative amendments.

   (e) It shall be the responsibility of the Charles County Department of Planning and Growth Management to coordinate the review of amendments to the Comprehensive Water and Sewer Plan.

(f) The Charles County Government shall submit copies of all materials received by the deadline for service category amendments, as well as all proposed text, map, and administrative amendments to planning agencies. For triennial amendments, the entire text and maps should be submitted to the local planning agencies.

(g) All materials received by the deadline are considered public record and are available for public review at the Department of Planning and Growth Management, Planning Division.

(h) The planning agencies shall review the proposed amendments to the Comprehensive Water and Sewer Plan and submit their comments to the Charles County Department of Planning and Growth Management.

(i) A public hearing before the Charles County Commissioners will be held to provide an opportunity for the public to comment on the proposed amendments. The Commissioners will receive oral or written testimony at this public hearing.

(j) Before the County Commissioners hold the public hearing, they must:

(1) Give local jurisdictions at least two weeks' notice of the hearing;

(2) Publish a legal notice for the public hearing detailing, at a minimum the time and place of the hearing, as well as a summary of proposed amendments, in at least one newspaper of general circulation, once each week for two successive weeks with the first notification appearing at least 14 days prior to the hearing.

(k) The County Commissioners will hold a public work session after the close of the public record. The County Commissioners may take action on the requests at this work session. The County Commissioners may approve, approve with conditions, disapprove, or defer requests. Requests for service category amendment must meet the criteria for priority re-classification established in this Comprehensive Water and Sewer Plan.

(l) Following the decision of the County Commissioners, the amendment shall be sent to the Maryland Department of the Environment for its review and final approval. The State has 90 days from receipt of the County's amendment package to review the materials. If the letter informing the County of the results of the MDE review is not received after the 90-day review period, and the review period is not extended by letter, the County Commissioners' decisions are official. Until this time, the Plan will remain in effect as currently adopted.

Table 1-3
Water Service Categories

Category	Definition of Category	Requirements	Exceptions
W1	Existing Service	Systems operational or has final plat approval and/or allocation granted.	N/A
W3	Planned Service	Hook-up to central or public systems required.	Public water required. *Replacement* wells more than 500 feet from distribution lines are permitted.
W5	Water Supply Zones and Future Water Service Areas	Individual wells permitted for single lots or minor subdivisions greater than 500 feet from distribution lines. Amendment for Water/Sewer Plan required to obtain capacity from the public water system.	New development on public water (Category change to W3 required).

W5(WCD)	Potential Water Service Areas within the WCD. This category is assigned to portions of the WCD that are surrounded or bounded on 3 sides by W1 or W3 categories and are determined to be readily serviceable. It may also apply to identified problem areas designated "E" that are determined to be readily serviceable.	Amendment of the category to W3 is required to obtain capacity from the public water system.	Individual wells permitted for single lots or minor subdivisions greater than 500 feet from distribution lines.
W6	Outside Designated Service Area	No planned service at this time. Individual wells permitted.	Individual wells permitted.
W6 (WCD)	No planned service (See Section 1.4.1 for a full explanation of the classification.)	No planned service without amendment to the Comprehensive Plan and Tier designation. Individual wells permitted.	Water infrastructure may be located in this area to access existing facilities, to expand existing facilities, or to inter-connect existing facilities in an economical manner.

Table 1-4
Sewer Service Categories

Category	Definition of Category	Requirements	Exceptions
S1	Existing Service	Systems operational or has final plat approval and/or allocation granted.	**White Plains Economic Development Service Area**: Sewer Service only available within the designated White Plains Economic Development Service Area as depicted on Sewer Maps 6 and 10. (See Policy in Section 1.3.10) **Clifton**: Moratorium in place; septic systems permitted with approval from Charles County Health Dept. and executed interim sewer agreement with Charles County Commissioners. **Cobb Island**: Moratorium in place; no available capacity.
S3	Planned Service	Improvements Programmed. Must obtain a sewer allocation.	White Plains Area: (See explanation under S1)
S5	Future Planned Service	Amendment to the Water and Sewer Plan required to obtain development approval.	"Single Lot" administrative exception allowed.

S5 (WCD)	Potential Sewer Service Areas within the WCD. This category is assigned to portions of the WCD that are surrounded or bounded on 3 sides by S1 or S3 categories and are determined to be readily serviceable. It may also apply to identified problem areas designated "E" that are determined to be readily serviceable.	Amendment to the Water and Sewer Plan required to obtain development approval.	"Single Lot" administrative exception allowed.
S6	No planned service	No planned service without amendment to the Comprehensive Plan. Individual septic systems permitted.	Pending approval of a water and/or sewer category change to S3, package treatment plants may be permitted for existing failing septic systems in residential, commercial, and industrial development areas.
S6 (WCD)	No planned service (See Section 1.4.1 for a full explanation of the classification.)	No planned service without amendment to the Comprehensive Plan and Tier designation. Individual septic systems permitted.	Sewer infrastructure may be located in this area to access existing facilities, to expand existing facilities, or to inter-connect existing facilities in an economical manner.

2. Fees
   A fee schedule established by the County Commissioners is to be applied to all applicants requesting revisions to the Water and Sewer Plan. These fees are not refundable, and must be paid at the time application is made by the applicant. The application cannot be processed without this fee.

3. Severability
   If any section, subsection, sentence, phrase, or portion of this Plan is for any reason held invalid or unconstitutional by any court of competent jurisdiction, such portion shall be deemed a separate, distinct, and independent provision and said holding shall not affect the validity of the remaining portion of these regulations; it being the intent of the County Commissioners of Charles County that these regulations shall stand, notwithstanding the invalidity of any section, subsection, sentence, clause, phrase or portion thereof.

1.5 LEGISLATIVE AND REGULATORY FRAMEWORK

This section covers Federal, State, and County agencies, laws, and regulations, under which the County must conduct water and sewer planning activities. The agencies, laws, and regulations include, but are not limited to, the following:

1.5.1 Federal Agencies, Laws, and Regulations

The Environmental Protection Agency (EPA) is the policy-making and enforcement agency at the Federal level. The EPA conducts and supports research, supports state and local water and wastewater plans, provides technical assistance, and supports projects demonstrating new and improved techniques. The EPA has delegated many programs under their authority to MDE.

In 1978, the EPA assisted Charles County and the Washington Suburban Sanitary Commission (WSSC) with a grant for the construction of the Mattawoman Wastewater Treatment Plant. Therefore, Charles County is subject to the rules and regulations which govern grant-funded facilities. These rules and regulations include, but are not limited to, the Federal Clean Water Act (codified as 33 United States Code § 1251 et seq.), the Federal Water Quality Act of 1987, as well as EPA rules and regulations (codified as Code of Federal Regulations, Title 40). In the late 1980's, Charles County again began working with the EPA and the Maryland Department of the Environment (MDE) to design and construct a wastewater treatment plant to serve Cobb Island.

1.5.2 State Agencies, Laws and Regulations

The Maryland Department of the Environment (MDE) is responsible for the administration and regulation of the water and sewer comprehensive planning program. MDE is the State agency responsible for permitting water and wastewater facilities and regulating the State's water and sewer planning regulations under authority of the Annotated Code of Maryland, Article 9, Subtitle 5, Code of Maryland Regulations (COMAR) Title 26, Subtitle 03, and Title 26, Subtitle 08 (Water Pollution).

The U.S. Army Corps of Engineers (Corps) and MDE are responsible for the regulation and permit issuance any floodplain, waterway, tidal or nontidal wetland under COMAR Title 26, Subtitle 23 (Nontidal Wetlands) and Tidal 26, Subtidal 24 (Tidal Wetlands).

The Code of Maryland Regulations also includes rules regarding sewage disposal and certain water systems for homes and other establishments where a public sewer system is not available (COMAR 26.04.02). Charles County is also governed by COMAR 26.04.03, which details the requirements for water supply and sewer systems. COMAR 26.04.04 covers the construction of water supply wells. Shared water supplies and sewer disposal facilities are covered in COMAR 26.04.05. Regulations concerning water supply and appropriations are covered under COMAR Title 08 (Natural Resources), Subtitle 05, Chapter 03. These regulations enable MDE and the County Department of Health to issue permits in accordance with State law. The County is obliged to follow the requirements and conditions as set forth in the permit. The County is not prohibited from passing more stringent regulations.

1.5.3 County Laws and Regulations

The following is a listing of County laws and regulations which relate to land use and the management of water and sewer facilities.

- Comprehensive Plan establishes the framework for the provision of County services.
- Zoning Ordinance and Subdivision Regulations includes provisions for adequate public facilities.
- Associated Regulations and Ordinances - Stormwater Management, Grading and Sediment Control, Forest Conservation, Floodplain Management, and Roads.
- Water and Sewer Ordinance.
- Standard Detail and Construction Manual for Water and Sewer.

In addition, Charles County has entered into several legal agreements regarding the provision of utilities services and development within the County, including:

- Agreement with WSSC (dated October 22, 1980 and amended April 15, 2004) related to the construction of the Mattawoman facility, shared cost with Prince Georges County, and a 20% reservation (3 million MGD) of the Mattawoman treatment capacity is guaranteed for Prince George's County *(Note: the 20% reservation was amended to 3 MGD during the last expansion of the Mattawoman plant to 20 MGD, since WSSC did not wish to participate in the expansion)*.
- Agreement with St. Charles Associates (dated November 29,1989) related to the allocation for water and sewer capacity for the property of the Interstate General Corporation.
- Agreement with Potomac Cliffs, Watson Limited Partnership, and Clifton Potomac Association (dated August 1, 1989) related to Clifton on the Potomac.
- Agreement with U.S. Steel (dated August 5, 1977, amended in 2005) related to the Swan Point wastewater treatment plant.
- Agreement with WSSC (dated March 10, 1987) related to the water supply interconnection at Sharpersville Road.
- Agreement with Panda-Brandywine L.P. (dated September 13, 1994) related to the use of Mattawoman treated effluent for operation of cooling tower.
- Swan Point Utility Agreement with Brookfield Homes, 2005.
- Agreement with Competitive Power Ventures for allocation of treated effluent

capacity (2009).

1.5.4 Incorporated Towns and Federal Facilities

The Annotated Code of Maryland and the COMAR address the potential for incorporation of subsidiary water and sewer plans developed by individual municipalities into the Charles County Comprehensive Water and Sewer Plan. COMAR 26.03.02.B provides Maryland municipalities that option to develop their own, or portions of their own water and sewer plan and have it incorporated into the County Plan. The County provided the Town of LaPlata and Town of Indian Head an opportunity to incorporate their own subsidiary plan into the County Plan and notice to provide review and comment. At this time, this plan does not incorporate subsidiary plans of the Towns. The Town of LaPlata has provided their Wastewater Capacity and Water Supply Capacity Management Plans to include in the Plan as Appendix 5.

CHAPTER 2
CHARLES COUNTY PROFILE AND DATA SUMMARY

2.1 BACKGROUND INFORMATION

Throughout most of its history, Charles County has been noted for its farmlands, waterways, shoreline, forests, and rural settlements. It has been characterized by its compact rural settlements interspersed throughout a landscape of farmlands, waterways, shoreline, and extensive undisturbed natural areas. Forests account for approximately 64 percent of the County’s land cover, attesting to its rural, environmental character.

The rapid growth of the past three decades, however, has brought great changes to the County and has also placed great development pressures against these assets for which the county has become known. These impediments to the quality of life have heightened the interest given to growth and development issues, both by the citizens and by the elected officials of Charles County. As a response to these concerns and in the face of increasing development pressure, the County's Comprehensive Plan, updated in 2016, delineates the County's goals and objectives in managing growth within the County’s identified Development District, while at the same time maintaining the County's rural nature and quality of life.

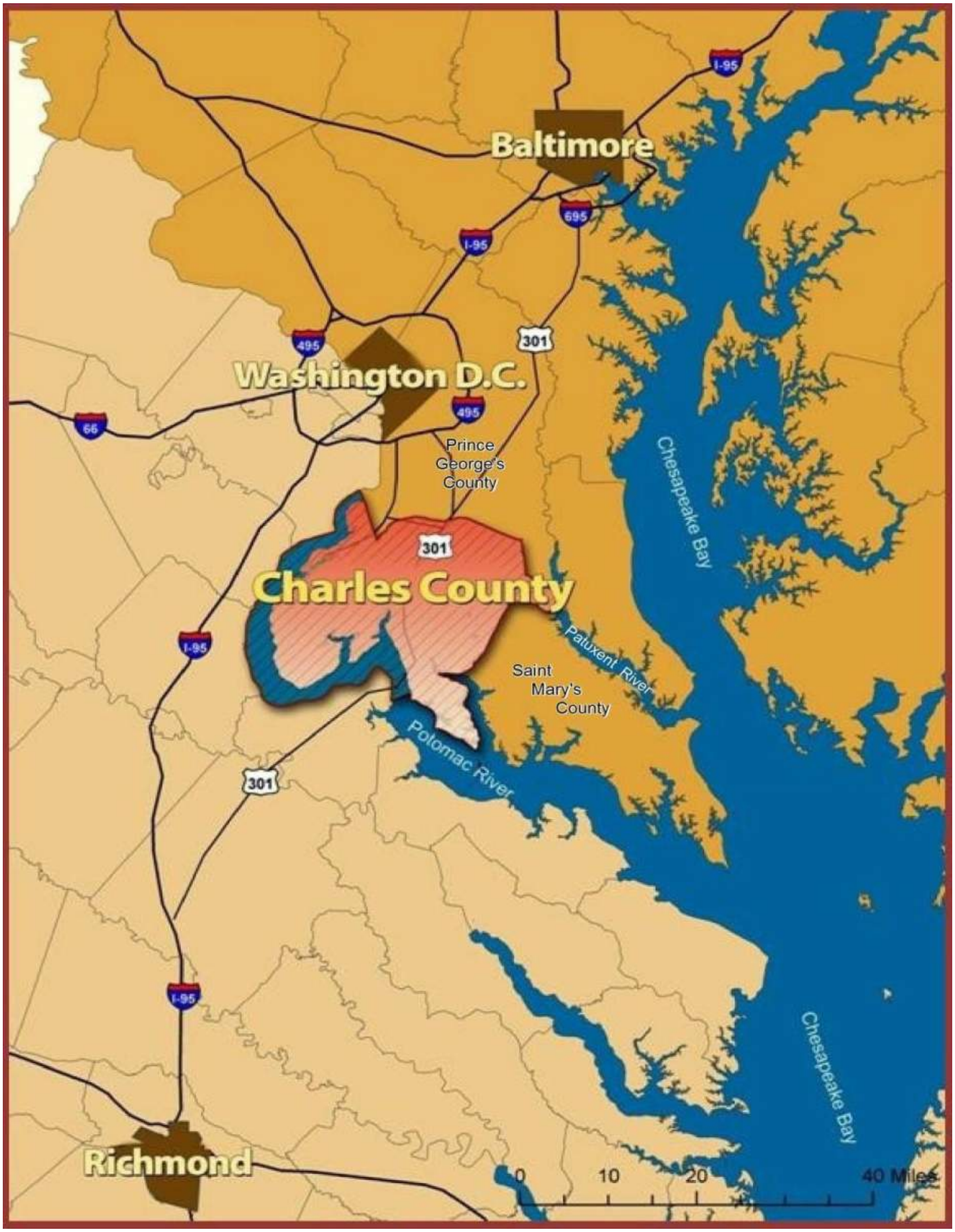
One of the primary growth management tools is the planned expansion of water and sewer services. The Comprehensive Water and Sewer Plan provides information and recommendations for those services. Prior to reviewing existing and future water and wastewater facilities and services within the County, a brief summary of the Charles County’s history, setting, natural characteristics, and resources is presented, as well as an overview of the County's demographic characteristics. An understanding of these demographics will enable the County to plan for the provision of water and sewer services over the ten-year planning period.

2.1.1 Location and Setting

Charles County is located approximately 30 miles south of the Washington, D.C. metropolitan area. Over the years, Charles County has been able to maintain a diversified community with extensive waterfront, unique environmental resources, agriculture, woodlands, a rich historical heritage, and urbanized areas. Located on a peninsula between the Potomac and Patuxent Rivers in southern Maryland, the county is bounded by Prince George's County to the north and St. Mary's County to the southeast, as shown in Figure 2-1. Most of the land area in Charles County is drained by tributaries of the Potomac River, with land elevations ranging from 0 to 235 feet above sea level according to the Maryland Geological Survey.

The local economy is strongly influenced by the Baltimore and Washington Highway corridors. Military installations, agriculture, and seafood harvesting industries contribute to the local economy. As the County continues to urbanize, areas are building up along the major highways (US 301, MD 228, MD 5, and MD 210). Charles County is linked with other cities in the Washington, D.C. suburban area and beyond through Interstates 495 and 95 and Maryland Routes 50, 3, and 70, with points south accessible via the Potomac River Bridge.

Figure 2-1. Charles County Location Map



2.1.2 History

Founded in 1658, Charles County embraces the traditions of southern Maryland, retaining many of the tobacco country customs now three centuries old. Charles County is Maryland's fifth oldest county and is unique among the old counties in that it possesses all its official records. Until 1895, the county seat of Port Tobacco served as the business and cultural center of Maryland. By 1890, however, Port Tobacco was losing eminence as a port due to the silting of the Port Tobacco River and the burning of the county courthouse in 1892. The county seat was relocated to La Plata in 1895.

Charles was one of Maryland's least known counties until 1940, when the Potomac River Bridge was opened, allowing through north-south traffic on US 301. Since 1950, population, housing, and commerce have expanded greatly due to the proximity to the Washington metropolitan complex. The County is now a mixture of the suburban development, primarily in the northwest section of the county, interspersed with older rural and semi-rural development patterns found elsewhere in the County. Waldorf, now the County’s largest community with a population close to 68,000 (Census Designated Place 2010), was first established in 1872 as a stop along the Baltimore and Potomac Railroad line. It began to transform from a local village into a regional service center and tourist destination with the construction of Crain Highway, which is also designated as US 301.

2.2 RESOURCE BASE

2.2.1 Topography

Located in the Atlantic Coastal Plain, Charles County is a relatively low-lying area. Elevations range from 10 feet above sea level near the Potomac River to approximately 235 feet near Waldorf. Large portions of the county are exceedingly flat, with a gentle slope toward the Chesapeake Bay or toward local drainage features. Broad plateau formations with sides dissected by drainage features are common throughout most of the county. This dissection of the county shows the easily eroded clays, sands, and gravels that underlie it. In some areas, dissection is incomplete, and flat areas several miles across have not yet been reached by headward cutting streams. Stream valleys affect local topography throughout the County. Refer to Appendix 2K for the topographical map.

Stream terraces are located in several locations along the County's 183 miles of river shoreline. These elevated terraces are found in the Marshall Hall, Stump Neck, Moss Point, Maryland Point, and Clifton areas. Adjacent to the Potomac and Patuxent Rivers are low-lying flats approximately 10 to 25 feet above sea level. These areas vary in width from a few feet where the river current of the Potomac River washes strongly against the shoreline, found at several locations in western Charles County near Indian Head and Potomac Heights~~—~~to more than a mile in the southern part of the county, at Allen's Fresh. The interior of the County, along US 301 from Faulkner to the Prince George's County line, is predominately flat. Outward from this plateau, dissection becomes more pronounced, and the land is gently rolling and hilly to steeply sloping.

2.2.2 Geology and Soils

The geologic formations beneath Charles County are composed of unconsolidated deposits of gravel, sand, silt, and clay. These materials were transported by streams, particularly the Potomac River, from the Appalachian and Piedmont regions west and north of the County throughout the geologic history of the County and were deposited in the form of alluvial fans and deltas. Tidal and marine mud and silt layers overlay dense, hard crystalline, metamorphic, and igneous rocks of the Precambrian Age. The crystalline bedrock formation is found deep below the surface.

In the vicinity of Faulkner are unique surficial sediments, which are a relatively young, thin veneer, approximately 30 feet in thickness, occupying elevations of 30 feet above mean sea level and consisting of gravel, sand, and silt. These sediments were deposited by the eastward flowing Potomac River as the river migrated slowly southeastward to its present location. Beneath this granular deposit is the Calvert formation of the Chesapeake Group, which is composed of the Fairhaven and Plum Point Marls. This formation overlies and tends to seal the surficial granular deposit from all the older geologic units. Gently rolling terrain, nearly level upland plateaus, low-lying swamp lands, and shoreline stream terraces are characteristic of Charles County. The Coastal Plains soils found in Charles County are generally naturally acidic, low in fertility, and highly intermixed and variable, thereby limiting their suitability for selected land uses. Most of the upland soils are well-drained to moderately-well drained and have a sandy loam or silt loam surface layer overlaying a sandy clay loam or silt loam subsoil. The sandier soils are better for farming and for many other land uses. A significant portion of the County possesses soil types characterized by clay-rich soils. These soils tend to be poorly drained and restrictive to percolation.

Approximately 65 percent of Charles County is nearly level or gently sloping, with 24 percent moderately or strongly sloping and 11 percent considered steeply sloping. It is estimated that 76 percent of the County is well-drained, with the remaining 24 percent characterized as poorly drained or tidal marsh. A detailed soil survey, published online and dated 2021, is available for the County. This survey describes various soil types and relates to maps of the County. The soil survey was made cooperatively by the U.S. Department of Agriculture Soil Conservation Service and the Maryland Agriculture Experiment Station. Refer to Appendix 2J for soil drainage characteristics of Charles County.

2.2.3 Water Resources

Although Charles County is bordered by both the Patuxent and Potomac River systems, their use as surface water supply sources is constrained because of salinity concentrations. The County also has a large number of smaller rivers and streams which are incapable of any large-scale water supply.

There are presently only three lakes in Charles County with a suitable surface water area of about 12 square miles required for use as reservoirs – Jameson Lake, Trinity Lake, and Wheatley Lake. However, due to the locations of the lakes and the infrastructure improvements necessary to serve the development district, these water sources are not a feasible source of public water supply.

The major groundwater resources of Charles County are the aquifers (from deepest to shallowest) of the Patuxent, Patapsco, Magothy, and Aquia Formations, and deposits of Pliocene and Pleistocene Age. The major water supply sources in the Waldorf area are the Magothy and Patapsco aquifers and in the Bryans Road area are the Patapsco and Patuxent aquifers which are used by the county for public systems. These aquifers are found at depths ranging from 300 to 1,000 feet below the ground elevation. Ground water provides the vast majority of the drinking water in Charles County. In a few places, it is available from springs; but in most locations, water is drawn from drilled or dug wells tapping into underlying water-bearing aquifers. In most cases, the aquifers most suitable for potable water supply occur 300 to 1,000 feet below the surface.

2.2.4 Groundwater and Surface Water Patterns

With the exception of Swanson and Indian Creeks, which flow into the Patuxent River system, all drainage flows into the Potomac River or its tributaries. Major water bodies within the County include the Wicomico River, Zekiah Swamp, Gilbert Swamp, Port Tobacco Creek, Port Tobacco River, Nanjemoy Creek, Mattawoman Creek and the Pomonkey Creek. Eastern portions of the County are drained by the Zekiah Swamp Run and the Gilbert Swamp Run, along with their tributaries. Northern portions of the County are drained by the Mattawoman and Pomonkey Creeks. Central and northwestern portions of the County are drained by the Port Tobacco River, Nanjemoy Creek, Wards Run and Mill Run. Chapter 3 provides additional information on the surface waters of Charles County. Refer to Appendix 2L for the map of the watersheds.

A. Gilbert Swamp: Gilbert Swamp is located in eastern Charles County, Maryland, and drains directly into the Wicomico River. Gilbert Swamp is approximately 11 miles long from the headwaters to confluence with the Wicomico River with approximately 39 square miles of its watershed contained within Charles County.

B. Mattawoman Creek: Mattawoman Creek is located in northwestern Charles County, Maryland, and drains directly into the Potomac River. Mattawoman Creek divides Charles County to the south and Prince George’s County to the north in the upper portion of the creek. Waldorf is located along the eastern portion of the Mattawoman Creek Watershed, with US Highway 301 (Crain Highway) running from the northern extent of the watershed through to the southeastern extent along the eastern boundary. The Town of Indian Head is located in the western portion of the watershed. Mattawoman Creek is approximately 34 miles long from the headwaters to confluence with the Potomac River with approximately 70 square miles of its watershed contained within Charles County

C. Nanjemoy Creek: Nanjemoy Creek is located in southwestern Charles County, Maryland, and drains directly to the Potomac River. Nanjemoy Creek is approximately 13 miles long from the northern-most headwaters to the confluence with the Potomac River, with a total watershed area of approximately 73 square miles. Upper Nanjemoy Creek is designated as a non-tidal wetland of Special State Concern.

D. Patuxent River: The Lower Patuxent River Watershed is located in northeastern Charles County, drains into the Patuxent River. Major tributaries include Swanson Creek and Indian Creek which have headwaters near Hughesville and flow east towards Benedict. The Lower Patuxent River portion within Charles County is approximately 3 miles long with a watershed of approximately 30 square miles.

E. Port Tobacco River: The Port Tobacco Watershed is located at the center of the County. It drains into the Potomac River. The Port Tobacco River is approximately 8.5 miles long with a watershed of approximately 44 square miles. Due to late 19th century deforestation, high sedimentation rates filled in the tidal wetlands and the port. Port Tobacco Run is designated as a non-tidal wetland of Special State Concern.

F. Potomac River: Charles County contains approximately 58 miles of the mainstem Potomac River from Piscataway Park at the border of Prince George's County upstream, to Cobb Island at the downstream extent. The Potomac River watersheds of Charles County are divided into three sections: the Upper, Middle, and Lower. These watersheds are located on the western and southern limits of Charles County, Maryland. The watersheds drain directly into the Potomac River, and ultimately into the Chesapeake Bay. The Lower Potomac River watershed is located in the southern portion of the County. The Port Tobacco River and Nanjemoy Creek divide the watershed into three sections.

G. Wicomico River: The Wicomico River watershed is located in southeastern Charles County, Maryland, and drains directly into the Potomac River. The Wicomico River receives drainage from both Charles and St. Mary's Counties; the Charles County portion of the watershed is approximately 36 square miles.

H. Zekiah Swamp: Zekiah Swamp is located in northeastern Charles County, Maryland, and drains directly into the Wicomico River. Zekiah Swamp is approximately 18 miles long from the headwaters to confluence with the Wicomico River with approximately 102 square miles of its watershed contained within Charles County. It is the largest hardwood swamp in Maryland. Zekiah Swamp and Gilbert Swamp Run, adjacent to Zekiah's eastern watershed boundary, are designated wetlands of Special State Concern.

Many of the freshwater streams are broad near their confluence with the Potomac and Patuxent Rivers and develop estuaries and tidal marshes due to the influence of the more saline waters of these receiving bodies. Stream systems with significant estuaries include the Mattawoman Creek, Pomonkey Creek, Port Tobacco River, Nanjemoy Creek, Wicomico River, Zekiah Swamp, and the Gilbert Run Swamp.

2.2.5 Aquifers

Several water-bearing formations are below the surface, and they can be tapped by wells ranging in depth from 10 feet or less to drilled wells greater than 1,400 feet in depth. The Charles County Health Department has discouraged the use of shallow wells since the 1950s in favor of drilled wells tapping deep-water aquifers. The major aquifers in Charles County are in the Patuxent, Upper and Lower Patapsco, Raritan, Magothy formations of the Cretaceous system, the Aquia Greensand of the Eocene series, and Pleistocene deposits. Water in the deeper formations is replenished from precipitation that filters through the soil zone in outcrop areas, most of which are not in Charles County. Some of Charles County's aquifers are recharged principally west of the Potomac River in Fairfax, Prince William, and Stafford Counties. Groundwater moves slowly through these aquifers generally south and east. Water in the upland deposits moves toward the central upland of the County to low-lying areas along the major stream valleys. Chapter 3 provides additional information on the County's aquifers. The Water Supply Plan provides information on technical aspects, including their capability and suitability for use.

2.2.6 Water Quality Criteria

Water quality criteria for the State of Maryland are included as part of COMAR 26.08.02.03, "Classifications of the Waters of the State":

Class I Waters:	All waters of the State shall be protected for use as water contact recreation, for fish, other aquatic life, and wildlife
Class II Waters:	Waters of the State which shall be additionally protected for shellfish harvesting
Class III Waters:	Natural trout waters
Class IV Waters:	Recreational trout waters

Waters within Charles County have been classified as either Class I or Class II waters. The Potomac River and its tributaries above a line from Smith Point to Simms Point are also classified as Class II waters. No waters have been classified as trout waters.

2.3 DEMOGRAPHICS

2.3.1 Regional Setting and Development Trends

Charles County's growth rate can be attributed to several factors, in particular its proximity to the Washington, D.C. metropolitan area, and regional out-migration trends into new suburban areas. Charles County is located in the Council of Government's Washington Metropolitan Statistical Area, composed of Charles, Prince George's, Calvert, Frederick and Montgomery Counties and the cities of Alexandria, Fairfax and Falls Church in Virginia, as well as the District of Columbia and Fairfax, Prince William, Arlington, Stafford and Loudon Counties and the cities of Manassas and Manassas Park in Virginia. Construction of new residential developments has been drastically reduced in the more urbanized areas of the Washington Metropolitan Area, as these areas become fully developed. Charles County's relatively low tax rate, lower housing costs and rural character add to its appeal as a popular realtor / homeowner market. In-migration is expected to continue over the planning period due to these trends.

Population distribution in the county reflects the influence of its proximity to Washington, the influence of local employment and the availability of public facilities to serve development. The County's densest population is in the northwestern quadrant of Waldorf, the same area which is currently experiencing the most rapid growth. This area is located approximately 20 miles from the Capitol Beltway (I-495) and is readily accessible to commuter traffic. Other important centers of population include the Town of La Plata and the Bryans Road/Town of Indian Head area in the western portion of the county.

The Washington Metropolitan Council of Governments (MWCOG) considers Charles County among the outer, or second-tier counties which will be influenced by the metropolitan area. Based on the MWCOGs Round 9.1a Cooperative Forecasts the metropolitan region is forecasted to add 1.4 million jobs to the region's job base between 2015-2045. Employment in Charles County is responding to the increase in residential growth with the Council of Governments projecting a 32% increase in county jobs between 2015-2045. Most of these new jobs are forecasted in the Services, Retail Trade, Government and Construction sectors.

2.3.2 Characteristics of Growth and Recent Trends

The 2019 Census recorded a population of 163,257 persons in Charles County, projected to increase to 218,550 in 2040. During 1980 to 1990, Charles County ranked as the third fastest growing county in the State of Maryland, with the average growth rate of 3.55 percent. The County was the ninth fastest growing County in the State among the 1990-2000 Census, reflecting an average annual rate of growth of 1.74 percent. Throughout the years of 2000-2010, the County was ranked second in terms of growth with a 1.96 percent annual growth rate. Charles County had a 1.09 percent annual growth rate during 2010-2020.

The Sixth Election District (Waldorf) showed the highest absolute growth in Census 2010, increasing by a total of 15,504 people. The highest rates of growth occurred in the Ninth (Hughesville) and Tenth (Marbury) Election Districts, which experienced 27% and 22% increases, respectively. The Eighth (Bryantown) and Third (Nanjemoy) Election Districts experienced the lowest percentages of growth at 7% and 6%.

Of particular significance is the fact that the Sixth (Waldorf) and Seventh (Pomonkey) Election Districts, representing the County's Development District, absorbed roughly 68 percent of the total population increase countywide between the 2000 census and Census 2010. This is just slightly less than the 80 percent of the growth absorbed by these two election districts during the previous decade.

Historically, the county's population began experiencing significant growth beginning in 1950, as shown on Table 2-1. Population's projections were developed by the Maryland Department of Planning, Projections and State Data Center.

Table 2-1
Charles County Population

Year	Population	% Change
1950	23,415	39%
1960	32,572	46%
1970	47,678	53%
1980	72,751	39%
1990	101,154	19%
2000	120,546	22%
2010	146,551	12%
2020	164,540	14%
2030	184,470	11%
2040	205,290	10%
2045	215,980	5%

Two of the most significant growth management objectives established in the County's Comprehensive Plan, originally adopted in 1990, were to establish a target average annual growth rate of 2.0 percent per year, and direct 75% of that growth to the County's Development District.

2.3.3 Population Projections

This Water and Sewer Plan discusses the County's demographic profile, and in particular future population projections to create an understanding of current and future conditions to be experienced in Charles County. This understanding is vital, as it provides an indication of the County's future water supply and sewer treatment needs. Thus, this section provides the linkage between the County's current and future population and its infrastructure needs. Population projections through the year 2045- are based on the Maryland Department of Planning population and employment totals for Charles County. For further information see Section 2.3.3.2 (Population Estimates).

2.3.3.1 Data Sources

Charles County has completed several studies and plans which contain population projection information. These studies and plans include the County-wide 2016 Comprehensive Plan.

Charles County completed its County-wide 2016 Comprehensive Plan Update, providing land use and density (unit per acre) information for the various land uses. The Comprehensive Plan also outlines the "Development District." As stated, the County's goal is to manage growth effectively by providing the necessary services within the Development District so that 75% of future growth occurs within the Development District.

These buildout flows were based on land use (and its associated population densities) per the Water Resource Element of the 2016 Comprehensive Plan. To determine buildout flows, the County estimated the acreage for each type of land use in conjunction with projected densities as established in the Comprehensive Plan. As a methodology, both documents were considered. By combining the residential and commercial/industrial flows, the total projected wastewater flows for various service areas, inside of Charles County, were estimated.

A refinement to the household, population and employment projections was prepared by the Planning Division with the Department of Planning and Growth Management. These refinements were made at the Transportation Analysis Zone (TAZ) level based on 2015 data. Projections made at this fine geographic level have been useful in projecting water and sewer flows which have been used by the County for hydraulic modelling and the evaluation of alternative sources of water.

2.3.3.2 Population Estimates

The most recent County population projections, included in this document, are based on the following assumptions:

- Population pressures from greater Washington area ex-urban movement will continue to stimulate residential development.
- Housing costs, compared to the greater Washington area, will remain somewhat lower in Charles County.
- Adopted growth control measures (excise tax, zoning, adequate public facility regulations, etc.) will continue to affect growth patterns.
- Through growth management strategies, 70 to 75 percent of new growth will be directed to the Development District, despite an increase in growth pressure in the rural areas.
- Economic development strategies will bring about a better balance between residential and commercial/industrial development.
- Jobs in Charles County will increase but a high proportion of the work force will continue to commute out of the County.
- Transportation improvements in the US 301 corridor will enhance mobility and promote economic development.
- Planned communities, especially in St. Charles, will absorb significant amounts of growth.

There has been an increasing emphasis on land use planning around the State. In fact, one of the twelve vision statements as stated in the newly created Land Use Article is that "development is concentrated in suitable areas." With this in mind, Charles County adopted its Comprehensive Plan in September 1990 and subsequently updated in 1997, 2006 and 2016 to conform to the Maryland Growth Management and Resource Protection Act of 1992 (Growth Act). The land use component of the Comprehensive Plan establishes the Development District. The "suitable areas" doctrine was further refined by the Growth Act. In an effort to increase conformance with State law, this Water and Sewer Plan segregates Development District and non-Development District population projections. These projections were the basis for the County's hydraulic modeling efforts. For all units, population is projected in 2015, 2020, 2025, 2030, 2040, and 2045 intervals. This type of projection allows the Water and Sewer Plan to present a picture of distribution and density patterns which will occur over the next 10 to 25 years.

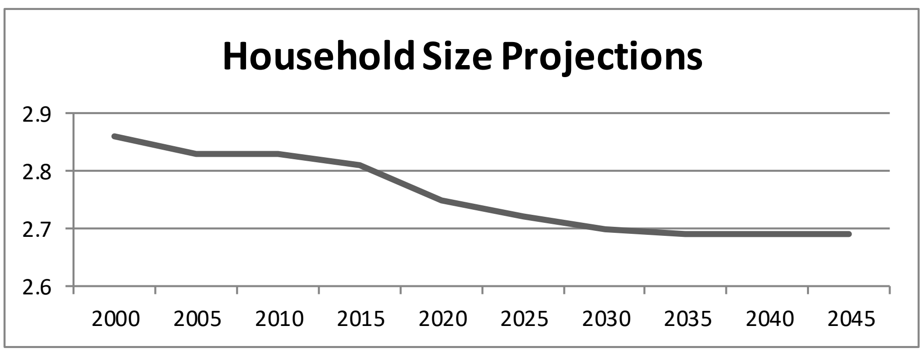
County Overall

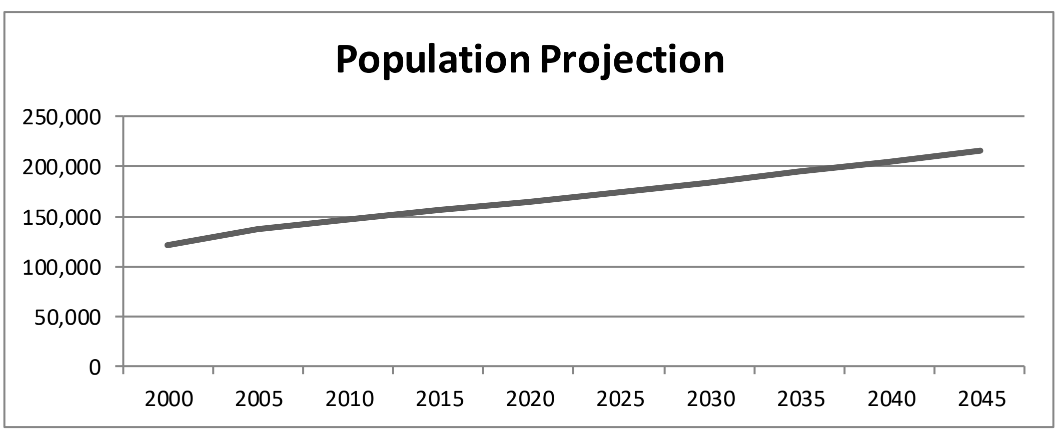
The anticipated projected average annual growth rate for Charles County is 1.4 percent for the period 2020 to 2045, based on the previously mentioned assumptions. Important factors in the data computations were Comprehensive Plan density projections, the 2000 census figures and housing unit totals. Projections were based on the County's current rate of growth factored into the expected housing unit growth and average household size for the year 2020 and the 2045 planning horizon.

TABLE 2-2
Charles County Population Projections vs. Household Size

Year	Household Size	Population Projection
2000	2.86	120,546
2005	2.83	138,002
2010	2.83	146,551
2015	2.81	155,790
2020	2.75	164,540
2025	2.72	174,220
2030	2.70	184,470
2035	2.69	194,850
2040	2.69	205,290
2045	2.69	215,980

Sources: Household Size data from Maryland Department of Planning, 2020
Population Projection data from Maryland Department of Planning, 2020





2.3.4 Projected Growth as a Basis for Water and Sewer Planning

As discussed above, the primary growth management and land use concept developed in the Charles County Comprehensive Plan is that of the establishment of the Development District, generally located in northwestern Charles County. The development district is intended to serve as the principal center for population growth, services, and employment. Comprising the most suitable area for new population growth, by virtue of existing development, infrastructure, and transportation networks, this area is planned to receive 75 percent of the County's growth through the year 2045.

The Development District generally corresponds to the Mattawoman Sewer Service Area, as delineated on the maps which accompany this document. The 2016 Comprehensive Plan reduced the Development District from previous plans by matching the Development District with the modified Priority Funding Area in the northern part of the County, in part to limit sprawl development and further protect the Mattawoman Creek from runoff from development. It also eliminated the Deferred Development District, converting it to a new Watershed Conservation District. Overall, these changes reduced the Development District from the previous 2006 Comprehensive Plan from 52,200 acres to 22,189 acres for a total reduction in the Development District of 30,011 acres.

Controlled growth within development districts will minimize sewer collection systems and potable water system costs and increase the opportunity for modifying existing water and sewer systems to meet the goals and objectives of this Plan. Wide-spread growth, resulting in sparsely populated areas, will increase potable water and sewer costs, increase private well and septic systems, and minimize the opportunity for modifying existing systems. The Comprehensive Plan indicates that the County will concentrate on public facilities needs in existing developed areas and those proposed to be served by public water and sewer systems. Conversely, infrastructure is not encouraged in the County's rural areas.

Charles County's computerized hydraulic modeling software enables the County to tie the County's population projections to its water and sewer needs. This is particularly important as the County begins to implement its adequate public facilities provisions, as established in the Zoning Ordinance. More information on the modeling effort is available from the Development Services Department in Planning and Growth Management. As an example Appendices 2A and 2B show the projected residential and employment growth in the Mattawoman Sewer Service Area (MSSA) by Transportation Analysis Zone (TAZ). Similarly Appendices 2C and 2D show potential growth in the Waldorf and Bryans Road water service areas. Appendices 2E through 2H outline the methodology used for projecting water and wastewater demand for the Waldorf, Bryans Road, and Mattawoman Service Areas.

2.4 LAND USE

2.4.1 Comprehensive Plan

The Charles County Comprehensive Plan was updated in 1997, 2006 and 2016 through careful review of the 1990 Plan policies and objectives. The updated plan is the result of a joint effort of elected and appointed officials, professional land use planners, and an extensive public outreach program in 2011. The plan presents policies and guidelines to serve the County for the duration of the 25-year planning horizon.

The Charles County Comprehensive Plan consists of a land use map, goals, objectives, policies, and recommendations that will guide future land development. Other elements of the Charles County overall comprehensive planning program include: documents prepared to complete the Comprehensive Plan (i.e. *the Waldorf Sub-Area Plan, the Bryans Road Sub-Area Plan, the Hughesville Re-vitalization Strategy, the Charles County Critical Area Program* and *the Charles County Land Preservation, Parks, and Recreation Plan*); documents that will serve to implement the comprehensive plan (i.e. *Zoning Ordinance, Subdivision Regulations of Charles County, Maryland*); and the documents that influence the comprehensive plan (i.e. *Comprehensive Sewer and Water Plan, Capital Programming, Comprehensive Plan for Schools, Solid Waste Management Plan, Public Safety Plan, Emergency Operations Plan,* and *Fire and Rescue Plan*). Refer to Appendix 2M for the land use map.

Topics discussed in the Charles County Comprehensive Plan include:

- Land Use
- Natural Resources
- Zoning Districts
- Economic Development
- Transportation
- Baseline Housing, Population, and Employment Projections
- Water Resources
- Community Development
- Energy Conservation
- Water Resource Element
- Telecommunications & Broadband

In relation to water supply and sewer planning, the Comprehensive Plan presents goals, policies, and implementation strategies for many public services, including the management of water supply and sewer treatment and disposal.

Under House Bill 1141, passed by the General Assembly in 2006, all jurisdictions that have zoning authority in the State of Maryland must adopt a Water Resources Element into their Comprehensive Plan to comply with the amendments to Article 66B of the Maryland Annotated Code. The overall purpose of the Water Resources Element (WRE) is to ensure that water supplies and sewer capacity can support projected growth countywide and to better link land use decisions to water quality. Charles County adopted a WRE in 2011 as an amendment to the 2006 Comprehensive Plan. It evaluates the policies of the 2006 Plan through the lens of HB1141 and identifies ongoing and future strategies to manage existing water supplies, wastewater effluent, and stormwater runoff for existing and future residents and businesses (including the growth projected for the County's municipalities). It also identifies the County's policies and initiatives for—as well as the opportunities and challenges related to—achieving water quality goals and ensuring adequate drinking water for future generations of Charles County residents. The current Water Resources Element updates, compiles, and expands upon many of the data, goals, and policies contained in the 2016 Comprehensive Plan. In particular, this WRE contains updated information on demand, flow, and capacity for public water and wastewater systems in the County.

2.4.2 Zoning Ordinance

The Charles County Zoning Ordinance was the first major legislative initiative intended to make the goals of the Comprehensive Plan become a reality. The Zoning Ordinance was adopted by the County Commissioners in August 1992 and became effective October 1, 1992. Subsequent revisions to the Zoning Ordinance have been made, including the creation of a new zoning district.

The Charles County Zoning Ordinance currently provides for one conservation zone, three rural zones, two village zones, four residential zones, four commercial zones, two industrial zones, one planned unit development zone, one waterfront planned community, five planned development zones, and three overlay zones. A brief description of each zone is provided below.

- The agricultural conservation (AC) zone provides a full range of agricultural and farming activities; protects these established uses from encroaching development, which may adversely affect the agricultural economy of the County; and encourages the right to farm in the County without undue burden on the landowner.

- The rural conservation (RC) and rural residential (RR) zones are intended to maintain rural character in the County areas consistent with the Charles County Comprehensive Plan objectives. In 2017 the County adopted the Watershed Conservation District (WCD) zone as recommended in the 2016 Comprehensive Plan. The WCD Zone incorporates the Mattawoman Stream Valley, most of the Mattawoman watershed, and an additional 1,160 acres on the eastern end of the district which is within the Port Tobacco Watershed. The intend of WCD zone is to protect the sensitive natural resources in these areas for their long-term value to the community, their ecological, aesthetic, and scenic values, and their recreation and economic value. Among other area, the WCD zone replaced the zoning in an area formerly designed as the Rural Conservation Deferred RD(D). The RD(D) zone had a minimum density of one unit per ten acres (1:10) and was intended to serve as a holding area for potential future development. The WCD zone establishes a minimum density of one unit per twenty acres (1:20) and is a land use intended to remain predominantly rural with low residential density, not planned for public water and sewer service. However, the Charles County Comprehensive Plan acknowledges properties planned for public water and sewer services predating the WCD zone.

- The village residential (RV) and village commercial (CV) zones are located at existing centers of population or commerce in areas of the County outside the Development District.

- The low-density suburban residential (RL), medium-density suburban residential (RM), high-density residential (RH), and residential office (RO) zones concentrate residential development in areas identified as Development Districts in the Charles County Comprehensive Plan.

- Neighborhood commercial (CN) and community commercial (CC) zones provide standards for the range of commercial uses from neighborhood business to highway-oriented commercial uses. The central business (CB) zone provides appropriate locations for high-intensity commercial uses and encourages development consistent with a traditional "downtown" area. The business park (BP) zone concentrates business and light industrial uses in a park-like setting to promote economic development and job creation while protecting the environment and reducing impacts on the surrounding residential neighborhoods.

- General industrial (IG) and heavy industrial (IH) zones strengthen the economic environment of the County by recognizing existing industrial uses and promoting industrial development to broaden the County's tax base and create new jobs.

- The planned unit development zone is designated for St. Charles. Activity within this zone is bound by the requirements of Docket 90, as amended, and all other legally binding agreements executed between the County and the developer.

- Swan Point is designated as a Waterfront Planned Community (WPC). The activities within this zone are bound by Docket 250. No additional waterfront planned community zones will be considered.

- Planned residential development (PRD), mixed use development (MX), planned employment and industrial park (PEP), planned manufactured home park (PMH) and transit-oriented development (TOD) zones encourage innovative and creative design of residential, commercial, and industrial development, and provide a broad range of housing and economic opportunities to present and future residents of the County consistent with the Charles County Comprehensive Plan.

- The three overlay zones include the Critical Area Zone, the Highway Corridor (HC) Overlay Zone and the Resource Protection Zone (RPZ). Within the Critical Area, the intense development (IDA), limited development (LDA), and the resource conservation (RCOZ) zones provide special regulatory protection for the land and water resources located within the Chesapeake Bay Critical Area in Charles County. These zones implement the Charles County Critical Area Program, the requirements of the Maryland Critical Area Law, and the Critical Area Criteria and are adopted pursuant to the Natural Resources Article, Subtitle 18 and COMAR 14.15, the Critical Area Criteria.

- Three (3) new zoning districts were established in the Bryans Road Town Center Core. Two (2) of these districts, the Core Retail Residential (CRR) and the Core Employment Residential (CER), permit mixed use development, with a maximum of fifteen (15) dwelling units per acre allowed for residential development. The Core Mixed Residential (CMR) is a new residential district that surrounds the two mixed use zones and allows a maximum of ten (10) dwelling units per acre.

- The Waldorf Urban Redevelopment Corridor has two (2) zones. The first being the Waldorf Central Zone (WC). This zone provides for moderate-to-high density development. There is also the Acton Urban Center Zone (AUC). This zone provides for high density, urban-scaled development. Both new zones are to be developed with a mix and intensity of uses supportive of rail transit. Development is to be consistent with the Downtown Waldorf Vision Plan and the Design Guidelines adopted by the County Commissioners.

Refer to Appendix 2N for the Generalized Zoning Map and Appendix 2O for the Development Plan Map.

2.4.3 Smart Growth

In 1997, Maryland's General Assembly adopted several specific programs, which collectively are referred to as Maryland's Smart Growth Program. The program has three very straightforward goals, which are:

- To save our most valuable remaining natural resources before they are forever lost.

- To support existing communities and neighborhoods by targeting state resources to support development in areas where the infrastructure is already in place or planned to support it, and

- To save taxpayers millions of dollars in the unnecessary cost of building the infrastructure required to support sprawl.

In order to achieve these goals, each county, after performing an analysis of its future growth needs, was requested to designate a "priority funding area". The Priority Funding Area (PFA) represents the area in the county where growth is planned, infrastructure is already in place, and which is consistent with criteria established by the State. When approving construction projects, the State will target funding for "growth related" projects to these areas, providing not only a great savings to taxpayers, but also protection from sprawl development to other areas of the county. Growth related projects are defined in the legislation and include most State programs which encourage or support growth, including the construction of sewer and water facilities.

Charles County's Development District was established prior to the enactment of the Smart Growth legislation. When the Priority Funding Area legislation was passed, the county used the Development District as a basis to begin the process of establishing and certifying the county's Priority Funding Area (PFA). Once approved locally, the PFA map was submitted to the State, in accordance with the State's Smart Growth requirements.

In responding to the State's Sustainable Growth and Agricultural Preservation Act of 2012, the County Commissioners adopted "Tier Maps" and associated policies in April of 2014. The legislation designates four areas (tiers) that are based on public sewer availability and County's natural resource base. This Plan and policies have been drafted in accordance with the County adopted Tier Mapping.

2.4.3.1 Priority Funding Areas and Water and Sewer Service Areas

In accordance with the Smart Growth Areas Act of 1997, Charles County designated PFA's in accordance with the state criteria. One of many criteria used to determine if an area qualifies as a PFA is the presence of existing water and sewer service or planned service within 10 years. As sewer and water service becomes available, additional PFA's may be designated if they meet the residential density criteria.

Charles County's Sewerage Service area generally coincides with the established Development District boundary in the 2016 Comprehensive Land Use Plan. The development district boundary is the primary area for build out, within the 2040-time frame. The 2016 Comprehensive Plan reduced the Development District from previous plans by matching the Development District with the modified Priority Funding Area in the northern part of the County.

2.5 MAJOR INSTITUTIONS

Federal facilities in Charles County include the Indian Head Naval Surface Warfare Center, Blossom Point Proving Grounds, and the Naval Research Laboratory. In addition, there are two properties owned by the National Park Service in Charles County: the Thomas Stone Historical Site and the Piscataway National Park. Many State Facilities are also located in Charles County, including Cedarville State Forest, Chapman's Forest, Chicamuxen Wildlife Management Area, Doncaster State Forest, Hughesville Pond, Myrtle Grove Wildlife Management Area, Patuxent River Natural Resources Area, Patuxent Vista Natural Resources Management Area, Purse State Park, Smallwood State Park, and the Zekiah Swamp Natural Environmental Area. Refer to

Appendix 2P for the map and table for major public institutions, such as schools, hospitals, correctional facilities, fire department, and government complexes.

TABLE 2-3
LAND USE IN ACRES

2010 (MDP) (MDP)			
Description	**Acres**		**Acre %**
Very Low Density Residential	18,721		
Low Density Residential	33,244		
Medium Density Residential	8,692		
High Density Residential	1,804	**62,461**	**21%**
Commercial	3,199		
Industrial	1,234	**4,433**	**2%**
Institutional	4,061		
Other Developed Lands	1,954	**6,015**	**2%**
Transportation	595	**595**	**0%**
			73,504
Agriculture	48,369		
Forest	164,425		
Barren Land	1,375		
Wetlands	6,780	**220,949**	**75%**
Total Land Area		**294,453**	
Water	119,856		

2017 (COUNTY)[1]			
Description	**Acres**		**Acre %**
Very Low Density Residential	19,514		
Low Density Residential	34,539		
Medium Density Residential	10,493		
High Density Residential	2,025	**66,571**	**23%**
Commercial	2,735		
Industrial	1,556	**4,291**	**1%**
Institutional	4,438		
Other Developed Lands	1,981	**6,419**	**2%**
Transportation	2,950	**2,950**	**1%**
			80,231
Agriculture	42,220		
Forest	161,955		
Brush	1,491		
Bare Ground	842		
Barren Land	494		
Extractive	856		
Wetlands	6,263	**214,121**	**73%**
Total Land Area		**294,352**	
Water	119,949		

1. Update of MDP 2010 Land Use data using 2017 Orthophotos

CHAPTER 3
THE WATER PLAN

3.1 PURPOSE AND SCOPE OF CHAPTER

The purpose of this chapter is to consolidate information to be used to plan, understand, utilize, conserve, operate and maintain, and to protect the County's water supply resources. In the planning period of this document, Charles County's population is expected to increase from its Census 2010 count of 146,551 to a projected population of 205,290 by the year 2040. As of 2019, County population reached 163,257. Approximately 75% of this growth will occur in the County's Development District. It is imperative that Charles County plans for its water supply systems so that they are adequate to serve existing and future development. This chapter includes the following:

1. A discussion of water resources, including groundwater and surface water resources;
2. A description of existing water supply facilities;
3. An assessment of the existing water systems;
4. A description of corrective approaches for problem areas of existing systems;
5. A description of the water demand and population/flow projections discussed in Chapter 2 relative to existing and future water system demands;
6. A description of failing well areas and potential corrective actions;
7. A description and discussion of the immediate and future requirements for water development within the County; and
8. A discussion of current and future fire suppression efforts.

The overall goal of the County regarding water supply and service is to provide a system of community facilities, public services, and utilities consistent with the Comprehensive Plan. This Plan is constructed to further explain the County's goals, objectives, and policies in relation to water supply, provide for the orderly expansion of water service, ensure adequate water supply for present and future needs, protect the public health, and provide the mechanism for capital programming of water service.

Ensuring that the provision of public services is coordinated with the demand for those services is a major component of any growth management strategy. Charles County faces two major issues regarding the provision of public services: (1) the County needs to develop those services and facilities necessitated by growth; and (2) the County needs to adopt policies that allow growth to occur at a rate at which the County can provide public services and utilities.

3.2 WATER SUPPLY RESOURCES

Presently, Charles County primarily relies on groundwater to meet its potable water supply needs. A comprehensive listing of the groundwater users are identified in throughout Appendix 3. There are 67 community water systems and the remaining which serve approximately 78 percent of the households of Charles County. The remaining percentage is served by individual wells. There are an additional 21 institutional systems operated by governmental entities. The Charles County Department of Public Works operates 16 of the 67 community water systems. The Town of Indian Head operates and owns its own municipal system. La Plata water system is municipally owned but operated by the quasi-government agency Maryland Environmental Service. The remaining 29 systems are operated by private utility companies or quasi-governmental organizations.

Two major industries, GenOn power plant at Morgantown and the Naval Support Facility Indian Head, utilize a mixture of groundwater for domestic use, and surface water from the Potomac River for industrial purposes in Charles County.

3.2.1 Groundwater Resources

Charles County lies entirely within the Atlantic Coastal Plain and is underlain by a wedge-shaped body of sediments, which generally thickens and deepens to the southeast. These include layers of gravel, sand, silt, and clay, and were deposited on the subsiding basement surface underlain by bedrock formations. Bedrock emerges at land surface along the Fall Line which approximately follows Interstate 95 in Virginia. The bedrock in the region has its greatest depth in southern Calvert and St. Mary’s Counties where it reaches 2,515 ft. below sea level. The depth of bedrock about 2 miles south of Waldorf is 1,976 below the land surface.

The sand and gravel deposits are porous, permeable, and contain large quantities of water in storage. These sands and gravel are generally capable of yielding water to wells. The silts and clays also contain interstitial water, but yields are typically unproductive or absent. Shallow wells are present in some rural areas of Charles County. These wells are prone to bacterial contamination from individual septic systems and other pollutants. Therefore, the Charles County Department of Health, which regulates individual wells, has encouraged the drilling of deep wells, tapping aquifers since the 1950s. Water in underground formations in Charles County is replenished mainly from precipitation that filters through the outcrop area (recharge areas) of the water-bearing formations. The precipitation filters through to the stratified sands and gravel, which are the major groundwater reservoirs or aquifers.

This Chapter draws on the reports provided by the Maryland Geologic Survey to provide specific information on the technical aspects of the aquifers and explores their capabilities for provision of potable water to serve Charles County's needs. Aquifers underlying the region include, in descending order (relative position below the ground surface): the surficial aquifer, the Aquia; the Magothy; the Upper Patapsco, the Lower Patapsco, and the Patuxent aquifer system, which is underlain by pre-Cretaceous basement rock. **Table 3-1** provides additional information on the stratigraphy of the County while **Table 3-2** provides the properties of geologic units underlying Charles County. The following aquifer descriptions are generally based on information contained in a regional water study entitled "Water-Supply Potential of the Coastal Plain Aquifers in Calvert, Charles and St. Mary's Counties, Maryland, 2007." **Figures 3-1** through **3-4**, derived from the aforementioned study, provide geological profiles through various parts of the County, and supplement the aquifer description.

Surficial Aquifer

The surficial aquifer is generally comprised of unconsolidated sands and gravels ranging from 10 to 40 feet in thickness. This aquifer is found at or near the ground surface, and in places seeps through as natural springs. Groundwater production capacity is limited in the surficial aquifer, and groundwater quality is highly variable. This aquifer is prone to bacterial contamination, particularly in the presence of high-water tables and individual septic systems. Use of this aquifer system for a potable source would require suitable treatment. The surficial aquifer is typically underlain by confining layers of clay approximately 200 to 250 feet thick, which separate it from the Aquia aquifer.

Aquia Aquifer

The Aquia aquifer is confined and typically varies between 80 and150 feet thick in the County. It is generally composed of clayey silts and fine sands that occur within the Aquia Formation. The Aquia aquifer is rarely used for groundwater production in the Waldorf area because of its low transmissivity of about 40 square feet per day (ft^2/day). The groundwater is moderately hard, comprised of the calcium/sodium-bicarbonate hydro chemical mineral material. Because the Aquia is not a productive aquifer in the Waldorf area, it is by-passed by well drillers for deeper, more productive aquifers for public uses. However, it can provide adequate supply for individual wells in the southeastern portion of the County. It may also have potential for use in the planned water system for Hughesville. Any development of the Aquia aquifer in this region should include testing for arsenic levels, which have been found to be high in the St. Mary's County area. (Drummond, 2007)

The Aquia aquifer is underlain by leaky confining units that are quite variable spatially and generally less than 60 feet in thickness. Even though the Aquia is a poor aquifer in the Waldorf region, it serves an important function of recharging the Patapsco aquifer system via downward assimilation.

Magothy Aquifer

The Magothy aquifer underlies the Aquia aquifer and is separated from it by the Brightseat confining unit. The Magothy aquifer pinches out in central Charles County but is used extensively for domestic and public supplies in the northeastern part of the County. The aquifer is about 50 feet below sea level in northwestern Charles with an average thickness in the Waldorf area of 50 feet.

The potentiometric surface of the Magothy shows a significant cone-of- depression in the Waldorf area. Heads in a test well in Waldorf have shown a 90-foot decline from 1975 to 2005. The decline at Waldorf was caused by significant population growth and increased pumpage for the public water systems in central part of the County. In recent years, increased water demand has been met by increasing withdrawals from the Patapsco aquifers. As a result, the heads have tended to stabilize in the Waldorf area.

TABLE 3-1
HYDROGEOLOGIC DESCRIPTIONS

Formation	Feet below Land Surface	Yield Potential
Basement Complex	500 to 2,500 feet	None
Patuxent	400 to 1,500 feet	Moderately large quantities
Arundel Clay	Between Patuxent and Patapsco	Aquitard, infrequently tapped for water
Patapsco	0 to 600 feet	Moderate/large quantities
Magothy	100 to 500 feet	3.3 mgd to 4.5 mgd (studies pending)[a]
Matawan-Monmouth		Aquitard
Brightseat		Aquitard
Aquia	0 to 300 feet	Small to moderately large
Marlboro Clay		Aquitard
Nanjemoy	0 to 70 feet	Aquitard
Calvert	Outcrops in portions of the County	Leaky aquitard, small yield
Choptank	Subcrops below Lowland Deposits	Aquitard
Upland Deposits		Moderate quantities in large shallow wells
Lowland Deposits	Stream valleys	Limited water in large diameter wells

Source:
1. Maryland Department of Natural Resources Administration and the Charles County Department of Public Works, "Charles County Area Water Supply Resources Development and Management Plan", 1984
2. "Charles County Area Water Supply Resources Development and Management Plan" (Maryland Department of Natural Resources Water Resources Administration and Charles County Department of Public Works, 1984)

TABLE 3-2

PROPERTIES OF GEOLOGIC UNITS IN CHARLES COUNTY

System	Series	Group	Geologic Unit (Aquifers)	Average Thickness (feet)	Water-bearing Properties
Quaternary	Recent and Pleistocene	Columbia	Lowland deposits (0-40 feet above sea level)	0-25+	Yields limited quantities of good water to large diameter dug or bored wells; has yielded 200 gpm to caisson-type wells.
Quaternary and Tertiary	Pleistocene and Pliocene	Columbia	Upland deposits (40+ feet above sea level)	0-30+	Yields as much as 25 gpm to large diameter dug or bored wells
Tertiary	Miocene	Chesapeake	Choptank	0-30+	Not water bearing in this county
Tertiary	Eocene	Pomonkey	Nanjemoy	70-200 +	Not water bearing in this county (clay member at base averages 30 feet)
Tertiary	Eocene	Pomonkey	Aquia Greens	80-150	Principal water-bearing formation in southeastern Charles County. Its potential in the eastern part of the county is untested; yields as much as 200 gpm in favorable locations
Tertiary	Paleocene	Pomonkey	Brightseat	0-30+	Not known to be an aquifer in the county
Cretaceous	Upper Cretaceous	Pomonkey	Monmouth and Matawan	0-60	Not considered as important water-bearing formations
Cretaceous	Upper Cretaceous	Pomonkey	Magothy	0-70	An important water-bearing formation in northeastern part of county; yields as much as 450 gpm to well
Cretaceous	Upper Cretaceous	Potomac	Raritan and Patapsco	400-900+	Principal water-bearing formation in western half of the county. Wells to these formations are commonly screened in more than one sand; wells yield as much as 560 gpm
Cretaceous	Upper Cretaceous	Potomac	Arundel Clay	Not positively identified as County	Not generally a water-bearing formation
Cretaceous	Lower Cretaceous	Potomac	Patuxent	200-600+	One of the principal aquifers in western Charles County where wells yield as much as 385 gpm.
Precambrian	Pre-cretaceous		Crystalline rocks	Unknown	Formation does not yield water

Source: Charles County Department of Planning and Growth Management and 1990 USGS Geology and Hydraulic Assessment (Plate 6)

Upper Patapsco Aquifer

The Upper Patapsco aquifer generally underlies the Magothy aquifer in Charles County and is separated from it by clayey units in the top of the Patapsco Formation and the bottom of the Magothy Formation. The Upper Patapsco includes separate interspersed sandy beds that appear to be sufficiently interconnected at the regional scale to form a single aquifer

The bluffs along the Potomac River in the northwestern part of the County contain outcrops of the Upper Patapsco aquifer. It also subcrops beneath the Potomac and river-water intrusion has occurred in the Indian Head area. The top of the Upper Patapsco ranges from 50 feet above sea level in northwestern Charles County to about 750 ft. below sea level in Calvert County. The bottom of the aquifer ranges from 100 ft. below sea level in western Charles to about 1000 ft. in Calvert County. There is a wide variation in the transmissivity due to the complex boundaries of the various porous beds within the confining layers. In western Charles, the transmissivity is less than 500 ft^2 /d.

The Upper Patapsco aquifer is used extensively for public supply in the central part of the County. Water levels have declined significantly in the Upper Patapsco since pumping began in northwestern Charles County. A cone-of-depression has formed in the aquifer centered in the La Plata area. At La Plata, where the aquifer is heavily pumped, water levels have declined from about 22 ft. below sea level in 1969 to about 140 ft. in 2004. Water quality in the Upper Patapsco is generally good. Water samples are primarily classified as sodium/potassium-bicarbonate hydro chemical mineral matter.

Lower Patapsco Aquifer

The Lower Patapsco aquifer underlies the Upper Patapsco, and is separated from it by clayey units in the middle part of the Patapsco Formation, referred to as the Middle Patapsco confining unit. Like the Upper Patapsco aquifer, the Lower Patapsco is composed of numerous sandy beds, which may be hydraulically separated locally, but coalesce on a regional scale to form a single aquifer. The top of the Lower Patapsco is about 100 ft. below sea level and the bottom is about 200 ft. in the western part of the County. Transmissivity of the Lower Patapsco aquifer in northwestern Charles County is about 500 ft^2 /d.

Water levels had declined significantly in the Lower Patapsco, especially in the northwestern part of the County where a cone-of-depression has formed that was nearly 200 ft. below sea level. Declines were the greatest in the late 1980’s through the mid-1990’s. With a shift to the public use of the Patuxent aquifer in the northwestern part of the County, the water levels have recovered steadily over the past 5 years. However, due to the potential for water levels to drop below the 80% management level regionally, the MDE reduced groundwater appropriations for Waldorf water system wells using this aquifer.

Water quality in the aquifer is generally good. The water is primarily in the sodium/potassium-bicarbonate hydro chemical type mineral matter. Elevated chloride concentrations can occur in the extreme northwestern part of the County likely attributable to river-water intrusion.

Patuxent Aquifer System

The confined Patuxent aquifer system is comprised of fine to coarse sand units that may be hydrologically interconnected. The top of the Patuxent aquifer system occurs at depths ranging from 1,000 to 1,600 feet below the surface, sometimes occurring at bedrock. As this aquifer has not been utilized to any great extent in Charles County, data on transmissivity is scarce, data suggested that transmissivity might be less than 100 ft^2/day. The groundwater is a very soft, sodium calcium bicarbonate-type water. The Patuxent aquifer system is not used to supply water to the Waldorf area. However, this system will be used in the future as overlying aquifers become taxed with major water users. This system is underlain by pre-Cretaceous basement rock. The Maryland Geological Survey (MGS), in cooperation with Charles County and the Maryland Department of the Environment, released a study in 1999 of the Patuxent Aquifer, entitled *Hydrogeological Evaluation of the Patuxent Aquifer in the Indian Head-Bryans Road Area*. The report indicated that the aquifer has potential to be a major water producer but the interconnection between the Patapsco and Patuxent may preclude total reliance on this aquifer. The 2015 Study of the Patuxent Aquifer performed by MGS provides the most up to date information about the characteristics of this aquifer in the Waldorf area.

Groundwater Availability and Regulatory Criteria

The availability of groundwater for appropriation purposes is determined by regulatory criteria that are based primarily on hydrogeologic considerations. Accordingly, this section outlines applicable regulatory criteria and then discusses groundwater availability in light of those criteria. Pursuant to State regulations and policy, groundwater appropriation must not have an unreasonable impact on the waters of the state or on other users of those waters. The groundwater appropriation permitting process and associated permit conditions are designed to ensure that such impacts will not occur.

The Maryland Department of the Environment (MDE), the lead agency involved in the groundwater appropriation process, specifies that "the regional sustained yield potentiometric surface of a confined aquifer may not be lowered below 80 percent of the drawdown available between the top of the aquifer and the historical pre-pumping level of the potentiometric surface. "Regional" is interpreted as an area in which water is appropriated or used from multiple wells located in a common source, or that location, which, as a result of the appropriation, is 50 percent of the distance from a single well to a point where the potentiometric surface lowered 1 ft. and has stabilized." As an additional criterion, the elevation of the water level within the well must not be drawn down below the top of the aquifer being pumped.

The Maryland Geological Survey (MGS) monitors a network of twenty-four (24) wells in Charles County with funding assistance from the County Commissioners. The groundwater levels are measured on a monthly basis to observe changes in water levels based on pumpage from wells This data is shared with MDE for use in decisions on groundwater appropriation permits, regarding depth of wells and the amount of water withdrawals to be permitted. In September of 2005, MGS presented the findings of the Southern Maryland Aquifer Study to the Charles County Commissioners, which concluded that certain areas of the County may experience groundwater levels below the 80% management level by 2030. In an effort to seek advice from multiple facets of the community, the Commissioners appointed a citizen member-based Water Resource Advisory Committee in 2006. The Committee presented a report to the Commissioners on alternative potable water resources and methods of reducing water consumption in October 2006. The Committee was re-commissioned in 2009 to develop a more refined Water Resource Management Strategy, which was provided to the Commissioners in September 2011. The Commissioner's charge for the Committee was to "[d]evelop a strategic plan to identify and evaluate alternative sources of water; promote use of reclaimed water; raise awareness of water value to public; promote water conservation; evaluate how proposed growth, development and aquifer trends will affect water resources."

3.2.2 Surface Water Resources

Charles County is bordered by the Patuxent and Potomac Rivers. While both offer large quantities of water, their use for water supply is constrained by their salinity concentrations, a result of the saltwater wedge that increases in salinity as the Patuxent and Potomac approaches the Chesapeake Bay. Therefore, the Potomac and Patuxent are brackish throughout Charles County's 183 miles of tidal shoreline and are currently unsuitable for potable water usage. Additionally, approximately 15 percent of the total area of Charles County is covered by water in the form of tidal estuaries, streams, swamps, man-made ponds, and lakes. Most of this water near the rivers is brackish, and many of the County's freshwater streams have small watersheds, undependable flow, and water of a quality that would require extensive treatment to be made potable. The County is presently investigating viable options to construct a surface water treatment plant to use surface water resources as a potable water supply for Charles County.

The principal streams in Charles County are Nanjemoy Creek, which drains the southwestern portion of the County; Mattawoman Creek, located in the northern portion of the County; and the Wicomico River, which drains the eastern half of the County. The drainage areas of the major streams in the County are indicated in **Table 3-3**.

The Charles Soil Conservation District indicates that reliable stream flows alone are not dependable or adequate to serve larger water demands. Average annual watershed yields range from 0.38 csm (cubic feet per second per square mile) to 0.85 csm. The poorest yielding watershed is Mattawoman Creek with 0.38 csm. The Charles Soil Conservation District report indicates that some streams frequently cease flowing and that reservoirs would be required to conserve surplus runoff as a source of dependable surface water storage. These watersheds could be used, with approval of the MDE, as an interim basis for a back-up source of water. The standards for drinking water from surface water are very different from groundwater use. Therefore, an assessment of operation and maintenance to supply this back-up water source would have to be conducted. Prior to consumption, potable water from these watersheds must meet standards of the Federal Safe Water Drinking Act (SWDA).

TABLE 3-3
WATERSHED AREA

Stream	Approximate Drainage Area (square miles)
Mattawoman Creek	98
Nanjemoy Creek	78
Port Tobacco River	47
Port Tobacco Creek	24
Wicomico River	247
Zekiah Swamp[1]	105
Gilbert Swamp[1]	45
Swanson Creek	27

Source: (1)The Department of Geology, Mines and Water Resources, "The Physical Features of Charles County," 1984. (2) Tributaries of the Wicomico River

In 1981, preliminary siting of potential water impoundments in Charles County was conducted by the SCS. Fifty-eight potential sites were identified under a broad classification for potential municipal water supplies, fish and wildlife, recreation, water quality control, and flood prevention. Since that time, many of the original 58 sites have been deleted due to changes in the site's physical conditions through development. The reservation concept is currently not considered a viable option, due to the added costs over groundwater, the variability of supply, and development around potential sites. The information should be used for preliminary planning purposes only.

There are presently three lakes in Charles County with a normal surface area of 12 acres or larger: Wheatley, Jameson, and Trinity. Lake Wheatley could yield a maximum of 0.24 mgd if it were to be operated for water supply under conditions of average precipitation. As development has occurred in the vicinity of this lake, the additional impervious surfaces have reduced the safe yield from the lake. The Town has abandoned the obsolete water treatment plant and the lake has been converted to purely recreational use.

The Waldorf area water supply system report, prepared by Whitman, Requardt and Associates in 1985, identified five potential impoundment sites for the Waldorf service area. An executive summary of that report limited the supply sources to Mattawoman Creek, Port Tobacco Creek, and

Zekiah Swamp. The summary indicated that surface water supplies are not feasible at this time due to low safe yields, environmental impacts, and high capital and operation and maintenance costs. However, because other more highly ranked alternatives for water supply may become impractical to develop, the report identified the Kerrick Run site as the most feasible of all the previously studied sites. The Kerrick Run site, however, is located within the St. Charles development. This site was not considered further due to the existing and proposed development around the Kerrick Run site.

Figure 3-1

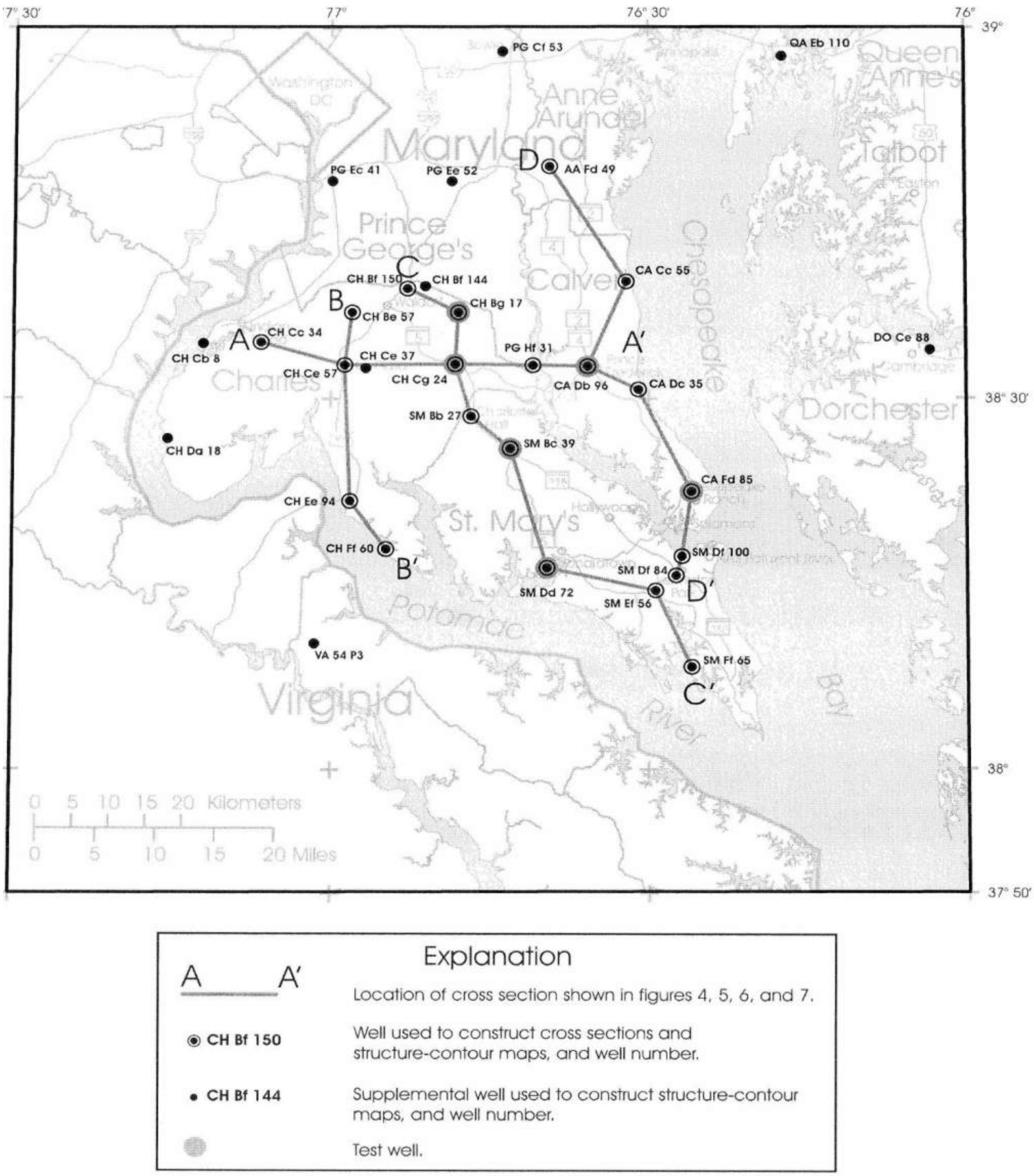


Figure 3. Locations of test wells, cross sections, and supplemental wells used to construct structure-contour maps.

Figure 3-2

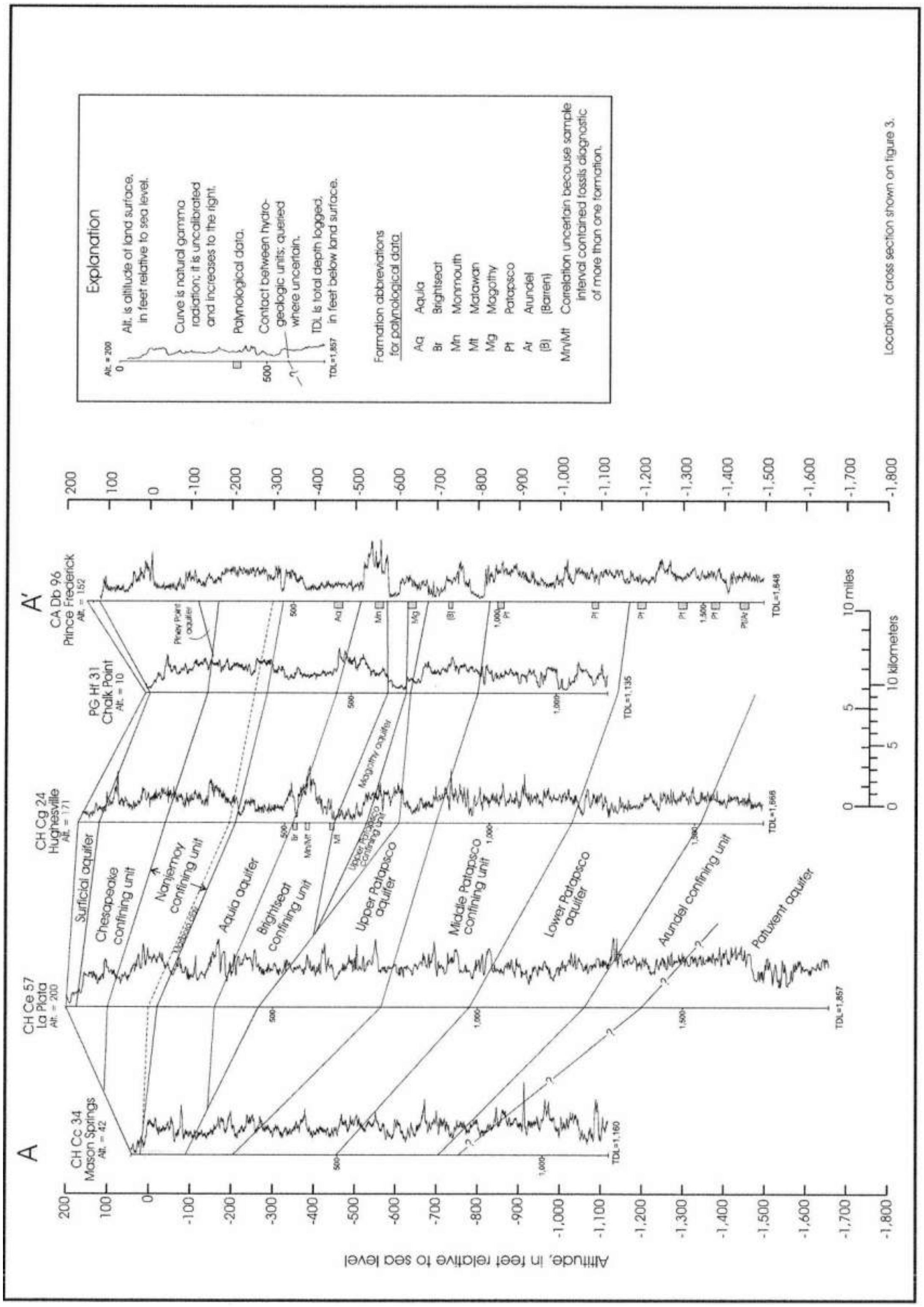


Figure 4. Hydrogeologic cross section A-A', Mason Springs to Prince Frederick.

Figure 3-3

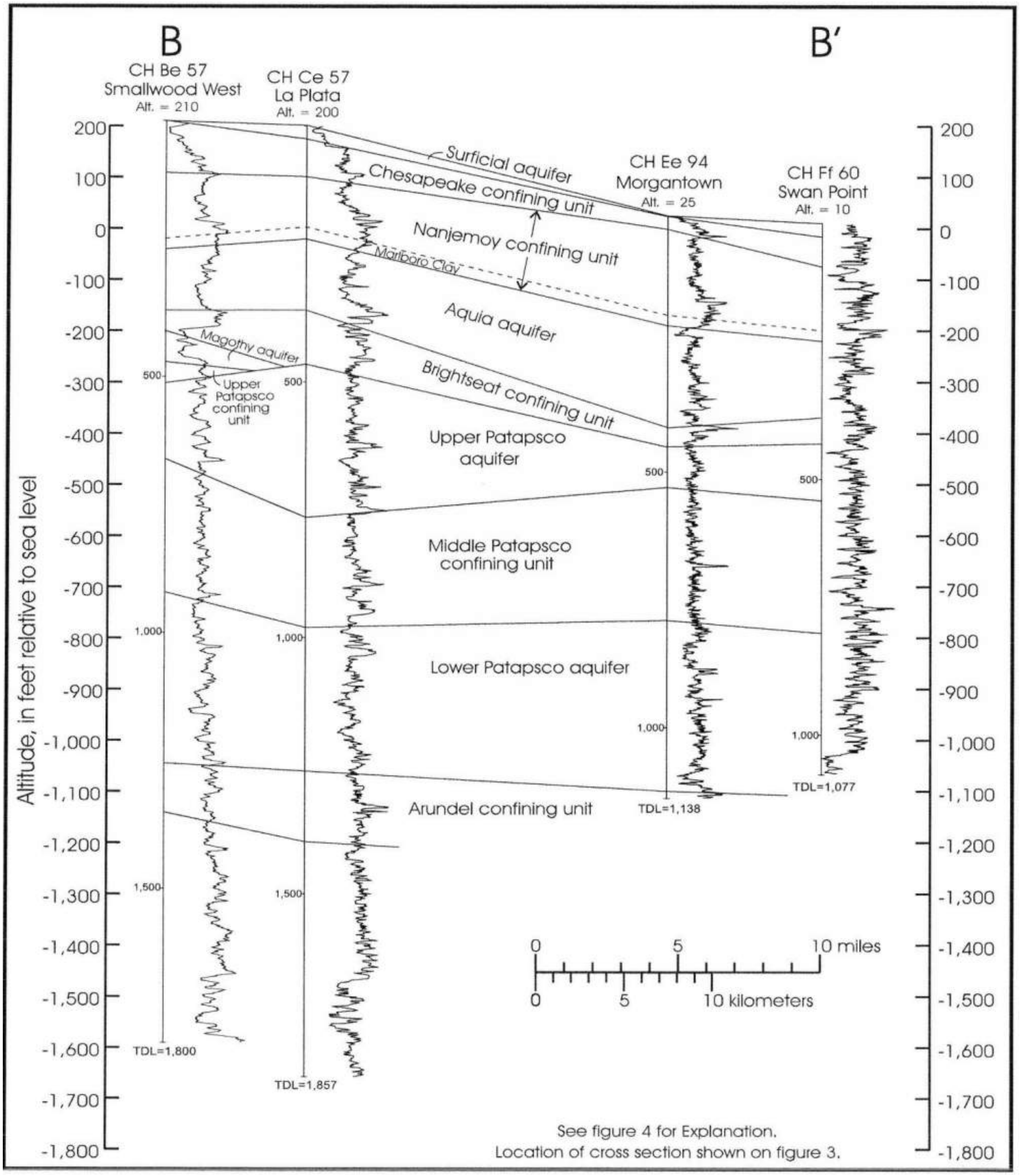


Figure 5. Hydrogeologic cross section B-B´, Smallwood West to Swan Point.

Figure 3-4

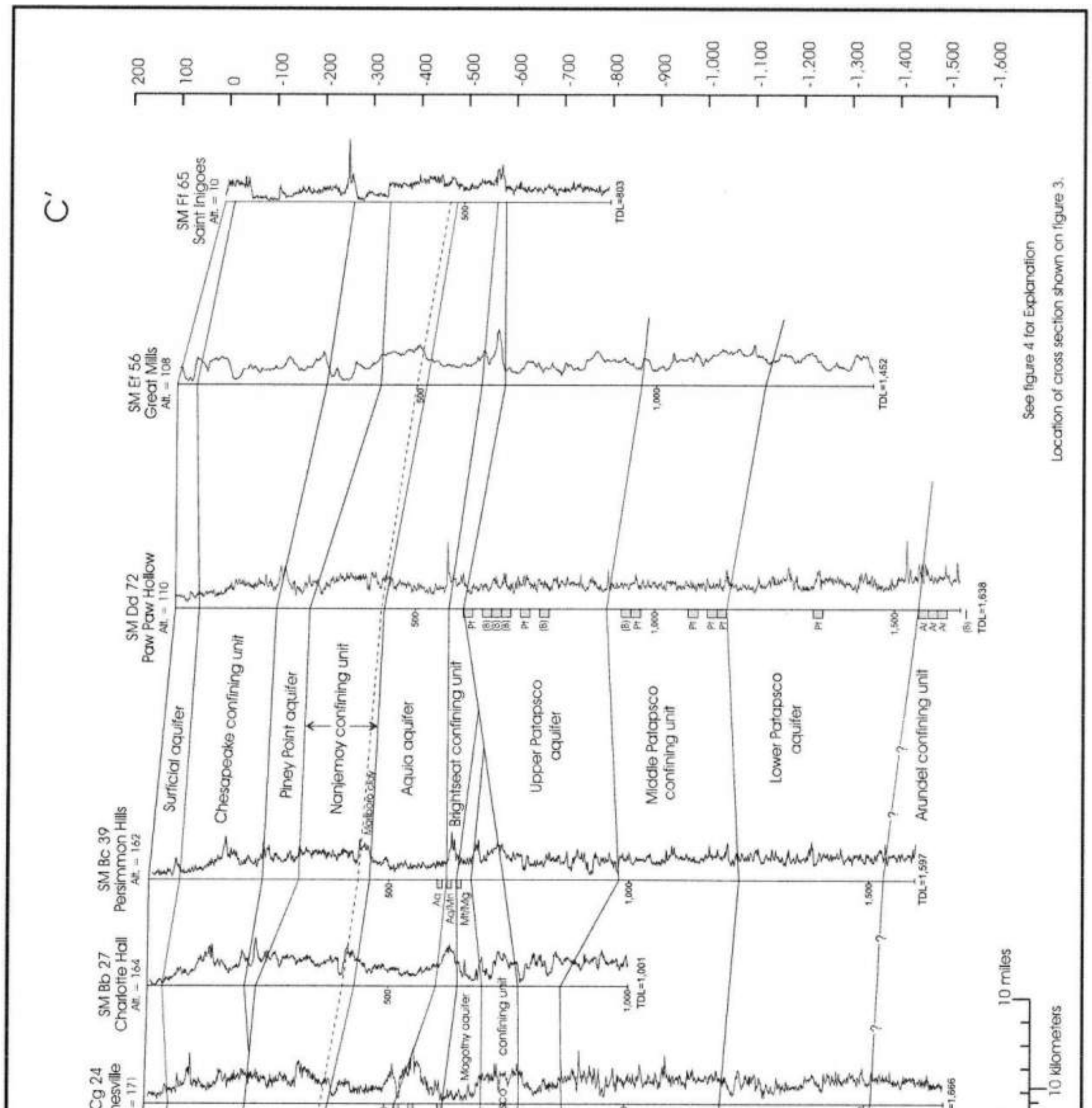


Figure 6. Hydrogeologic cross section C-C′, White Oak to St. Inigoes.

3.2.3 Water Quality Criteria

All water facilities must meet the standards of the Federal Safe Drinking Water Act (SDWA). The Maryland Department of the Environment (MDE) also requires that (at a minimum) the water system should meet the Federal standards. MDE can impose more stringent regulations specific to Maryland water systems. The State of Maryland water quality standards are contained in COMAR 26.04.01. The regulations set forth maximum contamination levels (MCLs); establish the monitoring frequency for certain bacteria, radiation, organic and inorganic chemicals; establish reporting procedures and require public notification in the event of MCL violation by water suppliers as prescribed by the SDWA.

In addition, the Maryland Plumbing Code and State regulations provide additional protection of the drinking water supply sources, including cross-connection control requirements. Cross-connection control programs are implemented within potable water systems to ensure that connections to the systems are made in an acceptable manner. The Charles County Department of Utilities has established a cross connection control program for all County-owned community water systems. The tapping of potable lines is controlled utilizing backflow prevention devices, meters, and other apparatus to reduce or eliminate the possibility that a pipeline conveying other than potable water could be connected to the potable water system.

3.2.4 Potential Sources of Pollution

Surface water and groundwater can be contaminated through several sources of pollution. The types of pollution can be grouped into two categories: point source and non-point source. Non-point source forms of pollution include surface water runoff from developed areas and runoff from farmlands that contain high levels of nutrients from fertilizers. Saltwater intrusion, sewage system effluent, and failing septic systems are considered point sources of pollution. All these sources are known to be potential sources of pollution that may affect the waters of Charles County.

Management programs involving sewer system control and maintenance of non-point pollution sources by agriculture and development would minimize pollutant loadings since impoundments should be treated as any other surface water supply. The County Department of Health currently regulates septic systems within the County; and the County has a policy regarding the use of septic systems within the Development District (provided in Chapter 1.)

Saltwater intrusion into some of the drinking water aquifers has been addressed in several reports by the Maryland Department of the Environment, Water Resources Administration. The main study reviewing saltwater intrusion, "Charles County, Maryland Water Supply Resources Development and Management Plan" (dated 1984), indicated that saltwater intrusions have occurred in several systems in western Charles County, specifically at the Naval Support Facility Indian Head and at one of the Indian Head wells.

Groundwater pollution occurs when surface water runoff from developed areas and runoff from farmlands that contain high levels of nutrients from fertilizers enter the groundwater through interconnected aquifers. Similarly, saltwater intrusion, sewage system effluent, and failing septic systems can enter the groundwater through seepage through the ground surface to the aquifers, contaminating several aquifers depending on their interconnection.

Contaminates can be found in groundwater due to naturally occurring elements derived from the surrounding soil and rock formations. Erosion of natural deposits of certain minerals that are radioactive may emit a form of radiation known as alpha radiation. Traces of alpha radiation have been detected in the groundwater in certain areas of Charles County. This incidence is listed in section 3.4.1.2.

3.3 EXISTING WATER SUPPLY FACILITIES AND WATER DEMAND

The existing central water supply facilities can be grouped into three types: private/community, public/municipal, and institutional/governmental. The County does not have impounded supply facilities. The designation is based on the owner/operator of the facility and corresponds to the appendices which appear at the end of this chapter. Private-community systems are indicated with an "A" suffix. Public-municipal systems have a "B" suffix, while institutional-governmental uses have a "C." This series follows throughout the appendices. Appendices 3A, 3B, and 3C present population projections, projected water demands, and planned capacity of each central water system in Charles County for private, public, and institutional, respectively. The present water demand and population served were obtained from MDE's Water Management Administration records and the Charles County Department of Planning & Growth Management.

The service areas for each of the private/community, public/municipal, and institutional/governmental water facilities are shown on the Comprehensive Water and Sewer Plan maps. These maps are incorporated as part of this document by reference. The appendices included as part of this chapter refer to "map numbers". These map numbers are the new map numbers resulting from the updated mapping base used for this plan update.

Appendix 3A lists current population served, gallonage consumed, existing and permitted capacity, year 2040 population to be served, and capacity required for private/community systems. Likewise, Appendix 3B provides the equivalent information for public, municipal system, as Appendix 3C does for institutional/government systems.

Appendices 3D through 3I provide an inventory of the existing water systems and treatment facilities. These appendices provide available information regarding the wells within the central systems. Also, water quality information is included in this table. Tables 3-9 and 3-10 provide water system information including groundwater appropriations, current and projected flows, and remaining capacity.

The number of people served by central water systems is summarized in **Table 3-4** and Figure **3-6**. The remaining County population is served by individual wells. The total domestic groundwater withdrawal in the County is estimated to be 8.3 mgd from the public/municipal systems (refer to Appendix 3B) and 0.2 mgd from individual private wells (assuming an average consumption of 66 gallons per person per day per Appendix 3A for private communities). From Appendices 3A, 3B, and 3C, and assuming groundwater will continue to be the primary supply the people of Charles County, the rate of groundwater withdrawal from central systems in Charles County is estimated to be 13.8 mgd in the year 2040.

Table 3-5 provides details on the break-down of ground and surface water withdrawals in Charles County based on the 2015 Water Use Data from USGS As can be seen, permitted surface water withdrawals exceed permitted ground water withdrawals by far. This use is exclusively for industrial purposes. The GenOn power generation plant is permitted to withdraw 3.44 mgd of surface water from the Potomac River for the air emissions facility and another 1,500 mgd for cooling. However, the GenOn plant is set to permanently retire in 2022.The Naval Support Facility Indian Head (NSFIH) in Indian Head is permitted to withdraw 3.3 mgd from the Potomac. Maryland Rock is granted 0.1 mgd of surface water.

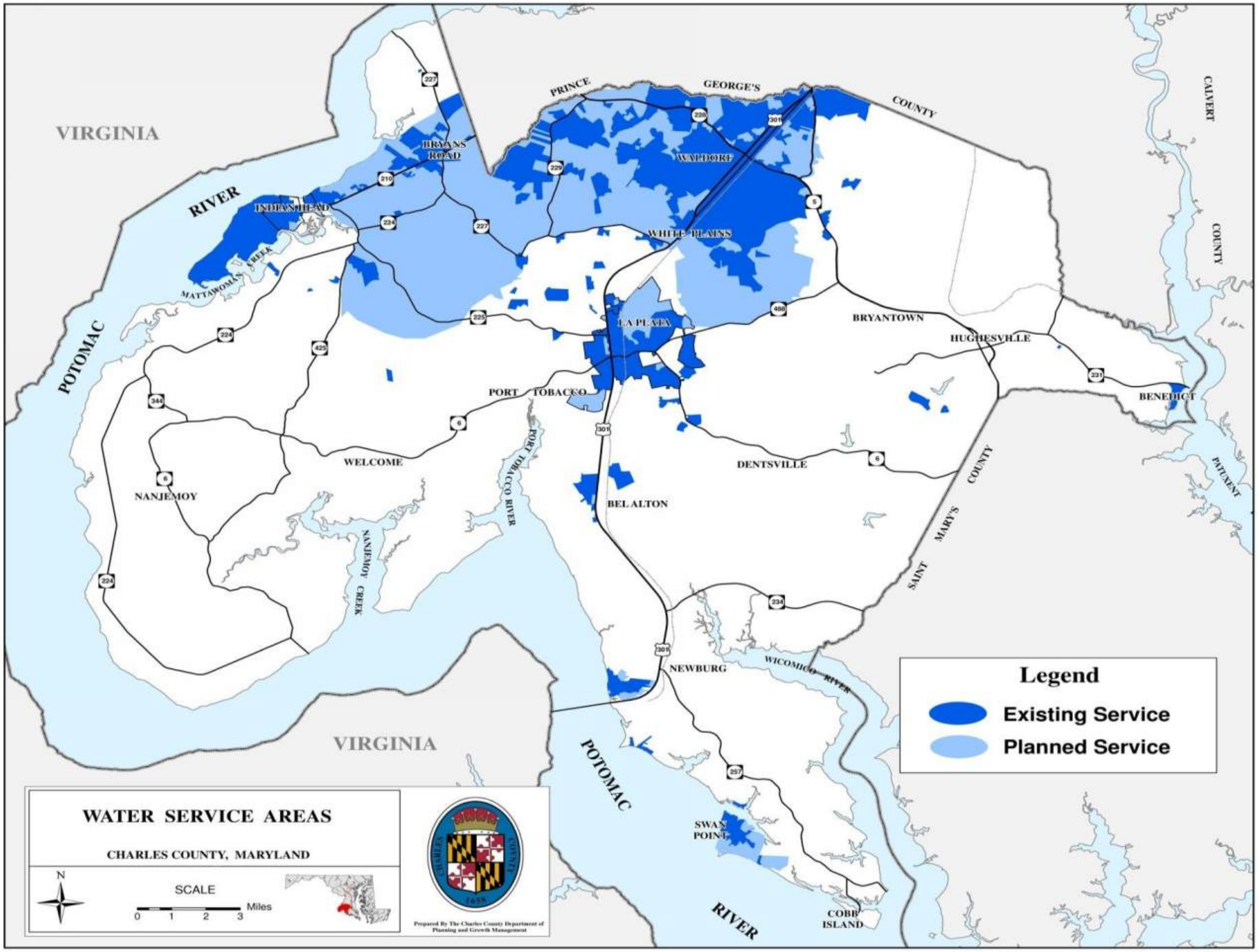

VIRGINIA
RIVER
POTOMAC
PRINCE
GEORGE'S
COUNTY
CALVERT
COUNTY
BRYANS ROAD
INDIAN HEAD
MATTAWOMAN CREEK
WALDORF
WHITE PLAINS
LA PLATA
BRYANTOWN
HUGHESVILLE
BENEDICT
PORT TOBACCO
WELCOME
NANJEMOY
DENTSVILLE
BEL ALTON
PORT TOBACCO RIVER
NANJEMOY CREEK
SAINT MARY'S COUNTY
PATUXENT
WICOMICO RIVER
NEWBURG
VIRGINIA
POTOMAC
RIVER
SWAN POINT
COBB ISLAND
Legend
Existing Service
Planned Service
WATER SERVICE AREAS
CHARLES COUNTY, MARYLAND
N
SCALE
0 1 2 3 Miles
Prepared By The Charles County Department of Planning and Growth Management

Figure 3-5

TABLE 3-4
NUMBER OF PEOPLE SERVED BY CENTRAL WATER SYSTEMS

Type of System	2019 Population
Private/Community	5,332
Institutional/Government	12,648
Public/Municipal	111,671
TOTAL	129,651

Source: Extracted from Appendices 3A, 3B and 3C

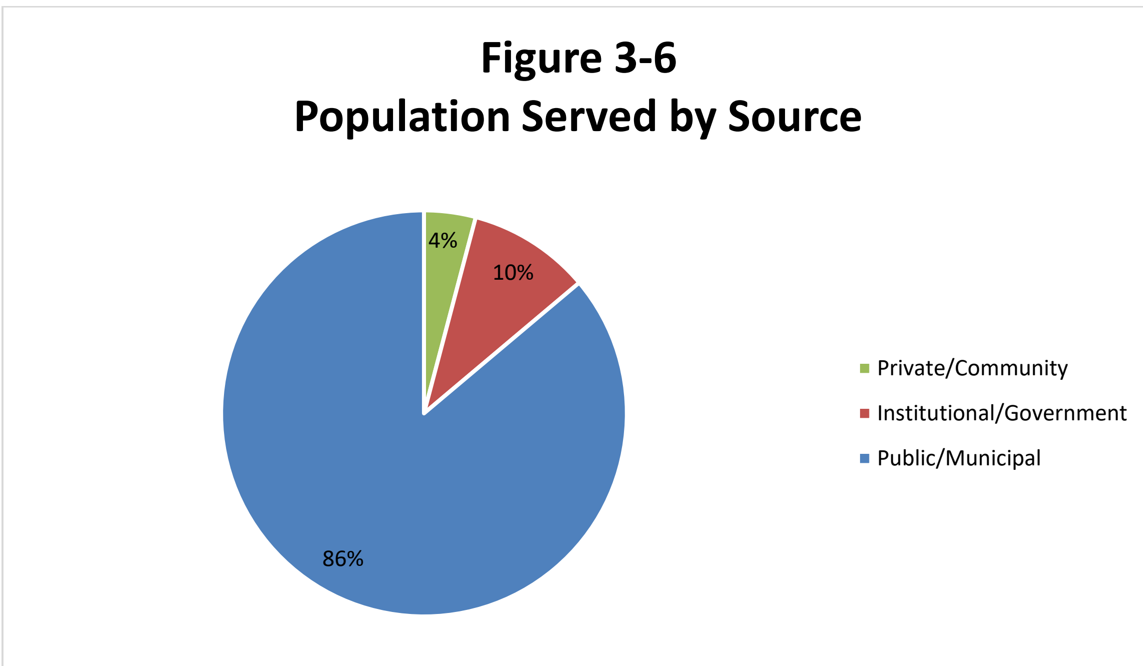


TABLE 3-5
GROUND AND SURFACE WATER WITHDRAWALS
1995 - 2015

Category	1995 Groundwater Withdrawals (MGD)	1995 Surface Water Withdrawals (MGD)	2005 Groundwater Withdrawals (MGD)	2005 Surface Water Withdrawals (MGD)	2015 Groundwater Withdrawals (MGD)	2015 Surface Water Withdrawals (MGD)
Domestic (Public-supplied and self-supplied)	4.500	0	9.000	0	4.190	0
Commercial	0.932	0	2.570	0	0.700	0
Industrial	0.008	0	0.020	0	0.010	0
Mining	0.005	0.800	0.010	0.080	0.160	0
Power Generation	0	989.041	0.570	1,166.550	0.480	1007.660
Agricultural/ Irrigation	0.007	0.427	0.240	0.090	0.180	0.100
Livestock	0.016	0	0.040	0.040	0.010	0.030
Totals	5.452	990.268	12.41	1166.76	5.730	1007.790

Source: 2005 Maryland Water Use Report (MDE), 2015 Maryland Water Use Data (USGS)

3.3.1 Private/Community Systems

There 26 private/community systems within Charles County. Refer to Appendix 3G for an inventory of these private facilities.

1. Banks O'Dee Citizen Association, Incorporated- This privately-owned and operated water system serves approximately 65 people and is supplied by one well. The system production capacity is 18,000 gpd with average daily demand estimated to be 4,550 gpd. Groundwater appropriation is for 7,000 gpd.

2. Bellewood Water Association, Incorporated- This privately-owned water system serves 128 people in Bellewood and is supplied by one well. Ground water is treated at each well by filtering where iron is removed, and disinfection occurs. The production capacity is 7,000 gpd and average daily demand is 6,500 gpd. The system has an appropriation of 12,000 gpd.

3. Charles County Gardens Water Co., Incorporated- Approximately 240 people in Charles County Gardens are served by this privately owned and operated water system. The system

is rated at 22,000 gpd and the average daily demand is 12,500 gpd. Two wells supply the system. The operator is certified. Water appropriation is for 22,000 gpd.

4. Du-mar Estates Water Co.- This privately-owned system serves approximately 150 people in Du-mar Estates and has a production capacity of 36,000 gpd. Present demand is 8,000 gpd. One well supplies the system. Groundwater appropriation is for 11,400 gpd. The operator is certified.

5. Ford Heights - Pomonkey Water Company, Incorporation- This private water system serves 125 people, by one well. The facilities are rated at 6,000 gpd. Average daily demand is approximately 5,000 gpd. Groundwater appropriation is for 6,000 gpd. The operator is certified.

6. Forest Park - Trimac Water Company, Incorporated- This water system is privately owned and operated and serves 139 people in Forest Park. Water is supplied by four wells. The system capacity is rated at 13,000 gpd. Average daily demand is 5,000 gpd. Groundwater appropriation is 13,000 gpd.

7. Garden Estates Water Company, Incorporated- Fifty-five (55) people are served in Garden Estates by this private water company. Average daily demand is estimated at 4,550 gpd. Appropriation is for 5,100 gpd.

8. Green Meadows Water Company- This privately-owned water system serves 90 people in Green Meadows. Water is supplied by two wells. Average daily demand is 11,400 gpd. Groundwater appropriation is 10,000 gpd. The operator is not certified. This facility does not receive treatment.

9. Hawthorne Water Supply, Incorporated- Sixty (60) people are served in Hawthorne by this private water system. One well supplies a system with the production capacity of 72,000 gpd. Daily demand is approximately 4,200 gpd. Groundwater appropriation is for 5,000 gpd.

10. Idlewood Mobile Home Park, Inc.- Three hundred twenty (320) people are served by this water system. One well supplies the system. Average daily demand approaches 18,300 gpd. The owner has expressed an interest into connecting with the Waldorf Water System. The groundwater appropriation is 25,000 gpd.

11. Independence Village (Sections 1 & 2)- This privately-owned water system serves approximately 88 people in Independence Village. One well supplies a system ~~rated~~ production capability of 22,000 gpd. The average daily demand is 6,200 gpd. Groundwater appropriation is for 6,400 gpd. The operator is certified.

12. Inman Utilities (Indian Head Manor II) – One hundred twenty-five (125) people are served in Indian Head Manor II by this private water system. The users of this private system have petitioned the County to connect to the Bryans Road System.

13. Kings Manor South - White Plains Water Company- Three hundred seventy-two (372) people are supplied water in Kings Manor South from two wells. Daily demand approaches 15,600 gpd. Groundwater appropriation is 22,000 gpd.

14. Laurel Water Supply, Incorporated- This water system serves approximately 50 people (16 homes) in the Montrose subdivisions. One well supplies the system. Average daily demand is approximately 3,500 gpd. Groundwater appropriation is for 3,700 gpd. The operator is certified.

15. Matthews Water Company- Forty-five (45) people are served by this private water system. Two wells supply the system. Average daily demand is estimated at 3,150 gpd. Groundwater appropriation is for 3,500 gpd.

16. Morgantown Water Company, Incorporated- This private water system serves 39 people in Morgantown and is supplied by one well. Daily demand is estimated at 2,700 gpd. Groundwater appropriation is for 3,900 gpd.

17. Newtown Estates (Tip Hill)- One hundred ten (110) people in Newtown Estates are serviced by this system. One well supplies the system. Average daily demand is approximately 7,800 gpd. Groundwater appropriation is 15,000 gpd.

18. Oak Hill Water Association, Incorporated- One well supplies this private system serving 180 people in Oak Hill Estates. The daily demand is 11,000 gpd. Groundwater appropriation is 16,000 gpd. The system was constructed in 1970. Occasional problems with iron and odor have been experienced in isolated sections of the community. Line sizes range from 1- ½" to 6".

19. Parkway Water Company, Incorporated- Fifty (50) people in Parkway are served by this private water system. One well supplies the system. Daily demand is approximately 3,500 gpd. Groundwater appropriation is for 3,600 gpd. The system is located adjacent to the town of La Plata's public water system service area.

20. Pine Hill Water Company, Incorporated- This private water system serves 140 people in Pine Hill Estates and is supplied by one well. Average daily water demand is 5,900 gpd. System production capacity is 25,000 gpd. Groundwater appropriation is 15,000 gpd.

21. Pomfret Estates - Utilico, Incorporated- One hundred fifty (150) people are served in Pomfret Estates by this private water system. One well in the Patuxent Aquifer supplies the system capacity of 43,000 gpd. Daily demand is 8,400 gpd. Groundwater appropriation is for 12,700 gpd. The distribution system is comprised mainly of 6" diameter lines.

22. Potomac Heights Mutual Homeowners Association, Incorporated- One thousand and eight hundred (1,800) dwellings, most of which are double occupancy dwellings, are served in Potomac Heights by this private homeowner’s association water system. Average daily

demand is 71,000 gpd; system pumping capacity is 735,000 gpd. A 180,000-gallon elevated tank provides water storage and maintains system pressure. Water is distributed through 6", 8" and 10" diameter pipes. The system predominately serves only residents of Potomac Heights. Two production wells tapping the Patapsco Aquifer supply the system. Groundwater appropriation is 150,000 gpd.

23. Red Hill Water Company, Incorporated- The Red Hill Water Company serves 200 people. Two wells supply the system rated at 18,000 gpd. Daily demand approaches 7,800 gpd. Groundwater appropriation is 18,000 gpd. The operator is certified.

24. Southview- Sixty-one (61) people are served by this private water system. One well supplies the system rated at 6,000 gpd. Average daily demand is estimated at 4,200. The operator is not certified. This facility does not receive treatment. The system has experienced problems with deteriorating infrastructure, high demand, seasonal functions, and inadequate capacity.

25. Turkey Hill Water Company, Incorporated- One well supplies this private water system serving 150 people in the Turkey Hill subdivision. This system has a production capability 43,000 gpd and average demand is 9,400 gpd. Groundwater appropriation is 11,000 gpd. The system was constructed in 1969.

26. West White Plains Water Company, Incorporated- Fifty (50) people in the West White Plains are served by this private water company. The capacity of the system is 29,000 gpd; average daily demand is estimated at 3,500 gpd. One well supplies the system. Groundwater appropriation is 3,500 gpd. The operator is not certified.

3.3.2 Municipal/Public Systems

There are 18 municipal public systems within Charles County, which provide potable water service to approximately 86 percent of the County's population. These systems are owned and operated by either Charles County (16 systems), the Town of Indian Head, and the Town of La Plata. Refer to Appendix 3H for the inventory of these public treatment systems.

1. Avon Crest- The Avon Crest Water System is operated by the Charles County Department of Public Works and serves approximately 81 people. A single well supplies the system which has a production capacity of 91,800 gpd. Average daily demand was approximately 5,300 gpd. The State appropriation for groundwater withdrawal is 9,100 gpd. Distribution is through 6" lines. The system was dedicated to the County in June of 1977.

2. Beantown Park- This water system was taken over by the Charles County Commissioners at the request of a citizen petition in 2003. One well supplies the system, which was drilled by the County in 2004. Water is treated for iron removal and hardness and is disinfected. The system capacity is 36,000 gpd. Average daily demand is estimated to be 7,500 gpd. Approximately 131 people are served in Beantown Park. The system was previously

connected to the Bellewood Water System for emergency transfer of water. Current groundwater appropriation is 14,000 gpd from the Magothy aquifer.

3. Bel Alton Estates- Bel Alton is served by two wells. The system's production capacity is 208,440 gpd and average daily demand is approximately 17,000 gpd. The County Department of Public Works operates the facility which includes disinfection. Three hundred and nineteen (319) people are served by this system. Water distribution is through 6" and 8" diameter lines. The system was dedicated to the County in December of 1977. Total groundwater appropriated is 25,000 gpd.

4. Benedict- The Benedict Water System is operated by the County's Department of Public Works and serves 374 residences. Two wells provide water to the system. A second well began operation in 1985, and the distribution system was extended to serve all residences. The system operation began in 1984, and water distribution is through 6- and 8-inch diameter lines. Groundwater appropriation is for 56,000 gpd. The average daily demand is 22,178 gpd.

5. Bryans Road- Formerly a private system operated by Charles Utilities it was acquired by the County in 1988. As a large part of the current service area is designated as Town Center in the Bryan Road Sub Area Plan, there is potential for high growth to occur resulting in a much higher demand on the water system. In response to this anticipated growth, the County will extend the Waldorf and Bensville water systems to Bryans Road to provide the necessary support and reduce the impact of drawdown on local private wells. In addition, the County completed an interconnection to the Strawberry Hills water system to the Bryans Road water system in August 2013, which provides additional water source diversification by eliminating dependence on the Lower Patapsco aquifer for those residents. The County is planning to construct the Bryans Village Interconnection, Strawberry Hills Waterline Extension, and Marshall Hall Road Waterline Extension to provide redundancy and adequate pressure within the Bryans Road water system

   Currently, the system has four wells and is rated at 583,200 gpd with an appropriation of 570,000 gpd. A new well with a capacity of 650,000 gallons per day and a one-million-gallon capacity elevated storage tank/water tower was constructed in 2003. The system previously served a population of 3,423. With the addition of the Strawberry Hills system, the service population has increased to approximately 5,000. In addition, the systems 500,000-gallon standpipe in the South Hampton Community was removed in 2005. Average daily demand is with Strawberry Hills is 378,000 gpd.

   The County has also approved a petition filed by the Jenkins Lane Water Company to connect to the Bryans Road System, which will add approximately 110 people to the Bryans Road System. The County replaced their failing private water system and assumed ownership, operations, and maintenance in 2010. The County completed design and construction of the new water system through the capital program. Jenkins Lane is currently connected to the Bryans Road public water system.

As an additional source of water supply, water system redundancy, and a means of water source diversification, the County has planned an additional well in the Patuxent aquifer, to compensate for the County's significant reductions in water withdraws from the Lower Patapsco aquifer in northwestern Charles County. As the third well into this aquifer, the County will be able to supplement the reduced withdraws from the Lower Patapsco and preserve water levels for homeowners on private wells or water systems. The County has been granted approval by the state legislature (2010) to receive a state appropriation of 1.0 million dollars for the construction of a groundwater well(s) in the Patuxent aquifer to serve the Bryans Road water system. This Patuxent well is currently being finalized for production.

6. <u>Chapel Point Woods</u>- This system was built in 1987 and dedicated to the County. The system serves approximately 280 persons and has been interconnected to Bel Alton High School Building and Jude House facility. Two wells serve this development which are rated at 200,880 gpd. Average daily demand is 32,800 gpd. Appropriation for this system is 80,000 gpd.

   In 2005, the County discovered traces of gross alpha radiation in water samples taken from one of the Chapel Point wells. The County installed Reverse Osmosis infrastructure at the well site to remove the radiation. Waste from the process is taken to the Mattawoman WWTP for processing. The County extended the water service to the Bel Alton School/Alumni Association and the Jude House facility. An additional well was developed at the Jude House site; however, it currently has shown evidence of Gross Alpha contamination.

7. <u>Clifton-on-the-Potomac</u> -This system is operated by the County and serves approximately 744 people. The County has operated this system since October of 1973. Previously, three wells supplied the system which is rated at 351,000 gpd. Average daily demand is approximately 54,300 gpd. Two new wells were constructed in 2000 to replace the two Aquia wells, which were pumping sand. Cliffton Well No. 2 is out of use due to the presence of gross alpha radiation. Cliffton is currently served by two wells – Cliffton Well No. 5 (replacement for Cliffton Well No. 2) and St. Annes Well. The groundwater appropriation is 85,000 gpd. Water is distributed through 6-inch, 8-inch and 10-inch diameter pipes. As part of the Cliffton Water Systems Improvements project, two (2) 8-inch diameter water distribution mains to interconnect the existing water system and improve reliability. The County is planning to construct a new 250,000-gallon elevated storage tank to improve system pressure.

8. <u>Ellenwood</u>- The Ellenwood water system is operated by the County's Department of Public Works and is rated at 151,200 gpd. The system is supplied by two wells. Approximately 235 people are served by the system. Average daily demand is 11,000 gpd. Water

distribution is through 4", 6" and 8" diameter pipes. This system was dedicated to the County in March 1980. Total groundwater appropriation is for 27,000 gpd.

9. Hunters Brooke- The Hunters Brooke water system was developed in 2003 for the Hunters Brooke and Falcon Ridge subdivisions. The system serves a population of 614. The system consists of two wells into the Patuxent aquifer, totaling 116,000 gallons per day. Average daily demand is steadily increasing with additional connections from new construction. Current pumpage totals 44,500 gpd.

10. The Town of Indian Head- This system is owned and operated by the Town of Indian Head and serves 4,100 residents within its corporate limits. Water supply is obtained from three (3) wells and is pumped through a water treatment facility for each well into water transmission mains. Total storage is 300,000 gallons (ground). Water is distributed through pipes varying in diameter from up to 8". Ground water appropriation is for 110,000 gpd from Patuxent and 244,000 gpd from Lower Patapsco. The average annual water withdrawal is 110,000 gpd from Patuxent and 216,000 gpd from Lower Patapsco.

    Allocation of water capacity within the Town of Indian Head is on a first come, first serve basis. However, the Town has more available water under their Groundwater Appropriation Permit, than the remaining developable land within the town boundary would require. A monthly monitoring report and a bi-annual report is submitted to MDE illustrating the Town water withdraws.

11. The Town of La Plata – Approximately 9,500 people are served by this municipal water system. The community obtains its water from five wells for daily operations. Groundwater is treated and chlorinated prior to discharge into the distribution system. Three elevated tanks (250,000 gallons, 300,000 gallons, and 750,000 gallons) and one 750,000 ground level storage provide over 2 million gallons of water storage. The rated capacity of the system based on average daily groundwater appropriations is 1.234 MGD. Average daily demand is approximately 878,300 gpd. The Town has the production capacity of more than 2.5 mgd with the current wells pumping 16 hours/day.

    Allocation of water capacity within the Town of La Plata is on a first come, first serve basis. For residential subdivision applications, the Town issues an Allocation Letter to the Charles County Department of Health to confirm that adequate water capacity exists within the Town's Groundwater Appropriation Permit. The Department of Health will sign the Allocation Letter once capacity is confirmed. A flow factor of 225 gallons per day per dwelling unit is used to determine water demand. The Town uses Maryland State Standards to determine the water demand of institutional, commercial, and industrial uses. A bi-annual report is submitted to MDE illustrating the Town water withdraws.

    The Town projects growth to 25,000 population to be served by 2030. Based on this proposed growth, the town must expand its groundwater appropriation permits, which may include one or more wells. The Town has applied for an increase in the GAP to 2.5 mgd and MDE is in the process of reviewing the capabilities of the Lower Patuxent aquifer to determine whether it will sustain the increased usage. The Town's Water Supply Capacity and Wastewater Capacity Management Plans are included in Appendix 5. In addition to the efforts to expand the groundwater appropriation, the County and Town are working towards an agreement to provide additional potable flow to the Town.

12. Mariellen Park- Two wells supply this County Department of Public Works water system. Approximately 184 people are served. System capacity is 57,600 gpd. Average daily demand is 9,100 gpd. Groundwater appropriation is 18,000 gpd. Water is distributed through 6" diameter pipes. This system was dedicated to the County in May 1983.

13. Mt. Carmel Woods- The County Department of Public Works operates this system, which was dedicated to the County in March of 1990. Approximately 175 people are served in Mt. Carmel Woods. Rated system capacity is 86,000 gpd; average daily demand is 12,600 gpd. Groundwater appropriation is 15,000 gpd. The #1 well went dry and the pump equipment has been removed. The County has constructed a new well which became operational in 1990. This well was drilled to the Patapsco Aquifer. Mt. Carmel Woods water system utilizes two previously existing wells as a stand-by supply. In 2006, traces of gross alpha radiation were found in the new production well. That well was abandoned, and a replacement well was drilled into another aquifer to supply water free of gross alpha.

14. Newtown Village - One hundred seventy (170) people in Newtown Village are served by this system which the County took over operation in 1992. One drilled well supplies the system rated at 100,000 gpd. Average daily demand is approximately 7,800 gpd. Groundwater appropriation is 15,000 gpd.

15. Oakwood- The County Department of Public Works operates this water system which serves 46 people. One well supplies the system rated at 26,100 gpd; daily demand is 2,000 gpd. Groundwater appropriation is 5,000 gpd. The system was dedicated to the County in November 1977.

16. Spring Valley- The County Department of Public Works operates this water system serving 91 people. The pumping capacity of the system is 67,000 gpd. Average daily demand is 5,400 gpd. One well supplies the system. Groundwater appropriation is 9,600 gpd. Distribution is through 6" and 8" diameter pipes. The system was dedicated to the County in January of 1977.

17. Swan Point- Dedicated to the County in 1984, the Swan Point water system serves approximately 945 people. Average daily demand is 59,100 gpd. This system consists of two wells that draw from the Patapsco aquifer. A 400,000-gallon water tower was constructed within the development to provide additional water storage capacity. Water distribution is through 6" and 8" diameter pipes. Swan Point has a Groundwater Appropriation Permit for 500,000 gpd, with a rated system production capacity of 800,000 gpd.

18. <u>Waldorf</u>- Constant growth and increased water demand characterizes the Waldorf Area. The system currently serves approximately 87,400 people. This area is served by an extensive distribution network owned, operated, and maintained by the Charles County Department of Public Works. At present, sixteen (16) wells provide groundwater to the Waldorf Area Water System. Pumpage of groundwater in the Waldorf System has increased from 0.1 mgd in 1962 to approximately 5.3 mgd in 2014. Prior to 2002, the total groundwater appropriation for the Waldorf system was 6.77 mgd. In late 2001, MDE, Water Rights Division altered several of the Waldorf groundwater appropriation permits, resulting in a net loss of approximately 500,000 gpd to the system. MDE altered permits based on average use of each well. The most recent groundwater appropriation permit issued by MDE for the expanded system reduced from 8.2 mgd to 5.67 mgd due to potential limitations in the Lower Patapsco aquifer indicated by current modeling.

    The area served by the Waldorf Water System is bounded by Berry Road at Briarwood Drive to the northwest; US 301, near the Prince George's County Line to the north; Sprague Road and Dent Drive in Pinefield to the east; and south at Theodore Green Boulevard in White Plains. Five (5) elevated tanks totaling 7.2 million gallons provide storage of water.

    Nine (9) of the existing sixteen (16) wells tap the Magothy Aquifer. The Westwood, Cleveland Park, St. Paul's, White Oak and Smallwood West, and Billingsley wells utilize the Patapsco Aquifer. The County's "Waldorf Area Water Supply System Report" indicates that the water table has declined continuously due to increased pumpage. Water Resources Administration indicates the level has stabilized since the County began to utilize the deeper Patapsco Aquifer. The report further indicates that a withdrawal rate of 4.0 mgd could be sustained without exceeding the benchmark of 80% of the available drawdown.

    The County-operated Bensville Water System was connected to the Waldorf Water System in 2007. The Bensville system was originally developer-constructed and dedicated to the County in 1997. The system originally served the planned developments of Kingsview, Highgrove, and Settle Woods. However, in late 2003, the County connected the Quiet Acres and Dutton’s Addition developments to the system by petition project. Since that time, additional units from Foxhall Estates have connected to this line extension. The communities of Laurel Branch and Eutaw Forest were also connected to the system in 2005, which included a new well within Eutaw Forest supporting the system. The system consisted of three production wells and one 250,000-gallon tower with distribution lines of 6- and 8-inch diameters.

    As of 2017, Brookwood Estates has been connected to the Linden Grove / Brentwood subdivisions and has become a part of the Waldorf water system. Due to this connection, the two (2) wells and storage tank will be abandoned and removed. The County is currently in the planning phase of Middletown Rd/Bensville Rd Waterline Interconnection project to construct a waterline interconnection from Middletown Road to Bensville Road to provide the necessary redundancy and system reliability to the Brookwood, Linden Grove, Brentwood, Kingsview, and Highview neighborhoods.

The County initiated the use of the WSSC water supply via the Bealle Hill Road connection in March of 2010 and is investigating a possible future connection along US 301 at the Charles County line. This is being closely evaluated due to the long detention times at the connection point and the presence of Total Trihalomethane (TTHM). In conjunction with the Maryland Geological Survey, the County conducted a Patuxent Aquifer Study in or near the Waldorf Water system to augment the supplies from the Magothy and Patapsco Aquifers. See Section 3.4.1.1 Groundwater Capacity Limitations for the results of the study.

3.3.3 Institutional/Governmental

Institutional/governmental water systems, as the name reflects, generally serve non-residential areas operated by Charles County, the State, or Federal agency. In addition, several educational facilities have their own water systems as Non-Transient Non Community (NTNC). Refer to Appendix 3I for the inventory of the institutional systems.

1. College of Southern Maryland- The College operates a water system has a production capacity of 151,000 gpd. Three (3) wells and a 45,000-gallon storage tank comprise the system. Treatment consists of disinfection only. Two of the three wells supply the College with water. The third well serves the wastewater treatment plant only. Groundwater appropriation is 18,000 gpd. The distribution system consists of 8" and 12" diameter water lines. Average daily water consumption for a service population of 1,220 is approximately 17,300 gpd.

2. Naval Support Facility, Department of the Navy- Naval Support Facility Indian Head water system serves approximately 3,321 people. Average daily groundwater demand is 0.5 MGD. At the Indian Head facility, water is supplied by four (4) wells and water treatment is by disinfection only. Groundwater appropriation for the combined Patapsco and Patuxent aquifers is for 1.14 MGD. Storage is provided in two 0.5 MG elevated tanks. Replacement of the approximately 80-year-old distribution system is scheduled for completion in 2024.

   The Stump Neck facility has a service population of 495 and consumes 26,000 GPD of ground water combined from two wells using disinfection only for treatment. The appropriation is for 60,000 GPD.

   A separate river water system is used to supply the water needed for steam generation, fire protection, and industrial use. The river water system is appropriated to use 3.3 MGD of water from the Potomac River.

3. Southern Maryland Pre-Release Unit – The Department of Public Safety and Correction Services closed this Pre-Release Facility in June 2021. At the time of operation, this

institutional water system was rated at 60,000 gpd (220 gpm). The average daily demand has been 26,000 gpd since 2017. Water was supplied by two wells and serves approximately 2000 residents. Well No. 1 was abandoned in 2012 and has been replaced with Well No. 3.

Groundwater appropriation is 28,000 gpd. The system was originally constructed in the mid 1960's and a Water Treatment Plant was constructed in the mid 1990's. Maryland Environmental Service (MES) operated the water treatment plant.

The Non-Transient Non-Community (NTNC) water systems and Transient Non-Community (NTC) water systems are listed in Appendix 3N and 3O, respectively. These facilities operate their own water treatment system. The County will determine the feasibility of connection to public system upon request.

3.4 ASSESSMENT OF EXISTING SYSTEMS

There are 64 central water facilities in Charles County. Approximately 4 percent of these systems are owned and operated by private entities (private/community). Another 86 percent of the water facilities are owned and operated by Charles County (public/ municipal). The remaining 10 percent are institutional facilities. The following sections describe the different kinds of problems associated with existing water systems and general corrective actions, followed by an assessment of the potential problems with each specific system.

3.4.1 Problem Areas and Corrective Approaches

The problems associated with existing water systems can be divided into the following categories:

- Groundwater Capacity Limitations
- Wells contaminated by bacteriological or chemical pollutants
- Insufficient Distribution system capacity
- Insufficient fire flow provision
- Infrastructure failure
- Saltwater intrusion
- WSSC Water Quality

A brief description of each problem type is provided herein.

3.4.1.1 Groundwater Capacity Limitations

Declining Aquifers

The drinking water aquifers are confined layers of silts and sands below the ground surface into which wells are drilled. The aquifers are tapped by Charles County wells, as well as those of other Maryland counties. Although the aquifers are replenished through recharge areas, which convey water from the surface downward into the aquifer, it is possible for the rate of recharge to be less than that of well pumping. Pumping in excess of recharging creates a drawdown effect.

The area of the aquifer influenced by pumping is called the "cone of depression." Ideally, each well would have its proprietary cone of depression. However, there are cases where cones of depression intersect. This intersection has a negative impact on pumping capacity which can be pumped from the wells with intersecting cones of depression.

Failing wells or low production wells can be corrected by several means including: (1) the system can be interconnected with systems that can produce sufficient water for both systems, (2) wells can be added to the system, or (3) existing wells can be "dropped" deeper into the aquifer (which is limited to the depth of the aquifer.) The Maryland Department of the Environment (MDE), Water Rights Division currently restricts the groundwater appropriations available to the Magothy aquifer in Waldorf to ensure suitable yields through the planning horizon. Previously, MDE recommended the development of wells into the Lower Patapsco or Patuxent aquifers, as these aquifers are significantly deeper than the Magothy and Upper Patapsco. Groundwater monitoring data indicates that the Lower Patapsco aquifer must be closely observed and managed to balance the groundwater withdraws with the recharge. Therefore, the Patuxent aquifer was evaluated for future use in Waldorf and White Plains area of Charles County.

Beginning in 2012 the County contracted with Maryland Geological Survey to study the hydrogeologic characteristics of the Patuxent aquifer system in the Waldorf area. The Patuxent aquifer system was identified by previous MGS/Charles County ground-water modeling studies as having the potential to meet projected water demands while reducing drawdown in the increasingly stressed Lower Patapsco aquifer system. The Study of four deep test wells was completed in 2015. Each well, except for Pinefield, was drilled to basement bedrock.

The top of the Patuxent aquifer system in the Waldorf area as determined from the test wells ranges from 10002 to 1633 feet below sea level. Total thickness of the aquifer system ranges from 285 to 440 feet and sand percentage ranges from 30 to 40 percent of total thickness. Sands in the Patuxent aquifer in the Waldorf area are thinner, less frequent, and finer-grained than in more productive areas to the west in Bryans Road-Indian Head area and to the north in Prince Georges and Anne Arundel Counties. The resulting low transmissivity rates and great drilling depths may limit potential for water resource development.

Among the positive results from the study is that there are no major water-quality constraints on the Patuxent aquifer in the study area. There is between 760 and 1280 feet of available drawdown to the 80 percent management level. Given the relatively large amount of remaining available drawdown in the study area, it is unlikely that use of the aquifer system will be constrained by the 80 percent management level in the foreseeable future. Finally, the study noted that 4-inch test wells generally have lower transmissivities than larger diameter production wells due to the relative difficulty in developing the wells, though the magnitude of difference is not easily quantified.

Alternative Water Sources

Charles County Government (the County) commissioned a Water Source Feasibility Study in response to projected population growth, declining water levels in regional aquifers, potential changes in groundwater quality and associated treatment requirements, and conditions laid out by the Maryland Department of the Environment. The main objective of this study was to evaluate potential options for meeting the Waldorf and Bryans Road water systems' future demand. However, due to the fact that nearly all water for domestic, industrial, and agricultural use in the County is withdrawn from the same confined aquifers, the findings of this study are meaningful to other nearby systems and may serve as a foundation for potential regional water supply solutions in the future.

The evaluation included two phases: Phase A-1 and Phase A-2. In Phase A-1, a comprehensive review of all potential water sources in the County was conducted, such as increased allocations from the Washington Suburban Sanitary Commission (WSSC), development of a surface water supply, new wells in confined and unconfined aquifers, water reuse, and a combination thereof. Water source alternatives were evaluated based on preliminary screen criteria: capital cost, operation and maintenance cost, water quality, supply reliability, ease of operation, constructability, ease of permitting, environmental stewardship, public acceptance, and regional benefits. Ultimately, these criteria and their associated pass/fail assessments for each water supply alternative enabled removal of options from further consideration that had notable conceptual weaknesses. Eleven water supply alternatives passed the preliminary screening process and were further evaluated in Phase A-2. The results of Phase A-2 of the evaluation are presented here, including the development and triple bottom line (TBL) assessment of the final water supply scenarios.

Following the completion of the Phase A-1 report, additional information became available for some of the alternatives. Supplemental analyses were conducted to further determine the feasibility of the eleven remaining alternatives from Phase A-1. The findings from the updated analyses and, where applicable, the basis for why some of the eleven alternatives were eliminated from further consideration, are summarized below.

- Alternatives B-2 and S-1: Riverbank Filtration and Surface Water Treatment Plant – Alternatives combined into a single Upper Reaches Potomac River Supply alternative with conventional surface water intake or riverbank filtration options within the alternative.

- Alternative S-5: Morgantown Generating Station – This alternative was removed from consideration due to potential issues with long-term reliability and lack of response from the facility owner.

- Alternative R-1: Non-Potable Reuse – This alternative was removed from consideration due to limited ability to offset potable water supply needs given future demands.

- Alternative P-1: Increased WSSC Allocations – Costs for the County to purchase water from WSSC at current rates and water quality at current and proposed connection locations were added to the evaluation of this alternative.

- Alternative W-1: Countywide Agreement – This alternative was removed as a stand-alone option because it would not provide additional water supplies to meet the County's demands. However, it remains a viable option to share costs and better manage water resources across Charles County.

- Alternative C-1: Aquifer Storage and Recovery – This alternative was removed as a standalone option because it would not provide additional water supplies to meet the County's demands. However, it was included in scenarios to extend reliability of seasonally variable water supplies.

- Alternative C-2: Conjunctive Use – This alternative was removed as a stand-alone option because it would not provide additional water supplies to meet the County's demands. However, it is included in scenarios that include both groundwater and surface water resources.

Using one or more feasible water supply alternatives from Phase A-1, comprehensive water supply scenarios were developed for evaluation in Phase A-2. The scenarios include the range of alternative water sources available to the County and were developed to maximize supply reliability and cost effectiveness. Scenarios were sized to augment the County's existing water supplies (groundwater wells and WSSC connection) to meet projected demands for 2045 (baseline average day demands of 11.2mgd and max day demands of up to 20 mgd). To confidently assume future use of existing groundwater supplies, the addition of greensand filtration to existing groundwater wells was assumed to address concerns related to dissolved iron and manganese contamination (i.e., brown water). Greensand filtration for existing groundwater supplies was assumed in every water supply scenario.

- Scenario 1: Increased Allocations from WSSC – This scenario includes 10 mgd of additional capacity from WSSC to meet projected average and max day demands.

- Scenario 2: Upper Reaches Potomac River Supply – This scenario includes 10 mgd of new capacity supplied from a surface water treatment plant in the upper reaches of the Potomac River in Charles County to meet projected average and max day demands. This scenario does not require additional WSSC allocation beyond current levels.

- Scenario 3: Surface Water Treatment Plant plus Increased Allocations from WSSC – This scenario includes 5 mgd of new capacity supplied from a surface water treatment plant in the upper reaches of the Potomac River in Charles County to meet average day demands. Max day demands would be met with 5 mgd of additional capacity from WSSC.

- Scenario 4: Managed Aquifer Recharge and Increased Allocations from WSSC – This scenario includes 5 mgd of new confined aquifer groundwater allocations to meet average day demands. Groundwater allocations would be increased based on aquifer recharge with highly treated wastewater from the Mattawoman Wastewater Treatment Plant. Max day demands would be met with 5 mgd of additional capacity from WSSC.

- Scenario 5: Increased Groundwater Appropriations, Surficial Aquifer, and Increased Allocations from WSSC – This scenario includes an additional allocation of 2.5 mgd of confined aquifer groundwater and a new allocation of 2.5 mgd of surficial groundwater to meet average day demands. Max day demands would be met with 5 mgd of additional capacity from WSSC.

A triple bottom line assessment of the five Water Supply Scenarios was conducted to evaluate each scenario across a broad range of decision-making criteria spanning economic, environmental, and social factors. The five Water Supply Scenarios were assigned scores for each criterion. These scores were then coupled with criteria weightings, which represent the relative importance of each criterion in the decision-making process (**Figure 3-7**). Criteria weightings were assigned based on discussions with PGM and DPW staff. It is understood that the criteria weightings may shift as the regulatory and physical environment in the County changes. This may result in different outcomes for policy and capital project selection.

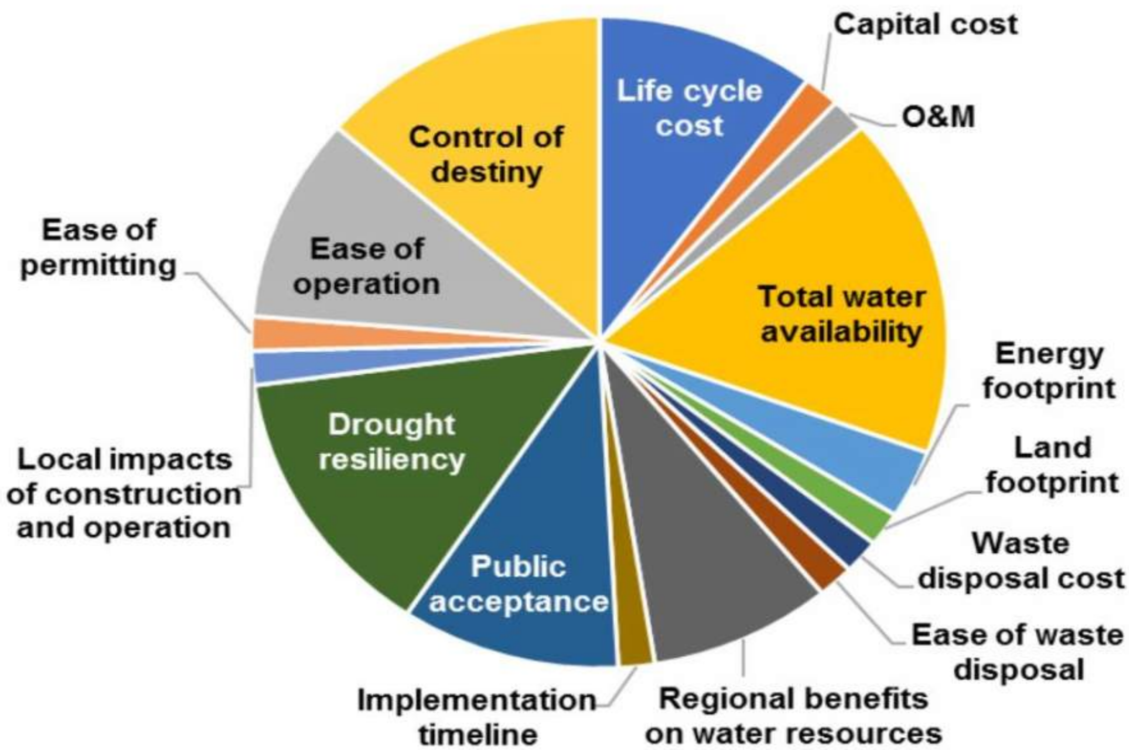


Figure 3-7: Relative Criteria Weightings in the TBL Assessment

The TBL results for each scenario are presented in **Figure 3-8**. Water Supply Scenario 2, an upper reaches Potomac River supply, is the highest ranked option, followed by Water Supply Scenario 3, an upper reaches Potomac River supply with increased allocations from WSSC. The lowest ranked option is Water Supply Scenario 5, increased groundwater appropriations.

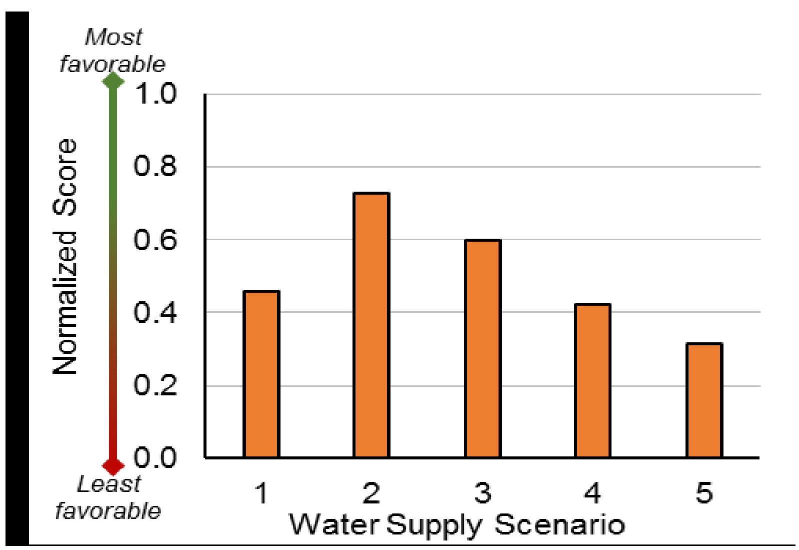


Figure 3-8: TBL Results

Therefore, Water Supply Scenarios 2 and 3 are the primary recommendations for the County's long-term expansion of the water supply system to meet future demands. Scenario 2 includes the continued use of existing groundwater allocations and a new upper reaches Potomac River supply (i.e., riverbank filtration or a surface water intake with a new treatment facility) to meet projected average day demands. Maximum day demands would be met with additional dependence on the upper reaches Potomac River supply and existing WSSC allocations as necessary (**Table 3-6**). An important benefit from this option is that the Potomac River has the potential to supply significantly more water than the County's planned needs. This provides additional options to the County for an expanded intake and treatment plant, such as supplying water to neighboring communities, reducing WSSC purchases, or discontinuing withdrawals from poor quality wells. Scenario 3 offers some of the same benefits as Scenario 2; however, it offers the WSSC option to provide a more immediate solution to the County's shorter-term water needs.

Table 3-6: Scenario 2 Upper Reaches Potomac River Potential Supply

Source of Supply	Average Day Supply Mix (mgd)	Design Capacity (mgd)
Existing groundwater	6.2	9.33
Existing WSSC	0	1.42
Upper reaches Potomac River supply	5.0	10.0
Total	**11.2**	**20.75**

Demand analyses indicated there could potentially be a near-term supply deficit as a new surface water intake and treatment plant are brought on-line. Additional water from WSSC via the existing connection and new confined aquifer wells were determined to be the best options to bridge the supply deficit. Further, if there were a major unforeseen obstacle that prevented the construction of a new Potomac River intake, a new connection to WSSC would be the next best option for the County. As such, it is recommended that County continue negotiations with WSSC to confirm costs of additional supply and service reliability, as well as pursue the confined aquifer element of Scenario 5 to expand the use of groundwater over the near-term to ensure adequate supplies prior to implementation of new long-term supplies. The Study illustrates how the identified Scenarios can be used individually or in combination to meet the County's projected water demand.

The Study provides detailed next steps for the County to move these recommendations forward and address important design questions in the process. The Water Supply Roadmap included in the Study shows the various steps and potential outcomes prior to initiating design of the new Potomac River supply and associated surface water treatment plant, as well as that required for the exploration of additional supplies from WSSC and/or groundwater. At the end of the Water Supply Roadmap, the County will have determined the necessary implementation timeline and capacity of the identified alternative water sources for best providing the County's water needs.

A preliminary CIP schedule and implementation timeline were created to support County planning and budgeting for the recommended Scenarios. The timeline currently shows that the overall program outlined in Scenario 2 is estimated to span approximately eight years, resulting in Potomac River supply being brought on-line in 2032, assuming a start date in 2021. The overall estimated cost of the Charles County Potomac River water supply program is estimated at $184 million. Other Scenarios or combinations of Scenarios would offer tradeoffs with less time in development and less cost.

The Water Supply Roadmap, task outlines, and CIP schedule provide the County with a detailed, flexible pathway for increasing available water supply and meeting projected demands over the planning horizon of this project. This Water Supply Roadmap and CIP Schedule will be amended annually as part of the County's Capital Improvement Program adoption and budgeting.

Under the Water Supply Roadmap Charles County is moving forward with a near-term plan to purchase additional water from WSSC. The overall upper limit of allocation is approximately 5 mgd. Currently, Charles County is using an estimated 1.4 to 1.8 mgd of WSSC water. The projected timeframe for completion of additional infrastructure work is 2024 to 2025. In the long-term plan County's goal is to build a surface water treatment plant withdrawing from the upper reaches of the Potomac River. The construction for the treatment plant is to be completed around year 2032.

3.4.1.2 Wells Contaminated by Bacteriological or Chemical Pollutants

Septic systems and their associated drain fields along with the surrounding soils typically serve as a filter to sewage, thereby providing cleansing prior to potential contact with the ground water. When a septic system fails, sewage passes directly into the groundwater with minimal treatment. This condition can contaminate wells in the immediate vicinity of the failing septic system. Likewise, the introduction of chemicals into the soil, either with pesticides and herbicides or the mishandling of chemical waste, can contaminate drinking water supplies.

The correction for systems with wells that have been contaminated by bacteriological or chemical pollutants includes connecting the affected areas into a larger distribution system, such as may be done for low production wells, resulting in the abandonment of shallow wells usually affected by contamination. In addition, correcting the failing septic system, (through a holding tank program or through a central sewer collection system, such as Cobb Island), mitigating the disposal of chemical pollutants, or ceasing the application of pesticides and herbicides are potential corrective measures for wells contaminated by bacteriological or chemical pollutants. The contamination of wells by bacteriological or chemical pollutants is less likely with deep well tapping.

Charles County Department of Utilities routinely monitors potable water throughout the community water system. A Reverse Osmosis Treatment System was installed for the Chapel Point Water System and began full operation starting June 1, 2006. From January 1st thru May 31st, 2006, public water system was in violation for exceeding the drinking water standard for gross alpha activity of 15 pCi/L. The gross alpha radiation is naturally occurring in the drinking water. Currently, the average Gross Alpha test result for the drinking water is 4.5 pCi/L which places the system in compliance[1]. An additional well has been developed at the Jude House site; however, traces of radiation have also been detected in that well. There are several strategies being explored by the County to address this problem. One would be to study the option of installing another Reverse Osmosis system. Another is to evaluate the feasibility of interconnecting Chapel Point with Waldorf and/or La Plata. This alternative has been analyzed and recommended by the Department of Public Works and is currently being developed as the South County Water Transmission Main project. There is now one Ground Water Appropriation Permit (GAP) for the Chapel Point wells and Jude House site which all fall under one County public water system.

Gross alpha radiation has been detected in certain wells within Charles County. For example, Cliffton Well #2 has been shut down, and is planned for replacement.

In 2015 The Maryland Geological Survey (MGS) conducted a review of existing water-quality data to evaluate the occurrence and distribution of gross alpha-particle activity (GAPA), gross beta-particle activity (GBPA), radium, and polonium in public water (groundwater) systems in Charles County, Maryland. Water samples from wells in five public water systems - Chapel Point Woods, Mt. Carmel Woods, Clifton-on-the-Potomac, Waldorf (St. Paul's Well 9 and St. Charles Well 16), and the Town of Indian Head – all of which are screened in either the Upper or Lower Patapsco aquifer systems, exceeded the GAPA Maximum Contaminant Level (MCL) of 15 picocuries per liter (pCi/L). Charles County is currently working with MGS on another study to look at elevated Gross alpha radiation levels. The study is scheduled to be completed in year 2022. The objectives of the study are to (1) confirm or determine that polonium-210 (Po-210) is the main source of elevated radioactivity in five public water systems with GAPA exceeding 15 pCi/L, and (2) better define the extent and occurrence of elevated radioactivity within the Patapsco aquifer system by sampling other public water systems and select domestic wells with GAPA exceeding 5 pCi/L.

3.4.1.3 Insufficient Distribution System Capacity

Insufficient system capacity refers to a deficit in a system's storage, wells, or infrastructure. Charles County determines the rated capacity by assuming an 18-hour run time for a given facility, in accordance with State regulations. Therefore, ideally a system which can pump 100 gpm has a rated capacity of 108,000 gpd (100 gallon per minute multiplied by 60 minutes per hour multiplied by 18 hours). Insufficient system capacity has been identified for the 10-year planning horizon (through the year 2030). The derivation of populations and flow demands for system capacity identification purposes is further discussed in a later section of this chapter. In addition, insufficient

[1] Source: Charles County Annual Drinking Water Quality Report, Chapel Point Community - MD0080064 by the Charles County Department of Utilities 2006.

system capacity also refers to required water needs within a system beyond the groundwater appropriation limit set forth by MDE.

Insufficient system capacity can be corrected through the addition of storage and/or wells to meet the needs of the system. Additional groundwater appropriation permits may be required. In cases of insufficient system capacity, it is generally best to limit the number of new customers to the system until deficiencies can be corrected.

3.4.1.4 Insufficient Fire Flow Provision

The requirements for fire flow within Charles County are generally based on the comparable facilities and typical fire events in Charles County and adjacent local jurisdictions. These requirements are also contained in the Charles County "Water and Sewer Ordinance" and the "Fire, Rescue, and EMS Plan". The County's 18 fire stations can deliver service to the County residents, however, there are several areas, particularly in the older industrial sections of the Waldorf system where fire flow insufficiencies, are a concern and will present problems if such a disaster happens. These areas are classified as high-risk industrial (see below). Examples of high-risk industrial activities include: warehouse storage as a primary business inside or outside completely enclosed structures; storage of petroleum products; or the commercial manufacture of chemicals or other combustible materials. The County has established a precedent of requiring new industries of this type to have on-site fire suppression towers. A system is said to have insufficient fire flow if it cannot provide the following fire flows during maximum day flow periods for an eight-hour pumping period:

Single-family detached	1,000 gpm for 2 hours
Apartments/Townhomes	1,500 gpm for 2 hours
Industrial and commercial	2,000 gpm for 2 hours
High-risk industrial	4,000 gpm for 3-4 hours

The addition of storage and well facilities to meet County requirements will correct systems with insufficient fire flow. Many fire flow problems can be mitigated through the looping of a distribution system, providing a water source from two sides of a loop. In fact, the County's hydraulic modeling, upon simulation of a fire event, has demonstrated that areas with water looping maintain constant static pressure levels. Conversely, areas near the end of distribution mains without significant looping are more prone to experience significant static pressure losses. Elevated storage tanks provide additional pressure within a system. In addition, Adherence to County policies regarding looping of water distribution systems will provide additional fire protection. The provision of alternate sources of water, such as on-site storage facilities, will also provide fire protection.

Under the Charles County Zoning Ordinance Section 297-261, developers in the Rural Areas are required to provide a fire suppression water source within 2 miles (4-mile round-trip) of the development if one is not currently available. In addition, residential homes built after January 2007 including rural homes must be constructed with an interior sprinkler system as an additional fire suppression measure.

3.4.1.5 Infrastructure Failures

Infrastructure failures are defined as those problems within a water system attributable to the distribution system (pipe network). Infrastructure failures range from excessive exfiltration (water loss through cracks in the pipe, leaking joints, or pipe failures) to deteriorating infrastructure which has reached the end of its useful life. With central water systems, a normal useful life of a water system is 50 years. Based on a water loss study for the County, the overall public system has relatively low water loss; however, there are certain problem areas throughout the County.

It should be noted that the correction of excessive exfiltration in water pipes may provide a capacity enhancement without increasing the well capacity within the system. In systems with excessive exfiltration and limited well capacity, correction of excessive exfiltration should be investigated as a viable alternative to the addition of a well to the system. When a central water system has become diminished by excessive use, Charles County will strive to determine leak detections before construction of a replacement or additional well. To determine if a system has exfiltration problems, the amount of water billed should be compared to the amount of water pumped into the system. A general rule of thumb is that if 10% or more of the water is not accounted for, an exfiltration problem may exist.

Infrastructure failure can be corrected through the replacement of pipes, valves, joints, or fittings. In addition, pipes can be slip-lined with new techniques that do not require taking the pipe out of service for long periods of time. The identification of infrastructure with potential failure risk (old infrastructure) and the replacement of this infrastructure on a regular monitoring schedule will prevent any major problems from pipe rupture. Prior to the dedication of any private facilities to Charles County, the County will require the owner to bring the system up to current County standards. Charles County will also make efforts to educate the public on water conservation.

3.4.1.6 Saltwater Intrusion

Saltwater intrusion occurs when the balance between the saltwater and freshwater interface is disrupted, usually through excessive pumping on the freshwater side of the interface. This condition generally occurs in areas adjacent to a river that is a direct tributary to the ocean (such as the Potomac.) Incidences of saltwater intrusion have been identified in the Indian Head system, as well as in the Naval Support Facility Indian Head in Charles County. Some of these incidences are attributable to multiple-aquifer wells, which draw and convey water between the aquifers. High sodium concentrations may or may not be indicators of saltwater infusion.

The correction of saltwater intrusion problems in existing systems may require: (1) the addition of treatment processes to remove the offending saltwater characteristics from the water prior to distribution, (2) the removal of multiple-aquifer wells to reduce the introduction of saline water into freshwater aquifers, (3) the digging of new wells outside of the saltwater intrusion zone to serve the system, or (4) the interconnection of the distribution system with a system that does not have saltwater intrusion problems (coupled with the capping of the wells that are producing substandard water).

3.4.1.7 WSSC Water Quality

Though Charles County has never had a violation for Disinfection By-Products (DBP), random sampling of the WSSC supplied water has revealed that Total Trihalomethane (TTHM) and Haloaccetic Acid (HAA5) some of the individual samples have been high with respect to DBPs. The Federal Government sets limits based on averages over a quarterly basis, and the samples did not fail this measure. These compounds are formed as a result of disinfection processes using chlorine and some studies have indicated that these compounds may be mutagenic. As part of the Alternative Water Source Feasibility Study, the County is negotiating with WSSC to increase previous water allocations and determine procedures that will be necessary to provide acceptable water quality.

It is likely that the presence of DBPs is a result of the long detention times encountered in the relatively stagnant extremes of the WSSC transmission and distribution system. The Department of Public Works (DPW) has considered several strategies to address the issue. One is to mix the incoming WSSC water with ground water. When WSSC water is utilized, the WSSC water is blended with Charles County well water. This approach ensures that the residents and businesses of Charles County are delivered safe and high-quality potable water.

3.5 FLOW PROJECTION ANALYSIS

The purpose of developing the population projections, included in Chapter 2 of this document, is to provide flow projections that are correlated to the population projections used throughout the County. Chapter 2 addresses the correlation of the County's dwelling unit projections to the projected water and wastewater flows for Charles County. To determine existing excess capacity, as well as new service areas and potential limited capacity problem areas, the population projections in this document were used to project water demands for the planning horizon.

3.5.1 Flow Generation Factors

Chapter 2 of this document report provides the methodology used to determine the population for Charles County as a whole, and the Development District specifically. The methodology included the derivation of housing units and population by traffic analysis zones. To convert populations of these units or figures and estimates for volume of potable water demands, flow factors were multiplied with the housing units to provide an average daily flow. A discussion of these factors follows.

3.5.1.1 Standard Flow Generation Factors

Flow generation factors are figures that are multiplied with a known unit (acre of land, dwelling unit, square foot) to yield a water demand in gallons per day. Generally, historical water use aggregated by consumer type is used to determine flow generation factors.

The lack of meters in some of the water systems, or other means of quantifying water produced, and water consumed, makes it difficult to precisely monitor and analyze water use in every water system. Accordingly, in those limited cases where there is a lack of metered water data, the analysis of existing conditions and the planning for future improvements must rely on theoretical, not actual, parameters. Metering of all water systems at the source and where water is consumed would enhance evaluation of the systems and serve as a valuable tool in programming future needs. Through this comprehensive metering strategy throughout the vast majority of publicly operated water systems, the County has determined flow generation factors for water usage within the County. These factors are provided in **Table 3-7**.

In addition to the review of water meter data, the County completed a study that compared local water consumption to several other jurisdictions in the Washington, D.C. metropolitan region. This review included water data from the Washington Suburban Sanitary Commission (WSSC), Howard County, Anne Arundel County, and Frederick County. This study concluded that water use per capita has declined over the last few decades due to water conserving fixtures and change in personal habits. This reduction in individual use was also confirmed through County meter data and is reflected in the factors identified on **Table 3-7**.

TABLE 3-7
FLOW FACTORS**

Type Use	Water Flow Factor
Single-Family Unit	185 gallons per day per unit
Townhouse Unit	141 gallons per day per unit
Duplex Unit	141 gallons per day per unit
Apartment Unit	132 gallons per day per unit
Commercial/Industrial/Business	*

*Nonresidential flows are allocated based on the Tables in the Water and Sewer Ordinance or empirically derived flows for specific uses.
**Flow Factors are for allocation purposes only, not for design purposes. For design flow factors, see the County's Water and Sewer Ordinance.
Sources: Charles County Department of Planning and Growth Management, 2020.

3.5.1.2 Water Conservation Factors

As a result of residential and business development, Charles County is confronted with an ever-increasing demand for water and wastewater treatment capacity. While this demand for services has paralleled growth, the cost of developing additional capacity and operating water and wastewater facilities has continued to increase. The County's goal is to reduce the need for new capital expenditures and make more effective use of the resources now available.

3.5.1.2.1 Water Resource Advisory Committee

The County is increasing the public's perception of the problem of water supply and encouraging citizens to help the County reach its conservation goals. The County provides guidance to homeowners interested in water conservation. To provide continued support of the County's efforts in potable water resources management, a Water Resource Advisory Committee (WRAC) was re-commissioned in 2009 through 2011. The "WRAC" recommended a comprehensive Water Conservation Program with three main components; including: Outreach and Education; Water Re-use; and Water Billing Structure.

Based on a 2002 EPA study of the Efficiency of Water Conservation Programs in 17 jurisdictions, comprehensive conservation programs can greatly reduce the need for increased water production. The water conservation programs sampled used many of the same strategies as recommended by the WRAC. When the results of the sampled programs are averaged, the overall finding was that these programs reduced the need for production by 21%. Therefore, it is reasonable to assume that a reduction on 20 % is not unreasonable to expect if Charles County continues to employ current strategies and enhance the efforts towards conservation as recommended by the WRAC and other best management practices.

3.5.1.2.2 Plumbing Code

The Plumbing code applies to The Building Code of Charles County. The Department of Codes, Permits, Inspection Services are responsible for enforcing the building code. The County is currently does not enforce compliance with the Maryland Water Conservation Plumbing Fixtures Act. However, the County has adopted a Water Conservation Plan to distribute retrofit kits for plumbing fixture water savings. These kits include a low flow showerhead, two sink aerators, toilet displacement devices, and other devices to result in an anticipated savings of 26 gpd per kit. For further details of the Water Conservation Plan, refer to Section 3.8.2. for goals under consideration.

3.5.2 Flow Projections - Water Demands

The water demands projected for the County were based on housing units projected. Each housing unit was assumed to have a demand of 185 gpd.

To project future non-residential flows, the proportion of metered non-residential flows to residential flows from the 2010 Water and Sewer Rate study was used. It was found that for every gallon produced for residential purposes the County provides 0.2 gallons of non-residential usage. For projection purposes it is assumed that this proportion will remain constant. **Table 3-8** provides the breakdown of flow county-wide by residential and non-residential components. Further, a general factor is shown which estimates non-residential flow as a factor of housing units. Similarly, the non-residential flow associated with housing units can be determined for the Development District. **Table 3-9** provides the breakdown of flow for the District by residential and non-residential components. Further, a general factor is shown which estimates non-residential flow as a factor of housing units. Using housing unit projections, coupled with the non-residential flow factor described above, a total potable water demand was determined.

TABLE 3-8 COUNTY-WIDE DOMESTIC WATER DEMAND

Year	Population	Housing Units	Residential Flow (mgd)[2]	Non-residential Flow (mgd)[1]	Total Water Flow (mgd)
1990	101,154	32,950	6.10	1.22	7.31
2000	120,546	41,668	7.71	1.54	9.25
2010	146,551	51,214	9.47	1.89	11.37
2020	164,540	59,150	10.94	2.19	13.13
2030	184,470	67,725	12.53	2.51	15.03
2040	205,290	75,325	13.94	2.79	16.72

1. Based on the proportion of non-residential to residential consumption in the 2010 Water and Sewer Rate Study (20%)

2. Assumes 185 gpd per dwelling.

Source: Charles County Department of Planning and Growth Management, 2020;

2030, and 2040 projections are from Maryland Department of Planning, 2020;

3. Refer to Appendices 3A, 3B and 3C for total population, served population., gallons per capital day and demands.

TABLE 3-9: DEVELOPMENT DISTRICT WATER DEMAND

Year	Housing Units[3]	Residential Flow[2] (mgd)	Non-residential Flow[1] (mgd)	Total Water Flow (mgd)
2010	28,276	5.231	1.046	6.277
2020	33,800	6.253	1.251	7.504
2030	40,110	7.420	1.484	8.905
2040	47,349	8.760	1.752	10.512

1. Based on the proportion of non-residential to residential consumption in the 2010 Water and Sewer Rate Study. (20 Percent)

2. Assumes 185 gpd per dwelling.

3. Water billing account in development district.

Source: Charles County Comprehensive Plan 2016,

4. Refer to Appendices 3A, 3B and 3C for total population, served population, gallons per capital day and demands.

3.5.3 Level of Service

The County has determined that adequate levels of service for water supply and distribution system shall maintain a minimum pressure of between 60 - 75 pounds per square inch (psi) at the main distribution line under average daily flow conditions. Pressure-reducing equipment is required for pressures exceeding 75 psi. Average daily flow conditions shall be as calculated using the American Water Works Association, Manual #22, Chapter IV, "Estimating the Probable Domestic Demand". For existing systems, the maximum daily demand is determined by using historical data. For new systems, the County uses a factor of 3.5 gpm per dwelling unit for the determination of peak rates.

Fire flow provisions are also required to assure that adequate fire suppression capabilities exist. A system is said to have sufficient fire flow if it can provide the following fire flows during maximum day flow periods:

Single-family detached	1,000 gpm for 2 hours
Apartments/Townhomes	1,500 gpm for 2 hours
Industrial and commercial	2,000 gpm for 2 hours
High-risk industrial	4,000 gpm for 3 - 4 hours

In designing a new system or expanding an existing system, the user should ensure that the County's level of service standards is met.

3.5.4 Water Demands as a Function of Existing Excess Capacity

While there are systems, both private/community and municipal/public, which have excess capacity, there are some facilities with average daily demands that exceed their current groundwater appropriation permit. The aquifer used as a groundwater source plays an important role if the water system taps the Magothy due to limited water withdrawal availability.

As shown in **Table 3-8**, County-wide water demands will be approximately 16.7 mgd by the year 2040. The 2020 water demand was approximately 13.1 mgd. Therefore, an additional 3.6 mgd (the difference between 16.7 and 13.1) of potable water capacity will be required. The current permitted excess groundwater capacity of 3.2 mgd (from **Tables 3-10** and **3-11**) will be insufficient, assuming the County provides all the potable water supply to meet future demands, as opposed to individual well systems.

The Development District water demand (including the municipalities) for 2020 shown on **Table 3-9** was approximately 7.5 mgd and is projected to increase to 10.5 mgd in the year 2040. The private/community and public/municipal systems located within the Development District (including the municipalities) have an excess capacity of groundwater supply of approximately 0.3

mgd (from **Table 3-10**). Therefore, it appears that on a District-wide basis, the Development District will approach the District-wide permitted groundwater appropriation capacity by 2030. However, as indicated in **Tables 3-10** and **3-11** the appropriation permit caps will be met sooner on an individual system basis.

3.5.5 Capacity Needs Based on Projected Water Demand

In an effort to provide information on capacity needs to serve new service areas which will be needed by 2040 the following section is provided. The methodology is a comparison of existing system excess capacity versus projected future demands. The resulting capacity needs are generally discussed in **Tables 3-10** and **3-11**. Assumptions used in the service growth projections include 2016 Comprehensive Plan Water Resource Element, housing and population projections, the Waldorf Capacity Management Plan 2015, as well as knowledge of planned development in specific locations.

A summary of this review is contained in Tables 3-9 and 3-10. New service areas are predominately within the Development District of the County including the Bryans Road and Waldorf Systems. The County has defined two interconnection zones: the Bryans Road interconnection zone, and the Waldorf interconnection zone. This analysis also projects the residential and non-residential development and growth that will occur in these zones. Since most development is directed to the Development District, the two, identified interconnection zones will require additional water sources to handle the projected flows to 2040.

Other potential new service areas will occur in the Towns of Indian Head and La Plata as well as the Village of Benedict. In all these systems alternative water sources will be needed to accommodate the planned growth.

TABLE 3-10
Groundwater Demand and Projection for Public/Municipal

Owner	Rated Capacity[1] (mgd)	Current Flow (mgd)	2030 Flow (mgd)	2040 Flow (mgd)	Remaining Capacity (mgd)[4]	Comments
Avon Crest	0.0073	0.0053	0.0053	0.0053	0.002	System built out. No planned growth.
Beantown Park	0.0135	0.0072	0.0075	0.0075	0.006	System built out. No planned growth.
Bel Alton Estates	0.0260	0.0173	0.017	0.017	0.0087	System built out. No planned growth.
Benedict	0.036	0.018	0.031	0.031	0.005	At full build out of the PFA based on the construction of a central sewer system, an additional water source and/or appropriation will be required prior to 2040.
Bryans Road	0.57	0.386	0.575	0.665	-0.095	Based on build out projections in the 2014 Comprehensive Plan (WRE), an additional water source and/or appropriation will be required prior to 2030. (See Actions and Policies in Section 3.8)
Chapel Point Woods	0.08	0.028	0.035	0.035	0.045	Represents build out of current commitments.
Cliffton on the Potomac	0.085	0.042	0.08	0.095	-0.015	Based on build out projections in the 2014 Comprehensive Plan (WRE), an additional water source and/or appropriation will be required prior to 2030. Assumes connection of existing lots.
Ellenwood	0.027	0.0010	0.0011	0.0011	0.016	System built out. No planned growth.
Hunters Brooke	0.116	0.044	0.067	0.067	0.049	Based on build out of the approved subdivision.
Indian Head, Town of	0.338	0.326	0.398	0.474	-0.136	Based on build out projections in the 2014 Comprehensive Plan (WRE), an additional water source and/or appropriation will be required prior to 2030.

La Plata, Town of	1.234	0.93	1.719	2.5	-1.267	Based on build out projections in the 2014 Comprehensive Plan (WRE), an additional water source and/or appropriation will be required prior to 2020.
Mariellen Park	0.018	0.0087	0.009	0.009	0.009	System built out. No planned growth.
Mt. Carmel Woods	0.015	0.010	0.008	0.008	0.007	System built out. No planned growth.
Newtown	0.0147	0.0084	0.008	0.008	0.007	System built out. No planned growth.
Oakwood	0.005	0.0016	0.002	0.002	0.003	System built out. No planned growth.
Spring Valley	0.0096	0.0042	0.0047	0.0047	0.0049	System built out. No planned growth.
Swan Point	0.15	0.054	0.231	0.338	0.162	Assumes maximum build out of 1500 dwellings
Waldorf	7.070	6.2	7.406	8.43	-1.36	2040 projections are based on build out projections in the 2014 Comprehensive Plan (WRE). 2020 projections are based on current commitments. Additional water sources and/or appropriations will be required prior to 2020. (See Actions and Policies in Section 3.8)

1. Please refer to Appendices 3B for total population, served population, gallons per capital day and demands.

TABLE 3-11
Groundwater Demand and Projection for Private/Community

Owner	Rated Capacity [1] (mgd)	2020 Flow (mgd)	2030 Flow (mgd)	2040 Flow (mgd)	Remaining Capacity (mgd)[3]	Comments
Banks O'Dee Citizens Assoc., Inc.	0.007	n/a[2]	n/a[2]	n/a[2]	0.007	System built out. No planned growth.
Bellewood Water Assoc.	0.012	0.0065	0.0065	0.0065	0.0055	System built out. No planned growth.
Charles County Gardens Water Co., Inc.	0.022	0.0125	0.0125	0.0125	0.0095	System built out. No planned growth.
Du-Mar Estates Water Co.	0.011	0.008	0.008	0.008	0.003	System built out. No planned growth.
Garden Estates Water Co.	0.005	n/a[2]	n/a[2]	n/a[2]	0.005	System built out. No planned growth.
Green Meadows Water Co.	0.01	0.0114	0.0114	0.0114	-0.0014	System built out. No planned growth.
Hawthorne Water Supply	0.005	n/a[2]	n/a[2]	n/a[2]	0.005	System built out. No planned growth.
Idlewood Mobile Home Park	0.025	0.0183	0.0183	0.0183	0.0067	System built out. No planned growth.
Independence Village	0.006	n/a[2]	n/a[2]	n/a[2]	0.006	System built out. No planned growth.
Inman Utilities Co. (Indian Head Manor -- Sec II)	0.014	0.0077	0.0077	0.0077	0.0063	System built out. No planned growth. To be connected to the Bryans Road Water System via petition project.
Laurel Water Supply, Inc.	0.0037	n/a[2]	n/a[2]	n/a[2]	0.0037	System built out. No planned growth.

TABLE 3-11
Groundwater Demand and Projection for Private/Community

Owner	Rated Capacity [1] (mgd)	2020 Flow (mgd)	2030 Flow (mgd)	2040 Flow (mgd)	Remaining Capacity (mgd)[3]	Comments
Matthews Water Co.	0.003	n/a[2]	n/a[2]	n/a[2]	0.003	System built out. No planned growth.
Morgantown Water Co.	0.0036	n/a[2]	n/a[2]	n/a[2]	0.0036	System built out. No planned growth.
Mt. Aventine Water Co.	0.003	n/a[2]	n/a[2]	n/a[2]	0.003	System built out. No planned growth.
Newtown Estates Water Co. (Tip Hill)	0.015	0.0078	0.0078	0.0078	0.0072	System built out. No planned growth.
Oak Hill Water Assoc.	0.016	0.011	0.011	0.011	0.005	System built out. No planned growth.
Parkway Water Co., Inc.	0.0036	n/a[2]	n/a[2]	n/a[2]	0.0036	System built out. No planned growth.
Pine Hill Water Co.	0.025	0.006	0.006	0.006	0.019	System built out. No planned growth.
Pomfret Estates Utility Co., Inc. (Utilico)	0.012	0.0084	0.0084	0.0084	0.0036	System built out. No planned growth.
Pomonkey Water Co. - Ford Heights	0.006	n/a[2]	n/a[2]	n/a[2]	0.006	System built out. No planned growth.
Potomac Heights Mutual Homeowners Assoc.	0.150	0.0715	0.0715	0.0715	0.0785	System built out. No planned growth.

TABLE 3-11
Groundwater Demand and Projection for Private/Community

Owner	Rated Capacity [1] (mgd)	2020 Flow (mgd)	2030 Flow (mgd)	2040 Flow (mgd)	Remaining Capacity (mgd)[3]	Comments
Red Hill Water Co.	0.018	0.0078	0.0078	0.0078	0.0102	System built out. No planned growth.
Southview	0.006	n/a[2]	n/a[2]	n/a[2]	0.006	System built out. No planned growth.
Spring Valley	0.0096	0.005	0.005	0.005	0.0046	System built out. No planned growth.
Trimac Water Co. - Forest Park Addition	0.013	0.005	0.005	0.005	0.008	System built out. No planned growth.
Turkey Hill Water Co.	0.011	0.0095	0.0095	0.0095	0.0335	System built out. No planned growth.
West White Plains Water Co.	0.0035	n/a[2]	n/a[2]	n/a[2]	0.0035	System built out. No planned growth.
White Plains Water Co.- Kings Manor	0.022	0.0156	0.0156	0.0156	0.0064	System built out. No planned growth.

Please refer to Appendices 3A for total population, served population, gallons per capital day and demands.

3.6 PLANNED WATER SYSTEMS

3.6.1 Hughesville

The Village of Hughesville is located along the south side of Maryland Route 5 and includes the crossroads with Md Rt. 231. Based upon the 2007 adoption of the Hughesville Village Revitalization Plan, a vital part of the implementation strategy is to provide needed infrastructure, including public water and sewer. The provision of this infrastructure will support current economic development initiatives as well as provide an environmentally sound reduction of septic systems within the village. Hughesville contains approximately 138 residential parcels and 92 commercial/industrial parcels. The Village is currently served by individual wells. Based on the revitalization plan and limitation of local private sewage systems, Charles County has funded the development of a public water system within the capital improvements program, consistent with the revitalization plan. The Hughesville Village Water and Sewer System project includes the design and construction of an elevated storage tower, wells, and water distribution system sized for the ultimate buildout of the community. Design services shall commence in 2022. The limits of the water service area will be consistent with the Priority Funding Area (PFA) designation for the Village of Hughesville.

3.7 CAPITAL IMPROVEMENTS PROGRAMMING

As previously stated, capital improvements programming (CIP) is the multi-year scheduling of public facilities project implementation. Charles County has conducted CIP planning for several years and identifies programs for funding on a five-year planning horizon. Eligible public facilities projects include schools, roads, parks, as well as water and sewer facilities. The purpose of this section is to: 1) provide guidance by which the County's needs for those public facilities are assessed along with the County's fiscal resources to annually adopt the most effective budget for capital construction; and 2) utilize this Comprehensive Water and Sewer Plan as a mechanism to target the County's water supply and sewer needs for implementation.

This chapter provides a list of needs for the existing water systems. This analysis ultimately culminates in a listing of problem areas. It should be noted that this Water and Sewer Plan differs from previous versions of the Plan by the approach to the utilization of these Tables. This version of the Plan presents these problem areas as projects for potential correction.

Through the creation of the Development Rights and Responsibility Agreement program along with the adequate public facilities ordinance, the provision of improvements to the public water supply and sewer systems will be facilitated. These private funds will help to leverage available

County funds and will supplement the County's ability to complete planned capital improvements projects. This type of coordination ultimately benefits the integrity and efficiency of the County's infrastructure improvement program.

These procedures also assist in the implementation of Section 5-7A-02 of the Annotated Code of Maryland (Finance and Procurement Article). This law relates to State funding policy, with respect to local government capital projects. Under this law, a project utilizing State funding, grants, loans, loan guaranties, or insurance may not be approved or constructed unless:

1) the project is consistent with the Charles County Comprehensive Plan; or
2) extraordinary circumstances exist. The Economic Growth, Resource Protection, and Planning Act of 1992 requires the County present a report outlining their capital projects to the State to assure consistency with the Act. Projects not conforming to the County's Comprehensive Plan are required to demonstrate that extraordinary circumstances exist, and to document such circumstances.

The County Commissioners conduct Capital Improvements Programming (CIP) on an annual basis. The process is a joint effort between the County Commissioners, the Department of Fiscal Services, the County's operating departments, and other County agencies. The Department of Fiscal Services coordinates the process and presents the County Commissioners with information on potential CIP projects. The County Commissioners must determine which of these projects are in the best interests of the citizens of Charles County. Ultimately, the County Commissioners adopt the County Capital Improvements Budget for that fiscal year which establishes programs and funding levels.

3.7.1 Priority System

The Departments of Utilities and Planning and Growth Management utilize a priority system to determine which projects listed in the Water and Sewer Plan should be presented to the County Commissioners for their consideration during the CIP process. The priority system is based on an assessment of need. The system is status-based, which relates to the status of the project or the funding source, and not project-based. The priority system is as shown in **Table 3-13**. These projects are further discussed in Chapter 5 of this document.

3.7.2 Capital Improvement - Short-Range (Immediate)

Proposed capital improvements are those improvements which should be completed in the immediate future. These include priority 1 projects, studies which are part of the conditional approval of development and projects that will be under construction within two (2) years. The projects identified are proposed by the County but are not necessarily funded by the County. These projects are listed in **Table 3-13**.

3.7.3 Capital Improvements - Mid-Range (Five Year Period)

Capital improvements which are scheduled to begin construction within 5 years of the adoption of the Plan. The projects identified are planned by the County, but not necessarily funded by the County. Projects planned for funding by the County as part of its capital improvements program are so designated within **Table 3-13**.

3.7.4 Capital Improvements- Long-Range (Ten Year Period)

Long term projects are those which have time frames for construction no greater than 10 years. They have been identified to provide a continuum of needs within the County based on the population and flow projections. These projects are also identified to ensure that potential private-public partnerships within certain areas served by these projects can be established as development takes place. The projects are identified by the County, but not necessarily funded by the County. In addition, the County meets with the Maryland Department of the Environment on a regular basis to discuss project needs and possible State funding for these projects. These projects are listed in **Table 3-13**.

Table 3-12 Priority System for Capital Improvements Program	
Priority 1	A project is to remedy a condition which is dangerous to public health and safety A project for which Federal or State funding level (at levels of 50% or greater) are available, and that funding period is limited. A project under State Consent Order for immediate correction. A project which will implement a major objective of the Comprehensive Plan. A program to correct deficiencies in existing infrastructure which are in a failing or deteriorating condition, and that system is in danger of infrastructure collapse.
Priority 2	A project for which 50%+ Federal or State funding is available, but which the funding period is flexible. A project to correct existing deficiencies or to replace or repair existing deficiencies (but still functioning) facilities. A program needed to promote the orderly development of a desirable, commercial, or residential areas. A project which will remedy available capacity levels in the County's major systems. A project needed to address public safety issues.
Priority 3	A project that is highly desirable and that both timing and funding are flexible. A project to assist in the proper timing of development but is not absolutely required at present. A program which will improve the efficiency of the County's water and sewer systems.
Priority 4	A project that is not needed now but may be needed in the future. A project that can be postponed without harming existing programs.
Priority 5	A project that raises serious question of need and that may require more study before commitment can be made.
Source: Charles County Department of Planning and Growth Management	

Table 3-13
Immediate, 5- & 10-Year Priorities for Water Development
Public-Municipal

Fiscal Year (Project Start)	Project No.	Description	County Priority	Estimated Cost (Thousands)			Project Schedule	
				Total	Federal /State	Local	Construction Start (Fiscal year)	Immediate, 5-, 10-Year
2002	6041	Old Washington Road Water System Improvements	1	$3,042	$0	$3,042	2024	Immediate
2008	6067	Waldorf Tower #6	1	$5,860	$0	$5,860	2022	Immediate
2008	6069	Cliffton Water System Improvements	1	$4,615	$0	$4,615	2021	Immediate
2010	6075	Waldorf Well #17 - Pinefield	1	$3,412	$0	$3,412	2023	Immediate
2010	6076	Bryans Road Well #7	1	$3,581	$1,000	$2,581	2018	Immediate
2011	6078	Cliffton Well (Replace #2)	1	$1,300	$0	$1,300	2018	Immediate
2013	6090	Water System Model Update	1	$1,435	$0	$1,435	2015	Immediate (ongoing)
2013	6091	Various County Water Studies	3	$40	$0	$40	2016	Immediate (ongoing)
2014	6093	Satellite Water Facility Upgrades	3	$7,879	$0	$7,879	2030	10-Year
2015	6099	Benedict Water System Improvements	1	$1,410	$0	$1,410	2021	Immediate
2015	6101	South County Water Transmission Main	2	$11,335	$0	$11,335	2023	5-Year
2016	6105	Underground Infrastructure Repairs	3	$6,980	$0	$6,980	2030	10-Year
2016	6109	Gleneagles Water Tower	2	$6,262	$0	$6,262	2023	5-Year
2017	6114	Hughesville Water	1	$4,795	$0	$4,795	2024	5-Year
2017	6116	Water Source Feasibility Study	1	$413	$0	$413	2016	Immediate
2018	6118	Pinefield Water Tower Rehabilitation	1	$2,388	$0	$2,388	2022	Immediate
2018	6119	Settle Woods Water Tower Rehabilitation	1	$685	$0	$685	2022	Immediate

Fiscal Year (Project Start)	Project No.	Description	County Priority	Estimated Cost (Thousands)			Project Schedule	
				Total	Federal /State	Local	Construction Start (Fiscal year)	Immediate, 5-, 10-Year
2018	6121	Waldorf-WSSC Interconnection	1	$55,206	$0	$55,206	2025	Immediate
2019	6129	Bryans Road (2 MGD) Water Tower	1	$5,844	$0	$5,844	2024	5-Year
2020	6134	Elsa Ave Area Water Service Interloop	1	$700	$0	$700	2022	Immediate
2020	6140	Automation & Technology Master Plan	2	$8,444	$0	$8,444	2025	5-Year
2020	6141	Middletown Rd-Bensville Rd Waterline Interconnection	2	$7,603	$0	$7,603	2025	5-Year
2021	6146	Waldorf Tower No. 5 Rehabilitation	1	$2,856	$0	$2,856	2022	Immediate
2021	6147	Bryans Road Waterline Interconnection	2	$2,141	$0	$2,141	2025	5-Year
2021	6148	Mill Hill Waterline Extension	2	$377	$0	$377	2023	Immediate
2021	6149	Strawberry Hills Waterline	2	$1,582	$0	$1,582	2024	5-Year
2021	6150	Marshall Hall Rd Waterline Ext	2	$764	$0	$764	2024	5-Year
2021	6151	Waldorf Fire House Water Tower Replacement	2	$6,165	$0	$6,165	2025	5-Year
2021	6152	WURC Water Distribution	3	$1,608	$0	$1,608	2025	5-Year
2022	6159	Potomac River Water Supply Treatment Plant	1	$179,902	$0	$179,902	2030	5-Year
2021	8126	Benedict Water Quality Study	2	$144	$0	$144	2022	Immediate

Source: Charles County Department of Planning & Growth Management and the Department of Public Works, 2020; CIP Quarterly Monitoring Report; 2022-2026 Capital Improvement Program.

Notes

1. The projects listed are those that involve the creation of system capacity or planning for capacity expansion.

3.8 ACTIONS AND POLICIES UNDER CONSIDERATION

The following actions and policies are under consideration to address water capacity and water quality deficiencies identified in this Plan. The actions and policies include the planned Capital Improvements Program (CIP) and additional strategies to work in coordination with the CIP.

3.8.1 Waldorf Water System

The following actions and policies are specifically directed at addressing the shortfall in capacity resulting from the reduction in permitted groundwater appropriation from the Maryland Department of the Environment (MDE).

Alternative Water Source Feasibility Study Implementation

The Charles County Government commissioned a Water Source Feasibility Study in response to projected population growth, declining water levels in regional aquifers, potential changes in groundwater quality and associated treatment requirements, and permitting conditions laid out by MDE. The main objective of this study was to evaluate potential options for meeting the Waldorf and Bryans Road water systems' future demand. County assessed feasible water supply alternatives to develop five comprehensive water supply scenarios to meet these future demands. A triple bottom line assessment of the five Water Supply Scenarios was conducted to evaluate each scenario across a broad range of decision-making criteria spanning economic, environmental, and social factors. A scenario that used a blend of increased WSSC supply to address near-term shortfalls and the Potomac River supply for long term needs was ultimately recommended for implementation. Under the current plan near-term activities include meeting with MDE to secure an updated groundwater appropriations permit, meeting with WSSC to negotiate a new, expanded water supply agreement of up to 5 mgd and for the long-term plan to build a surface water treatment plant withdrawing from the upper reaches of the Potomac River.

1. **Additional Use of the Magothy Aquifer** – Request an additional groundwater appropriation from MDE to enhance the Waldorf system capacity. This would include the evaluation of an additional well #17 described in CIP project #6075.
2. **Interconnection between the Bryan's Road and Waldorf Water Systems –** This project has been put on hold pending the results and continued analysis from the Alternative Water Source Feasibility Study.
3. **Maximize the Use of the Existing WSSC Water Connection** – The County needs to use the full 1.4 mgd of water allocated by WSSC. The high levels of disinfection biproducts that are likely a result of the very long detention times encountered in the relatively stagnant extremes of the WSSC transmission and distribution system need to be addressed so that the full complement of water may be used. The Department of Public Works (DPW) has considered several strategies to address the issue. One is to mix the incoming WSSC water with a new ground water source.

4. **Expand the Use of WSSC Water** – Explore the expansion of additional water connections in the vicinity of Rt. 210 in Bryans Road and Rt. 301 in Waldorf. The interconnection in the Rt. 301 to provide up to 5 mgd of potable water is currently under consideration.
5. **Patuxent Aquifer Development -** The County's 2015 Patuxent Aquifer Study, performed by the Maryland Geological Survey, evaluated the Patuxent Aquifer for potential use as a potable water source for the Waldorf area. Based on the findings of the County's 2015 study, increased energy and maintenance costs associated with deeper water levels may make use of the Patuxent aquifer system economically undesirable. Given the finding that the water quality is generally good and the large untapped availability of water in the aquifer, the County needs to continue to explore the viability of the aquifer as a future water source. This is especially true since the study acknowledged that the development of a production well will result in improved transmissivity for the well. As the availability of sources diminishes and the costs of production rise, the Patuxent aquifer may become a more desirable water source.

3.8.2 Water Conservation Measures

The County Commissioners adopted a new Water Conservation Plan for the Waldorf System on July 19, 2022, with the implementation of the following water conservation measures:

Objective 1 – Improve Drought and Emergency Preparedness: The County is prioritizing water conservation to better prepare for future droughts and other emergency situations. By minimizing future demand, the County will be better positioned to continue meeting the needs of customers when resources are more limited. In addition to water conservation, the County is developing an Emergency Response Plan for the Waldorf System which is required per America's Water Infrastructure Act (AWIA).

Objective 2 – Maintenance Plans: Ensuring proper maintenance on pertinent water equipment and ensuring that accurate readings are obtained from all water source and distribution meters will allow the County to analyze, reduce, and eliminate potential water loss and leaks. Implementing water conservation measures will reduce demands on existing equipment and provide the County with the information required to develop successful and cost-effective maintenance plan strategies. This will allow the County to continue to conduct the distribution system maintenance & inspections and collect critical system data that is necessary to meet water supply and conservation goals.

Objective 3 – Resource Management: Preservation of groundwater resources is a priority for the County. Future source developments will be focused primarily on surface water resources. Implementing water conservation measures will allow for minimizing reliance on groundwater.

Objective 4 – Develop Public Outreach and Education Strategy: Educating the public about the value of water is key to the success of any conservation measures. Many of the conservation measures analyzed as part of this Plan rely on public buy-in. The County understands that continued outreach and education is critical.

Objective 5 – Investigate Water Re-use Strategies: Expanding water re-use strategies presents significant opportunities for reducing potable water demand in the County. Continued evaluation of current and future activities is critical, and the County is committed to developing a strategy to explore and implement future reuse opportunities.

CHAPTER 4
THE SEWER PLAN

4.1 PURPOSE AND SCOPE OF CHAPTER

The purpose of this chapter is to provide information to be used by the County to utilize, operate, maintain, and protect the County's environmental resources through the use of safe wastewater systems that are adequate to serve orderly development. This chapter includes the following:

1. A description of existing wastewater treatment facilities;
2. An assessment of existing systems;
3. A projection of the wastewater production for the County as a whole, and the Development District in particular; and
4. A description of the capital improvements necessary for the planning horizon (next 10 years).

The goal of the County with regards to sewer service is as stated within the Comprehensive Plan is to accommodate 75 percent of the County's population growth through the year 2040 within the areas of the Mattawoman Sewer Service Area and the Towns of Indian Head and La Plata. Ensuring that the provision of public services is coordinated with the demand for those services is a major component of any growth management strategy. Charles County faces two major issues regarding the provision of public services. One of the strongest factors in influencing the location and intensity of development is the presence of community facilities and services. The County’s goal is to have development occur within the urban core and emanate outward. Water and Sewer infrastructure encourages development in areas of availability. Therefore, the County strives to develop water and sewer infrastructure within the urban areas and expand the systems outward.

4.2 EXISTING WASTEWATER TREATMENT RESOURCES

The existing sewer service within Charles County can be grouped into several categories. The designation is based on the responsible party for the facility. The types of facilities include:

- Private/Community;
- Public/Municipal;

- Institutional/Government;
- Industrial; and
- Individual Septic Systems.

There are two private/community systems within the County, ten public/municipal wastewater treatment facilities, five institutional/government facilities, and six industrial or commercial facilities served by wastewater treatment plants. In addition, there are areas throughout the County that use on-site systems for wastewater treatment and disposal. On-site systems may include conventional septic systems, mound systems, or low-pressure dosing.

4.2.1 Designated Service Areas

The service areas for the private/community, public/municipal, institutional/government, and industrial facilities are shown on the corresponding Comprehensive Water and Sewer Plan maps, which are incorporated as part of this document by reference. The service areas have been defined by the County Commissioners, defined through agreements with developers, or are subject to inter-jurisdictional agreements. In addition, the Appendices included which follow this chapter refers to "map numbers." These map numbers correspond to those listed on the Comprehensive Water and Sewer Plan maps.

4.2.2 Correlation of the Mattawoman Sewer Service Area with Development District

As stated in Chapter One, the County's policy is to direct 75 percent of the new growth to the Development District. The Development District contained within the Mattawoman Sewer Service Area (MSSA) as delineated on the Comprehensive Water and Sewer Plan maps. The MSSA will ultimately be served by the Mattawoman Wastewater Treatment Plant (WWTP). Thus, it is the County's ultimate objective to provide a municipal/public level of service to all residences within the Development District.

For growth outside of the Development District, the County's stated objective is to direct growth to areas of available service. The County limits growth through the use of individual septic systems, especially in areas of unsuitable soils. The Comprehensive Plan discourages the extension of public services to rural areas of the County and focuses development to the Development District. Areas within the Mattawoman Sewer Service Area (MSSA) that coincide with the Tier 4 Area Designations by the County to comply with the State's Sustainable Growth and Agricultural Preservation Act and the Watershed Conservation District (WCD) in the 2016 Comprehensive Plan are designated as S-6 (WCD) on the Water and Sewer Priority Maps. Within the MSSA, it is recognized that sewer infrastructure exists in the S-6 (WCD) or may be needed to serve existing or planned adjacent development in the Planned Sewer Service areas. These areas are restricted from development on public sewer systems unless there are corresponding amendments to the County's Tier 4 and Comprehensive Plan Districts.

Areas currently served by individual septic systems, but in which the individual septic systems are not functioning correctly (failing), have been also identified by the Maryland Department of the Environment and the Charles County Department of Health. These problem areas are being assessed by the County and may be addressed through connection to an existing facility or through other innovative and alternative means of wastewater treatment and disposal. The known failing septic areas are identified on the corresponding Comprehensive Water and Sewer Plan maps within this plan with the letter "E".

4.2.3 Sewer Collection and Treatment System Types

4.2.3.1. Conventional Public Systems

In areas within Charles County served by a central treatment facility, a variety of sewer collection and treatment methods are used. The County can generally be divided into drainage basins. These areas are identifiable through the ridges and valleys created by the many streams, creeks, and rivers within the County. The County's current policy regarding collection systems recommends the utilization of gravity collection systems through the use of topography, where possible. The Comprehensive Plan also discourages and/or limits the usage of pumping stations.

The County prefers gravity collection systems for a variety of factors. Compared to force main systems, they are less costly, easier to maintain, and require no associated equipment (such as pump stations or booster stations). With these factors in mind, the County's primary system, the Mattawoman Sewer Service Area, generally corresponds to the natural drainage basin of the Mattawoman Creek, as well as other areas which were previously developed.

Pump stations can represent a higher annual operation and maintenance cost due to power usage, replacement of moving parts, and lubricants required to keep the station in working order. However, the most significant factor against pump stations is that they must be monitored continuously, this requiring constant County staff and costly equipment at the telemetry control station. Pump stations may be used, however, to "lift" wastewater over the ridge between sub-basins, or to "lift" wastewater into existing interceptors. An example of the use of pump stations for this purpose is the Waldorf system. Pump stations and lift stations convey sewage out of the Zekiah basin into the Mattawoman basin. Pump stations must be monitored by mechanical equipment. The monitoring facility must be staffed in case of emergency. In some cases, the elevation or depth of piping can be manipulated, and sewer may flow by gravity to the County's systems, thus avoiding the need for a pump station.

4.2.3.2 Alternative Collection Systems

There are several other alternatives which may provide sewer service if gravity or force collection systems cannot be employed. Special site conditions, such as steep slopes or high-water table may prevent the utilization of conventional systems. These alternative systems are described below.

Small Diameter Gravity Sewers (SDGS)

Small diameter gravity sewers (SDGS) are an alternative in isolated unsewered areas because of their low construction costs. Unlike conventional sewers, primary treatment is provided at each connection by new or existing septic tanks, and only the liquid tank effluent is collected. Grit, grease, and solids that might cause obstructions in the collector mains are separated from the waste flow and retained in septic or interceptor tanks.

With the settleable solids removed (trapped in the interceptor tank), collector mains can be designed with smaller diameter pipe (4 inches). It is also not necessary to design for minimum self-cleansing velocities. Without the requirement for minimum velocities, the pipe slope may be reduced. This results in less excavation to lay the pipe. (Conventional sewers require minimum cleansing velocities, and thus more slope and more cut.)

Fewer manholes are also used, and most are replaced by clean-outs except at major junctions to limit infiltration/inflow (I/I) and entry of grit. The required size and shape of the mains is dictated primarily by hydraulics rather than solids-carrying capabilities as with conventional gravity sewers.

Designers must still, however, be cognizant of I/I and ultimate growth in sizing these systems. Construction costs are reduced by 30-65 percent because SDGSs may be laid to follow the topography more closely than conventional sewers and routed around most obstacles within their path without installing manholes. The interceptor tanks are an integral part of the system. They are typically located on private property, but are usually owned or maintained by the utility districts so that regular pumping is ensured to remove the accumulated solids for safe disposal. Routine maintenance is low in cost.

SDGS systems consist of:

- A house connection (household wastewaters leave the building and enter the interceptor tank);
- An interceptor tank, which is a watertight tank with baffled inlets and outlets. They are designed to remove both floating and settleable solids from the waste stream through quiescent settling over a period of 12-24 hours. Ample volume is also provided for storage of the solids, which must be periodically removed

through an access port. Typically, a single-chamber septic tank, vented through the house plumbing stack vent, is used as an interceptor tank;

- A service lateral which connects to the interceptor tank and discharges to the collector main. Laterals are 3 inches in diameter, but should be no larger than the collector main to which they are connected. (Conventional gravity laterals are 4 inches in diameter.) They may include a check valve or other backflow prevention device near the connection to the main.

- A collector main is a small diameter (3 to 4 inches minimum) plastic pipe, although 1.25-in pipe has been used successfully. (Conventional gravity laterals are 8 inches in diameter.) The mains are trenched into the ground at a sufficient depth to collect the settled wastewater from most connections by gravity. Unlike conventional gravity sewers, SDGSs are not necessarily laid on a uniform gradient with straight alignment between clean-outs or manholes. In places, the mains may be depressed below the hydraulic grade line. Also, the alignment may be curvilinear between manholes and clean-outs to avoid obstacles in the path of the sewers.

- Collector main clean-outs, manholes, and vents. These appurtenances provide access to the collector mains for inspection and maintenance. (Conventional gravity sewers require manholes.) In most circumstances, clean-outs are preferable to manholes because they are less costly and can be more tightly sealed to eliminate most infiltration and grit, which commonly enter through manholes. Vents are necessary to maintain free-flowing conditions in the mains. Vents in the household plumbing are sufficient except where depressed sewer sections exist. In such cases, air-release valves or ventilated clean-outs may be necessary at the high points of the main.

SDGSs have potential for wide application. They are a viable alternative to conventional sewers in many situations, but are particularly well suited for low-density residential and commercial developments. Because of their smaller size, reduced gradients, and fewer manholes, they can have a distinct cost advantage over conventional gravity sewers, where adverse soil or rock conditions create mainline excavation problems, or where restoration costs in developed areas can be excessive. In new developments, construction of the sewers can be deferred until the number of homes built warrants their installation. In the interim, septic tank systems or holding tanks can be used. When the sewers are constructed, the tanks can be converted for use as interceptor tanks. SDGSs usually are not well suited to high-density developments because of the cost of installing and maintaining the interceptor tanks.

One major drawback to SDGS systems is that the wastewater, which has been detained for 12-24 hours, is septic and contains sulfides. Sulfides are a major nuisance byproduct of wastewater.

They cause odor problems; form sulfuric acid, which leads to corrosion problems in the collection system, as well as the receiving WWTP; and, depending on the percentage of septic wastewater to fresh wastewater, cause treatment difficulties at the WWTP.

Pressure Sewers

Pressure sewer systems typically consist of small grinder pump stations, which receive the wastewater from one or more homes or commercial establishments (depending upon their proximity to each other) and pump the wastewater into a pressurized network of small diameter pipes. The pressure collection system consists of polyethylene tubing, PVC pressure pipe, and simplex (one pump) or duplex (two pumps) grinder pump stations housed in fiberglass basins. The pressure systems can discharge into gravity sewers, manholes, pump stations, larger force mains, or the WWTP. This system is provided at Cobb Island, with the addition of a septic tank effluent pumping (STEP) system, in combination with lagoons and spray fields.

The pumps generally utilize a 2-horsepower or less motor. The force main is a small (2 to 6 inches in diameter) pipeline, which is shallowly buried (minimum of 30 inches) and follows the profile of the ground.

Each home uses a small pump to discharge to the main. This pump may be a grinder pump (GP), which grinds the solids present in wastewater to a slurry in a manner similar to a kitchen sink garbage disposal. There are two pump system configurations. One configuration utilizes a small holding tank of 30 to 60 gallons followed by a grinder pump. The second configuration places the pump at the discharge point of the existing septic tank. This second type system is called a septic tank effluent pumping (STEP) system.

The septic tank of a STEP system captures the solids, grit, grease, and stringy material that could cause problems in pumping and conveyance through small diameter piping. Grinder pumps serving individual homes are usually 2-horsepower in size; but STEP pumps, because they are not grinding material, are usually a fractional horsepower.

The service line leading from the pumping unit to the main is usually 1-to-1.5-inch diameter PVC. Backflow is prevented by a check valve on the service line and a redundant check valve at the pumping unit. If a malfunction occurs, a high-liquid-level alarm is activated. This alarm may be a light mounted on the outside wall of the home, or it may be an audible alarm, which can be silenced by the resident. The resident then notifies the sewer service district, which responds to make the necessary repair.

The construction of pressure sewers involves narrow trenches and shallow pipe depths, thereby minimizing construction costs and disturbances in developed areas. No well point dewatering is required. Disturbances to existing roads and trees can be avoided by routing the pressure pipe around obstructions and beneath roads.

Developments experiencing slow growth find pressure sewers economically attractive. The front-end infrastructure (mainline) is inexpensively provided. The cost of the pumping units is deferred until the homes are built and occupied. The cost for the pumping units may also be financed with the home.

Pressure sewer equipment can also be used in conjunction with conventional systems. Where a low-lying home or basement is too low to allow gravity flow into a fronting conventional sewer, a grinder pump, or pressure-sewer-type solids-handling pump may be used at that home to discharge to the sewer. Similarly, STEP units can be used to discharge to high-lying drainfields, sand filters, mounds, and other forms of on-site wastewater disposal. A STEP system is in place in the Cobb Island portion of the County.

Vacuum Sewers

Vacuum sewers are typically considered alongside of pressure sewers, where gravity system sewers are not cost effective. A vacuum sewer system consists of three major components: the vacuum station, the collection piping, and the services. This system is used at Swan Point, due to the high-water table.

The vacuum station is the heart of the vacuum sewer system. It is similar to a conventional wastewater pumping station. These stations are typically two-story concrete and block buildings, approximately 25 by 30 feet in floor space. Equipment in the station includes a collection tank, a vacuum reservoir tank, vacuum pumps, wastewater pumps, and pump controls. In addition, an emergency generator is standard equipment, whether it is located within the station or outside the station, in an enclosure, or of the portable, truck-mounted variety.

The collection tank, made of either steel or fiberglass, is the equivalent of a wet well in a conventional pumping station. The vacuum reservoir tank is connected directly to the collection tank to prevent droplet carryover. The reservoir tank also reduces the frequency of vacuum pump starts, which extends pump life. The vacuum pumps can be either liquid-ring or sliding- vane type. These pumps are usually sized for 3 to 5 hours per day run time. The wastewater discharge pumps are non-clog pumps with sufficient net positive suction head to overcome tank vacuum. Level-control probes in the collection tank regulate the wastewater pumps. Vacuum switches on the reservoir tank regulate the vacuum pumps. A fault-monitoring system alerts the operator should a low-vacuum or high-wastewater-level condition occur.

The vacuum collection piping usually consists of 6-inch and 4-inch mains, although some recent installations also include 10-inch mains. Smaller 3-inch mains used in early vacuum systems are no longer recommended, as the cost savings in mains are insignificant.

Both solvent-welded PVC pipe and rubber gasket pipe have been used, although past experience indicates that solvent welding should be avoided when possible. Where rubber gaskets are used, they must be certified by the manufacturer as being suitable for vacuum service. The mains are generally laid to the same slope as the ground with a minimum slope of 0.2 percent. For uphill transport, lifts are placed to minimize excavation depth. There are no manholes in the system; however, access can be gained at each valve pit or at the end of a line, where an access pit may be installed. Installation of the pipe and fittings follows water distribution system practices. Division valves are installed on branches and periodically on the mains to allow for isolation when troubleshooting or making repairs. Plug valves and resilient wedge gate valves have been used.

Wastewater flows by gravity from one or more homes into a 30-gallon holding tank. As the wastewater level rises in the sump, air is compressed in a sensor tube, which is connected to the valve controller. At a preset point, the sensor signals for the vacuum valve to open. The valve stays open for an adjustable period of time and then closes. During the open cycle, the holding tank contents are evacuated. The timing cycle is field adjusted between 3 and 30 seconds. This time is usually set to hold the valve open for a total time equal to twice the time required to admit the wastewater. In this manner, air at atmospheric pressure is allowed to enter the system behind the wastewater. The time setting is dependent on the valve location, since the vacuum available will vary throughout the system, governing the rate of wastewater flow.

The valve pit typically is located along a property line. The valve pit holding tanks are usually made of fiberglass, although modified concrete manhole sections have been used for special situations (deep basements, large user, pressure/vacuum interface, etc.). A non-traffic lightweight aluminum cast lid is available for yard installations. Where the installation will be subjected to vehicular loading, a flush-mounted cast iron lid is used. An anti-flotation collar may be required in some cases.

Vacuum sewers are being used in portions of the Swan Point system where there is inadequate slope on the pipes for gravity flow.

4.2.3.3 On-Site Treatment Systems

Treatment systems within Charles County range from the basic individual septic systems in low density and agricultural areas to the Mattawoman WWTP site, with a treatment capacity of 20 million gallons per day (mgd). The treatment systems used throughout Charles County are also discussed in Section 4.2.4~~.~~

On-site treatment and disposal systems include a variety of components and configurations. The most common system is the conventional septic tank with a conventional drainfield (soil absorption system).

Innovative and Alternative Wastewater Treatment Program

The April 1, 1996, adoption of the "Alternative On-Site Wastewater Treatment Program" allows the Charles County Department of Health to utilize new types of alternative on-site sewage treatment systems for unimproved lots that were legally established prior to September 28, 1994 and cannot pass a conventional percolation test. Innovative on-site systems may be used for lots with an existing dwelling. The priority ranking for the utilization of these systems is as follows:

Innovative & Alternative Systems

1. Existing dwelling with Failed Septic System - may utilize conventional, innovative, or alternative systems.
2. Existing dwelling with no indoor plumbing - may utilize conventional, innovative, or alternative systems.
3. Unimproved lot that was legally established prior to September 28, 1994 - may utilize conventional or alternative systems.

The specific site dictates the type of on-site system required. Areas with sandy soils, low groundwater tables, and minimal environmental sensitivity may successfully utilize conventional septic tanks with conventional drainfields. However, areas with poor soils, high groundwater tables, and proximity to surface water bodies may require the use of advanced septic tank systems. Advanced systems include:

- Aerobic septic tanks and treatment systems;
- Alternating Fields;
- At-Grade Mound;
- Clivus System (Waterless Toilets);
- Holding Tank;
- Low Pressure Dosing; and
- Sand Mound

These advanced systems are combined with discharge systems for disposal and additional treatment. Specifically, these discharge systems are surface disposal systems; subsurface disposal systems; and evapotranspiration systems. Surface disposal requires a nearby surface water body, however obtaining discharge permits for this type of system is highly unlikely for water bodies of Critical State Concern. Evapotranspiration systems require evapotranspiration rates that exceed rainfall, and this is not the case for Charles County (due to winter temperatures). Therefore, subsurface disposal is the only viable option.

Conventional Septic Tanks

Conventional septic tanks treat the wastewater by settling solids, trapping floating materials (oils and greases), and providing anaerobic treatment to the liquid stream. As the wastewater leaves the septic tank, some biological degradation is performed by soil microorganisms within the drainfield. The drainfield consists of perforated discharge pipes that are set in a bed of gravel. The tank effluent flows by gravity to the perforated pipe, where it is disbursed over the gravel and seeps into the soil. Although there is some biological degradation of the trapped material, periodical (recommended once every 3 years) removal of the floating and settled material should be performed. Improper maintenance may result lesser treatment of the wastewater and reduced drainfield life.

Beginning January 1, 2013, the requirements of COMAR Section 26.04.02.07 were amended to state that "A person may not install, or have installed, an onsite sewage disposal system unless the onsite sewage disposal system utilizes Best Available Technology (BAT) for any of the following:

- New construction in either the Chesapeake Bay Watershed or the Atlantic Coastal Bays watershed;
- New construction in any watershed of a nitrogen impaired body of water; or
- The repair or replacement of a system at a property in either the

  Chesapeake Bay critical area or the Atlantic Coastal Bays critical area.

Other types of systems such as aerobic septic tank systems, nutrient removal septic tanks and treatment systems and sand filtration that may meet the requirements of the MDE are discussed below. The Maryland Department of the Environment (MDE) maintains a list of approved BAT systems.

Aerobic Septic Tank Systems

The aerobic septic tank is designed to provide additional biochemical oxygen demand (BOD) removal. An aerobic septic tank is essentially an enlarged septic tank, followed by an aeration/settling tank. These systems mechanically aerate the raw wastewater much like an extended-air wastewater treatment plant. Manufacturers of these systems claim treatment efficiencies similar to those of municipal WWTPs (90 percent BOD and 90 percent total suspended solids (TSS) removal). Unlike conventional septic tanks, aerobic systems promote nitrification of the wastewater. Nitrification is the biochemical oxidation of ammonia found in the raw wastewater to nitrates. Nitrates are a regulated wastewater effluent constituent due to potential health risks from the nitrate contamination of groundwater.

Nutrient Removal Septic Tank Systems

Nutrient removal septic tanks offer BOD and TSS removal efficiencies comparable to aerobic systems and offer some additional nutrient removal (nitrates only). These systems are similar to the aerobic system configuration, with the addition of a sand filter. Generally, the wastewater flow is separated and rerouted to achieve the additional treatment. Some of these systems are designed to separate the wastewater flow from the building into gray water (wash water) and the black water (human and food wastewater). The majority of the BOD and nutrients are contained in the black water. These systems are more capital- and energy-intensive than conventional septic tank systems and requires maintenance of the motors, pumps, and blowers. They may also require periodic chemical addition.

Sand Filtration Systems

A sand filtration system may follow a conventional septic tank or aerobic treatment system. Sand filtration systems aid in the degradation and removal of suspended solids, providing a higher quality effluent. Solids are captured and biologically degraded within the sand media.

Subsurface Disposal

The most common subsurface disposal practice is to utilize a soil absorption system, such as a conventional drainfield. However, in areas with poorly drained soils, alternatives to the conventional drainfield can be used. These systems essentially distribute the flow over a larger area and utilize soil microorganisms to degrade wastes. There are many types of subsurface application systems available, including:

- Alternate trench drainfields and serial distribution drainfield
- Leaching chambers
- Mound systems
- Pressure-dosed distribution
- Shallow-trench, low-pressure distribution

In the alternating trench system, there are multiple drainfields. One field is in rest, while another is in use. This approach allows each field to renew, which extends drainfield life. It also provides a standby if one field fails. A valve directs the sewage liquid to the proper field. Fields are usually switched every 6 to 12 months. With serial distribution, a pump forces the liquid to perforated pipes in a contoured absorption field. Drop boxes regulate the liquid flow so that the highest trench fills up first, the second fills up next, and the lowest fills up last. This method is used in sloping areas.

Another method of gravity subsurface septic tank effluent application is the use of leaching chambers. Effluent flows by gravity to concrete or arched plastic chambers, where effluent is stored. The effluent floods the soil surface prior to seeping vertically through the bottom of the chamber. Soil microorganisms then break down the organic matter. In areas where soils are poor, a more porous sand soil may be constructed in a mound. Absorption drainfields may be laid down within this mound system. Septic tank effluent is pumped up to the mound where it discharges to the mound soil. Septic tank effluent is then degraded in a manner similar to the standard drainfield.

There are also systems available that dose the subsurface discharge beds periodically using a pump or syphon system to a drainfield. Pressure-dosed distribution systems force the effluent through a larger area under the soil. In addition, this system improves the exchange of air into the effluent, promoting more rapid degradation of septic tank effluent. Shallow-trench, low-pressure pipe distribution systems operate on the same principal as pressure-dosed distribution, although the drainfield is much closer to the soil surface. Aerobic soil zones are contacted, promoting more rapid and more complete degradation of septic tank effluent discharge.

4.2.3.4 Septic Problem Areas

Several areas throughout Charles County have difficulty passing the conventional percolation test, administered by the Charles County Department of Health. This is commonly due to poorly drained soils or a high-water table. Several areas throughout the County experience difficulty passing the test for an On-Site Sewage Disposal System (OSDS). Properties that do not pass the test for an OSDS may not have a structure built upon them unless public sewer becomes available to the property. However, OSDS test have become more stringent in the last two decades due to systems being installed on poor soils or high-water table areas. Several existing communities in the rural areas of the County have experienced continual septic problems, requiring replacement of the OSDS or conversion to a holding tank. Further, these systems may be leaching high levels of nutrients into the water table or surface water sources.

Charles County is working with the Maryland Department of the Environment and local citizen groups to seek grant funding through the state's Bay Restoration Fund to assist in the repair and enhancement of the existing systems. Effective October 1, 2005, an annual fee is collected from each user served by an onsite system. The total estimated program income is $27 million per year based on the current charge of $60 per user. Sixty percent of these funds are used for septic system upgrades and the remaining 40 percent are used for cover crops. There are 420,000 onsite systems in Maryland. With priority given to failing septic systems in Critical Areas, funds can be provided for upgrades of existing systems to best available technology for nitrogen removal or for the marginal cost of using best available technology instead of conventional technology. Changes in 2012 to the BRF law allow funding, of sewer connections for communities with failing on-site sewage disposal systems.

Due to very high demand, the Maryland Department of the Environment now prioritizes funding for septic system upgrades toward those systems that pose the greatest threat to clean waterways and drinking water. In accordance with State law, the Bay Restoration Fund prioritizes upgrades as follows:

1. Failing OSDS or holding tanks in the Critical Areas

2. Failing OSDS or holding tanks not in the Critical Areas

3. Non-confirming OSDS in the Critical Areas including new BAT installation

4. Non-confirming OSDS outside the Critical Areas

5. Other OSDS in the Critical Areas, including new construction

6. Other OSDS outside the Critical Areas, including new construction

4.2.4. NPDES Permitting Process

The treatment and disposal of wastewater and sludge are regulated by several Federal, State, and local agencies. The degree of regulation is dependent on the treatment process used. The regulation of central wastewater systems discharging to surface waters (point source discharge) is regulated by the Environmental Protection Agency (EPA) through the National Pollutant Discharge Elimination System (NPDES) and the Maryland Department of the Environment (MDE.) On-site facilities, such as individual septic systems, are regulated by the Charles County Department of Health. Systems discharging treated effluent to land application systems and collection and transmission systems are regulated by MDE.

The EPA regulates the discharge of pollutants into navigable water of the United States under the Federal Clean Water Act of 1977 (CWA), as amended by the Water Quality Act of 1987. Navigable water means waters of the United States, including the territorial seas, subject to the ebb and flow of the tide; all interstate waters, including interstate wetlands; and all other intrastate lakes, rivers, streams, and other wet areas (the use, degradation, or destruction of which would or could affect interstate or foreign commerce). In addition to identified water bodies, impoundments of such water bodies and tributaries to such water bodies are included. EPA adopted numerous regulations to implement the CWA. These regulations are found in Title 40, Code of Federal Regulations (CFR).

The basic thrust of the Clean Water Act is the establishment of technology-based effluent limitations for major industrial categories. The technology requirement that applies to a given source depends on its industrial type, its age, and the pollutant involved. The regulations applicable to NPDES permitting are set forth at 40 CFR Parts 122, 124, and 125. These regulations have been significantly amended by modifications throughout recent years. While modifications have occurred to the NPDES permitting process, the basic procedure has remained constant.

1. *Pre-operation Permit* - NPDES permits are operating permits, rather than construction permits. NPDES permit applications are required to be filed no later than 180 days prior to the commencement of operation of the facility.

2. *Five-Year Permit* - NPDES permits are ordinarily issued for a term of 5 years unless the implementation of new guidelines for a particular industry in question or other circumstances would justify issuance for a shorter period.

3. *Best Professional Judgement* - Permitted sources are required to meet the technology-based effluent limitations established by the EPA for that particular industry, if any, and established on a case-by-case basis pursuant to 402(a)(1) of the CWA. These latter determinations are called best professional judgement (BPJ) limits and are based on consideration of appropriate factors set forth in Section 304.

4. *Compliance, Monitoring, Recordkeeping and Reporting Requirements* - NPDES permits require the permittee to demonstrate that the effluent meets any applicable effluent limitations established by EPA. Records are required to be kept for at least 3 years, and reports are to be made to the EPA. These and other requirements are contained in general provisions, which EPA puts in the boiler plate of all permits.

5. *Federal Enforcement* - EPA enforces the requirements of the NPDES permit and CWA through the use of civil penalties and administrative penalties (fines). In addition, the EPA has the authority to pursue criminal cases within the courts. In enforcement situations, a notice of violation is ordinarily sent to the alleged violator with an opportunity to confer prior to subsequent action. In addition, the Clean Water Act has a provision for a citizen suit, whereby third parties can seek to require EPA to enforce against an alleged violator.

A summary of the current NPDES permitted discharge points for the centralized sewer facilities within Charles County are provided in Appendix 4A. The NPDES permits show conformance with the effluent limitations of the receiving waters.

4.2.5. Level of Treatment

The degree to which wastewater should be treated depends on the raw wastewater quality and the desired quality of the finished effluent. Since the degree of treatment determines the number and types of unit operations and processes to be used, there are numerous combinations of processes employed in wastewater treatment. Therefore, treatment methods can be divided into three categories, depending on the level of treatment each provides: primary, secondary, and tertiary or advanced treatment.

Primary Treatment

Primary treatment includes those processes which reduce the floating and suspended solids present in the water by mechanical means or by the action of gravity. This involves passage of raw or pre-aerated wastewater through sedimentation or flotation tanks or through fine screens designed to remove the readily settleable material from suspensions. To accelerate the settling process, inorganic or organic coagulant aids may be used to increase the size and/or density of the flocculent solids and the proportion of solids that settle. Adequately designed primary treatment units remove from 98 to 99 percent of the settleable solids and from 30 to 50 percent of the oxygen demand from a domestic waste. Primary treatment, in effect, separates the raw waste into a water component and a concentrated solid or sludge component. The water component still contains significant amounts of dissolved and colloidal pollutants unaffected by primary treatment. The water component can be discharged or given further treatment designed to remove the residual pollutants. Solid components then receive additional treatment, such as digestion.

The use of primary treatment as a sole form of treatment is dependent on the receiving water used for discharge of effluent. In general, additional treatment is recommended to maintain the quality of the waters within the State.

Secondary Treatment

Secondary treatment depends on biological processes to reduce further the suspended and dissolved solids that are present in the liquid effluent after primary treatment. Secondary treatment processes include the trickling filter and activated sludge. Both require a source of balanced food, atmospheric or pure oxygen, and an environment suitable for the growth of the microorganisms.

In the trickling filter, the clarified primary effluent is allowed to trickle down through media designed to provide: 1) sufficient surface area for the types and volume of organisms required to consume the organic materials and nutrients, and 2) sufficient void volume to permit passage of liquid wastes and air in the bed. The biological life removes the pollutants from the liquid waste by absorption during its passage through the bed and converts the waste constituents to energy, new cells, waste products, and water.

In the activated-sludge process, the liquid waste is brought into intimate contact with the biological life required to assimilate the food contained in the waste and added with the raw or settled waste in the form of a return activated sludge. The return sludge is biologically activated sludge from the aeration tank, which is removed from the aerated wastes in a final sedimentation tank. The oxygen requirements of the mixed liquid, consisting of waste and activated sludge, are supplied by introducing air into the aeration tank using aeration devices. Oxygen goes into solution and is used in the metabolism of the food. The activated-sludge process involves many process variations and utilizes many different types of aeration tanks and aeration equipment. In each case, however, the biological life of the activated sludge moves through the aeration tank with the waste flow. The amount of returned sludge and aeration provided is determined by the volume and strength of the waste and the particular process variation time. Secondary treatment processes can be designed to provide overall removals of 85 to 95 percent of the suspended solid and oxygen demand present in the raw waste.

Tertiary (Advanced) Treatment

Tertiary treatment of waste effluent from secondary treatment plants generally involves nutrient removal treatment or additional solids removal and is used to produce effluent of higher quality. Conventional secondary sewage treatment processes do not remove most inorganic soluble salts. The effluent from secondary treatment contains the biochemical oxygen demand (BOD) that escaped biochemical decomposition. Part of this BOD is exerted by the suspended solids in chemical oxygen demand (COD) of dissolved organics that resist further biodegradation in the plant. When the effluent is discharged into a watercourse, these residual contaminants continue in the natural cycle to decomposition and recomposition.

There are many methods and processes for removing nitrogen and phosphorus from domestic wastewater. Some methods rely on chemicals while others employ biological processes. Biological nutrient removal processes often enjoy significant economic advantages due to reduced operational costs. Regulatory pressures to remove nutrients and economic benefits of biological processes are the main reasons biological nutrient removal processes have flourished in recent years.

The number and reliability of biological nutrient removal processes have dramatically increased in the last 10 years. Some processes have focused on nitrogen removal, some on phosphorus removal, and others accomplish both. However, all create the appropriate environments in one shape or another.

Biological nitrogen removal is the most understood and reliable process. Two zones are necessary in all biological nitrogen removal processes. An aerobic zone is needed to provide an oxygen-rich environment where bacteria convert soluble organic nitrogen and ammonia to nitrate. Conversion of organic nitrogen and ammonia to nitrate is called nitrification. Nitrate is converted to nitrogen gas in the second zone called the anoxic zone. The anoxic zone must be completely absent of free oxygen and contain sufficient organic carbon to allow biological conversion of nitrate to nitrogen gas. This conversion is called de-nitrification. Nitrogen gas is then freely stripped from the liquid, and nitrogen removal is complete.

Biological phosphorus removal processes are somewhat more complex than biological nitrogen removal processes. However, all biological phosphorus removal processes create an anaerobic zone somewhere in the process. Phosphorus-loving bacteria enjoy biochemical advantages over other normal wastewater bacteria in the activated sludge. A readily available organic substrate (soluble BOD) is also needed in the anaerobic zone to increase the selection process.

4.2.6 Summary of Environmental Impact- FONSI and MOU

On January 17, 1989, the U.S. Environmental Protection Agency completed a "Finding of No Significant Impact" for the Mattawoman WWTP, indicating that implementing the project would not result in any significant primary environmental impacts. However, the FONSI was issued with reservations noted for a number of secondary impacts identified in the Environmental Assessment and in the supporting Mattawoman 201 Facilities Plan available in the Department of Planning and Growth Management.

4.2.7. Effluent Disposal Techniques

Until recently, the primary means of effluent disposal from sewage treatment plants was direct discharge into a watercourse. With increased population growth and subsequent increased discharges of sewage effluent, the natural purification processes in watercourses have been stressed, and water quality has slowly deteriorated.

The alternatives to the discharge of sewage effluent into a watercourse include:

- land application (including spray irrigation and rapid infiltration basins)
- wetlands systems
- reclaimed water/reuse systems
- gray water systems

In a land application system, the soil and vegetative cover purify and dissipate the effluent as it percolates into the ground. In addition to the primary benefit of eliminating harmful pollutants in watercourses, land application can also serve to recharge groundwater supplies, allow recovery and reuse of nutrients, and may provide an economic return if used for some agricultural purposes.

Land treatment of wastewater may involve a wide variety of techniques and in some cases combinations of several. These include spray irrigation and rapid infiltration basins, overland flow. Land treatment systems vary depending on the overall design and the selected site. Major design parameters include topography, permeability of the soils, depth to the groundwater table, and location of nearby residences. The County has expressed a preference for land application methods of effluent disposal over surface water discharge within policy statements found in Chapter 1.

Disposal of effluent via spray irrigation requires large expanses of land that are sprayed with effluent at very low application rates (1 to 2 inches per week). Suitable spray irrigation areas are characterized by permeable to highly permeable soils. The effluent seeps through the soils, which act as a filter for the effluent. As noted above, land requirements are considerable for this disposal method due to the low effluent application rates. However, use of this method on land requiring substantial irrigation (such as golf courses or agricultural areas) is feasible. This method is discussed later in this section.

On dedicated lands, spray irrigation would be considered a non-public access method of effluent disposal. Treatment requirements would include secondary treatment with some denitrification to remove nutrients.

Rapid infiltration basins (RIBs) filter effluent through permeable to highly permeable soils at a faster pace. Basins are situated in areas where rapid infiltration is likely, such as high knolls and areas with rolling topography. Land requirements are not as extensive as for spray irrigation. RIBs require secondary treatment, at a minimum. Depending on the location of the basins, additional treatment may be necessary.

Wetland application is a concept rapidly gaining recognition as a viable alternative for effluent disposal. It represents an extension of the land treatment reuse/recycle concepts strongly encouraged by Congress. The U.S. Environmental Protection Agency (EPA) is also encouraging the use of wetlands.

The topography of most wetland ecosystems is flat; thus, the movement of water across a wetland is typically a slow process. This slow water movement results in long retention times and subsequent deposition of suspended soils and other materials. Wetlands are highly productive and efficient consumers of nutrients.

Considerable permitting and monitoring requirements are associated with wetlands use; but this method, in combination with other disposal methods, has the potential for providing the Charles County with a cost-effective and environmentally acceptable effluent disposal alternative.

A different approach to effluent disposal is encompassed in the reuse alternative. Effluent is collected and treated by the local treatment facility, then returned to the developer or area of origin for reuse which is normally spray irrigation. This alternative places the responsibility for effluent reuse and disposal on the area generating the wastewater.

Reclaimed water recipients (i.e. developers, residents, or others) may use a variety of methods to dispose of the returned effluent. Three methods are briefly described below; however, more detailed investigation of these and other effluent disposal methods is recommended prior to their use in Charles County.

- Urban irrigation
- Agricultural irrigation
- Potable reuse

For the purposes of this Comprehensive Water and Sewer Plan, urban irrigation included providing reclaimed wastewater to virtually any irrigated land within Charles County. Public access reuse can encompass irrigation of golf courses, parks, playing fields, cemeteries, commercial/industrial areas, multifamily residential lawns, single-family residential lawns, medians, and rights-of-way.

Since urban irrigation involves applying reclaimed water to areas accessible to the public, public access levels of treatment are needed. Treatment requirements essentially include secondary treatment with filtration and high-level disinfection.

Irrigation of agricultural crops requires public access levels of treatment (filtration and high-level disinfection). A major restriction with the use of reclaimed water is that it cannot come in direct contact with foods that will not be cooked, peeled, skinned, or thermally processed prior to consumption. This restriction does not prohibit the irrigation of these crops with reclaimed water, but restricts the irrigation method that can be utilized.

Indirect potable reuse has been occurring throughout the world unintentionally wherever wastewater is discharged to a receiving stream or is applied to the land and infiltrates into an aquifer, and the stream or aquifer is subsequently used as a drinking water source. The discussion in this section focuses on the intentional blending of water supplies with reclaimed water, often referred to as pipe-to-pipe or direct-potable reuse.

For most of the other forms of reuse discussed in this report, there is experience within the United States. Intentional direct potable reuse is not currently practiced in Maryland. Potable reuse does not have the historical background that the irrigation forms of reuse have. Because of this lack of a database, intentional direct-potable reuse is not an alternative that can be implemented in the near term. It is also perceived as a last resort for water supply when all other sources have been exhausted. Less risk would be involved in the desalinization of groundwater than in the treatment of wastewater for potable purposes.

The term "gray water" has been defined as any wastewater generated from baths, showers, and washing machines. "Black water" is defined as wastewater from water closets, kitchen sinks, dishwashers, or any other non-gray water source. Basically, a gray water system consists of dual in-house piping, a septic tank, and a drainfield. One piping system collects the gray water from the baths, showers, and washing machines and conveys it to the septic tank. The other system collects the remaining wastewater (black water) and conveys it to a central sewer system.

Gray water systems can reduce wastewater flow to the central sewer system by as much as 50 percent. Flow reduction approaches 60 percent when water-saving devices (i.e., low-flush toilets) are used. When gray water systems and new collection lines are used, a stronger wastewater influent is expected. However, if the collection system is old, and groundwater is infiltrating the pipes, the influent characteristic would probably be similar to that of a conventional system. It is also important to realize that as flow to the plant is reduced, wastewater strength increases; thus, savings in treatment costs are usually much less than the reduction in flow. The major savings potential of a gray water system is in effluent disposal.

Gray water effluent quality is better than that of septic tank effluent, but poorer than that of treated effluent. Potential contamination of groundwater and surface water (i.e., lakes) is of concern, particularly in a service area which provides high recharge to an aquifer. The added capital cost of the gray water system (attributed to the installation of a septic tank, drainfield, and central sewer system) to the developer/homeowner is another disadvantage. However, this additional cost could be offset by reduced connection fees, since less flow would be expected from the dual system.

The PANDA Plant in Prince George's County uses effluent waters from the Mattawoman Wastewater Treatment Plant (MWWTP) for Cooling purposes. The CPV Maryland Power Plant Project in eastern Charles County constructed effluent water line from the MWWTP to the power plant located next to the County Landfill on Billingsley Road. The plant is expected to use 3-5 MGD of treated effluent. The County continues to promote the use of the effluent water to reduce discharge into the rivers and streams.

4.2.8 Sewage Sludge Management Practices

The purpose of wastewater settling and biological aeration is to remove organic matter and concentrate it in a much smaller volume of sludge for ease of handling and disposal. The cost of facilities for stabilizing, dewatering, and disposing of this concentrate is about one-third of the total capital investment in a treatment plant. Operating expenses in sludge handling may amount to an even larger fraction of the total plant operating costs.

The quantity and nature of sludge generated vary based on the character of the raw wastewater and processing units employed. Primary settling produces an anaerobic sludge of raw organics that are actively decomposed by bacteria. Therefore, these solids must be handled properly to prevent emission of obnoxious odors. In comparison with secondary biological waste, primary sludges thicken and dewater readily because of their fibrous and coarse nature. Waste from secondary biological treatment, such as aeration, is made up of suspended and colloidal solids. It is relatively odor-free because of biological oxidation, but the finely divided and dispersed particles make it difficult to de-water.

Techniques for processing waste sludge depend on the type, size, and location of the wastewater plant, unit operations employed in treatment, and the method of ultimate solids disposal. Common methods for handling, processing, and disposing of waste sludge include: storage prior to processing in the primary clarifiers or separate holding tank; thickening prior to dewatering or digestion by gravity settling or dissolved air flotation; conditioning prior to dewatering by chemical treatment; stabilization by aeration (aerobic digestion); dewatering by vacuum filtration, pressure filtration, centrifugation, and drying beds; solids disposal by burial in a landfill, incineration, or spreading on farmland; and production of soil conditioners.

Most sewage treatment plants in operation in Charles County use aerobic digestion followed by dewatering on sand beds. These plants produce approximately 7 wet tons per year (see Appendix 4E for a complete listing). The Mattawoman WWTP uses gravity thickening, aerobic digestion, and Belt Filter Processing with the County's Land Application Contracts. Currently, the Mattawoman WWTP is processing sludge generated by its own processes plus septage from septic and holding tank sewage pumping trucks. This is approximately 6.0 to 7.0 wet tons of sludge/million gallons of plant flow. New State regulations require that all septage gathered by sewage pumping trucks be treated at a sewage treatment plant. According to these regulations, raw septage may not be applied directly to any land surface in the State. The total sludge processed at the Mattawoman WWTP is approximately 93 percent of the sludge generated in Charles County. A review of the sludge management practices at the Mattawoman WWTP was recently completed as part of the Section 201 Facility Plan. Beginning in May 1990, Mattawoman sludge was no longer landfilled. The County has recently contracted to have its sludge applied to farmland.

The Town of La Plata currently processes sludge in its aerobic digesters and dewaters it by pressure filtration in a belt filter press. It is then disposed of in a landfill in Virginia. This plant also has anaerobic digesters, which currently are not in use. Recently, a filter press (pressure filtration) was installed to dewater the sludge. The Town of Indian Head processes sludge in an aerobic digester and dewaters it on sludge drying beds. Currently, the town trucks its sludge to the MWWTP. The other smaller plants located in the County do not have the facilities to process excess sludge. These plants contract haulers to dispose of the excess sludge, either at the Mattawoman WWTP or via land spreading. Appendix 4E provides information on the sludge management practices used within the County.

4.2.9 Pretreatment of Industrial Wastes[1]

The objective of an industrial pretreatment program is to ensure that no industry or group of industries is permitted to discharge wastes which may adversely affect the operation of the treatment works. Certain wastes should be totally excluded from the treatment plant. These fall into three categories:

- Fire or explosion hazards
- Wastes which will impair hydraulic capacities
- Safety hazards for people operating the plant or sewer system.

The County has determined that an effective means to control commercial/industrial (C/I) user's discharge containing certain quantities of toxic or limited substances is through an industrial waste permit system. The permit system requires all existing and future C/I users classified as major or minor to obtain a permit.

Section 403.8(f)(2) of the General Pretreatment Regulations identifies the procedures that the County has established to ensure compliance with the requirements of a pretreatment program. These implementation responsibilities are to:

- identify and locate all C/I users possibly subject to pretreatment program
- identify the character and volume of pollutants discharged to the treatment works by these users
- notify C/I users of applicable standards and requirements
- receive and analyze self-monitoring reports and other notices from C/I users
- randomly sample and analyze industrial effluents
- investigate instances of non-compliance
- comply with public participation requirements

4.2.10 Marina Pump-out Program

The major water quality problem involving marinas is caused by the watercraft that use the facilities. Generally, marinas are located within protected coves with little tidal action to provide

[1] "Charles County Pretreatment Program Report for Mattawoman WWTP", August 1, 1990, PSC Engineers and Consultants, Inc.

the potential for water exchange. Therefore, whenever watercraft dump their domestic wastes into the waters of the marina, these waste load concentrations tend to remain in the same general area and cause severe pollution levels throughout that portion of the waterway. All marinas with 50 or more boat slips are regulated to have pump-outs, however, the County's objective is to have all marinas served by pump-out facilities.

This potential source of pollution should be attacked at both the watercraft level and the marina level. All watercraft should be prohibited from dumping their partially treated waste loads indiscriminately throughout the waterways, and they should be required to dispose of their wastes at a central location for ultimate treatment and disposal. Federal regulations governing waste disposal from watercraft are enforced by the Coast Guard and the Maryland Department of Natural Resources Police. Until a decision is made on these proposals, the enforcement efforts by local regulatory agencies to restrict watercraft dumping will continue to be severely restricted. So that boats have a safe place to dispose of their wastes, marinas are strongly encouraged to install waste collection systems to remove the wastes from the watercraft and treatment facilities to properly handle the wastes.

There are currently at least 15 marinas located in Charles County The facilities are located mainly on the Patuxent River at Benedict, near Cobb Island, and at the mouth of the Port Tobacco River. These marinas provide onshore sanitary facilities, and are equipped with systems for collection and treatment of wastes generated in the watercraft that use the facility. The Maryland Department of Natural Resources (DNR) regulates the marina program, although the County does implement holding tank “pump out” programs at some marinas.

Furthermore, existing marinas should be required to upgrade their onshore waste disposal systems where pollution concentrations above the allowable limits have been documented. The County recognizes the problem imposed by watercraft sanitary wastes and will develop procedures to regulate watercraft waste disposal. The Charles County Department of Health is the lead local agency for marina pump-outs. Marina pump-out facilities were included in the Cobb Island sewer project.

The DNR has procedures and rules whereby new marinas are required to be properly served by adequate sanitary waste disposal systems that eliminate this potential pollution. These systems include both onshore facilities and dockside facilities for the watercraft.

4.2.11 Wastewater Reuse

As the cost of producing water for non-potable uses increases and wastewater treatment requirements have become progressively more expensive to meet, the reuse of highly treated wastewater for a variety of industrial, commercial, and agricultural uses has become more attractive and economically feasible. Reuse has the dual benefit of reducing direct discharges of wastewater from the County’s wastewater treatment facilities while at the same time reducing water supply demand on the County's limited aquifers. To promote the broader use of alternative wastewater disposal methods, MDE has subsequently developed new guidelines for the application of use of four (4) classes of reclaimed water, including the application of highly treated effluent to public areas.

Charles County has been a leader in the effort to achieve practical and environmentally sound wastewater reuse. The primary emphasis thus far has been the use of the effluent from the Mattawoman Treatment works as cooling water for electrical generation facilities located in or near the Development District.

The first such project was the 230 MW Panda Energy International Brandywine natural gas fired generating plant located in Prince Georges County near the Charles County line. The facility has an agreement with the County to take up to 2.7 MGD of effluent from the Mattawoman facility. The average amount of effluent used in 2019 was 0.42 MGD. The reuse water is pumped through a 16-inch twenty-mile-long main to the power plant site. Approximately 20% of the reuse water is returned to the Mattawoman collection system in the form of boiler breakdown.

Another similar project that has come online is the Competitive Power Ventures (CPV) 640 MW natural gas fired generating plant located in the Southern Industrial Park area of St. Charles. The agreement between CPV and the County calls for 650 to 750 million gallons of reclaimed water per year with a maximum use of 5.4 MGD. Current estimates are that the summertime average usage will be 3.3 MGD. Reclaimed water traverses approximately ten miles of the existing reuse water transmission main and then a spur approximately three miles long carries the treated wastewater the remainder of the distance to the generating plant. The project includes pumping station and facility upgrades at the Mattawoman Wastewater Treatment Plant. As with the Panda plant blowdown comprising approximately 20% of the reuse volume will be returned to the County collection system.

Another potential power plant reuse customer is the existing NRG (formerly Genon) coal fired plant located at Morgantown near the US 301 Bridge on the Potomac. It is estimated that this 1475 MW facility could use as much as 4 MGD.

The policy for the allocation of Reclaimed Effluent Supply is found in Section 6.9 of the Water and Sewer Ordinance.

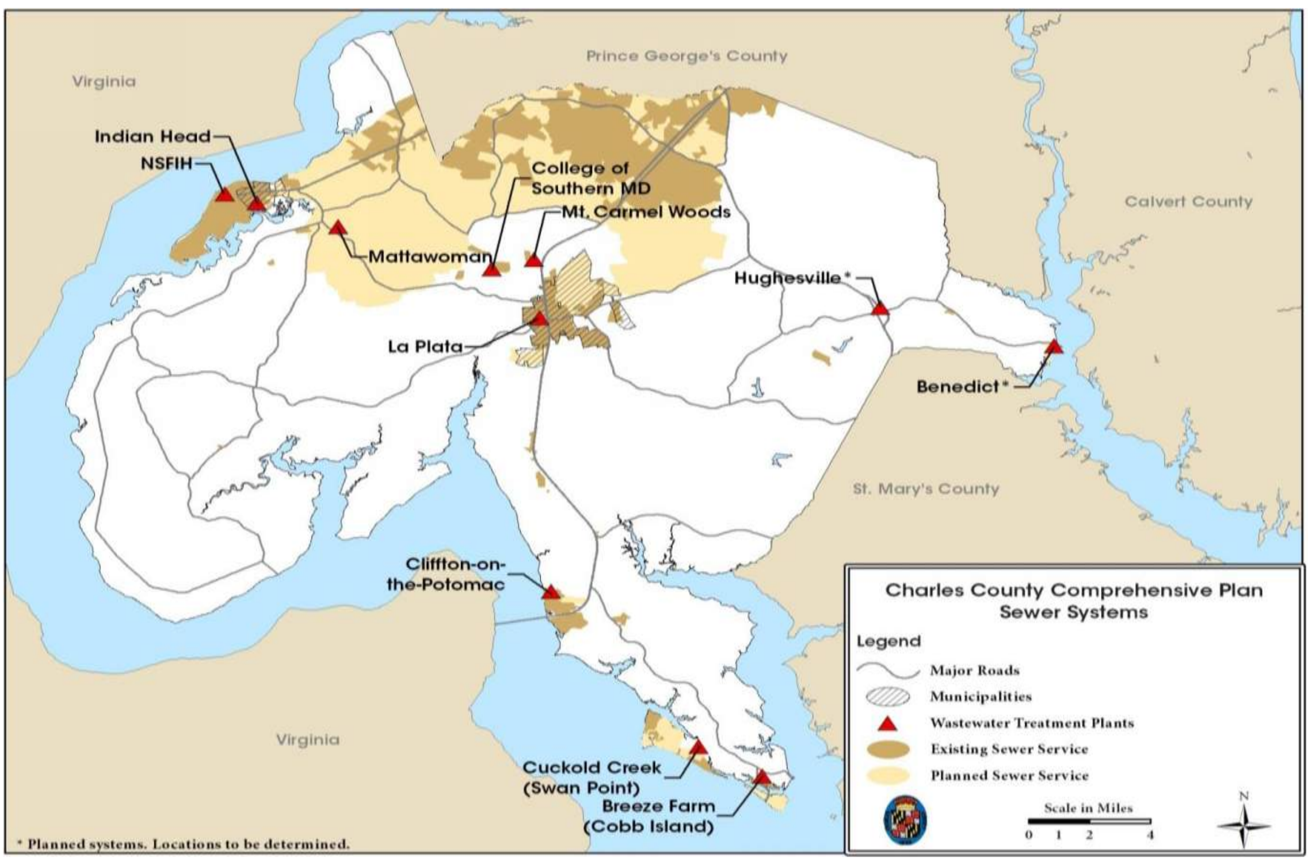
4.3 INVENTORY OF EXISTING SEWER SYSTEMS

The existing sewer treatment and disposal systems can be grouped into four types: private/community, public/municipal, and institutional/governmental. Figure 4-1 shows the geographic coverage of central sewer systems in the County. This listing contained herein, corresponds to the informational Appendices which appear at the end of this chapter.

Appendix 4A provides a summary of the characteristics of existing and planned NPDES permitted discharge points. Appendix 4B provides an inventory of existing and planned Wastewater Treatment Plants including treatment type, point of discharge, and capacity information. Appendices 4C and 4D show the flow data for wastewater treatment plants, pumping stations, collector sewers and force mains.

Appendix 4F provides information regarding sanitary facilities at Marinas. Appendix 4G provides an inventory of sewage problem areas in private and public sewer system. Appendix 4H shows the projected sewage demand and capacity for public systems.

Figure 4-1: Charles County Sewer Systems



4.3.1 Private/Community

There are currently two private/community systems operating in Charles County: Hughesville Sanitary Commission and Potomac Heights facilities

Hughesville Sanitary Commission – The Hughesville Sanitary Commission owns and operates a private/community wastewater treatment facility. The facility is located in the eastern portion of the County and provides treatment for 0.006 mgd of wastewater through the use of an absorption field. The system serves 13 commercial lots; many of which are vacant at this time. The County has a capital project titled Hughesville Water and Sewer System to design and construct a new wastewater treatment plant and land application site to serve the Hughesville area.

Potomac Heights – The Potomac Heights area is served by a private collection system. The system is located next to the Town of Indian Head. The County constructed a County-operated sewer pump station and force main to convey the sewage to the County-operated Mattawoman WWTP. Under the Mattawoman Inflow and Infiltration program, the County is assessing the I&I issues in the sewer system.

4.3.2 Public/Municipal

There are seven public/municipal facilities in Charles County. The Town of Indian Head and the Town of La Plata provide public sewer services for properties within their corporate limits. The Charles County Commissioners own and operate the remaining five sewer treatment facilities. These facilities are described below. Appendix 4B provides additional information regarding treatment types, capacities, and points of discharge for public/municipal facilities.

Bel Alton – The Bel Alton WWTP is permitted for a flow of 0.32 mgd. The plant was originally under private ownership, the plant was taken over by the County and was converted to a conventional activated sludge system to meet permit standards. The plant was replaced with a new package treatment plant and is processing about 0.010 mgd. There are currently commitments for 7,133 gpd. There is a need for another 2,700 gpd to accommodate developed properties abutting the current collection system.

Cliffton-on-the-Potomac – Cliffton-on-the-Potomac is a 512-lot subdivision with a 110-acre commercial and light industrial component. This subdivision is served by a treatment plant and four (4) pumping stations. The plant design capacity is 70,000 gpd, with a current average daily flow of 34,000 gpd. The effluent from the plant is pumped into the Potomac River.

The collection system does experience excessive inflow/infiltration (I/I) during wet weather. The County has analyzed the sewer system and located problem areas, which will be repaired to reduce the I/I in the system. The treatment plant uses the activated sludge process operated in the contact stabilization mode. There is a 0.8-acre pond used for flow equalization. Sludge is processed on-site in an aerobic digester and transported for ultimate disposal.

Cliffton is currently under a building moratorium because the treatment plant operates at capacity. [See Cliffton policy on septic systems, Section 1.3.6]. The August 1, 1989, agreement with a private developer to increase the treatment capacity of the plant has not resulted in an increase in treatment capacity as was expected by the County. The treatment plant is undergoing improvements to replace equipment for a Conventional Activated Sludge (CAS) process at existing capacity with the capability to upgrade to an Enhanced Nutrient Removal (ENR) process in the future.

Cobb Island – As a result of the Cobb Island 201 Facilities Plan, a wastewater treatment plant was constructed which serves the Cobb Island area and adjacent subdivisions of Pine Grove, Hill Boulevard, Woodland Point, Potomac View, and Matthews Manor. The service area of the Cobb Island Facility is also shown on the Water and Sewer Plan maps and may not be expanded in conformance with an agreement between the County and the Maryland Department of the Environment.

Sewage from Cobb Island, Pine Grove, and Hill Boulevard is transported by means of a force main to a two-cell lagoon located on the Breeze Farm site. The effluent is discharged onto the land by means of a spray irrigation system on the Breeze Farm site and on the Cuckold Farm site. Septic tank effluent pumps (STEP) have also been installed to serve the Matthews Manor, Woodland Point, and Potomac View subdivisions. The sewage is pumped through a force main to a two-cell lagoon located on the Cuckold Farm site. The effluent is discharged onto the land by means of spray irrigation on the Cuckold Farm. The "general conditions" agreed to by the County and The Maryland Department of the Environment are listed in the supplemental policy for the allocation of Cobb Island sewer capacity.

In 1996 the County Commissioners adopted the Cobb Island Sewer Allocation Policy which allowed 27,000 gallons per day (gpd) of sewage treatment capacity to be allocated for ninety-seven (97) equivalent dwelling units for residential and 30 EDU allocations for commercial. The County Commissioners, and Maryland Department of the Environment agreed, that there is sufficient capacity in the system to accommodate these allocations.

The 1996 annual average flow was 99,032 gallons per day which is generated by 506 service connections (residential and commercial). Rated capacity is currently 158,000 gpd with 20% of the potential capacity held back for future consideration. Flows have been temporarily diverted to the Swan Point Plant to assist in providing adequate flows to insure proper operation. Consequently, the effluent has dropped to 47,000 gpd. The County has completed a permanent inter-connection to Swan Point and will evaluate the performance of the current system to determine if there is potential excess capacity. The County will evaluate the capacity of the Cobb Island treatment plant and adjust based on those findings.

Patuxent Woods – The Patuxent Woods is a facility consisting of a shared septic system serving four (4) currently recorded lots within the Patuxent Woods subdivision. The lots served contain single family housing units only, intended as homes for low-income and moderate-income households. The maximum number of households on the systems is eleven.

These lots are served by an off-site septic system with an absorption field. In 2014 the County became the operating authority for the system whereby the homeowners pay for the recent upgrade of the system.

The disposal area of two systems were created - one area for the initial unit and another area for the recovery unit. The initial septic unit has 6 trenches, and the potential recovery unit may have up to 10 trenches.

Town of Indian Head – The incorporated limits of the Town of Indian Head are served by a central sewage collection system and wastewater treatment plant with a 500,000 gallons per day capacity. The current plant began operation in 1968 and received a plant upgrade in 1992. Most recently the plant was upgraded to ENR technology in 2008 which included a flow equalization basin to assist with I/I flow. Both the systems and facility are owned and operated by the Town. The plant presently has an average daily flow of 0.431 mgd. The plant is presently achieving all the effluent quality requirements set by the NPDES permit.

The Town presently serves approximately 1,254 residential and commercial accounts within the Town of a population of 4,100. The Town's wastewater collection system dates in some areas from the 1930's. The system has periodically been expanded as warranted by development, annexation, and provision of sewage treatment services to surrounding subdivisions. The collection system presently consists of approximately 54,700 linear feet of mains ranging in size from 4-inch to 12-inch. In addition, the Town operates six (6) pumping stations within the system. The present system experiences heavy inflow/infiltration (I/I) problems.

The Indian Head Wastewater Treatment Plant has a design capacity of 500,000 gpd and consists of preliminary treatment in the form of a fine mechanical screen and grit removal, Advanced treatment in the form of a five-stage reactor, final clarification followed by “up flow” infiltration, chlorine contact chambers, and dechlorination. A thickened sludge holding tank is utilized on site for sludge reduction. Liquid sludge is handled via tanker trucks and hauled to the Mattawoman WWTP.

Allocation of sewer capacity within the Town of Indian Head is on a first come, first serve basis. Monthly monitoring reports are submitted to the Maryland Department of the Environment (MDE) for sewage treatment flows.

Town of La Plata – The Town of La Plata is served by a sewer system that it owns and operates. The wastewater treatment facility (WWTP) is located northeast of the intersection of US 301 and MD 6 on an un-named tributary of the Port Tobacco River. La Plata expanded the common elements of the treatment facility in 2002 to handle up to 2.5 mgd, but the rated capacity of the plant is 1.5 mgd. As shown in **Table 4-1**, wastewater flows to this treatment facility averaged 1.164 mgd in 2019, with peak flows as high as 3 mgd during major rain events due to inflow/infiltration problems within the collector system. The sewage flow to the WWTP is generated by about 9,500 residents, numerous commercial establishments, seven schools and various governmental offices located within the Town Limits. La Plata is the County Seat for Charles County and the quantity of sewage treated daily by the Town is much higher than would normally be expected from its residential population alone.

There are approximately 6,000 additional residential units planned to be built in the Town over the next twenty years. This growth will ultimately require an additional treatment capacity of as much as 1.5 million gallons per day. The expansion of the WWTP to provide the needed capacity will be paid for primarily by the development community.

Table 4-1

La Plata WWTP CAPACITY 2020	
Capacity of WWTP 1-1-21	1,500,000
Average daily effluent 2021	1,088,900
Average daily sewage generation August and Sept 2021	891,800
Three-year average effluent, 2019, 2020, 2021	1,160,266
Three-year average flow % capacity	77.3%
Average daily I and I 2021	197,100
Percent of I and I 2021	18.1%
Three-year average I and I	229,600
Three-year average percent of I and I	19.8%
Available Capacity EDU's 1-1-21	1,530
Available Capacity EDU's 1-1-21 less average I and I	1,308

The expansion of the WWTP in 2002 included the addition of Biological Nutrient Removal (BNR) using a Modified Ludzack-Ettinger (MLE) process including final filtration and ultraviolet disinfection. An Enhanced Nutrient Removal (ENR) upgrade, financed primarily by the Bay Restoration Fund, was completed no later than in 2014. A new NPDES permit has been issued and the rated capacity of the WWTP will be increased to 2 mgd.

The treatment plant is operated on a day-to-day basis by the Town of La Plata. MES submits monthly monitoring reports to the Maryland Department of the Environment (MDE) for the effluent being discharged from the plant.

Allocation of sewer capacity within the Town of La Plata is on a first come, first serve basis. For residential subdivision applications, the Town issues an Allocation Letter to the Charles County Department of Health to confirm that adequate sewer capacity exists at the Wastewater

Treatment Plant. The Department of Health will sign the Allocation Letter once capacity is confirmed. A flow factor of 225 gallons per day per dwelling unit with 15% added for I&I is used to determine sewer demand. The Town uses Maryland State Standards to determine the sewer demand of institutional, commercial, and industrial users. The Wastewater Capacity Management Plan adopted by the Town contains a process for allocating the remaining capacity in the plant as the flow increases.

The collection system consists of a network of sewer lines, varying in size from 8" to 24", providing service to areas within the incorporated limits. The collection system that serves La Plata includes approximately 37 miles of sewer line and sixteen (16) pumping stations. All but two of them have emergency power available. The Haldane Pump Station serves only 17 residences, and it will be eliminated when the La Grange Development is completed.

Inflow and infiltration are major problems in the La Plata sewer system. The magnitude of the I&I is such that the average influent flow of 1 mgd at the WWTP has been as high as 4 mgd during periods of very heavy rain. Flows in excess of 2.5 mgd exceed the capacity of the existing collection system and overflows occur at the manholes at the lowest point in the system. Portions of the system are 55 years old and were originally designed for a maximum flow of 350,000 gpd. Not only are these interceptors and trunk lines too small to handle the current flow, but they have deteriorated over the years. Due to the damage from hydrogen sulfide generated by the pump stations and long force mains in the system, portions of the system have been replaced and others have been lined to get rid of excessive I&I.

The Town has entered into a consent decree with MDE and agreed to eliminate overflows. In order to accomplish this, a sewer improvement team was formed in 2007 to develop a long-range plan. An inventory was made of all properties in Town and an estimate made of the anticipated flow if they are all developed at the maximum density permitted under current zoning. As a result of this inventory and a Wastewater Capacity Management Plan prepared by the Town, seven improvements were identified that need to be made to handle the 2.5 mgd of sewage that will be generated when the Town is fully built out. Four of the seven projects that were identified have been completed as of January 1, 2010. The new pump station to replace the old Willow Lane Pump Station and new sewer lines from the pump station to the WWTP has taken care of two more of the identified problems and should eliminate all overflows from the collection system. The seventh project, a new force main from Buckeye Circle to the WWTP will not be needed until the Stagecoach Crossing subdivision is developed.

With the upgraded collection system, it is likely that the peak flow arriving at the WWTP will be more than it can handle at times and portions of the plant may have to be bypassed during major rain events. The Town has added a 1,500,000-gallon equalization tanks at the WWTP to maintain a more constant flow through the treatment process and eliminate any overflows or discharge of effluent that does not meet the requirements of the NPDES permit.

La Plata has undertaken, as a continuing improvement project, the work of identifying sources and locations of the inflow/infiltration problems and determining the exact magnitude of their effect upon the collection and treatment system. Where feasible, La Plata is presently correcting the sources of inflow and infiltration as they are discovered; thereby continually upgrading the existing collection system The Town has also purchased specialized equipment and is engaged in an I&I elimination program to reduce the excess flow into the system.

Mattawoman Wastewater Treatment Plant (WWTP) – The Mattawoman WWTP is a tertiary treatment plant located at Mason Springs that is providing chemical and biological nutrient reduction. The Mattawoman plant was constructed in 1979 as a 5.0 mgd facility. The facility was expanded to accommodate flows up to 10.0 mgd in 1990. The expansion and the upgrade of the plant to 15.0 mgd was in accordance with the Mattawoman Wastewater Management (201) Facilities Plan and complies with Maryland's Potomac Strategy Committee's Policy on discharge to the Potomac estuary. The last major upgrade was the enhanced nutrient removal (ENR) upgrade completed in 2007. The current configuration of the plant has the discharge loadings for total nitrogen and phosphorus based on an annual average flow (AAF) of 20 million gallons per day (MGD). The ENR upgrade included the following major components:

- One (1) new 130-foot diameter primary clarifier
- Conversion of existing aeration basins to five (5) three-zone ENR oxidation ditches with internal recycle
- New blower and electrical building for the ENR tanks
- Two (2) new 130-foot diameter secondary clarifiers
- New RAS pump station
- Conversion of the chlorine contact tanks to ultraviolet (UV) disinfection channels
- One (1) new 40-foot diameter gravity thickener
- Replacement and re-routing of underground power cables

Since the ENR upgrade several other facilities have been upgraded or modified, with significant projects including:

- Two (2) screen replacements
- Refurbished one (1) grit chamber, and began installation of a new grit chamber
- Laboratory upgrades

Raw influent to the plant is screened, de-gritted and then pumped via the influent pumping station to the primary splitter box. From the primary splitter box, the influent is then distributed to the primary clarifiers. Effluent from the primaries flows by gravity to the enhanced nutrient removal (ENR) reactor tanks while primary sludge is pumped to the gravity thickeners. The oxidation ditch style ENR reactor tanks biologically treat the wastewater to reduce the biological oxygen demand, and the total nitrogen through nitrification and denitrification processes occurring within different zones in the reactors. The effluent from the ENR tanks then flows to the secondary clarifiers. Secondary effluent flows from the secondary clarifiers to the final clarifier distribution box where ferric chloride is added to precipitate with phosphorus and settle in the final clarifiers to meet the total phosphorus effluent limit of 0.18 mg/L. Clarified effluent then flows to the traveling bridge effluent filters and then through ultraviolet (UV) disinfection. A portion of the effluent is pumped offsite for re-use by an electrical power generating facility, and the remaining effluent is pumped through an effluent force main to a manhole, then flows by gravity to the Potomac River.

The Mattawoman Plant was one of the first plants within Maryland to be upgraded to reduce nutrient discharges to the Chesapeake Bay and planning for the ENR upgrade began prior to the establishment of the Chesapeake Bay TMDL. Since this upgrade was completed in 2007, the plant has been operating well below permit levels for nitrogen and phosphorus and, as a result, discharges from this major facility are less than half of the TMDL load caps that were established for during the watershed implementation planning process.

The County's capital improvement program also reflects planning that is underway for additional facility enhancements at the Mattawoman WWTP that are necessary to support the County's overall WIP strategy and water conservation goals.

As described in previous sections of this plan, Charles County has aggressively promoted greater reuse of highly treated wastewater, consistent with MDE's water conservation goals, for irrigation and industrial uses. The Mattawoman Plant, because of its ability to meet the high treatment thresholds for reuse, represents the best source of reclaimed water that can be used at an alternative to groundwater or surface water withdrawals within the County. As a result, the County is designing new effluent and influent pumping upgrades at the Mattawoman WWTP to support this reuse strategy.

The County is in the design phase for a flow equalization facility for the Mattawoman WWTP that will help optimize ENR processes and allow plant to continue to provide high levels of nutrient reduction performance as growth occurs within the Mattawoman WWTP. A study of plant flows that was completed in 2013 revealed several adverse operational impacts that were resulting from surges in influent flows that were experienced during large storms, and the County is in the process of implementing the report's recommendations. There are CIP projects to improve the automation and electrical components at the Mattawoman Plant.

The service area for the Mattawoman WWTP was established during the development of the 201 Facilities Master Plan for the Mattawoman Watershed in 1989. This facility was designed to serve as the primary regional wastewater treatment facility for the County's primary development area and portions of Prince George's County, and the County has made significant capital investments since 1989 to build the infrastructure necessary to convey and treat wastewater within the Mattawoman Sewer Service Area (MSSA). The MSSA was intended to serve the natural drainage basin of the Mattawoman Creek, areas previously served when the MSSA was established, and areas within the Comprehensive Plan's Development District. The designated MSSA has been reduced to implement the intent of the Watershed Conservation District in the 2016 Comprehensive Plan.

The actual planning area boundaries set by the State of Maryland include the entire Mattawoman Creek Basin, Waldorf, St. Charles, the Town of Indian Head, and a portion of Prince Georges County. The major interceptors which transport wastewater to the Mattawoman WWTP include: the Mattawoman Interceptor; the Piney Branch Interceptor; and the Bryans Road Interceptor. The Mattawoman Interceptor extends from the plant along Mattawoman Creek and terminates in the vicinity of the Pinefield subdivision. The Piney Branch Interceptor, which discharges into the Mattawoman Interceptor, extends along the Piney Branch, and terminates at US 301, across from St. Charles. The Bryans Road interceptor transports sewer from the Bryans Road area to the Mattawoman Treatment Plant.

Directing growth to this state-of-the-art facility is an integral part of the County's strategy to meet nutrient load reductions to the Chesapeake Bay under Maryland's Phase II Watershed Implementation Plan (WIP), as well as its overall goals to protect sensitive resources within the Mattawoman Watershed. By providing public sewer service for existing and planned development within the MSSA at the Mattawoman Plant, the County is minimizing the adverse environmental impact from discharges from smaller, lower performing satellite treatment facilities and low-density development in unserved areas.

Charles County and the Washington Suburban Sanitary Commission (WSSC) entered into an agreement October 22, 1982, concerning the Mattawoman basin sewer service. Briefly, that agreement provides the following:

- An understanding that the treatment facility is designed to accommodate future expansion in stages to increase treatment capacity to fifty (50) million gallons per day.

- That the WSSC shall participate in the funding of construction, maintenance, and operation of the wastewater treatment plant, pumping station, the outfall line, and the Mattawoman interceptor in return for the vested right to discharge wastewater from the Washington Suburban Sanitary Commission into the sewer facilities.

- An agreement that Prince George's County will, as the treatment capacity of the Mattawoman WWTP is enlarged, receive additional usage and treatment capacity not to exceed twenty percent (20%) of the expanded capacity to 15 mgd. Due to the ENR construction, the Maryland Department of the Environment re-rated the plant to 20 mgd.

Prince George's County was not a party to this recent construction. Therefore, the Prince George's County bulk allocation remains at 3 mgd of the total plant capacity.

The County completed the ENR system and MDE has re-rated the NPDES Permit for the plant in 2010. The discharge quality standards were computed based on a 20 mgd average daily flow. The current 2-year annual average flow is 13.1 mgd (effluent flows). This does not include approximately 0.42 mgd that is used by the Panda power plant. As the predominant regional wastewater treatment facility in the County flow projections are shown in **Table 4-2.**

Recent State and Federal agreements and planning have dictated that major treatment works, such as the Mattawoman facility achieve nitrogen and phosphorus removal to the "limits of technology", which is generally defined as limiting average effluent total nitrogen concentrations to 3.0 mg/l and effluent total phosphorus concentrations to 0.18 mg/l.

As noted, such requirements greatly increase the complexity and cost of wastewater treatment facilities. More importantly the permit limits also set a cap on the mass of nutrients that may be discharged from the treatment works. In the case of the Mattawoman treatment plant this limit is 243,645 pounds per year for nitrogen and 10,964 pounds per year for phosphorus.

The significance of these figures is that they represent the maximum values that can be discharged from the treatment works regardless of any future increases in treatment capacity. Since the facility has already been upgraded to attain nutrient concentrations representing the upper capabilities of current technology, it is unlikely that a significant fraction of the required nutrient removals can come from additional incremental treatment efficiency.

Accordingly, if the treatment works is significantly expanded beyond the current 20 MGD size, nutrient credits must be obtained by the utility, either in the form of nonpoint source mitigation efforts such as extensive best management practices in terms of stormwater management and treatment or by purchase of credits from other entities.

Table 4-2 – Mattawoman Effluent Flow Projection to River (MGD)

	2019[1]	**2025**	**2030**	**2035**	**2040**
Commercial and Gov't. Users	1.019	1.040	1.061	1.122	1.186
Residential (HHs)	8.39	10.639	11.993	13.101	14.2
CPV	2.55	1.15	1.15	1.15	1.15
WSSC	1.4	3.000	3.000	3.000	3.000
TOTAL	**13.359**	**15.829**	**17.204**	**18.373**	**19.536**

1. Uses Employment and Household estimates rather than actual metered flow. Metered effluent flow was 10.05 MGD for 2020 and 10.9 MGD for 2019 for an average of 10.475 MGD.
2. Projections are based on Household and Employment from TAZ Projections and use an average of 260 gpd per Household and 21 gpd per employee. (Schools use per pupil factor.)
3. In 2019 a total of 10.15 MGD was processed and released as effluent. The difference represents Panda flows. This amount better represents the true hydraulic flow within the plant; however, the effluent discharged to the Potomac is the best measure of nutrient loading.

Table 4-2 projections are for plant effluent going to the river which affects our NPDES permit limitations. The estimated increased flows from development and interconnections does not take into account the full hydraulic demands and operational needs. For example, in 2019 the plant treated 10.15 MGD when the amount sent to Panda is considered. For the past two years, Panda received a monthly average over 14 MG during the months of maximum demand starting from June to November. This impact from inflow and infiltration will likely shorten the time that the WWTP will be able to continue to meet discharge standards. As a result, plant improvements such as flow equalization and influent and effluent management techniques will be needed to continue to provide high quality effluent. The needed plant improvements may require an expansion to the current site to accommodate the facilities.

Mt. Carmel Woods (MCW) – The Mount Carmel Woods Subdivision is served by an extended aeration package treatment plant located south of Mitchell Road, west of US 301, and north of MD 225. The service area is shown on the Comprehensive Water and Sewer Plan maps. This wastewater facility is operated by the Charles County Commissioners. The plant discharges to Jennie Run. The design capacity of the plant is 21,000 gpd, permitted for 21,000 gpd with a current hydraulic loading of about 7,000 gpd. The plant receives wastewater from the approximately 70 connections in Mount Carmel Woods by a gravity collection system with no pumping stations. The County and MDE discussed alternatives to combine MCW and the College of Southern Maryland's wastewater treatment plants (WWTP) in March 2020. It was determined that MCW WWTP should upgrade the treatment process to meet new requirements set by MDE. Additionally, MCW WWTP cannot increase its permitted capacity due to nutrient loading limitations at its current discharge point that is regulated by MDE. The County plans to replace the MCW WWTP to address aging infrastructure and to meet the latest MDE regulatory requirements.

Strawberry Hills Estates – The Strawberry Hills Estates sewer treatment facility is out of service since the Strawberry Hills Estates subdivision has been tied into the Mattawoman WWTP. The collection system consists of approximately 15,204 linear feet of eight (8) inch diameter asbestos-cement pipe and is connected to the Bryans Road Interceptor Collection System.

Swan Point – Through 2006, the Swan Point sewage treatment plant has been limited by a treatment capacity of 70,000 gallons per day (gpd). A bulk sewer allocation for the community was issued to the original developer based on the Docket 250 developer agreement to expand the treatment plant. In 2004, the NPDES permit was expanded to accommodate proposed growth in the Swan Point development, totaling 600,000 gpd. Allocation of treatment capacity will be granted as a bulk sewer allocation for the residential and commercial units within the Swan Point development up to 530,000 gpd of capacity. Allocations of up to 70,000 gpd will be granted to applicants outside of the Swan Point development through the County's supplemental allocation procedures. Currently, the plant has been upgraded to a capacity of 300,000 gpd with allocations of up to 35,000 gpd to be granted to applicants outside of the Swan Point development. A flow factor of 230 gpd per single family dwelling has been designated for allocating capacity in the Swan Point sewer system. Present flow is approximately 91,000 GPD.

4.3.3 Institutional/Government

Four entities own and operate institutional/government wastewater treatment facilities in Charles County: the Charles County Board of Education, Charles County Community College, the Southern Maryland Correctional Institution, and the Navy (at the Naval Support Facility Indian Head). These facilities are described below. Appendix 4B provides additional information regarding treatment types, capacities, and points of discharge for institutional facilities.

The Board of Education of Charles County – The Board of Education of Charles County operates treatment plants that serve Gale-Bailey Elementary School, Matthew Henson Middle School, Piccowaxen Middle School, and Mt. Hope Elementary School. J.C. Parks Elementary School is served by trickling filter plants. Formerly served by a trickling filter plant, Gale-Bailey Elementary School is no longer under an NPDES Permit. The Mt. Hope Elementary School is served by a zero-discharge water re-cycling treatment system. All plants are currently operating under design loads and are meeting NPDES permit effluent limitations. Construction of a sewer line to connect Lackey High School to the Mattawoman Interceptor was completed in 2003. Upon completion of the connection, the school's existing sewage treatment facility was abandoned. There are currently no plans for future expansions or sewer connections of the other listed school facilities.

College of Southern Maryland (CSM) – This institutional complex is served by a wastewater treatment facility located north of Mitchell Road on the east side of Port Tobacco Creek. The plant is owned and operated by the CSM and serves the campus area, Maurice J. McDonough High School, the James Craik Elementary School, and the Vocational-Technical Center. The system consists of a separate grit chamber, comminutor, activated sludge aeration basin, final settling tank, post-aeration, and chlorine contact chamber. In 1977, the College added a 20,000-gallon surge tank, tertiary treatment, chlorination, and dechlorination of wastewater. The outfall line extends to Port Tobacco Creek. The sludge is digested in an aerobic digester and dried in sand drying beds.

The treatment facility is designed for a sewage flow of 60,000 gpd and is currently treating an average of 29,000 gpd. The collecting sewers vary in size from 6" to 8" and serve the campus area and the other aforementioned institutions. The collection system is gravity and force main flow and is considered adequate for the wastewater flows generated in the areas presently served.

Based on the projected enrollment figures and the current plans to supply sewer services to a new middle school and an enlarged Community College, the projected wastewater flows are expected to be approximately 60,000 gpd. The current plan is to remove the existing CSM Wastewater

Treatment Plant and construct a new wastewater treatment plant on the CSM campus, in essentially an adjacent location. The new plant will continue to receive and treat wastewater from three schools, without measurable change in volume, nor how the wastewater is delivered to the new plant for treatment on CSM's campus.

Southern Maryland Correctional Institution/Pre-Release Unit – The Southern Maryland Pre-Release Unit Wastewater Treatment Plant was upgraded in 2016 to an advanced Membrane Bioreactor packaged plant with U.V disinfection. However, the Department of Public Safety and Correctional Services close this Pre-Release Facility in June 2021. At the time of operation, the plant served 200 residents and was designed for 20,000 gal per day annual average flow and 45,000 gpd equalized peak flow. The plant was operated by the Maryland Environmental Service at higher flow rates and processed over 33,000 gallons per day, and this increases to as high as 40,000 gallons per day**.** There is a need to increase the hydraulic capacity of the treatment plant to 40,000 gallons per day.

Naval Support Facility Indian Head (NSFIH) – Naval Support Facility Indian Head is located west of and adjacent to the Town of Indian Head. The collection system and treatment facilities, which serve this area, are owned by the Federal Government. The system and facilities serve 3,321 employees and residents at Indian Head and 495 employees at the Stump Neck Annex. A pressure main runs under the Mattawoman Creek connecting Stump Neck Annex to the main site collection system. The total estimated wastewater flow at NSFIH is presently 340,000 gpd.

The treatment facility is an Enhanced Nutrient Removal plant and includes 2 parallel Sequencing Batch Reactors (SBRs) and 6 denitrification filters also used for phosphorus removal. UV is used for disinfection. The total design capacity is 0.5 MGD with a peak flow of 0.75 MGD. Sludge is periodically removed from the aerated sludge holding tanks and hauled wet for further treatment at another treatment plant. Effluent from the treatment plant is discharged into the Potomac River.

The collection system is 52 miles long with 18 pump stations at the main site and 11 at the Stump Neck Annex. Infiltration/inflow (I/I) is an ongoing issue in the collection system. Many projects have been completed to address I/I issues and have improved the situation. Projects are being planned to continue the sewer collection system rehabilitation to eliminate extraneous flow.

4.3.4 Industrial

NRG - Morgantown – The NRG (formerly Genon) generating station at Morgantown is served by a 20,000 gpd activated sludge treatment plant. In 2020, the average daily flow is 3,000 gpd. The plant is presently meeting all the NPDES effluent limitations based on monthly flows for 2020. The plan is expected to shut down in June 2022.

<u>Commercial Facilities</u> – There are three commercial establishments that are served by their own treatment facilities in the County. These establishments are Shine Inn, Relax Inn and Thunderbird Motel located along Route 301 south of La Plata.

4.4 PLANNED SEWAGE TREATMENT SYSTEMS

4.4.1 <u>Benedict</u>

The Village of Benedict is located along the shoreline of the Patuxent River, on the south side md Route 231. Benedict contains approximately 139 homes and mix of commercial properties that are primarily oriented along the waterfront. The Village is currently served by individual septic systems and a county-owned and operated public water system. As the village has a mean elevation of 9 feet above sea level and shallow depth to groundwater, the subject septic systems have either experienced failures or may be leaching nutrients into the groundwater table. The County is conducting the Benedict Water Quality Study to analyze water quality tests and contaminant source tracing to gain greater understanding of potential impacts to public health and area waterways. At this time, the County does not have any known non-point sources. If the suspected water quality issues are found and linked to septic systems in the community, the County will pursue remedies that may include a public sewer system. If determined to be the solution, the existing septic systems will be connected to the treatment facility which is intended to reduce the levels of nitrogen, phosphorus, and bacteria potentially affecting local water bodies, and improving water quality in the Patuxent River and ultimately the Chesapeake Bay. Previous designs of a Benedict wastewater treatment facility will be consisted of both gravity and pressurized force mains that will be served by a series of pump stations and a wastewater treatment facility. This facility would have a planned design capacity of 60,000 gallons per day (gpd), with the first phase consisting of 33,000 gpd and the remaining 27,000 gpd will be constructed as the flows warrant the additional treatment capacity. The peak capacity of the plant will be designed to treat up to 0.24 mgd. The means of discharging the treated effluent will need to be determined and is still under study. The study will evaluate the need to acquire additional nutrient credits through trading or offset for the new point source discharge. The limits of the sewer service area would be contiguous with the Priority Funding Area (PFA) designation for the Village of Benedict.

4.4.2 <u>Hughesville</u>

The Village of Hughesville is located along the south side of Md Route. 5, and includes the crossroads with Md Rt. 231. Based upon the 2007 adoption of the Hughesville Village Revitalization Plan, a vital part of the implementation strategy is to provide needed infrastructure, including public water and sewer. The provision of this infrastructure will support current economic development initiatives as well as provide an environmentally sound reduction of septic systems within the village. Hughesville contains approximately 138 residential parcels and 92 commercial/industrial parcels. The Village is currently served by individual septic systems and the privately-owned and operated Hughesville Sanitary Commission which provides wastewater service to twelve (12) commercial lots along Maryland Business Route 5. The absorption field utilized by the Hughesville Sanitary Commission is operating at approximately 90% of the total capacity and does not have the ability to serve additional properties. Based on the revitalization plan and limitation of local private sewage systems, Charles County has funded the development of a public wastewater treatment plant and collection system within the capital improvements program, consistent with the revitalization plan. The limits of the sewer service area will be consistent with the Priority Funding Area (PFA) designation for the Village of Hughesville.

The design services for new sewer system are under the Hughesville Village Water and Sewer project includes a packaged WWTP, land application, and sewer collection system,and shall commence in 2022. The discharge of the new Hughesville WWTP system shall be a land application site; therefore no additional nutrient credits are required.

4.4.3 Southerland Subdivision

The Southerland Subdivision encompass 35 lots (27 existing homes and 8 vacant lots) located on Jay Street, Bland Street, and Frances Street along Mill Hill Road in Waldorf, MD. The existing homes were built on impermeable soils and currently have failing on-site sewage disposal systems. The County has funded a project titled Southerland Septic Connection to provide an opportunity for properties with failing septic systems to connect to the public sewer within the Priority Funding Area. The sewage will discharge to the North Pointe Pump Station. This project supports the County’s goals of meeting Chesapeake Bay Total Maximum Daily Loads while taking additional steps towards achieving the objectives outlined in Phase III of the Chesapeake Bay Watershed Implementation Plan.

4.5 ASSESSMENT OF EXISTING SYSTEMS

In addition to the centralized systems described above, many areas of Charles County are served by on-site septic systems. An assessment of existing systems, both centralized and on-site, is provided in this section.

4.5.1 Septic Tank Improvement Areas

Approximately 30% of the County's households rely on an individual treatment system, primarily consisting of septic tanks and subsurface drainfields, to provide sewage disposal. The performance of an individual septic system is dependent on installation maintenance on unsuitable soils. For some areas, these individual systems are prone to failure or malfunction due to the surrounding soil conditions and high-water tables due to improper installation, maintenance, or unsuitable soils characteristics.

Systems that are located in areas with severe sewage disposal soil suitability limitations can be expected to malfunction eventually. Regularly scheduled maintenance of septic tank systems is necessary if they are to operate properly. Poorly maintained systems eventually lead to clogging of the drainfield.

The County has in place a failing septic tank area petition process authorized by Article II of Chapter 97 of the County Code; whereby failing areas can appeal to the County for assistance in mitigating their failing systems. This process is included in Appendix 4I and 4J. In addition to the petition process, failing septic areas that meet the Commissioners Goals and Objectives are eligible to be funded by the County through the Capital Improvements Program.

4.5.2 Maryland Watershed Implementation Plan for Septic and Wastewater

The Charles County Phase II WIP Strategy evaluated the impact of septic systems and wastewater on the loading of total nitrogen into the County's waterways. Phase II WIP strategy utilized local County data to calculate baseline loads and target loads set at the same percent reduction presented in the Maryland's Phase II WIP. Maryland's Phase II WIP showed that the County had to reduce its septic system sector loading by 32 percent. That percent reduction target was applied using County data for the septic system sector. The County's Phase II WIP goals are shown in **Table 4-3** and **Table 4-4**.

Table 4-3 – Charles County Phase II WIP Goals for Total Nitrogen

	2010 Progress (Mil Lbs./Yr.)	2017 Interim Strategy (Mil Lbs./Yr.)	2025 Final Strategy (Mil Lbs./Yr.)	Final Target (Mil Lbs./Yr.)
Septic	0.184	0.177	0.123	0.124
Wastewater	0.304	0.302	0.347	0.347

Table 4-4 – Charles County Phase II WIP Goals for Total Phosphorus

	2010 Progress (Mil Lbs./Yr.)	2017 Interim Strategy (Mil Lbs./Yr.)	2025 Final Strategy (Mil Lbs./Yr.)	Final Target (Mil Lbs./Yr.)
Septic	0.000	0.000	0.000	0.000
Wastewater	0.019	0.017	0.020	0.020

Local TMDLs in the Mattawoman Creek Watershed and Mill Creek of the Lower Patuxent River Basin may impact wastewater and septic sector beyond the Chesapeake Bay TMDLs. Local TMDLs should be evaluated on an individual basis.

In 2019, Maryland entered the third phase of the Chesapeake Bay TMDL WIP to increase restoration strategies to further reduce nitrogen by 2025. Results of Phases I and II show that Maryland is on track to meet its phosphorus and sediment goals, however additional focus and implementation are required to meet the final nitrogen goal. Charles County Phase III WIP goals are the following:

1. Maintain 125,000 lbs. of Total Nitrogen in the Septic sector
2. Maintain 132,938 lbs. of Total Nitrogen in the Wastewater sector

The Phase III WIP Septic Strategy for Charles County includes 72 septic connections, 472 septic denitrifications, and 833 septic pump-outs.

4.5.3 Corrective Measures

The correction of failing on-site septic areas can be accomplished in one of three ways: 1) individual repairs may correct the problem; 2) the area involved can connect to a centralized system if one is available; and 3) in areas where a centralized facility is not available, the area can employ innovative and alternative technologies for correction of the failing on-site septic system. These innovative and alternative systems may include rehabilitation of the septic via a mound system, utilization of a Septic Tank Effluent Pump (STEP) system, and conveyance of water to a centralized facility and on-site individual treatment facilities. Some funding for the correction of failing individual septic systems is available through the State.

As part of Maryland Phase III WIP, the State has expanded the Septic Strategies to provide additional funding for failing individual septic system connections. Septic Strategy 4 utilizes the wastewater Bay Restoration Fund and state Revolving Loan Fund to increase the number of households onsite septic disposal systems (OSDS) to sewer connections. Septic Strategy 5 develops credit mechanisms to incentivize the use of higher-level in situ and ex site treatment systems. Septic Strategy 6 focuses on funding sewer connections or constructing small wastewater treatment facilities to provide a maximum benefit for large septic load areas (i.e. Bermed Infiltrations Ponds (BIPs), mobile home parks, campgrounds). Septic Strategy 7 offers credit for household septic pump-outs on a routine basis.

The County has explored several projects to connect parcels on septic systems to the sewer system, including several projects in the Development District. While connecting systems in the Development District could be very helpful in reducing load, most of the septic systems that contribute highest loads – those located in the critical area – are not located in the Development

District. The County’s WIP strategy gives consideration for projects outside of the Development District. To determine the potential impact on load reduction of these potential projects, GIS was used to identify the specific parcels that were included in the County’s plans for each project. As described above, the parcels were identified as either residential or non-residential so that the appropriate septic system loading rates could be applied. Next, the location of these parcels relative to the three septic system loading categories (within critical area; not within critical area but within 1,000 feet of a perennial stream; or not within critical area and not within 1,000 feet of a perennial stream) were evaluated to determine the septic load that would be generated from each parcel. As a final step, a load reduction factor of 90 percent was applied to the septic system load from each parcel to reflect the load reduction that would be achieved by connecting the parcels to a WWTP. The County has identified several potential septic system connection projects and is developing an implementation strategy.

4.6 PROJECTED SEWER SERVICE DEMANDS

As stated in Chapter 2, the purpose of developing the population projections included as part the Comprehensive Water and Sewer Plan is to provide flow projections that are correlated to the population projections used throughout the County. Chapter 2 addresses the correlation of the County's dwelling unit to the projected water and wastewater flows for Charles County. To determine existing excess capacity, as well as new service areas and potential limited capacity problem areas, the population projections derived in Chapter 2 of this report were used to project wastewater service demands for the planning horizon. The flow projections were completed as part of the Comprehensive Plan 2014 Update. The assumptions used are described herein.

4.6.1 Population Projection Summary

Chapter 2 of this report provides the methodology used to determine the population for Charles County as a whole, and the Development District specifically. The methodology included the derivation of housing units. To convert population projections to wastewater service demands, a flow factor was multiplied with the housing units to provide an average daily flow. Wastewater service demand was calculated with a private/community or municipal wastewater treatment provider.

4.6.2 Flow Generation Factors

4.6.2.1 Standard Flow Generation Factors

Flow generation factors are those numbers that are multiplied with a known unit (acre of land, dwelling unit, square foot) to yield a wastewater service demand in gallons per day. Generally, historical water use aggregated by consumer type is used to determine flow generation factors. The County has determined flow generation factors for wastewater service within the County. These factors are provided in **Table 4-5**.

4.6.2.2 Water Conservation Factors

As a result of rapid residential and business development, Charles County is confronted with an ever-increasing demand for water and wastewater treatment capacity. While this demand for services has paralleled growth, the cost of developing additional capacity and operating water and wastewater facilities has continued to increase. The County's goal is to reduce the need for new capital expenditures and make more effective use of the resources now available.

The County is increasing the public's perception of the problem of water supply and encouraging them to help the County reach its goal. Specifically, that goal is to reduce per water consumption by 20 percent by the end of the planning period within existing systems and to provide for water conservation in all new systems implemented during the planning period. A reduction in potable water usage has a similar effect on wastewater service demand.

TABLE 4-5
FLOW FACTORS

TYPE USE	SEWAGE FLOW FACTOR
Single-Family Unit	260 gallons per day per unit
Townhouse/Duplex Unit	202 gallons per day per unit
Apartment Unit	173 gallons per day per unit
Commercial/Industrial/Business	*

*Non-residential flows are allocated based on Appendix T in the Water and Sewer Ordinance or empirically derived flows for specific uses.

Sources: Charles County Department of Planning and Growth Management, 2020; Charles County Water and Sewer Ordinance Appendix S

4.6.3 Level of Service

A level of service is a benchmark for determining if a system is providing wastewater service that is, at a minimum, comparable to other wastewater services in the County and meets the

County's minimum standards for service. The level of service for wastewater is generally defined as a facility being able to effectively treat and dispose of 260 gpd per single-family connection (the flow generation factor used in determining total wastewater service demand set by the County), on an average daily basis, to a level consistent with the centralized facilities' NPDES-permitted discharge limits. Charles County has further defined level of service to include a maximum infiltration/inflow rate of less than or equal to 20 percent of the total flow delivered to a facility. In addition, the wastewater system should be capable of accommodating the disposal of flows listed under the "Levels of Service" for water supply.

In designing a new system or expanding an existing system, the user should ensure that the County's level of service standards are met.

4.6.4 Flow Projections - Wastewater Production

The wastewater demands projected for the County were based on housing units projected. Each housing unit was assumed to have a demand of 260 gpd. To project future non-residential flows, the proportion of metered non-residential flows to residential flows from the 2010 Water and Sewer Rate study was used. It was found that for every gallon produced for residential purposes the County provides 0.2 gallons of non-residential usage. For projection purposes it is assumed that this proportion will remain constant. **Table 4-6 (A)** provides the breakdown of flow county-wide by residential and non-residential components to project the total waste flows. Further, the wastewater treatment commitments made by the County for WSSC, Panda and CPV were added to the County total wastewater treatment demand.

A similar methodology was used to project the total wastewater flows for the Comprehensive Plan designated Development District and Deferred Development District. **Table 4-6 (B)** shows a projected wastewater generation from the Development District and Deferred Development District to be 22.3 mgd by 2040. It is assumed that a significant number of the properties in the Deferred Development District will remain on septic systems through the planning horizon of 2040.

TABLE 4-6 (A)
COUNTY-WIDE WASTEWATER PRODUCTION

Year	Population	Housing Units	Residential Flow (mgd)[2]	Non-residential Flow (mgd)[1]	Commitment By Agreement[3]	Total Wastewater Flow (mgd)
1990	101,154	32,950	8.57	1.71	N/A	10.28
2000	120,546	41,668	10.83	2.17	N/A	13.00
2010	146,551	51,214	13.32	2.66	5.50	21.48
2020	164,540	59,150	15.38	3.08	5.50	23.96
2030	184,470	67,725	17.61	3.52	5.50	26.63
2040	205,290	75,325	19.58	3.92	5.50	29.00

TABLE 4-6 (B)
DEVELOPMENT DISTRICT WASTEWATER PRODUCTION

Year	*Housing* Units	Residential Flow[2]	Non-residential Flow[1]	Commitment By	Total Wastewater Flow
		(mgd)	(mgd)	Agreement[3]	(mgd)
2020	33,800	8.788	1.758	5.50	16.046
2030	40,110	10.429	2.086	5.50	18.015
2040	47,349	12.310	2.462	5.50	20.272

1. Based on the proportion of non-residential to residential consumption in the 2010 Water and Sewer Rate Study. (20 Percent)
2. Assumes 260 gpd per dwelling.
3. Takes into consideration 3 mgd to Prince Georges County and 2.5 mgd to Panda and CPV return flow. N/A means not applicable.

Source: Charles County Department of Planning and Growth Management, 2020; 2020 data is based off current water/sewer account information; 2030 and 2040 projections are from Maryland Department of Planning

4.6.5 Wastewater Generation as a Function of Existing Excess Treatment Capacity

Table 4-6 projects the wastewater flows at the treatment plants for the County's significant central wastewater systems. The projections were developed by the Department of Planning and Growth Management using a variety of sources including the flow data from the Department of Public Works, Charles County Comprehensive Plan (2016) and the 2010 Engineering and Operations Plan. Flows are projected through 2040 with 10-year increments. The Table included the projected flows of the planned treatment plants for Benedict and Hughesville.

As evidenced in **Table 4-7**, most of the Central Sewer Systems have excess available treatment capacity to meet in the near-term demands. The projections in ten-year increments give an approximate time frame for the need for additional capacity at each plant. As **Table 4-6** indicates, several plants, including the Mattawoman WWTP, will require additional treatment capacity to meet projected 2040 demands. Charles County is currently evaluating wastewater treatment capacity in its capital planning and may consider a wider regional approach to capacity management to address local capacity deficits.

TABLE 4-7
EXISTING CENTRAL WASTEWATER FACILITIES COMPARED TO PROJECTED SERVICE DEMANDS

Owner	Rated Capacity (mgd)	2020 Flow (mgd)	2030 Flow (mgd)	2040 Flow (mgd)	Remaining Capacity (mgd)	Comments
Bel Alton	0.032	0.011	0.021	0.03	0.002	Assumes connection of existing residential and commercially developed properties as well as additional development within the PFA.
Cobb Island	0.158	0.061	0.075	0.09	0.068	Cobb Island Plant is considered at capacity based on the agreement in conjunction with the 201 Facilities Plan and the grant approval. The planned growth assumes that 30,000 gallons per day will be diverted to Swan Point for treatment.
Cliffton on the Potomac	0.07	0.072	0.05	0.061	0.009	Based on build out projections in the 2016 Comprehensive Plan (WRE), additional plant capacity may not be needed if the effectiveness of the current plant is improved. However, the Comprehensive Plan has identified the Cliffton/Newburg area as a target for a Sub-Area Plan with potential Sewer Service Area recommendations.
Indian Head, Town of	0.5	0.366	0.374	0.385	0.115	Based on build out projections in the 2016 Comprehensive Plan (WRE). This assumes that the Town makes gains in controlling the level of I/I coming into the Plant.
Hughesville	0.4	0.15	0.2	0.3	0.1	Based on ADF needed from the Build out analysis in the 2010 Hughesville Water/Sewer Study. Assumes 138 dwellings and 56 acres of commercial development.
La Plata, Town of	1.5	1.46	2.0	2.66	-1.16	Based on build out projections in the 2016 Comprehensive Plan (WRE), a major plant expansion will be required prior to 2020 to ensure compliance with discharge requirements.
Mt. Carmel Woods	0.021	0.011	0.011	0.012	0.009	System built out. Plant to be upgraded to ENR.

Swan Point	0.3	0.1	0.308	0.515	-0.215	Assumes maximum build out of 1500 dwellings which includes 70,000 gpd set aside for County use. The plant expansion to 0.600 mgd will need to be online prior to 2030.
Mattawoman	20	16.7	19.24	21.77	-1.77	2040 projections are based on build out projections in the 2016 Comprehensive Plan (WRE). 2020 projections are based on current commitments. 2030 projections are comparable to the projections made in the 2010 E and O Plan. Projections include the WSSC commitment of 3.0 mgd. The remaining 1.8 mgd WSSC flows were added to the 2020 projections as well as an estimated return flow from CPV of 2.0 mgd. Additional plant capacity will be required prior to 2030 to ensure compliance with discharge requirements.

Source: Flow data from Charles County Department of Public Works and Maryland Department of the Environment.
Projections from Charles County Planning and Growth Management using the 2016 Comprehensive Plan, Water Resource Element and the 2010 Engineering and Operations Plan.

4.7 CAPITAL IMPROVEMENTS PROGRAMMING

As previously stated, capital improvements programming (CIP) is the multi-year scheduling of public facilities project implementation. Charles County has conducted CIP planning for several years and identifies programs for funding on a five-year planning horizon. Eligible public facilities projects include schools, roads, parks, as well as water and sewer facilities. The purpose of this section is to: 1) provide guidance by which the County's needs for those public facilities are assessed along with the County's fiscal resources to annually adopt the most effective budget for capital construction; and 2) utilize this Comprehensive Water and Sewer Plan as a mechanism to target the County's water supply and sewer needs for implementation. This chapter provides a list of needs for the existing water and sewer systems. This analysis ultimately culminates in a listing of problem areas. It should be noted that this Water and Sewer Plan differs from previous versions of the Plan by the approach to the utilization of these Appendices. This version of the Plan presents these problem areas as projects for potential correction.

With the adoption of the Zoning Ordinance, the County has gained new programs, such as the development guidance system and the Adequate Public Facilities Ordinance, to assist in the provision of improvements to its public water supply and sewer systems. These efforts will supplement the County's own capital improvements capital projects. This type of coordination ultimately benefits the integrity and efficiency of the County's infrastructure improvement program.

These procedures assist in the implementation of Section 5-7A-02 of the Annotated Code of Maryland (Finance and Procurement Article). This law relates to State funding policy, with respect to local government capital projects. Under this law, a project utilizing State funding, grants, loans, loan guaranties, or insurance may not be approved or constructed unless:

1) the project is consistent with the Charles County Comprehensive Plan; or

2) extraordinary circumstances exist. The Economic Growth, Resource Protection, and Planning Act of 1992 requires the County present a report outlining their capital projects to the State to assure consistency with the Act. Projects not conforming to the County's Comprehensive Plan are required to demonstrate that extraordinary circumstances exist, and to document such circumstances.

The County Commissioners conduct capital improvements programming (CIP) on an annual basis. The process is a joint effort between the County Commissioners, the Department of Fiscal Services, the County's operating departments, and other County agencies. The Department of Fiscal Services coordinates the process and presents the County Commissioners with information on potential CIP projects. The County Commissioners must determine which of these projects are in the best interests of the citizens of Charles County. Ultimately, the County Commissioners adopt the County Capital Improvements Budget for that fiscal year which establishes programs and funding levels.

4.7.1 Priority System

The Departments of Utilities and Planning and Growth Management utilize a priority system to determine which projects listed in the Water and Sewer Plan should be presented to the County Commissioners for their consideration during the CIP process. The priority system is based on an assessment of need. The system is status-based, which relates to the status of the project or the funding source, and not project-based. The priority system is shown in Table 3-11, and applies to Chapter 4, The Sewer Plan. These projects are further discussed in Chapter 5 of this document.

4.7.2 Capital Improvement - Short-Range (Immediate)

Proposed capital improvements are those improvements which should be completed in the immediate future. These include priority 1 projects, studies which are part of the conditional approval of development and projects under construction within two (2) years[1]. The projects identified are proposed by the County but are not necessarily funded by the County. These projects are listed in **Table 4-8**. These projects are further discussed in Chapter 5 of this document.

4.7.3 Capital Improvements - Mid-Range (Five Year Period)

Capital improvements which are scheduled to begin construction within 5 years of the adoption of the Plan. These projects are not on the strict time frame as those listed within the Proposed Capital Improvements section, but are necessary in the near term are defined as planned capital improvements. The projects identified are planned by the County, but not necessarily funded by the County. Projects planned for funding by the County as part of its capital improvements program are so designated within **Table 4-8**.

4.7.4 Capital Improvements- Long-Range (Ten Year Period)

Long term projects are those which have time frames for construction no greater than 10 years. They have been identified to provide a continuum of needs within the County based on the population and flow projections. These projects are also identified to ensure that potential private-public partnerships within certain areas served by these projects can be established as development takes place. The projects are identified by the County, but not necessarily funded by the County. In addition, the County meets with the Maryland Department of the Environment

[1] A historical example of a conditional project is the Lakewood Development approval. The approval included the priority classification change if the developer implemented improvements to the Waldorf system as part of his development.

on a regular basis to discuss project needs and possible State funding for these projects. These projects are listed in **Table 4-8**.

Table 4-8
Immediate, 5- & 10-Year Priorities for Wastewater Development for Public Municipal

Fiscal Year (Project Start)	Project No.	Description	County Priority	Estimated Cost (000s)				Project Schedule	
				Total	Federal /State	Local	Private	Construction Start (Fiscal year)	Immediate, 3-5 Year, 6-10 Year
2001	7039	Bryans Rd Sewer Infrastructure Improvements - Gravity line from Md. Airport	2	$1,765	$0	$1,765	$0	2025	5-year
2003	7043	Benedict Central Sewer System	3	$5,125	$0	$5,125	$0	2025	6-10 years
2006	7058	College of So. WWTP Replacement	2	$4,000	3000	$1,000	$0	2025	5-year
2008	7080	White Plains Failing Septic Sewer Improvements (Gateway and Park Avenues)	2	$2,169	$0	$2,169	$0	2022	Immediate
2010	7088	Hughesville Package Treatment Plant	2	$5,120	$0	$5,120	$0	2025	3-5 years
2012	7091	Various Sewer Model Updates	1	$1,557	$0	$1,557	$0	2022	Immediate (ongoing)
2013	7095	Mattawoman WWTP Flow Equalization	1	$44,116	$0	$44,116	$0	2021	Immediate
2008	7074	Mattawoman Infiltration & Inflow	1	$31,782	$0	$31,782	$0	2018	Immediate (ongoing)
2012	7098	Satellite Plant Upgrades (Includes Mt. Carmel Estates)	1	$7,349	$0	$7,349	$0	2019	Immediate
2014	7106	MD Rt. 5 Pump Station Force Main (to divert flows to St. Marks)	1	$1,977	$0	$1,977	$0	2020	Immediate

Fiscal Year (Project Start)	Project No.	Description	County Priority	Estimated Cost (000s)				Project Schedule	
				Total	Federal /State	Local	Private	Construction Start (Fiscal year)	Immediate, 3-5 Year, 6-10 Year
2015	7107	Zekiah Pump Station Upgrade	3	$2,613	$0	$2,613	$0	2030	6-10 years
2015	7108	Zekiah Pump Station Force Main	2	$3,007	$0	$3,007	$0	2030	6-10 years
2015	7109	Zekiah Interceptor Sewer Upgrades	2	$3,613	$0	$3,613	$0	2030	6-10 years
2015	7115	Old Washington Road Sewer (WURC)	2	$2,376	$0	$2,376	$0	2025	5-year
2014	n/a	Pump Station #7 – Wooded Glen	1	$8,000	$0	$0	$8,000 (SCC)	2018	Immediate
2015	7123	Cliffton WWTP Upgrade	1	$7,522	$0	$7,522	$0	2021	Immediate
2017	7132	Post Office Road Sewer Capacity Imps.	2	$6,455	$0	$6,455	$0	2021	Immediate
2017	7050	Piney Branch Interceptor Sewer Capacity Upgrades	2	$9,900	$0	$9,900	$0	2021	Immediate
2016	7162	Sewer Pump Station Capacity Study	2	$169	$0	$169	$0	2023	3-5 years
2019	7078	MWWTP Electrical System Replacement	1	$10,368	$0	$10,368	$0	2023	Immediate
2010	7083	Mattawoman WWTP Automation	1	$9,568	$0	$9,568	$0	2023	Immediate
2012	7093	MWWTP Clarifier and Thickener Repairs	1	$16,678	$0	$16,678	$0	2025	3-5 Years
2013	7097	Pump Station Rehabs and Replacements	2	$14,995	$0	$14,995	$0	2030	6-10 Years

Fiscal Year (Project Start)	Project No.	Description	County Priority	Estimated Cost (000s)				Project Schedule	
				Total	Federal /State	Local	Private	Construction Start (Fiscal year)	Immediate, 3-5 Year, 6-10 Year
2014	7101	MWWTP Utility Water System Evaluation & Improvement	2	$3,547	$0	$3,547	$0	2023	Immediate
2017	7130	MWWTP Septage Receiving Facility Improvements	2	$1,179	$0	$1,179	$0	2023	Immediate
2017	7138	Hughesville Collection Sewer System	2	$5,120	$0	$5,120	$0	2025	3-5 Years
2019	7143	Cobb Island Septic Tank Effluent Pump (STEP) Station Rehabs	1	$2,160	$0	$2,160	$0	2023	Immediate
2019	7144	Mattawoman Infiltration & Inflow Phase II	1	$28,380	$0	$28,380	$0	2030	6-10 years
2021	7151	Southerland Septic Connection	1	$1,459	$0	$1,459	$0	2022	Immediate
2021	7152	MWWTP Reclaimed Water Filtration Facility	2	$15,589	$0	$15,589	$0	2025	3-5 Years
2021	7163	Piney Branch Interceptor Sewer Capacity Upgrades - Phase II	1	$1,545	$0	$1,545	$0	2022	Immediate
2021	7164	MWWTP Effluent Filters #7-#16	2	$18,844	$0	$18,844	$0	2025	3-5 Years
2021	7165	MWWTP Final Filter Disinfection System	2	$1,697	$0	$1,697	$0	2023	Immediate
2021	7166	MWWTP Reclaimed Water Pump Station Improvements	2	$1,968	$0	$1,968	$0	2023	Immediate
2021	7167	MWWTP Effluent PS Force Main Surge Mgmt. System	2	$1,526	$0	$1,526	$0	2023	Immediate

Fiscal Year (Project Start)	Project No.	Description	County Priority	Estimated Cost (000s)				Project Schedule	
				Total	Federal /State	Local	Private	Construction Start (Fiscal year)	Immediate, 3-5 Year, 6-10 Year
2021	7168	MWWTP Belt Filter Press Replacement Phase II	2	$17,886	$0	$17,886	$0	2023	Immediate
2021	n/a	Pump Station #8 – Stonehaven	2	$6,000	$0	$0	$6,000	2021	Immediate

Source: Charles County Department of Planning & Growth Management and the Department of Public Works, 2021; Charles County Capital Improvement Plan, FY 2022.

Notes

1. Projects included in this table are not all capital projects planned and funded by the County. It includes those projects that involve system expansion either for capacity enhancement or geographical extent. It also includes studies and improvements addressing capacity and effluent quality enhancements. It does not include projects determined to maintain existing facilities such as repair and replacement projects.

CHAPTER 5
FINANCIAL IMPLEMENTATION PLAN

5.1 PURPOSE AND SCOPE OF CHAPTER

Over the past several decades, reduced Federal funding levels and limited State and Federal revenue sources have placed more of the burden of funding infrastructure improvements on local government. This has created the need to develop alternative financing approaches capable of generating the capital necessary to fund extensions and improvements of the County's public water supply and sewer systems. Today's financial environment is far different than it was in the past. Therefore, a wide range of possible funding alternatives is considered, as no single source can fully fund the County's water and sewer infrastructure needs. Consequently, this Water and Sewer Plan presents a financial implementation plan to implement its water and sewer needs programs.

This chapter presents information on Charles County's existing financing programs, those financing sources available to the County, as well as a discussion of financing strategies which may be useful in the future. This chapter also provides a connection between the County's water supply and sewer system needs and their implementation. Thus, it is an important link between the Water Plan (Chapter 3) and the Sewer Plan (Chapter 4). Also included is information on the capital improvements planning and budgeting process, explaining how water and sewer projects are selected and prioritized for presentation to the County Commissioners for decisions regarding funding and implementation. This Financial Implementation Plan also provides coordination between the Water and Sewer Plan and other County plans and programs, in particular, programs and policies developed as a result of the County's Comprehensive Plan. At this time, the Maryland Department of the Environment has not required the County to prepare a Financial Management Plan.

5.2 CHARLES COUNTY'S EXISTING FINANCING PROGRAMS

5.2.1 Water and Sewer Enterprise Fund

Charles County's Water and Sewer Enterprise Fund was established in 1976 as a self-supporting financing mechanism to assure that the users of the system, who directly benefit from public water and sewer service, bear the total local share of the costs of financing and operating the program. (Formerly, the water and sewer system were operated by the Charles County Sanitary Commission, a quasi-public organization similar to St. Mary's County Sanitary Commission). Some counties finance their water and sewer programs through their property tax system and general fund revenues; this system has a major disadvantage as the actual usage of a water or sewer facility is not directly tied to the user's property value. Therefore, a property with high value, but low service potential, pays a disproportionate share. For these reasons, Charles County developed a system which assures that those receiving service pay appropriate amounts and that the financial burden is not placed on the general population of the County.

The Charles County Department of Planning and Growth Management and the Department of Fiscal and Administrative Services established a multi-faceted financing system. The various component fees, and their intended funding targets, are as follows:

A. User Fees - Cover operation and maintenance costs of the system. These are in the form of quarterly bills to the users of the County's public water and sewer systems. The County rate structure is based on a tiered use system. The rate structure is reassessed annually and is adjusted. Non-metered sewer customers are charged a flat fee based on the equivalent meter size.

B. Connection Fees - Cover capital costs and debt retirement for the County's major public water supply and sewer treatment facilities, and capacity planning and expansion at those facilities. Costs are based on actual expenditures, planned capital project costs, debt principal amounts on bond issues associated with debt financed projects, as well as administrative costs. Connection fees serve as impact fees for the public water and sewer system; these were the first impact fees charged by the County. Connection fees are assessed to new customers paying for new capacity, and are reassessed and adjusted annually.

C. Front Foot Assessment - Levied on a per linear foot of frontage on water and sewer line right-of-ways. Front foot assessments are levied on those having frontage on water and sewer lines, and thus the potential for receiving public service. Fees are levied on those lines that the County builds or purchases and are intended to cover the costs of constructing those lines. The fee is paid annually for a period of years coextensive with the period of maturity of bonds out of the projects of which the construction was done.

5.2.2 Rebate Program

The County provides a rebate program to the private sector to supplement the County's needs for water and sewer infrastructure development. Through the rebate program, the private sector is reimbursed for the costs attributed to the over-sizing of facilities in excess of the project needs. The County will reimburse off-site improvements through third-party connection fees. This program provides another means by which the County's facility needs are met for both current and future needs and conditions.

Within a fifteen year period from the date of dedication of the off-site improvement, the developer shall be entitled to a payment or credit from the County in an amount up to the certified construction cost of the on-site or off-site improvement which has capacity available to serve other off-site County customers. All agreements to construct facilities, subject to these regulations, and to become beneficiary to this program, shall be codified within a developer agreement between the Department of Planning and Growth Management and the developer and may include subsidiary agreements with the Department of Fiscal Services. The number of connections shall be limited to the available excess capacity of the off-site improvements over and above that which is required by the developer who constructed and dedicated the improvement. The amount of reimbursement shall be limited to the amount of pre-determined and agreed upon cost of the excess capacity of the developer constructed improvement.

The County customer connecting to an off-site improvement will be required to pay to the County a system expansion fee (SEF), in addition to the County's standard connection fee, at the time a utility permit is issued. No system expansion fee will be charged after fifteen years from dedication of an on-site improvement. The SEF will be assessed to each customer based on the amount of available capacity to serve future development and the customer's meter size. Further details may also be found in Chapter One of this document and County Commissioner Resolution 92-91, which is the official document that established the rebate policy.

5.2.3 Bonds

The primary method that Charles County uses to fund its capital construction needs related to the expansion of water and sewer capacity and the provision of public facilities related to capacity expansion, is through the issuance of bonds. The County Commissioners utilize bonds only for projects associated with these conditions. Bonds have also been used for major repairs or replacements which enhance the useful life of the system-at-large and projects which have a useful life beyond the terms of the bond. The Commissioners have developed a multi-faceted approach, whereby the Enterprise Fund covers a substantial portion of the debt retirement associated with bonding, operation and maintenance costs, line extensions, and other projects deemed necessary by the County Commissioners. The private sector also provides facilities associated with trunk line and lateral extensions off the County's interceptors and other projects with a primary use by the affected property or properties.

The County Commissioners, as the governing body of Charles County, issue "Consolidated Public Improvement and Refunding Bonds" on a regular basis with coordination with the County’s Bond Counsel and Advisors. The County currently has three bond ratings: Moody's

Investors Service rates the County at "AAA"; Standard and Poors Corporation rating is “AAA”; and a third rating comes from Fitch, which rates the County “AAA”.

The types of bonds which could be used by the County are as follows:

5.2.3.1 General Obligation Bonds

As a Code Home Rule county, Charles County may authorize the issuance of general obligation and revenue bonds by a public local law enacted by the County Commissioners. The County is authorized to issue bonds for water and sewer and solid waste management projects in an amount not to exceed 10% of the total value of property assessed for County tax purposes within the Special Taxing District in which such project is located.

5.2.3.2. Revenue Bonds

Revenue bonds differ from general obligation bonds in that the revenue projected to be derived from a particular public service facility (i.e. park, wastewater treatment plant) is utilized to retire the bond. Thus, the operation of a particular public service facility is used generate funds over the active term of the bond. Under Maryland law, counties and municipalities are authorized to sell revenue bonds to finance specific projects. Maryland law also allows counties and municipalities to utilize revenue bonds for industrial and public service companies. The proceeds of such bond issues have been used to purchase or construct "industrial buildings or port facilities." Machinery and equipment for industrial purposes, including water quality or pollution control, can also be financed.

5.2.3.3. Other Bond Types

Double-barreled bonds pledge multiple sources of revenue against the retirement of the bond issue. Two or more sources of funds may be used. This may allow financing flexibility in situations where the construction of facilities may have a repayment which is beyond the active term of the bond. These sources are defined as part of the bond issue. Generally, net revenues from a utility and an assessment or tax are pledged in a double-barreled issue. The County utilized General Obligation Bonds to provide funds for the Phase III upgrade of the Mattawoman Sewer Treatment Facility. This project is one of the County's largest capital construction projects ever undertaken.

5.2.4 Adequate Public Facilities Provisions

Another important means of implementing or supplementing the County's water and sewer needs program is through the Adequate Public Facilities program, as established in the Charles County Zoning Ordinance. As traditional funding sources are limited or unavailable, the County is increasingly dependent on the private sector for some of the needed extensions, expansions, and improvements. The County, through the Comprehensive Plan and the Zoning Ordinance, must assure that development pays its share and that needed facilities are in place prior to development.

At the present time, the Adequate Public Facilities Manual (APF) contains limited provisions for adequate public facilities for water services. The policies and intent of the Comprehensive Plan clearly established the foundation for the APF program. The Zoning Ordinance further developed the program and included provisions for roads, schools, and groundwater impacts. The Ordinance included categories for water and sewer facilities, but indicated that details would be developed in the future if/when needed. There are provisions for groundwater supply, in that a development must demonstrate that it will not have an adverse impact on adjacent users.

Though sections were reserved in the Zoning Ordinance for water and sewer APF provision, it has not been deemed necessary based on the authority to ensure adequacy of water and sewer facilities stated in other County ordinances and permitting processes. Section 45 (b) of the County's Subdivision Regulations require the determination of adequacy of water and sewer facilities prior to the approval of subdivisions. Part VI of the Water and Sewer Ordinance requires a determination of adequate sewer and water capacity prior to the granting of an allocation. Finally, the design review and approval process for water and sewer facilities serving new development set forth in the Water and Sewer Ordinance ensures that the planned facilities serving development are adequate.

5.2.5 Developer Contributions

In Charles County, developer contributions have been used for some time. For many years, most extensions to the County's water and sewer systems have been realized through developer contributions. There are a wide variety of developer contribution programs operating in local jurisdictions around the country. The range of venues where contributions are made is also wide, and have been applied at many points in the development process. The range of possible developer contributions includes:

- The installation of necessary improvements for the extension of water and sewer service to the property, at the applicants cost, and these improvements then deeded over to the County;
- Provide contributions-in-aid-of-construction (CIAC), which represent the applicants share of the necessary improvements, up front for the County's use in building the improvements;
- Provide easements and property for improvements necessary to not only serve the applicants property, but others as well; or

- Install improvements for the applicants property, but also incorporate improvements that will serve adjacent properties in need of service due to failing systems.

5.3 INFRASTRUCTURE FINANCING ALTERNATIVES

5.3.1 Federal and State Grant or Loan Assistance

There are several sources of grants and loans available through Federal and State agencies. Currently, grant programs are limited and have been limited for a number of years. Previously, however, grants were used to provide substantial portions of County projects (such as the Construction Grants 201 Program). These have been largely replaced by equivalent "loan-format" programs, through which the County can borrow money at a low-interest rate. However, there are other sources of grant or loan monies that should be considered. These forms of assistance have been divided herein into "federal" and "state" assistance programs.

5.3.2 Federal Assistance

5.3.2.1. Rural Development Administration Loans

The Federal government also provides grants-in-aid and low interest loans through other departments, such as the Farmer's Home Administration (FmHA, now RDA). These grants or loans are generally reserved for lower income and rural areas. These funds can be applied on an area-specific basis, and need not be County-wide. This allows projects in specific, often isolated, areas to be addressed. The purpose of these grants is to upgrade the quality of life, remove public health hazards, and promote orderly growth within the lower income areas through the provision of basic services. Local governments can apply these funds to service populations of 20,000 people or less. Both water supply and sewer projects are eligible for FmHA (RDA) grants. FmHA (RDA) also provides low interest loans, based on the median income of the population to be served by the eligible project. There are three levels of interest rates: poverty, intermediate, and market rate. The rates are adjusted quarterly.

5.3.2.2 Community Development Block Grant

The Federal Department of Housing and Urban Development (HUD) has established a grants program under the Community Development Block Grant (CDBG) program. Both water and sewer projects are eligible for CDBG funding. Improvements to water systems must be carried out as part of an approved Community Development Housing Plan. This program has been used to provide improvements in the Patuxent Woods subdivision in eastern Charles County, Brawners Estate in Bryans Road and Independence Village near Hughesville. The Town of La Plata used the CDBG program to provide utilities to the Mary Ball annexation.

5.3.3. State Assistance

5.3.3.1 Maryland Water Quality Financing Administration (MWQFA) – Drinking Water Fund & Water Quality Improvement Fund

The Maryland Water Quality Revolving Loan Fund was authorized through Title VI of the Clean Water Act of 1987, and the 1988 Maryland Water Quality Financing Administration Act, Environmental Article 9-1601 through 9-1622, inclusive, of the Annotated Code of Maryland. Its purpose it to make low-interest loans to local governments for publicly owned wastewater facilities and non-point source pollution control projects. Selections are based on a Priority List, compiled through the Maryland Department of the Environment. Loans and/or Bay Restoration Fund Wastewater Grants can be provided for up to 100% of project cost. The County has used this program to fund Dutton's Addition, Brookwood Estates, and a portion of the failing septic correction program.

This program also includes consideration for Water Supply Grants and Loans. The County used such a grant on the Jenkins Lane Waterline Extension project.

5.3.3.2. Health Hazard Abatement Program

The State of Maryland established the Health Hazard Abatement Grant Program to meet the needs of projects which historically have been bypassed or received a low rating from the EPA Construction Grant Program Priority List. The program recognizes that health hazards arising from failing septic tanks are critical to the public health in certain communities, and the program is oriented toward those problems. The failing septic areas listed in Chapter 4 may be eligible for this program.

5.3.3.3. Water Supply Construction Financial Assistance Program

Authorized through COMAR 26.03.08, the State provides assistance in the form of grants, loans, and loan guarantees to local governments for construction of new wastewater facilities, supplementing the Water Quality Loan funds. Generally, this fund is used where affordability is a problem; and to correct public health or water quality problems with low cost projects.

5.3.3.4. Biological Nutrient Removal Program

Charles County used this program to construct a Biological Nutrient Removal (BNR) system into the Mattawoman Wastewater Treatment Plant to reduce the nutrient levels in discharged effluent. In 2001, the County began coordination of the BNR system design with the Maryland Department of the Environment. The reduction of nutrient levels discharged from the plant were the result of the goals of the Clean Water Act and the 2001 revision of the Chesapeake Bay Agreement.

5.3.3.5. Water Supply Financing Program

Established by Chapter 306, Acts of 1982, which amended the Water Quality Loan Act of 1974, the Water Supply Financing Program provides financial assistance for governmental entities for construction, acquisition, etc., of water supply facilities. The primary concern of this program is to assist small communities. The procedures for obtaining this funding are very similar to those established by the sewer construction and RDA programs. A maximum of $500,000 per project is available, at 87.5% of eligible costs.

5.3.3.6. Marina Pump-out Program

In 1988, the Maryland legislature authorized the creation of the Marine Sewage Pump-out Program. In 1989, the administration of this program was granted to the Maryland Department of Natural Resources. The program is funded through a 5% excise tax on boats and a portion of the State's gasoline tax. Its purpose is strictly to benefit boaters through the maintenance of the waterways of Maryland. Although the program was fully funded by the State in fiscal years '90, '91 and '92, funding was deleted as part of the fiscal year '93 and '94 budgets. DNR, however, has some remaining funding from previous years.

In addition, the federal government, as part of the 1992 Clean Vessel Act, has created a source of funding to the states to continue their efforts in maintaining America's waterways. DNR expects, through a combination of remaining funds and federal funds, that they will be able to continue the Marina Pump-out program. The program has grants for marina owners of up to $12,500 for the installation of pump-out facilities. Application is made to DNR for reimbursement of the pump-out facility. The grantee also agrees to charge no more than $5 per pump-out for the first ten years of operation, as a stipulation of receiving grant funds. Charles County has been successful in obtaining these funds for marinas throughout the County, and specifically in the Cobb Island area.

5.4 ALTERNATIVE FUNDING STRATEGIES

The following provides a discussion of alternative financing strategies for potential future use by the County. Currently, these have not been utilized in the operation of the water and sewer systems and the County has limited experience with these strategies. However, these could be further developed for future use if the need warrants. With the decrease in available funding sources in both the Federal and State assistance and local tax revenues, many local municipalities have turned toward alternative funding strategies of this sort to fund or supplement their public water supply and sewer system needs.

There are five (5) innovative funding strategies described in this section. However, this list can be supplemented as new financial programs develop in the future. These include:

5.4.1. Escrow Contributions

Many jurisdictions supplement their water and sewer infrastructure needs programs with escrow fund programs. This type of project typically enables jurisdictions to receive contributions from the private sector, either a direct financial contribution toward a designated fund or in lieu of the construction or in lieu of the installation of facilities or infrastructure. The Zoning Ordinance establishes the need for several escrow funds, including the failing septic correction fund. This Water and Sewer Plan further recommends that this fund be established. The term of escrow funds used by local jurisdictions around the country varies widely. Some short-term funds are used for the installation of specific projects (i.e. "road clubs" in use throughout several jurisdiction in the Washington metropolitan area). Long-term funds may be used to establish revolving funds for specific purposes.

An escrow account may be managed by a third party or by the County. Several such programs currently exist in the County; however, they are not used to any large degree and have not been used in the water and sewer system. The fire and rescue program and the fire and rescue length of service award program are examples of escrow programs. These types of programs may be more beneficial in the future, particularly as the County gains experience from its experience with financing involving the private sector.

5.4.2. Public-Private Partnerships

Public-Private Partnership are contractual relationships between a public and private party that commit both to providing specified services. Private sector involvement in the realm of water and sewer facilities may be broad ranging and may come in the form of design, financing, construction, ownership, and/or operation of a facility that will provide services to the public.

This financing strategy includes, but is not limited to, the privatization of public facilities. Other forms of public private partnerships are contract services, turn-key projects, developer financing, and merchant-operated facilities. Public-private partnerships of water or wastewater treatment facilities are a way for the private sector to work together with local governments in obtaining and/or operating needed facilities. These public/private partnerships are based on sharing benefits and responsibilities. Advantages of public-private partnerships may include reduced costs for services, rapid project completion, and specified performance.

One example of public-private partnerships which the County may use includes the funding of an improvement by a developer, but the improvement is designed and built by the County. Similarly, the developer may design the improvement, and the County may affect its implementation. The County may fund the improvement together with the developer or the County may identify a need and the developer implements the project.

5.4.3. Special Taxing Districts

The concept of special taxing districts (STD) began with self-supporting or subsidized school districts earlier in this century. The taxing districts may or may not require a private sector authority to finance, construct, and operate a wide range of programs and facilities. Local jurisdictions may also serve as the authority within a special taxing district. An example is the St. Mary's County Commission, which operates water and sewer facilities in St. Mary's County.

A special taxing district may be delineated and established for areas where water and wastewater services are to be provided. These facilities may be provided by funds generated from bond issues, service charges, real estate, or other taxes or revenue projected within that STD. The end result is that the private sector offsets the cost of an added facility or service which is present in that district over time. A local jurisdiction may levy additional taxes/assessments within a STD. Increased ad valorem taxes are typically also generated within the district.

Charles County gained the precedent for the creation of special taxing districts, when the General Assembly approved a special taxing district, on behalf of the County Commissioners, to fund stormwater improvements for the Pinefield subdivision. However, special taxing districts have never been used for water and sewer improvements. Local jurisdictions establish an STD by ordinance and have the power to levy and collect taxes both for county purposes and services within the STD. Generally, referenda are not required for local jurisdictions to levy ad valorem taxes or special assessments for providing services within the STD, if the monies are not used for leveraging bonds. Counties may borrow and expend money, and issue bonds and other obligations of indebtedness to provide services in an STD if ad valorem taxes are approved via a referendum.

5.4.4. Special Assessment Funds

Special assessment bonds are underwritten by charges imposed against property in a specific geographic area because that property will receive a special benefit from some public improvement. Special assessment bonds are paid from assessments levied against benefitted property according to the value of the benefit received. Essentially, each benefitted property pays its pro-rata share of the cost of the facility or service based upon its proportionate share of the benefits. Special assessment bonds typically do not pledge the full faith and credit of the local government. Bondholders may only look to the special assessments levied against lands receiving the benefit for payment of such bonds. Normally, local governments may approve such special assessment bonds (and the underlying special assessments) by resolution or ordinance.

5.4.5 Tax Increment Financing

Tax increment funding can readily be coupled with community development strategies for areas planned to undergo development. Originally conceived for urban renewal strategies, this financing strategy can be used for other areas where there is an appreciable increase in ad valorem tax value between the present and some specified future date (due to the addition of a public facility, rezoning, or development plans). Tax increment financing capitalizes on the difference between current and future assessments generated by the increased value of a redeveloped area. The ad valorem revenues are used to offset the public expense incurred in connection with the redevelopment. In most jurisdictions, tax increment financing is associated with bond issues. In practice, the increase in such taxes is used to repay bondholders who provide the capital at the inception of the bond issue through the purchase of tax-increment secured bonds.

This method may be used to provide front-end financing in an area where large-scale redevelopment is feasible. A district is delineated around the proposed development. The tax base of this district is equivalent to the values of all property within the area. The tax revenues paid to taxing units are computed on the initially established tax base during the redevelopment, which is usually the expected life of the project. The area is then redeveloped. This redevelopment is financed with funds from the sale of tax-increment bonds, which are sold by the municipality or special taxing district. When the property is redeveloped, the value of the property rises, thus generating more tax revenue. This tax "increment" above the initially established level goes into a fund to retire the bonds. As stated, Charles County may require enabling legislation from the General Assembly to issue taxes.

The Disney Corporation and Apple, Incorporated, use variations of tax increment financing to provide needed public facilities to an area in advance of development. Disney places a heavy reliance on the local jurisdiction to provide front funding for needed roads and water and sewer improvements in exchange for the long-term funds to be generated from sales taxes and real estate, ad valorem, and other taxes. Apple also tax increment financing: the difference between the corporations is that Apple typically provides up-front incentives to the local community and provides some, although not all, of the needed public facilities.

5.5 CAPITAL IMPROVEMENTS PROGRAMMING PLANNING AND BUDGETING PROCESS

Capital improvements programming (CIP) is the multi-year scheduling of public facilities project implementation. Charles County has conducted CIP planning for a number of years and identifies programs for funding on a five-year planning horizon. Eligible public facilities projects include schools, roads, parks, as well as water and sewer facilities. The purpose of this section is to: 1) provide guidance by which the County's needs for those public facilities are assessed along with the County's fiscal resources in order to annually adopt the most effective budget for capital construction; and 2) utilize this Comprehensive Water and Sewer Plan as a mechanism to target the County's water supply and sewer needs for implementation.

The County Commissioners conduct capital improvements programming (CIP) on an annual basis. The process is a joint effort between the County Commissioners, the Department of Fiscal and Administrative Services (FAS), the County's operating departments, and other County agencies. The Department of FAS coordinates the process and presents the County Commissioners with information on potential CIP projects. The County Commissioners must determine which of these projects are in the best interests of the citizens of Charles County. Ultimately, the County Commissioners adopt the County Capital Improvements Budget for that fiscal year which establishes programs and funding levels.

Previous chapters of this document provided needs of the County's operating departments, inventoried existing water and sewer systems, and assessed the County's systems and noted deficiencies. This analysis ultimately culminates a listing of problem areas which is contained in this Plan. It should be noted that this Water and Sewer Plan differs from previous versions of the Plan by the approach to the utilization of these Tables. This version of the Plan presents these problem areas as projects for potential correction. Formerly, projects were listed in these Tables, only if adopted as part of the County's CIP funding program. This Plan also lists projects which may be accomplished by the private sector. As such, it is not the intent of the relevant Tables to assume County liability, but to publish a list of possible projects for public and private sector involvement through the County's adequate public facilities provisions, the development guidance system, or other examples of public-private partnerships.

With the adoption of the Zoning Ordinance the County has gained new programs, such as the development guidance system and the adequate public facilities ordinance, to assist in the provision of improvements to its public water supply and sewer systems. These efforts will supplement the County's own capital improvements capital projects. Therefore, tables in Chapters 3 and 4 present a summary of water and sewer project needs, as well as options for Zoning Ordinance programs. This type of coordination ultimately benefits the integrity and efficiency of the County's infrastructure improvement program.

These procedures also assist in the implementation of Section 5-7A-02 of the Annotated Code of Maryland (Finance and Procurement Article). This law relates to State funding policy, with respect to local government capital projects. Under this law, a project utilizing State funding, grants, loans, loan guaranties, or insurance may not be approved or constructed unless: 1) the project is consistent with the Charles County Comprehensive Plan; or 2) extraordinary circumstances exist. The Economic Growth, Resource Protection, and Planning Act of 1992 requires the County present a report outlining their capital projects to the State to assure consistency with the Act. Projects not conforming to the County's Comprehensive Plan are required to demonstrate that extraordinary circumstances exist, and to document such circumstances.

5.5.1. Prioritization and Coordination

A secondary purpose of this chapter is to utilize this Comprehensive Water and Sewer Plan as a mechanism to target the County's water and sewer needs for implementation. The Water and Sewer Plan presents an array of potential projects for correction. These tables are updated to assure that the information contained is current, through the Plans amendment cycles (see Chapter 1). This section will provide a mechanism which will enable the County's professional staff to objectively evaluate the County's water and sewer facility needs, to identify specific projects for possible implementation, and to present recommendations to the County Commissioners. The County Commissioners select specific projects for implementation through their review process.

The departments of Utilities and Planning and Growth Management utilize a priority system to determine which projects listed in the Water and Sewer Plan should be presented to the County Commissioners for their consideration during the CIP process. County staff utilizes a priority system to present recommendations for potential projects to the County Commissioners. This priority system provides guidance which enables staff to present recommendations on the most suitable projects and culminates in the recommendation of potential projects to the County Commissioners. This status-based system relates to the status of the project or the funding source and is not project-based. The priority system is as follows:

Priority 1

- A project is to remedy a condition which is dangerous to public health and safety.
- A project for which Federal or State funding level (at levels of 50% or greater) are available, and that funding period is limited.
- A project under State Consent Order for immediate correction
- A project which will implement a major objective of the Comprehensive Plan
- A program to correct deficiencies in existing infrastructure which are in a failing or deteriorating condition, and that system is in danger of infrastructure collapse.

- A legally binding agreement

Priority 2

- A project for which 50%+ Federal or State funding is available, but which the funding period is flexible

- A project to correct existing deficiencies or to replace or repair existing deficiencies (but still functioning) facilities.

- A program needed to promote the orderly development of a desirable, commercial, or residential areas

- A project which will remedy available capacity levels in the County's major systems.

- A project needed to address public safety issues.

Priority 3

- A project that is highly desirable and that both timing and funding are flexible

- A project to assist in the proper timing of development but is not absolutely required at present.

- A program which will improve the efficiency of the County's water and sewer systems.

Priority 4

- A project that is not needed now but may be needed in the future

- A project that can be postponed without harming existing programs

List of Appendices
Chapter 1

Appendix Number	Appendix Title	Subheading
1A	Definitions	Varies
1B	Abbreviations	Varies

APPENDIX 1-A

The following definitions are employed for use in this plan and are consistent with COMAR Title 26, Subtitle 3, Chapter 1 Planning Water Supply and Sewer Systems.

26.03.01.01 Definitions.

A. "Approving authority" means one or more officials, agents, or agencies of local government designated by the local governing body or specified by other provisions of Environment Article, Title 9, Subtitle 5, to take certain actions as a part of implementing these regulations.

B. "Community sewerage system" means any system, whether publicly or privately owned, serving two or more individual lots, for the collection and disposal of sewerage or industrial wastes of a liquid nature, including various devices for the treatment of the sewage and industrial wastes.

C. "Community water supply system" means a source of water and a distribution system, including treatment and storage facilities, whether publicly or privately owned, serving two or more individual lots.

D. "County plan" means a comprehensive plan for the provision of adequate water supply systems and sewerage systems, whether publicly or privately owned, throughout the county and all amendments and revisions to it.

E. "Department" means the Department of the Environment.

F. "Existing service area" means that area that is currently served.

G. "Final planning stages" means a work or works of community water supply and community sewerage system for which contract plans and specifications have been completed.

H. "Financial management plan" means, for:

(1) Publicly-owned community sewerage systems, a portion of the county water and sewerage plan, as described in Regulation .08B, of this chapter, which demonstrates to the Department's satisfaction that adequate fiscal resources will be available to support the satisfactory operation and maintenance of each system in the county to meet existing and future needs;

(2) Other sewerage systems or extensions, a package of information for each system, as specified in COMAR 26.03.02.02J, which demonstrates to the Department's satisfaction that adequate fiscal resources will be available to support the satisfactory operation and maintenance of the system to meet existing and future needs.

I. "Five- or six-year period" means that period, depending upon the county's capital improvement program, 5 or 6 years following the date of adoption of the plan, its amendment, or revision by the county.

J. "Immediate priority" means a work or works of community water supply and community sewerage system for which the beginning of construction is scheduled to start within 2 years following the date of adoption of the plan, its amendments, and its revision.

K. "Individual sewerage system" means a single system of sewers and piping, treatment tanks or other facilities serving only a single lot and disposing of sewage or individual 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.

L. "Individual water supply system" means a single system of piping, pumps, tanks, or other facilities utilizing a source of ground or surface water to supply only a single lot.

M. "Maintenance expense" means those expenses for labor, materials, utilities, and other items necessary to preserve the facility for its designed service life. Equipment or tools under $200 should be included in this amount.

N. "Marina" means a dock, wharf, or basin providing mooring for boats which contain on-board toilet facilities, operated under public or private ownership, either free or on a fee basis, for the convenience of the public or club membership.

O. "Multi-used sewerage system" means a single system serving a single lot, whether owned or operated by an individual or group of individuals under private or collective ownership and serving a group of individuals for the collection and disposal of sewage or industrial wastes of a liquid nature, including various devices for the treatment of sewage and industrial wastes having a treatment capacity in excess of 5,000 GPD.

P. "Multi-use water supply system" means a single system of piping, pumps, tanks, or other facilities utilizing a source of ground or surface water to supply a group of individuals on a single lot and having a capacity in excess of 1,500 GPD.

Q. "Non-point source" means pollution originating from land run-off where no specific outfall can be identified.

R. "Operation expense" means those expenses such as labor, utilities, supplies, contractual services, training, and insurance, necessary to operate the treatment plant during its designed service life so as to achieve the capacity and performance standards for which it was designed, constructed, and permitted.

S. "Sewerage service area" is that area served, or potentially served, by a system of sanitary sewers connected to a treatment plant, or in a very large system, sub-areas as delineated by the county.

T. "Ten-year period" means that period of the 6 or 7 through 10 years following the date of adoption of the plan, its amendment, or its revision by the county.

U. "Under construction" means a work or works of community water supply and community sewerage systems where actual work is progressing or where a notice to proceed with a contract for this work has been let as of the adoption date of the plan, its amendment or revision.

V. "Water service area" means that area served, or potentially served, by a single distribution system under control of a single utility, or, in a very large system, sub-areas as delineated by the county.

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APPENDIX 1-B

ABBREVIATION	DEFINITION
AAF	Annual Average Flow
ADF	Average Daily Flow
APF	Adequate Public Facilities Manual
BAT	Best Available Technology
BMP	Best Management Practices
BNR	Biological Nutrient Removal
BOD	Biochemical Oxygen demand
BP	Business Park
BRF	Bay Restoration Fund
CCGTV	Charles County Government Television
CIP	Capital Improvements Program
CIP	Capital Improvement Program
COMAR	Code of Maryland Regulations
CPV	Competitive Power Ventures
CSM	College of Southern Maryland
CWA	Clean Water Act
DBP	Disinfection By-Products
DNR	Department of Natural Resources
DPW	Department of Public Works
EDU	Equivalent Dwelling Units
EMS	Emergency Medical Services
ENR	Enhanced Nutrient Removal
EPA	Environmental Protection Agency
FY	Fiscal Year
GAP	Groundwater Appropriation Permit
GIS	Geographic Information System
GPD	Gallons Per Day
GPD	Gallons Per Day
ISA	Interim Sewer Agreements
MCL	Maximum Contamination Levels
MDE	Maryland Department of the Environment
MDP	Marylande Department of Planning
MES	Maryland Environmental Services
MGD	Millions of Gallons per Day
MGS	Maryland Geological Survey
MSSA	Mattawoman Sewer Service Area
MSSA,	Mattawoman Sewer Service Area
MW	MegaWatt

MWCOG	Washington Metropolitan Council of Governments
MWWTP	Mattawoman Wastewater Treatment Plant
NPDES	Nation Pollution Discharge Elimination System
OSDS	On-Site Sewage Disposal System
PFA	Priority Funding Area
PGM	Planning and Growth Management
PVC	PolyVinyl Chloride
RAS	Return Activated Sludge
RDA	Rural Development Administration
RIB	Rapid Infiltration Basins
SBR	Sequencing Batch Reactor
SCS	Soil Conservation Service
SDWA	Safe Drinking Water Act
SEF	System Expansion Fee
STD	Special Tax District
STEP	Septic Tank Effluent Pumping
TAZ	Transportation Analysis Zones
TMDL	Total Maximum Daily Load
TN	Total Nitrogen
TOD	Transit Oriented Development
TSS	Total Suspended Solids
USGS	United States Geological Survey
WCD	Watershed Conservation District
WIP	Watershed Implementation Plan
WIP	Watershed Implementation Plan
WPC	Waterfront Planned Community
WRAC	Water Resource Advisory Committee
WRE	Water Resources Element
WSSC	Washington Sanitary Sewer Commission
WURC	Waldorf Urban Redevelopment Corridor
WWTP	Waste Water Treatment Plant

Charles County. Maryland
List of Appendices
Chapter 2

Appendix Number	Appendix Title	Subheading
2A	Household and Population Projections by TAZ	MSSA
2B	Wastewater Demand Projections for Commercial and Government Users	MSSA
2C	Household and Population Projections by TAZ	Waldorf Water System
2C	Household and Population Projections by TAZ	Bryans Road Water System
2D	Water Demand Projections for Commercial and Government Users	Waldorf Water System
2D	Water Demand Projections for Commercial and Government Users	Bryans Road Water System
2E	Waldorf and Bryans Road Water Projections by TAZ	Methodology for Employee Water Consumption Projections
2F	Waldorf and Bryans Road Water Projections by TAZ	Methodology for Residential Water Consumption Projections
2G	Mattawoman Sewer Service Area Wastewater Projections	Residential
2H	Mattawoman Sewer Service Area Wastewater Projections	Employment Based
2I	Organization Chart	DPW/Utilities/O&M
2J	Hydraulic Soil Group	County-wide
2K	Topographical Map	County-wide
2L	MDE Watershed Map	County-wide
2M	Land Use Map	County-wide
2N	Generalized Zoning Map	County-wide
2O	Development Plan Map	County-wide
2P	County Road & Major Public Institution Map	County-wide
2P	Major Public Institution List	County-wide

Appendix 2A
MSSA Household and Population Projections

TAZ	2020		2025		2030		2035		2040	
	Households	Population	Households	Population	Households	Population	Households	Population	Households	Population
3136	756	2,094	775	2,108	794	2,120	813	2,146	832	2,180
3137	1,729	4,789	1,959	5,328	2,170	5,794	2,253	5,948	2,272	5,953
3138	628	1,740	647	1,760	666	1,778	685	1,808	704	1,844
3141	994	2,753	1,013	2,755	1,100	2,937	1,119	2,954	1,138	2,982
3142	980	2,715	1,187	3,229	1,252	3,343	1,335	3,524	1,354	3,547
3144	193	535	212	577	231	617	250	660	269	705
3145	1,585	4,390	1,604	4,363	1,777	4,745	1,796	4,741	1,815	4,755
3146	656	1,817	675	1,836	959	2,561	1,167	3,081	1,286	3,369
3159	167	464	170	461	175	467	177	467	179	469
3167	1,498	4,149	1,517	4,126	1,536	4,101	1,555	4,105	1,574	4,124
3168	1,330	3,684	1,349	3,669	1,368	3,653	1,387	3,662	1,406	3,684
3169	693	1,920	712	1,937	731	1,952	750	1,980	769	2,015
3170	406	1,125	425	1,156	444	1,185	463	1,222	482	1,263
3171	1,344	3,723	2,363	6,427	3,382	9,030	4,401	11,619	5,420	14,200
3172	162	450	178	483	604	1,613	1,019	2,691	1,794	4,700
3173	175	485	298	811	569	1,520	694	1,831	705	1,847
3175	1,946	5,390	1,965	5,345	1,984	5,297	2,003	5,288	2,022	5,298
3176	1,311	3,631	1,330	3,618	1,349	3,602	1,368	3,612	1,387	3,634
3177	573	1,587	782	2,127	801	2,139	820	2,165	839	2,198
3178	761	2,108	896	2,437	1,157	3,089	1,418	3,744	1,679	4,399
3181	1,385	3,836	1,448	3,939	1,557	4,157	1,666	4,398	1,775	4,651
3182	839	2,324	858	2,334	877	2,342	896	2,365	915	2,397
3186	784	2,172	803	2,184	822	2,195	841	2,220	860	2,253
3191	2,222	6,155	2,241	6,096	2,288	6,109	2,307	6,090	2,326	6,094
3192	5,357	14,839	5,466	14,868	5,566	14,861	5,648	14,911	5,667	14,848
3193	594	1,645	613	1,667	761	2,032	780	2,059	799	2,093
3194	1,159	3,210	1,318	3,585	1,482	3,957	1,501	3,963	1,520	3,982
3195	800	2,216	819	2,228	896	2,392	915	2,416	934	2,447
3198	1,470	4,071	1,487	4,044	1,504	4,015	1,521	4,015	1,538	4,030
3901	10	26	19	52	79	210	138	364	198	517

Appendix 2A
MSSA Household and Population Projections

TAZ	2020		2025		2030		2035		2040	
	Households	Population	Households	Population	Households	Population	Households	Population	Households	Population
3902	143	396	162	441	181	483	200	528	219	574
3903	65	180	84	228	103	275	122	322	141	369
3904	181	501	200	544	219	585	238	628	257	673
3905	72	199	91	248	110	294	129	341	148	388
3906	22	61	41	112	60	160	79	209	98	257
3907	19	53	38	103	57	152	76	201	95	249
3908	19	53	38	103	57	152	76	201	95	249
3909	485	1,343	504	1,371	523	1,396	542	1,431	561	1,470
3910	78	216	97	264	116	310	135	356	154	403
3911	20	55	59	160	78	208	97	256	116	304
3912	24	66	93	253	261	697	429	1,133	598	1,567
3913	23	64	42	114	61	163	80	211	99	259
3914	21	58	103	280	310	828	517	1,365	724	1,897
3915	52	144	134	364	341	910	548	1,447	755	1,978
3916	20	55	79	215	219	585	359	948	499	1,307
3917	100	277	147	400	249	665	351	927	453	1,187
3918	19	53	103	280	315	841	527	1,391	739	1,936
3919	294	814	313	851	332	886	351	927	370	969
3920	170	471	189	514	208	555	227	599	246	645
3921	505	1,399	524	1,425	543	1,450	562	1,484	581	1,522
3922	20	55	39	106	58	155	77	203	96	252
3923	493	1,366	512	1,393	531	1,418	550	1,452	569	1,491
3924	968	2,681	987	2,685	1,006	2,686	1,025	2,706	1,044	2,735
3925	261	723	380	1,034	399	1,065	418	1,104	437	1,145
3926	19	53	38	103	57	152	76	201	95	249
3927	24	66	43	117	62	166	81	214	100	262
3928	386	1,069	405	1,102	424	1,132	443	1,170	462	1,210
3929	29	80	348	947	367	980	386	1,019	405	1,061
Total:	37,039	102,599	40,921	111,305	46,128	123,161	50,387	133,021	54,614	143,087

APPENDIX 2B

Wastewater Demand Projections for Commercial and Government Users (MSSA) - Waldorf

TAZ	2020		2025		2030		2035		2040	
	Employment	GPD	Employment	GPD	Employment	GPD	Employment	GPD	Employment	GPD
3136	430	9,030	433	9,093	435	9,135	438	9,198	438	9,198
3141	191	4,011	194	4,074	195	4,095	193	4,053	195	4,095
3142	139	2,919	154	3,234	152	3,192	154	3,234	155	3,255
3145	238	4,998	240	5,040	243	5,103	240	5,040	242	5,082
3159	94	1,974	95	1,995	94	1,974	93	1,953	93	1,953
3167	1,659	39,972	1,690	40,623	1,680	40,413	1,674	40,287	1,691	40,644
3168	234	4,914	237	4,977	231	4,851	229	4,809	231	4,851
3169	586	12,306	911	19,131	1,220	25,620	1,529	32,109	1,544	32,424
3170	42	882	90	10,290	89	10,269	88	10,248	91	10,311
3171	121	2,541	191	4,011	246	5,166	300	6,300	361	7,581
3172*	189	1,153,969	161	1,153,381	194	1,154,074	224	1,154,704	257	1,155,397
3173	676	14,196	702	14,742	727	15,267	736	15,456	743	15,603
3175	478	10,038	484	10,164	475	9,975	471	9,891	475	9,975
3176	2,095	53,165	2,137	54,047	2,126	53,816	2,119	53,669	2,141	54,131
3177	173	9,997	193	10,417	190	10,354	188	10,312	192	10,396
3178	72	1,512	81	1,701	94	1,974	107	2,247	122	2,562
3181	139	2,919	143	3,003	144	3,024	146	3,066	153	3,213
3182	92	1,932	94	1,974	91	1,911	90	1,890	91	1,911
3186	92	4,022	94	4,064	91	4,001	90	3,980	92	4,022
3191	393	13,096	399	13,222	391	13,054	386	12,949	389	13,012
3192	1,376	44,026	1,403	44,593	1,381	44,131	1,370	43,900	1,381	44,131
3193	337	33,861	352	34,176	357	34,281	354	34,218	363	34,407
3194	127	2,667	138	2,898	143	3,003	140	2,940	141	2,961
3195	236	4,956	240	5,040	240	5,040	239	5,019	242	5,082
3198	339	7,119	343	7,203	336	7,056	333	6,993	336	7,056
3902	356	7,476	364	7,644	363	7,623	363	7,623	368	7,728
3903	5	105	6	126	7	147	8	168	9	189
3904	593	12,453	605	12,705	604	12,684	603	12,663	610	12,810

APPENDIX 2B

Wastewater Demand Projections for Commercial and Government Users (MSSA) - Waldorf

TAZ	2020		2025		2030		2035		2040	
	Employment	GPD	Employment	GPD	Employment	GPD	Employment	GPD	Employment	GPD
3905	2,432	51,072	2,477	52,017	2,472	51,912	2,467	51,807	2,492	52,332
3906	2,526	53,046	2,574	54,054	2,568	53,928	2,563	53,823	2,589	54,369
3907	3,644	76,524	3,712	77,952	3,704	77,784	3,696	77,616	3,733	78,393
3908	2,796	58,716	2,848	59,808	2,842	59,682	2,836	59,556	2,865	60,165
3909	972	20,412	990	20,790	986	20,706	984	20,664	994	20,874
3910	2,408	50,568	2,453	51,513	2,448	51,408	2,443	51,303	2,467	51,807
3911	742	15,582	852	17,892	1,143	24,003	1,334	28,014	1,543	32,403
3912	515	10,815	836	17,556	938	19,698	1,038	21,798	1,152	24,192
3913	932	19,572	950	19,950	949	19,929	948	19,908	958	20,118
3914	1,305	27,405	1,811	38,031	2,431	51,051	3,047	63,987	3,704	77,784
3915	483	10,143	498	10,458	1,250	26,250	1,998	41,958	2,775	58,275
3916	1,568	32,928	1,894	39,774	2,191	46,011	2,486	52,206	2,813	59,073
3917	1,066	22,386	1,492	31,332	1,826	38,346	2,158	45,318	2,356	49,476
3918	16	336	22	462	271	5,691	517	10,857	772	16,212
3919	858	18,018	874	18,354	872	18,312	870	18,270	879	18,459
3920	383	8,043	391	8,211	391	8,211	390	8,190	395	8,295
3921	170	3,570	154	3,234	333	6,993	412	8,652	417	8,757
3922	931	19,551	949	19,929	948	19,908	946	19,866	957	20,097
3923	81	4,804	84	4,867	83	4,846	82	4,825	84	4,867
3924	288	10,625	294	10,751	290	10,667	288	10,625	292	10,709
3925	18	378	26	546	26	546	26	546	27	567
3926	1,128	23,688	1,150	24,150	1,148	24,108	1,147	24,087	1,159	24,339
3927	68	1,428	71	1,491	72	1,512	73	1,533	74	1,554
3928	400	8,400	407	8,547	406	8,526	405	8,505	410	8,610
3929	1,579	33,159	1,629	34,209	1,625	34,125	1,621	34,041	1,638	34,398
Total:	**38,381**	**2,033,195**	**41,179**	**2,100,353**	**44,317**	**2,166,251**	**47,242**	**2,227,676**	**50,253**	**2,290,907**

APPENDIX 2B

Wastewater Demand Projections for Commercial and Government Users (MSSA) - Waldorf

TAZ	2020		2025		2030		2035		2040	
	Employment	GPD	Employment	GPD	Employment	GPD	Employment	GPD	Employment	GPD

* Note that the projected demand includes 1.15 mgd for sewer demand from CPV. All other values are based on water demand.

APPENDIX 2B

Wastewater Demand Projections for Commercial and Government Users (MSSA) - Bryans Road

TAZ	2020		2025		2030		2035		2040	
	Employment	GPD	Employment	GPD	Employment	GPD	Employment	GPD	Employment	GPD
3137	463	9,723	484	10,164	487	10,227	486	10,206	490	10,290
3138	404	8,484	411	8,631	409	8,589	407	8,547	412	8,652
3146	872	25,230	888	25,566	901	25,839	909	26,007	924	26,322
Total:	**1,739**	**43,437**	**1,783**	**44,361**	**1,797**	**44,655**	**1,802**	**44,760**	**1,826**	**45,264**

Appendix 2C
Waldorf Water

TAZ	2020		2025		2030		2035		2040	
	Households	Population	Households	Population	Households	Population	Households	Population	Households	Population
3141	994	2753	1013	2755	1100	2937	1119	2954	1138	2982
3142	980	2715	1187	3229	1252	3343	1335	3524	1354	3547
3145	1585	4390	1604	4363	1777	4745	1796	4741	1815	4755
3167	1498	4149	1517	4126	1536	4101	1555	4105	1574	4124
3168	1330	3684	1349	3669	1368	3653	1387	3662	1406	3684
3169	693	1920	712	1937	731	1952	750	1980	769	2015
3170	406	1125	425	1156	444	1185	463	1222	482	1263
3171	1344	3723	2363	6427	3382	9030	4401	11619	5420	14200
3172	162	450	178	483	604	1613	1019	2691	1794	4700
3173	175	485	298	811	569	1520	694	1831	705	1847
3175	1946	5390	1965	5345	1984	5297	2003	5288	2022	5298
3176	1311	3631	1330	3618	1349	3602	1368	3612	1387	3634
3177	573	1587	782	2127	801	2139	820	2165	839	2198
3178	761	2108	896	2437	1157	3089	1418	3744	1679	4399
3181	1385	3836	1448	3939	1557	4157	1666	4398	1775	4651
3182	839	2324	858	2334	877	2342	896	2365	915	2397
3186	784	2172	803	2184	822	2195	841	2220	860	2253
3191	2222	6155	2241	6096	2288	6109	2307	6090	2326	6094
3192	5357	14839	5466	14868	5566	14861	5648	14911	5667	14848
3193	594	1645	613	1667	761	2032	780	2059	799	2093
3194	1159	3210	1318	3585	1482	3957	1501	3963	1520	3982
3195	800	2216	819	2228	896	2392	915	2416	934	2447
3198	1470	4071	1487	4044	1504	4015	1521	4015	1538	4030
3902	143	396	162	441	181	483	200	528	219	574
3903	65	180	84	228	103	275	122	322	141	369
3904	181	501	200	544	219	585	238	628	257	673
3905	72	199	91	248	110	294	129	341	148	388
3906	22	61	41	112	60	160	79	209	98	257
3907	19	53	38	103	57	152	76	201	95	249
3908	19	53	38	103	57	152	76	201	95	249

Appendix 2C
Waldorf Water

3909	485	1343	504	1371	523	1396	542	1431	561	1470
3910	78	216	97	264	116	310	135	356	154	403
3911	20	55	59	160	78	208	97	256	116	304
3912	24	66	93	253	261	697	429	1133	598	1567
3913	23	64	42	114	61	163	80	211	99	259
3914	21	58	103	280	310	828	517	1365	724	1897
3915	52	144	134	364	341	910	548	1447	755	1978
3916	20	55	79	215	219	585	359	948	499	1307
3917	100	277	147	400	249	665	351	927	453	1187
3918	19	53	103	280	315	841	527	1391	739	1936
3919	294	814	313	851	332	886	351	927	370	969
3920	170	471	189	514	208	555	227	599	246	645
3921	505	1399	524	1425	543	1450	562	1484	581	1522
3922	20	55	39	106	58	155	77	203	96	252
3923	493	1366	512	1393	531	1418	550	1452	569	1491
3924	968	2681	987	2685	1006	2686	1025	2706	1044	2735
3925	261	723	380	1034	399	1065	418	1104	437	1145
3926	19	53	38	103	57	152	76	201	95	249
3927	24	66	43	117	62	166	81	214	100	262
3928	386	1069	405	1102	424	1132	443	1170	462	1210
3929	29	80	348	947	367	980	386	1019	405	1061
Total:	**32900**	**91134**	**36465**	**99184**	**41054**	**109615**	**44904**	**118546**	**48874**	**128050**

Appendix 2C
Bryans Road Water

TAZ	2020		2025		2030		2035		2040	
	Households	Population	Households	Population	Households	Population	Households	Population	Households	Population
3137	1729	4789	1959	5328	2170	5794	2253	5948	2272	5953
3138	628	1740	647	1760	666	1778	685	1808	704	1844
3146	656	1817	675	1836	959	2561	1167	3081	1286	3369
Total:	**3013**	**8346**	**3281**	**8924**	**3795**	**10133**	**4105**	**10837**	**4262**	**11166**

Appendix 2D

Waldorf Water Demand Projections for Commercial and Government Users

TAZ	2020		2025		2030		2035		2040	
	Employment	GPD	Employment	GPD	Employment	GPD	Employment	GPD	Employment	GPD
3141	191	4,011	194	4,074	195	4,095	193	4,053	195	4,095
3142	139	2,919	154	3,234	152	3,192	154	3,234	155	3,255
3145	238	4,998	240	5,040	243	5,103	240	5,040	242	5,082
3167	1,659	39,972	1,690	40,623	1,680	40,413	1,674	40,287	1,691	40,644
3168	234	4,914	237	4,977	231	4,851	229	4,809	231	4,851
3169	586	12,306	911	19,131	1,220	25,620	1,529	32,109	1,544	32,424
3170	42	882	90	10,290	89	10,269	88	10,248	91	10,311
3171	121	2,541	191	4,011	246	5,166	300	6,300	361	7,581
3172	189	1,153,969	161	1,153,381	194	1,154,074	224	1,154,704	257	1,155,397
3173	676	14,196	702	14,742	727	15,267	736	15,456	743	15,603
3175	478	10,038	484	10,164	475	9,975	471	9,891	475	9,975
3176	2,095	53,165	2,137	54,047	2,126	53,816	2,119	53,669	2,141	54,131
3177	173	9,997	193	10,417	190	10,354	188	10,312	192	10,396
3178	72	1,512	81	1,701	94	1,974	107	2,247	122	2,562
3181	139	2,919	143	3,003	144	3,024	146	3,066	153	3,213
3182	92	1,932	94	1,974	91	1,911	90	1,890	91	1,911
3186	92	4,022	94	4,064	91	4,001	90	3,980	92	4,022
3190	95	6,595	98	6,658	99	6,679	97	6,637	100	6,700
3191	393	13,096	399	13,222	391	13,054	386	12,949	389	13,012
3192	1,376	44,026	1,403	44,593	1,381	44,131	1,370	43,900	1,381	44,131
3193	337	33,861	352	34,176	357	34,281	354	34,218	363	34,407
3194	127	2,667	138	2,898	143	3,003	140	2,940	141	2,961
3195	236	4,956	240	5,040	240	5,040	239	5,019	242	5,082
3198	339	7,119	343	7,203	336	7,056	333	6,993	336	7,056
3901	1,038	21,798	1,058	22,218	1,063	22,323	1,067	22,407	1,085	22,785
3902	356	7,476	364	7,644	363	7,623	363	7,623	368	7,728
3903	5	105	6	126	7	147	8	168	9	189
3904	593	12,453	605	12,705	604	12,684	603	12,663	610	12,810
3905	2,432	51,072	2,477	52,017	2,472	51,912	2,467	51,807	2,492	52,332
3906	2,526	53,046	2,574	54,054	2,568	53,928	2,563	53,823	2,589	54,369

Appendix 2D

Waldorf Water Demand Projections for Commercial and Government Users

3907	3,644	76,524	3,712	77,952	3,704	77,784	3,696	77,616	3,733	78,393
3908	2,796	58,716	2,848	59,808	2,842	59,682	2,836	59,556	2,865	60,165
3909	972	20,412	990	20,790	986	20,706	984	20,664	994	20,874
3910	2,408	50,568	2,453	51,513	2,448	51,408	2,443	51,303	2,467	51,807
3911	742	15,582	852	17,892	1,143	24,003	1,334	28,014	1,543	32,403
3912	515	10,815	836	17,556	938	19,698	1,038	21,798	1,152	24,192
3913	932	19,572	950	19,950	949	19,929	948	19,908	958	20,118
3914	1,305	27,405	1,811	38,031	2,431	51,051	3,047	63,987	3,704	77,784
3915	483	10,143	498	10,458	1,250	26,250	1,998	41,958	2,775	58,275
3916	1,568	32,928	1,894	39,774	2,191	46,011	2,486	52,206	2,813	59,073
3917	1,066	22,386	1,492	31,332	1,826	38,346	2,158	45,318	2,356	49,476
3918	16	336	22	462	271	5,691	517	10,857	772	16,212
3919	858	18,018	874	18,354	872	18,312	870	18,270	879	18,459
3920	383	8,043	391	8,211	391	8,211	390	8,190	395	8,295
3921	170	3,570	154	3,234	333	6,993	412	8,652	417	8,757
3922	931	19,551	949	19,929	948	19,908	946	19,866	957	20,097
3923	81	4,804	84	4,867	83	4,846	82	4,825	84	4,867
3924	288	10,625	294	10,751	290	10,667	288	10,625	292	10,709
3925	18	378	26	546	26	546	26	546	27	567
3926	1,128	23,688	1,150	24,150	1,148	24,108	1,147	24,087	1,159	24,339
3927	68	1,428	71	1,491	72	1,512	73	1,533	74	1,554
3928	400	8,400	407	8,547	406	8,526	405	8,505	410	8,610
3929	1,579	33,159	1,629	34,209	1,625	34,125	1,621	34,041	1,638	34,398
Total:	**39,420**	**2,059,614**	**42,240**	**2,127,234**	**45,385**	**2,193,279**	**48,313**	**2,254,767**	**51,345**	**2,318,439**

Appendix 2D

Bryans Road Water Demand Projections for Commercial and Government Users

TAZ	2020		2025		2030		2035		2040	
	Employment	GPD	Employment	GPD	Employment	GPD	Employment	GPD	Employment	GPD
3137	463	9723	484	10164	487	10227	486	10206	490	10290
3138	404	8484	411	8631	409	8589	407	8547	412	8652
3146	872	25230	888	25566	901	25839	909	26007	924	26322
TOTAL	**1739**	**43437**	**1783**	**44361**	**1797**	**44655**	**1802**	**44760**	**1826**	**45264**

Waldorf & Bryans Road: Water Projections by Traffic Analysis Zone (TAZ) - 2015

Methodology for Employment Based Water Consumption Projections

Assumptions:

1. **That the location of existing employment is a good indicator of where future jobs will be located. It is where the zoning is appropriate and where the economic activity has occurred.**
2. **The growth in individual TAZs will approximate the countywide employment projections by Industry category adjusted for planned employment generating development.**
3. **The per employee water use factor is a good indicator of future use in the Waldorf Water Service Area.**
4. **Certain uses such as schools and heavy industrial water users need to be projected independently.**

Approach:

Phase 1 – Establish 2015 employment base for each TAZ. Use Info USA data 2010 for wage and salary jobs. Add employment generators for 2010 through 2015. Sort by new 3900 series TAZs for further refinement of data.

Phase 2 – Identify Planned Non-residential Development, but not developed by TAZ.

- Approved Site Plans for major commercial but not built.
- Commercial Development Shown on approved Master Plans. Including Waldorf Crossing TOD, WUDS Plan and Phase I of the WURC, St Charles.
- Commercial Development shown on pending Master plans. (Including Lake Acton.)
- Add planned schools including schools in St. Charles.

Phase 3 – Use Employment Generation rates compiled by MWCOG (Attachment A) for office, retail, industrial, and other (ORIO)by square footage of building area to be applied to areas that have detailed plans such as the WURC, Phase 1 and other planned development.

Phase 4 – Using employment projections from MDP to get 5 year incremental growth rates for each category.

Phase 5 – Make Employment Projections to 2040 with 5 year increments to be inserted into the COG Projections and shared with AECOM for the MTA transit study using the following employment growth analysis

Phase 6 – Determine average employee water consumption for the Waldorf Sewer Service Area. Determine average per student water consumption by school level.

Phase 7 – Apply the average per employee and student consumption rates to the employment projections by TAZ.

Employment Growth Analysis:

Task 1- Starting with the Info USA job distribution, distribute the planned Commercial Development according to the following Buildout Rules.

- Projects with approved site plans . **(0-5 years)**
- Non residential Development Shown on approved Master Plans. Including Waldorf Crossing TOD, WUDS Plan and Phase I of the WURC, Heritage Green. **(**Use approved development schedule if available. St. Charles and Waldorf Crossing) (Develop a build out schedule from 5-25 years.)
- Non-residential Development shown on pending Master plans. (Including Lake Acton.) (**10 – 25 years**)
- Use projected school construction.

Task 3 – Assign employment to TAZ with planned schools.

Task 4 – Assign employment to WURC, St. Charles, Waldorf Station, Lake Acton using employment generation rates.

Task 5 – Distribute self employed (5% of projected growth) to all TAZs proportional to the number of HHs.

Task 6 – Assign the balance of the projected employment countywide from MDP to the TAZs proportional to the 2015 distribution of employment. Use developed land analysis done by Glenn Gorman in 2012 to insure that the employment assignment is reasonable. For example, TAZs that are completely built out would not receive additional employment.

Water Demand Projections for Commercial and Government Users

Task 1 – Determine the average water consumption per employee for the Waldorf and Bryans Road Water Service Areas.

- Identify the TAZs included in the Waldorf and Bryans Road Service areas and total the number of employees. Exclude the School employees and the CPV employees since they will be calculated separately.
- From the Utility Billing Department get the total Commercial and Government water consumption for the Waldorf Water Service area. Less the school usage.
- Divide the Total Metered Water Consumption by the number of employees. The average per employee is 21 gallons per day.
- Using the consumption for schools in the Waldorf Water Service Area and the total enrollments for each school the average per pupil water usage was determined.

Task 2 – Project the Water demand for Commercial and Government Users in the Mattawoman Sewer Service Area.

- Multiply the per employee consumption times the projected employment by TAZ.
- Add the per pupil water consumption for existing schools and planned schools by TAZ.
- Add **230,000 MGD water demand for CPV** Co-generation Plant in the 2015-2020 timeframe.

Waldorf Service Area Residential Projections

Methodology for Residential Projections

Description: The following describes the methodology used to make residential projections by small geographic areas know as Traffic Analysis Zones (TAZs). These areas cover the entire County and have been historically used by MWCOG for regional transportation modeling. For purposes of the Waldorf Water Service Area projections, the service area was overlaid on the TAZs to determine which were in and which were outside. About 6 of the TAZs were split by the Water Service Boundary. In those cases we established a percentage of the individual TAZ to be included. We looked at geographic area included, existing development in the TAZ, Tier Designation and knowledge of planned development.

Assumptions:

1. All planned development will build out over the 25 year planning period.
2. That though some projects will not proceed, it is assumed that others will take the place of failed projects.
3. That the current stage of a residential project is a good indicator of the potential buildout schedule.
4. That the Tier 4 areas will receive no additional major subdivision activity.

Background Data:

Phase 1 – Establish 2015 dwelling unit base for each TAZ.

Through GIS scribed each TAZ and identified the existing housing units for 2015. (June 2014) Source data is the Dept. of Assessments and Taxation. TAZs in addition to the MWCOG TAZs for transit study purposes were calculated. The 3900 series TAZs are a subset of the MWCOG TAZs

Phase 2 – Identify Planned Development, but not developed by TAZ.

Task 1 – Using the master list “Status of Residential Buildout for Forecasting Purposes” identify the following for each TAZ:

- Assign TAZ to each planned development
- Subdivisions with Preliminary Plans Pending
- Subdivisions with Preliminary Plans Approved but not recorded
- Subdivisions with all or some Recorded Lots but not built out
- Multi-family developments shown on Approved Site Plans but not built.

- Residential Development Shown on approved Master Plans. Including Waldorf Crossing TOD, WUDS Plan and Phase I of the WURC, St. Charles, and Heritage Green.
- Residential Development shown on pending Master plans. (Including Lake Acton.)

Task 2 – Determine the number of dwelling units planned but not built for the categories identified in Task 1.

- Update the SF and TH projects on the master list using the building permit report by subdivision.
- Update the APT counts on the master list based on the planned and constructed. Query APT Permits built after 2014 in the New World System. Use Site Plans for location of buildings and numbers of dwellings; compare to constructed buildings as shown on Google Maps 2015 to get units not built.
- Identify Planned Growth in the Town of La Plata. (Heritage Green, Steeple Chase, Agricopia)

Phase 3 – Make Residential Household Projections to 2040 with 5 year increments to replace the MWCOG Projections. The TAZs for transit study purposes are a subset of the MWCOG TAZs so the data is preserved for MWCOG.

Buildout Analysis:

Task 1 – Update school allocations column on master list (including DRRA school allocations.)

Task 2- Distribute the planned residential Development according to the following Buildout Rules.

- Projects with all recorded lots, portion of building permits issued, and school allocations granted . **(0-5 years) (Use project buildout projections when available. For example DRRA takedown schedules.)**
- Subdivisions with all or some recorded Lots but no building permits (**0-5 years**)
- Subdivisions with Preliminary Plans Approved, not recorded, but all School Allocations received. (**5-10 years**)
- Subdivisions with Preliminary Plans Approved but not recorded and no school allocations. (**10-15 years**)
- Multi-family shown on approved site plans with school allocations (**0-5 years**)
- Multi-family shown on approved site plans with no school allocations (**5-10 years**)

- Residential Development Shown on approved Master Plans. Including Waldorf Crossing TOD, WUDS Plan and Phase I of the WURC, Heritage Green. **(Use approved development schedule if available. St. Charles and Waldorf Crossing) (Develop a build out schedule from 5-25 years.)**
- Residential Development shown on pending Master plans. (Including Lake Acton.) (**10 – 25 years**)
- Based on historical data, large subdivisions generally have a longer buildout; therefore a 10 year buildout was assumed for:
    - Rural subdivisions > 50 lots
    - Development District subdivisions > 100 lots

Task 3 – Calculate the population based on current and projected household size.

Task 4 – Refine projections based on staff knowledge of the project. For example, a project may have a difficult water/sewer access problem.

Task 5 – Account for growth not currently planned including minor subdivisions and infill lots. The growth not planned equals the difference between the buildout of the planned development and the 2040 projections from MDP. The unplanned growth will be distributed 75% in the Development District TAZs and 25% in the Rural TAZs

	Planned Development 2040	MDP projections 2040	Growth Not Planned 2040
Pop	196,120	220,850	24,740
HH	74,855	83,275	8,420

*Use declining HH size per MDP.

Distribution of Growth Not Planned

Increment	DD TAZs (0.75)	Rural TAZs (0.25)
2015-2020	1,263	421
2020-2025	1,263	421
2025-2030	1,263	421
2030-2035	1,263	421
2035-2040	1,263	421

DD TAZs = 66   Outside DD TAZs = 64

Mattawoman Sewer Service Area Residential Projections

Methodology for Residential Projections

Description: The following describes the methodology used to make residential projections by small geographic areas know as Traffic Analysis Zones (TAZs). These areas cover the entire County and have been historically used by MWCOG for regional transportation modeling. For purposes of the Mattawoman Sewer Service Area projections, the service area was overlaid on the TAZs to determine which were in and which were outside. About 6 of the TAZs were split by the Sewer Service Boundary. In those cases we established a percentage of the individual TAZ to be included. We looked at geographic area included, existing development in the TAZ, Tier Designation and knowledge of planned development.

Assumptions:

1. All planned development will build out over the 25 year planning period.
2. That though some projects will not proceed, it is assumed that others will take the place of failed projects.
3. That the current stage of a residential project is a good indicator of the potential buildout schedule.
4. That the Tier 4 areas will receive no additional major subdivision activity.

Background Data:

Phase 1 – Establish 2015 dwelling unit base for each TAZ.

Through GIS scribed each TAZ and identified the existing housing units for 2015. (June 2014) Source data is the Dept. of Assessments and Taxation. TAZs in addition to the MWCOG TAZs for transit study purposes were calculated. The 3900 series TAZs are a subset of the MWCOG TAZs

Phase 2 – Identify Planned Development, but not developed by TAZ.

Task 1 – Using the master list "Status of Residential Buildout for Forecasting Purposes" identify the following for each TAZ:

- Assign TAZ to each planned development
- Subdivisions with Preliminary Plans Pending
- Subdivisions with Preliminary Plans Approved but not recorded
- Subdivisions with all or some Recorded Lots but not built out
- Multi-family developments shown on Approved Site Plans but not built.

- Residential Development Shown on approved Master Plans. Including Waldorf Crossing TOD, WUDS Plan and Phase I of the WURC, St. Charles, and Heritage Green.
- Residential Development shown on pending Master plans. (Including Lake Acton.)
- Add developing subdivisions in the Towns to master list. (Steeple Chase, agricopia, heritage green.)

Task 2 – Determine the number of dwelling units planned but not built for the categories identified in Task 1.

- Update the SF and TH projects on the master list using the building permit report by subdivision.
- Update the APT counts on the master list based on the planned and constructed. Query APT Permits built after 2014 in the New World System. Use Site Plans for location of buildings and numbers of dwellings; compare to constructed buildings as shown on Google Maps 2015 to get units not built.
- Identify Planned Growth in the Town of La Plata. (Heritage Green, Steeple Chase, Agricopia)

Phase 3 – Make Residential Household Projections to 2040 with 5 year increments to replace the MWCOG Projections. The TAZs for transit study purposes are a subset of the MWCOG TAZs so the data is preserved for MWCOG.

Buildout Analysis:

Task 1 – Update school allocations column on master list (including DRRA school allocations.)

Task 2- Distribute the planned residential Development according to the following Buildout Rules.

- Projects with all recorded lots, portion of building permits issued, and school allocations granted . **(0-5 years) (Use project buildout projections when available. For example DRRA takedown schedules.)**
- Subdivisions with all or some recorded Lots but no building permits (**0-5 years**)
- Subdivisions with Preliminary Plans Approved, not recorded, but all School Allocations received. (**5-10 years**)
- Subdivisions with Preliminary Plans Approved but not recorded and no school allocations. (**10-15 years**)
- Multi-family shown on approved site plans with school allocations (**0-5 years**)

- Multi-family shown on approved site plans with no school allocations (**5-10 years**)
- Residential Development Shown on approved Master Plans. Including Waldorf Crossing TOD, WUDS Plan and Phase I of the WURC, Heritage Green. **(Use approved development schedule if available. St. Charles and Waldorf Crossing) (Develop a build out schedule from 5-25 years.)**
- Residential Development shown on pending Master plans. (Including Lake Acton.) (**10 – 25 years**)
- Based on historical data, large subdivisions generally have a longer buildout; therefore a 10 year buildout was assumed for:
    - Rural subdivisions > 50 lots
    - Development District subdivisions > 100 lots

Task 3 – Calculate the population based on current and projected household size.

Task 4 – Refine projections based on staff knowledge of the project. For example, a project may have a difficult water/sewer access problem.

Task 5 – Account for growth not currently planned including minor subdivisions and infill lots. The growth not planned equals the difference between the buildout of the planned development and the 2040 projections from MDP. The unplanned growth will be distributed 75% in the Development District TAZs and 25% in the Rural TAZs

	Planned Development 2040	MDP projections 2040	Growth Not Planned 2040
Pop	196,120	220,850	24,740
HH	74,855	83,275	8,420

*Use declining HH size per MDP.

Distribution of Growth Not Planned

Increment	DD TAZs (0.75)	Rural TAZs (0.25)
2015-2020	1,263	421
2020-2025	1,263	421
2025-2030	1,263	421
2030-2035	1,263	421
2035-2040	1,263	421

DD TAZs = 66 Outside DD TAZs = 64

Mattawoman Sewer Service Area Wastewater Projections by Traffic Analysis Zone (TAZ) -- 2015

Methodology for Employment Based Water Consumption Projections

Assumptions:

1. **That the location of existing employment is a good indicator of where future jobs will be located. It is where the zoning is appropriate and where the economic activity has occurred.**
2. **The growth in individual TAZs will approximate the countywide employment projections by Industry category adjusted for planned employment generating development.**
3. **The per employee water use factor is a good indicator of future use in the Mattawoman Sewer Service Area.**
4. **Certain uses such as schools and heavy industrial water users need to be projected independently.**

Approach:

Phase 1 – Establish 2015 employment base for each TAZ. Use Info USA data 2010 for wage and salary jobs. Add employment generators for 2010 through 2015. Sort by new 3900 series TAZs for further refinement of data.

Phase 2 – Identify Planned Non-residential Development, but not developed by TAZ.

- Approved Site Plans for major commercial but not built.
- Commercial Development Shown on approved Master Plans. Including Waldorf Crossing TOD, WUDS Plan and Phase I of the WURC, St Charles.
- Commercial Development shown on pending Master plans. (Including Lake Acton.)
- Add planned schools including schools in St. Charles.

Phase 3 – Use Employment Generation rates compiled by MWCOG (Attachment A)for office, retail, industrial, and other (ORIO)by square footage of building area to be applied to areas that have detailed plans such as the WURC, Phase 1 and other planned development.

Phase 4 – Using employment projections from MDP to get 5 year incremental growth rates for each category.

Phase 5 – Make Employment Projections to 2040 with 5 year increments to be inserted into the COG Projections and shared with AECOM for the MTA transit study using the following employment growth analysis

Phase 6 – Determine average employee water consumption for the Mattawoman Sewer Service Area. Determine average per student water consumption by school level.

Phase 7 – Apply the average per employee and student consumption rates to the employment projections by TAZ.

Employment Growth Analysis:

Task 1- Starting with the Info USA job distribution, distribute the planned Commercial Development according to the following Buildout Rules.

- Projects with approved site plans . **(0-5 years)**
- Non residential Development Shown on approved Master Plans. Including Waldorf Crossing TOD, WUDS Plan and Phase I of the WURC, Heritage Green. **(**Use approved development schedule if available. St. Charles and Waldorf Crossing) (Develop a build out schedule from 5-25 years.)
- Non-residential Development shown on pending Master plans. (Including Lake Acton.) (**10 – 25 years**)
- Use projected school construction.

Task 3 – Assign employment to TAZ with planned schools.

Task 4 – Assign employment to WURC, St. Charles, Waldorf Station, Lake Acton using employment generation rates.

Task 5 – Distribute self employed (5% of projected growth) to all TAZs proportional to the number of HHs.

Task 6 – Assign the balance of the projected employment countywide from MDP to the TAZs proportional to the 2015 distribution of employment. Use developed land analysis done by Glenn Gorman in 2012 to insure that the employment assignment is reasonable. For example, TAZs that are completely built out would not receive additional employment.

Water Demand Projections for Commercial and Government Users

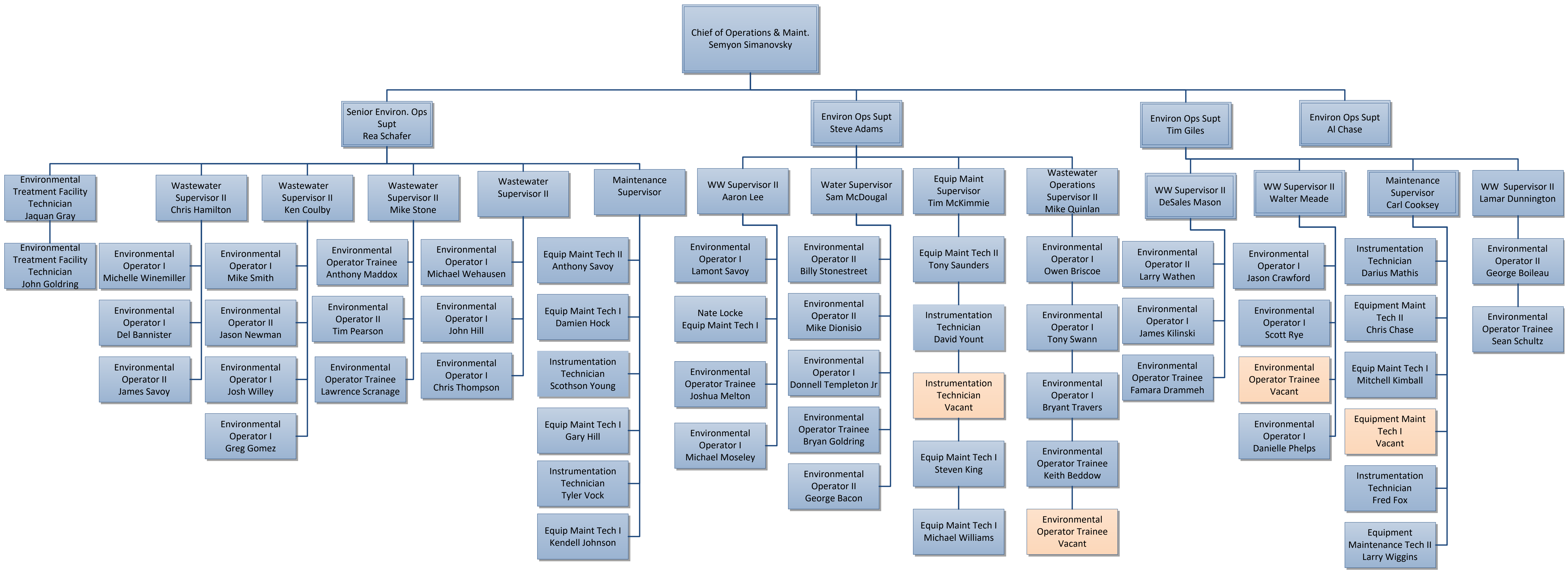
Task 1 – Determine the average water consumption per employee for the Mattawoman Sewer Service Area.

- Identify the TAZs included in the Mattawoman Sewer Service area and total the number of employees. Exclude the School employees and the CPV employees since they will be calculated separately.
- From the Utility Billing Department get the total Commercial and Government water consumption for the Mattawoman Sewer Service area. Less the school usage.
- Divide the Total Metered Water Consumption by the number of employees. The average per employee is 21 gallons per day.
- Using the consumption for schools in the Mattawoman Sewer Service Area and the total enrollments for each school the average per pupil water usage was determined.

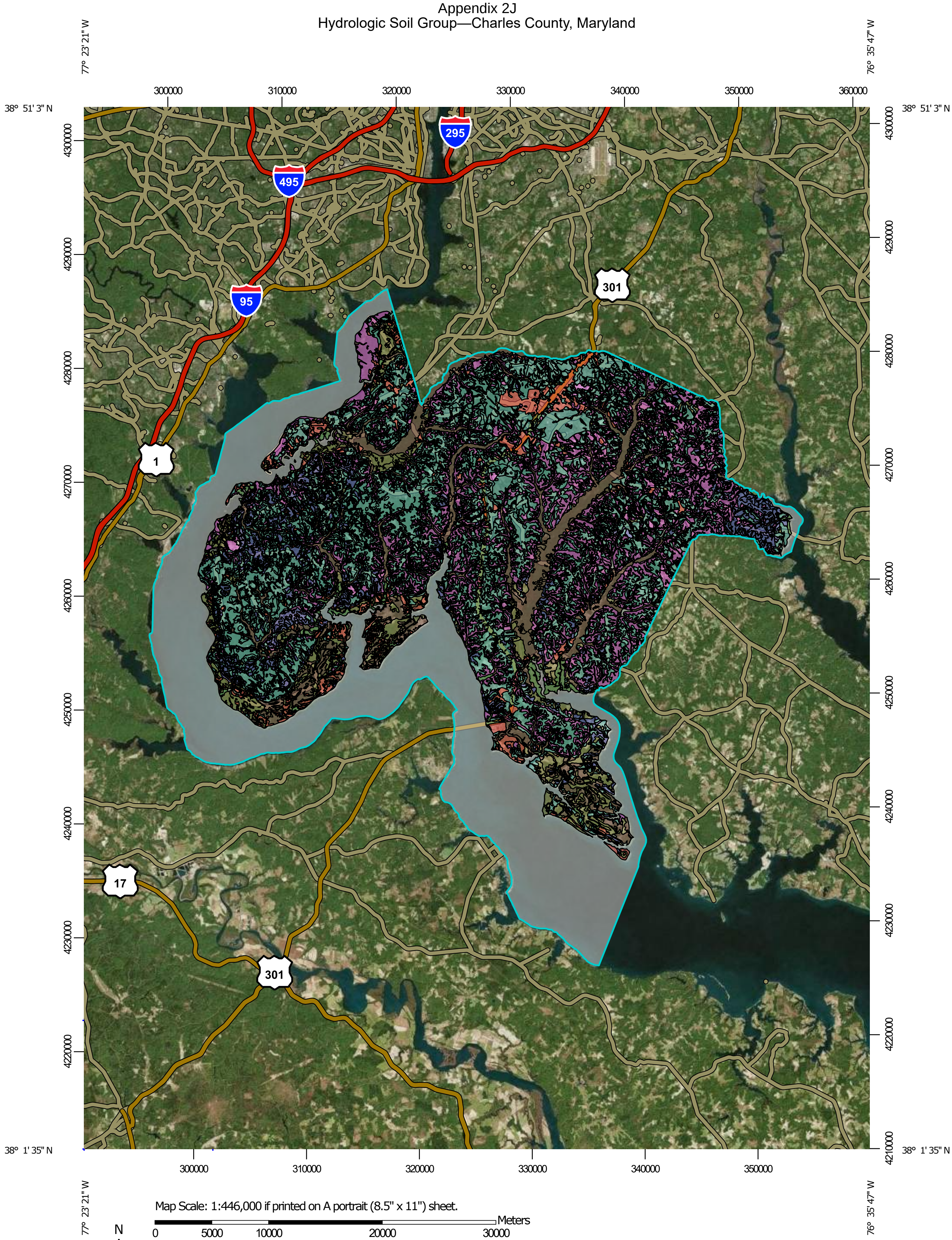
Task 2 – Project the Water demand for Commercial and Government Users in the Mattawoman Sewer Service Area.

- Multiply the per employee consumption times the projected employment by TAZ.
- Add the per pupil water consumption for existing schools and planned schools by TAZ.
- Add **1.15 MGD sewer demand for CPV** Co-generation Plant in the 2015-2020 timeframe.

Charles County, Maryland
Appendix 2I
Public Works/Utilities/Operations and Maintenance



Hydrologic Soil Group—Charles County, Maryland



Map Scale: 1:446,000 if printed on A portrait (8.5" x 11") sheet.

Meters: 0, 5000, 10000, 20000, 30000

Feet: 0, 20000, 40000, 80000, 120000

N

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 18N WGS84

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Lines

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Points

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Water Features

Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:12,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Charles County, Maryland
Survey Area Data: Version 14, Jun 11, 2020

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jan 1, 1999—Dec 31, 2003

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
AnE	Annapolis fine sandy loam, 15 to 25 percent slopes	C	732.4	0.2%
AnG	Annapolis fine sandy loam, 25 to 60 percent slopes	C	763.9	0.2%
AsA	Annemessex silt loam, 0 to 2 percent slopes	B/D	9,106.7	2.2%
AsB	Annemessex silt loam, 2 to 5 percent slopes	B/D	1,262.3	0.3%
BaB	Beltsville silt loam, 2 to 5 percent slopes	C	57,261.0	13.9%
BaC	Beltsville silt loam, 5 to 10 percent slopes	C	11,845.3	2.9%
BcA	Beltsville-Aquasco complex, 0 to 2 percent slopes	C	6,941.0	1.7%
BgB	Beltsville-Grosstown-Woodstown complex, 0 to 5 percent slopes	C	6,913.7	1.7%
BuB	Beltsville-Urban land complex, 0 to 5 percent slopes	C	5,061.4	1.2%
CAC	Collington and Annapolis soils, 5 to 10 percent slopes	B	114.9	0.0%
CAD	Collington and Annapolis soils, 10 to 15 percent slopes	C	268.3	0.1%
CmD	Croom-Marr complex, 10 to 15 percent slopes	C	286.8	0.1%
CmE	Croom-Marr complex, 15 to 25 percent slopes	C	1,412.1	0.3%
CmG	Croom-Marr complex, 25 to 60 percent slopes	C	474.6	0.1%
DfA	Dodon fine sandy loam, 0 to 2 percent slopes	C	1,573.5	0.4%
DfB	Dodon fine sandy loam, 2 to 5 percent slopes	C	1,189.4	0.3%
DnA	Donlonton fine sandy loam, 0 to 2 percent slopes	C	92.3	0.0%

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
DnB	Donlonton fine sandy loam, 2 to 5 percent slopes	C	438.5	0.1%
EkA	Elkton silt loam, 0 to 2 percent slopes, frequently ponded	C/D	1,442.8	0.4%
GcB	Galestown-Hammonton complex, 0 to 5 percent slopes	A	2,776.8	0.7%
GgB	Grosstown gravelly silt loam, 2 to 5 percent slopes	A	5,411.5	1.3%
GmD	Grosstown-Marr-Hoghole complex, 5 to 15 percent slopes	A	15,293.6	3.7%
GmF	Grosstown-Marr-Hoghole complex, 15 to 40 percent slopes	A	37,380.5	9.1%
GwD	Grosstown-Woodstown-Beltsville complex, 5 to 15 percent slopes	C	15,071.7	3.7%
HgB	Hoghole-Grosstown complex, 0 to 5 percent slopes	A	8,483.1	2.1%
Is	Issue silt loam, occasionally flooded	B/D	3,039.4	0.7%
LQA	Lenni and Quindocqua soils, 0 to 2 percent slopes	C/D	11,091.8	2.7%
LsA	Liverpool silt loam, 0 to 2 percent slopes	D	2,719.2	0.7%
LsB	Liverpool silt loam, 2 to 5 percent slopes	D	3,438.9	0.8%
LxD	Liverpool-Piccowaxen complex, 5 to 15 percent slopes	D	2,362.0	0.6%
MaA	Magnolia silt loam, 0 to 2 percent slopes	B	678.1	0.2%
MaB	Magnolia silt loam, 2 to 5 percent slopes	B	1,353.9	0.3%
MaC	Magnolia silt loam, 5 to 10 percent slopes	B	511.2	0.1%
McC	Magnolia-Grosstown complex, 5 to 10 percent slopes	B	212.4	0.1%
McD	Magnolia-Grosstown complex, 10 to 15 percent slopes	B	640.7	0.2%
McE	Magnolia-Grosstown complex, 15 to 25 percent slopes	B	1,425.6	0.3%

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
MfA	Marr fine sandy loam, 0 to 2 percent slopes	B	657.0	0.2%
MfB	Marr fine sandy loam, 2 to 5 percent slopes	B	370.2	0.1%
MfE	Marr fine sandy loam, 15 to 25 percent slopes	B	963.2	0.2%
MfG	Marr fine sandy loam, 25 to 60 percent slopes	B	1,395.1	0.3%
MkB	Marr-Beltsville complex, 2 to 5 percent slopes	B	856.6	0.2%
MkD	Marr-Beltsville complex, 5 to 15 percent slopes	B	5,151.4	1.3%
MkE	Marr-Beltsville complex, 15 to 25 percent slopes	B	982.9	0.2%
MkF	Marr-Beltsville complex, 25 to 40 percent slopes	B	316.1	0.1%
MnB	Marr-Dodon complex, 2 to 5 percent slopes	B	872.5	0.2%
MnC	Marr-Dodon complex, 5 to 10 percent slopes	B	1,534.8	0.4%
MnD	Marr-Dodon complex, 10 to 15 percent slopes	B	740.0	0.2%
MT	Mispillion and Transquaking soils, tidally flooded	A/D	4,418.7	1.1%
NG	Nanticoke and Mannington soils, frequently flooded	C/D	1,024.5	0.2%
PcA	Piccowaxen loam, 0 to 2 percent slopes	C/D	4,646.8	1.1%
PcB	Piccowaxen loam, 2 to 5 percent slopes	C/D	1,773.0	0.4%
PT	Pits, gravel	A	921.5	0.2%
Pu	Potobac-Issue complex, frequently flooded	B/D	27,610.0	6.7%
RgA	Reybold loam, gravelly subsoil, 0 to 2 percent slopes	B	719.5	0.2%
RgB	Reybold loam, gravelly subsoil, 2 to 5 percent slopes	B	538.0	0.1%
RsA	Reybold silt loam, 0 to 2 percent slopes	B	592.2	0.1%
RsB	Reybold silt loam, 2 to 5 percent slopes	B	1,051.0	0.3%

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
RsC	Reybold silt loam, 5 to 10 percent slopes	B	353.3	0.1%
UdB	Udorthents, loamy, 0 to 5 percent slopes	C	2,013.4	0.5%
UdD	Udorthents, loamy, 5 to 15 percent slopes	C	183.7	0.0%
UgB	Udorthents, reclaimed gravel pits, 0 to 5 percent slopes	C	1,654.1	0.4%
UhG	Udorthents, refuse substratum, 0 to 50 percent slopes	C	142.8	0.0%
UK	Urban land	D	2,711.7	0.7%
UmB	Urban land-Beltsville complex, 0 to 5 percent slopes	D	1,667.7	0.4%
UoB	Urban land-Grosstown complex, 0 to 5 percent slopes	D	473.1	0.1%
UoD	Urban land-Grosstown complex, 5 to 15 percent slopes	D	508.3	0.1%
UpB	Urban land-Piccowaxen complex, 0 to 5 percent slopes	D	675.1	0.2%
W	Water		118,943.5	28.9%
WdaA	Woodstown sandy loam, 0 to 2 percent slopes, Northern Coastal Plain	C	3,678.5	0.9%
WdaB	Woodstown sandy loam, 2 to 5 percent slopes, Northern Coastal Plain	C	2,455.0	0.6%
WdC	Woodstown sandy loam, 5 to 10 percent slopes	C	313.4	0.1%
Totals for Area of Interest			**411,979.6**	**100.0%**

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

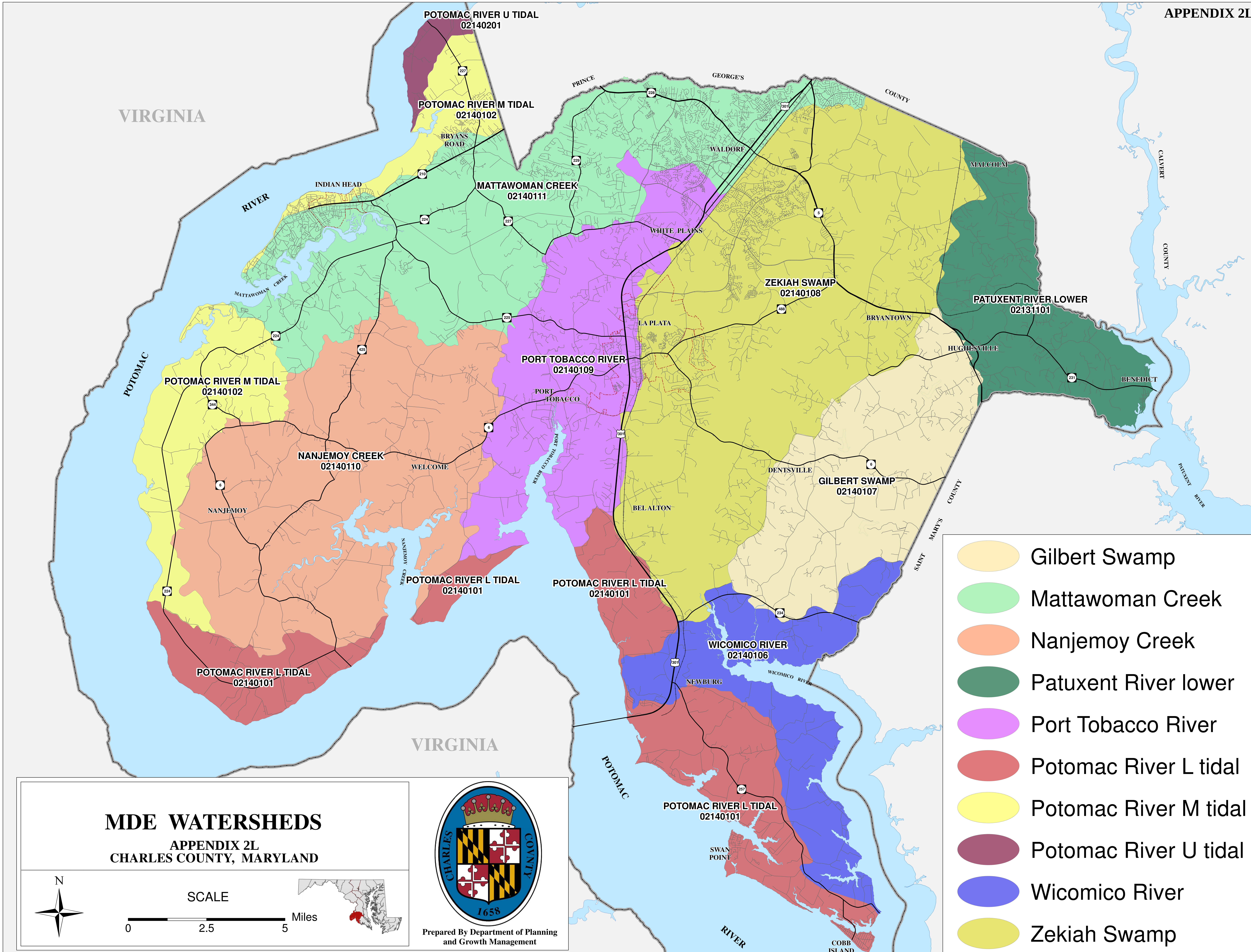
Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher


APPENDIX 2K
VIRGINIA
VIRGINIA
POTOMAC
RIVER
POTOMAC
RIVER
INDIAN HEAD
BRYANS ROAD
MATTAWOMAN CREEK
PRINCE GEORGE'S COUNTY
WALDORF
WHITE PLAINS
LA PLATA
BRYANTOWN
HUGHESVILLE
BENEDICT
PORT TOBACCO
PORT TOBACCO RIVER
WELCOME
NANJEMOY
NANJEMOY CREEK
BEL ALTON
DENTSVILLE
SAINT MARY'S COUNTY
CALVERT
WICOMICO RIVER
NEWBURG
SWAN POINT
COBB ISLAND
LEGEND
Incorporated Town
Park/Forest/Recreation
Federal/Military
CSX Rail Tracks
State Route
Local Route
ROADSIDE CULTURE
Airport
Armory
Athletic Field
Camping Facility
Cemetery
Church/Religious Inst.
City/Town Hall
College (Junior)
College/University
Commuter Station w/ Parking
County Police
Courthouse
Md. Dept. of Agriculture Farmers Market
Fire/Rescue
Garage/SHA/County/Municipal
Golf Course/Country Club
Hospital
Hospital w/ 24 hour Emergency Room
Library
Lighthouse
Light Rail (MTA)
Md. Motor Vehicle Administration Location
Metro (MTA)
Metrorail (WMATA)
Park and Ride Location
Picnic Site
Post Office
Prominent Peak w/ Elevation
Radio/Microwave/TV Tower
Rest Area w/ Restrooms
Salvage Yard
School
Shopping Center/Mall
State Police
Trailer Park
Welcome Center
Wildlife Area (State)
Wildlife Area (Federal)
Yacht Club/Marina
CHARLES COUNTY, MARYLAND
APPENDIX 2K
TOPO MAP
N
SCALE
0 2 4 Miles
CHARLES COUNTY 1658
Prepared By The Charles County Department of Planning and Growth Management
MAY 2021


APPENDIX 2L
POTOMAC RIVER U TIDAL
02140201
POTOMAC RIVER M TIDAL
02140102
VIRGINIA
BRYANS ROAD
INDIAN HEAD
RIVER
PRINCE GEORGE'S COUNTY
WALDORF
MALCOLM
CALVERT COUNTY
MATTAWOMAN CREEK
02140111
WHITE PLAINS
ZEKIAH SWAMP
02140108
PATUXENT RIVER LOWER
02131101
BRYANTOWN
LA PLATA
HUGHESVILLE
BENEDICT
MATTAWOMAN CREEK
POTOMAC
PORT TOBACCO RIVER
02140109
PORT TOBACCO
POTOMAC RIVER M TIDAL
02140102
NANJEMOY CREEK
02140110
WELCOME
DENTSVILLE
GILBERT SWAMP
02140107
SAINT MARY'S COUNTY
PATUXENT RIVER
NANJEMOY
BEL ALTON
NANJEMOY CREEK
PORT TOBACCO RIVER
POTOMAC RIVER L TIDAL
02140101
POTOMAC RIVER L TIDAL
02140101
WICOMICO RIVER
02140106
NEWBURG
WICOMICO RIVER
POTOMAC RIVER L TIDAL
02140101
VIRGINIA
POTOMAC
POTOMAC RIVER L TIDAL
02140101
SWAN POINT
RIVER
COBB ISLAND
Gilbert Swamp
Mattawoman Creek
Nanjemoy Creek
Patuxent River lower
Port Tobacco River
Potomac River L tidal
Potomac River M tidal
Potomac River U tidal
Wicomico River
Zekiah Swamp
MDE WATERSHEDS
APPENDIX 2L
CHARLES COUNTY, MARYLAND
N
SCALE
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2.5
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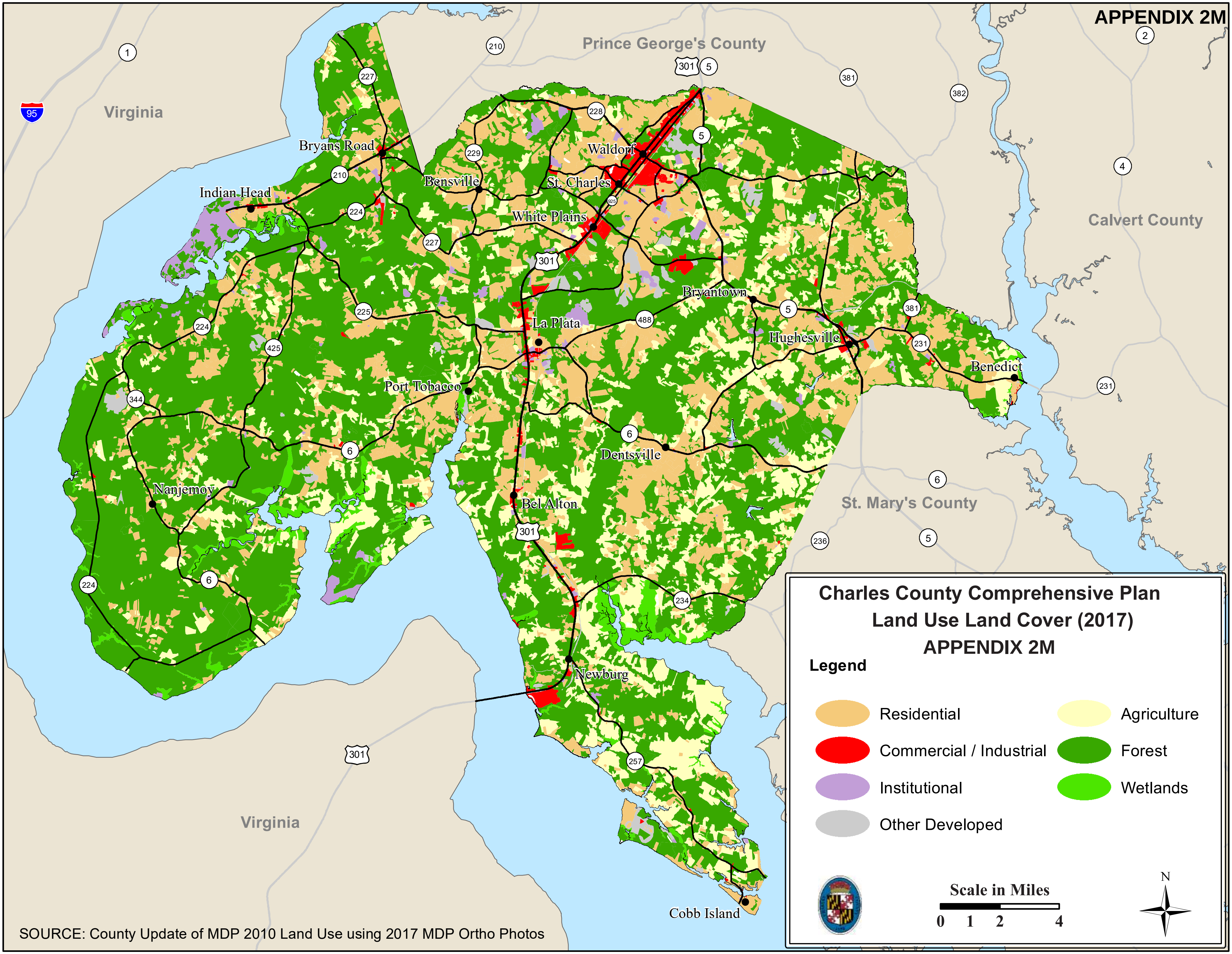
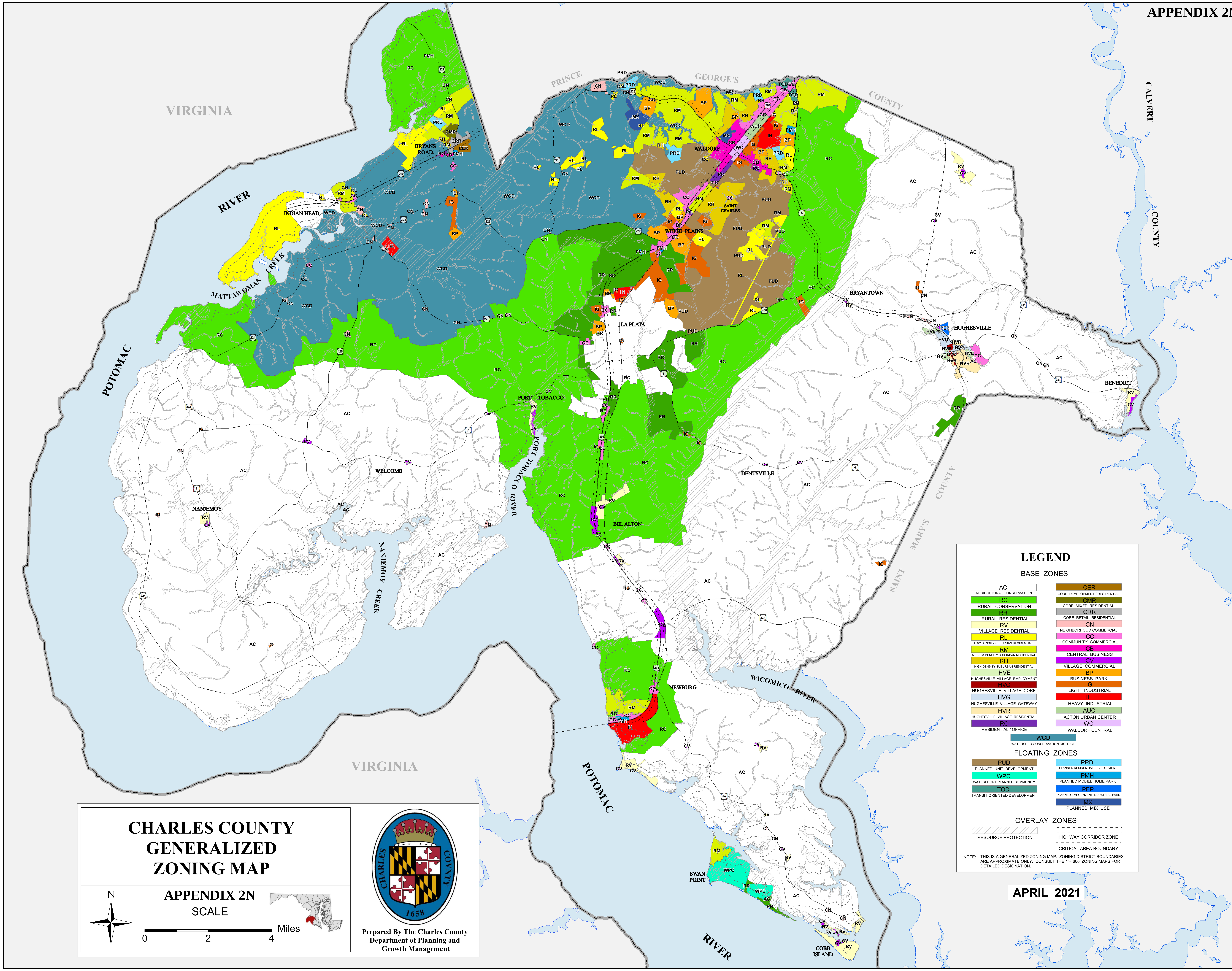
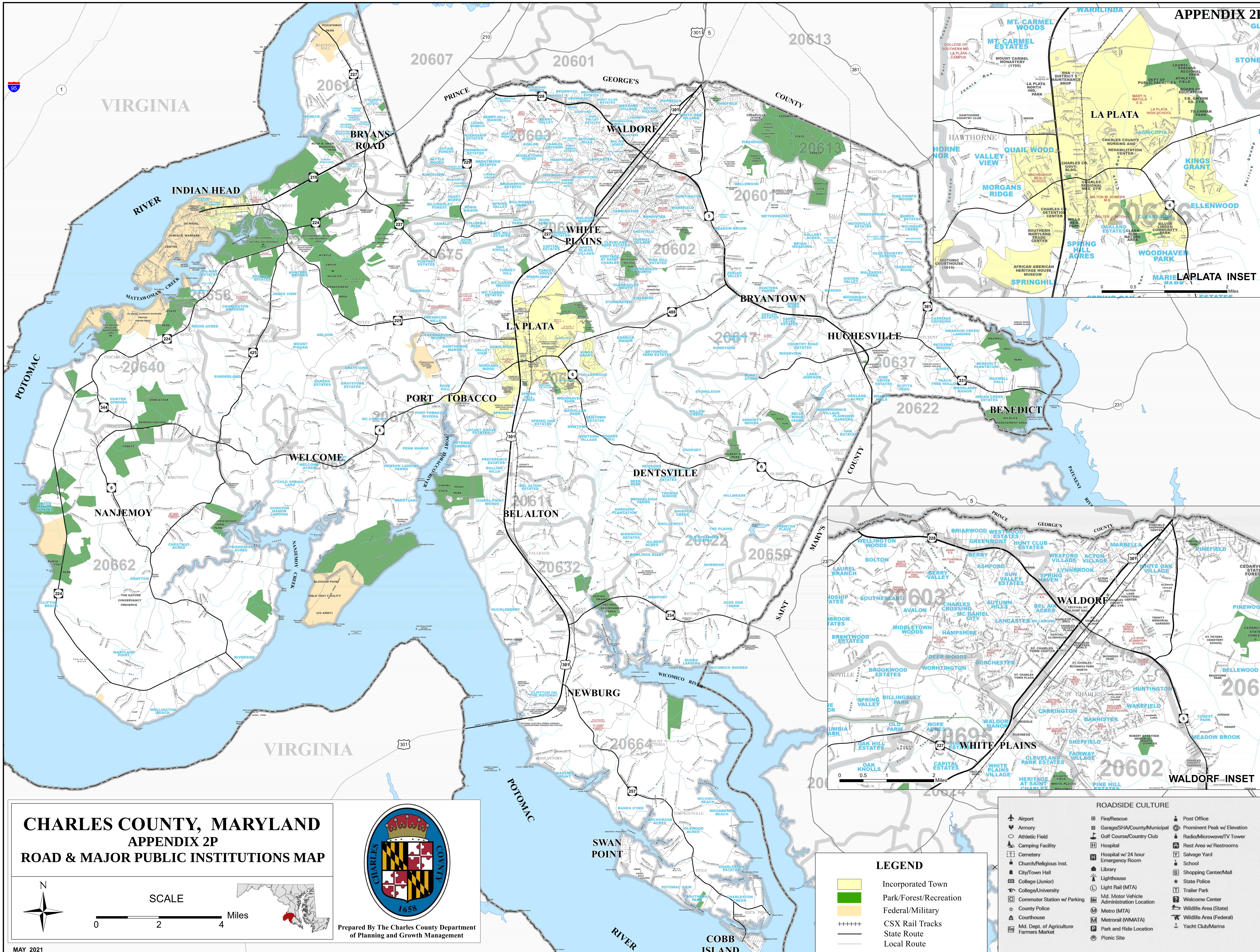
Miles
CHARLES COUNTY
1658
Prepared By Department of Planning and Growth Management



SOURCE: County Update of MDP 2010 Land Use using 2017 MDP Ortho Photos


APPENDIX 2N
CHARLES COUNTY
GENERALIZED
ZONING MAP
APPENDIX 2N
SCALE
N
0
2
4
Miles
CHARLES COUNTY
1658
Prepared By The Charles County
Department of Planning and
Growth Management
APRIL 2021
LEGEND
BASE ZONES
AC
AGRICULTURAL CONSERVATION
RC
RURAL CONSERVATION
RR
RURAL RESIDENTIAL
RV
VILLAGE RESIDENTIAL
RL
LOW DENSITY SUBURBAN RESIDENTIAL
RM
MEDIUM DENSITY SUBURBAN RESIDENTIAL
RH
HIGH DENSITY SUBURBAN RESIDENTIAL
HVE
HUGHESVILLE VILLAGE EMPLOYMENT
HVC
HUGHESVILLE VILLAGE CORE
HVG
HUGHESVILLE VILLAGE GATEWAY
HVR
HUGHESVILLE VILLAGE RESIDENTIAL
RO
RESIDENTIAL / OFFICE
CER
CORE DEVELOPMENT / RESIDENTIAL
CMR
CORE MIXED RESIDENTIAL
CRR
CORE RETAIL RESIDENTIAL
CN
NEIGHBORHOOD COMMERCIAL
CC
COMMUNITY COMMERCIAL
CB
CENTRAL BUSINESS
CV
VILLAGE COMMERCIAL
BP
BUSINESS PARK
IG
LIGHT INDUSTRIAL
IH
HEAVY INDUSTRIAL
AUC
ACTON URBAN CENTER
WC
WALDORF CENTRAL
WCD
WATERSHED CONSERVATION DISTRICT
FLOATING ZONES
PUD
PLANNED UNIT DEVELOPMENT
WPC
WATERFRONT PLANNED COMMUNITY
TOD
TRANSIT ORIENTED DEVELOPMENT
PRD
PLANNED RESIDENTIAL DEVELOPMENT
PMH
PLANNED MOBILE HOME PARK
PEP
PLANNED EMPLOYMENT/INDUSTRIAL PARK
MX
PLANNED MIX USE
OVERLAY ZONES
RESOURCE PROTECTION
HIGHWAY CORRIDOR ZONE
CRITICAL AREA BOUNDARY
NOTE: THIS IS A GENERALIZED ZONING MAP. ZONING DISTRICT BOUNDARIES ARE APPROXIMATE ONLY. CONSULT THE 1"= 600' ZONING MAPS FOR DETAILED DESIGNATION.
VIRGINIA
POTOMAC RIVER
MATTAWOMAN CREEK
PRINCE GEORGE'S COUNTY
CALVERT COUNTY
SAINT MARY'S COUNTY
BRYANS ROAD
INDIAN HEAD
WALDORF
SAINT CHARLES
WHITE PLAINS
LA PLATA
BRYANTOWN
HUGHESVILLE
BENEDICT
PORT TOBACCO
PORT TOBACCO RIVER
WELCOME
NANJEMOY
NANJEMOY CREEK
DENTSVILLE
BEL ALTON
NEWBURG
WICOMICO RIVER
SWAN POINT
COBB ISLAND
VIRGINIA
POTOMAC
RIVER


APPENDIX 2O
COMPREHENSIVE PLAN
Quality Places
Natural Spaces
CHARLES COUNTY MARYLAND
APPENDIX 2O
LEGEND
Development District
Residential
Watershed Conservation District
Employment & Industrial Park Districts
Commercial & Business Districts
Mixed Use Districts
Redevelopment District
Suburban Large Lot District
Rural Residential
Agriculture Conservation District
Rural Conservation District
Incorporated Towns
Incorporated Town Growth Areas
Transit Corridor
Protected Lands
Major Stream Valleys
Military or Federally Owned Lands
Chesapeake Bay Critical Area
Villages
Residential
Commercial
Mixed Residential & Commercial
> 150 Acres
50 - 100 Acres
< 50 Acres
LAND USE PLAN
JULY 12, 2016
CHARLES COUNTY
DEPARTMENT OF PLANNING
AND GROWTH MANAGEMENT
Miles
0
1
2
PRINCE GEORGE'S COUNTY
VIRGINIA
SAINT MARYS COUNTY
PATUXENT
POTOMAC
MATTAWOMAN
CREEK
RIVER
WICOMICO
RIVER
NANJEMOY
CREEK
PORT TOBACCO
RIVER
BRYANS
ROAD
INDIAN HEAD
WALDORF
SAINT CHARLES
WHITE PLAINS
LA PLATA
PORT TOBACCO
MALCOLM
GALLANT
GREEN
BRYANTOWN
HUGHESVILLE
BENEDICT
PISGAH
IRONSIDES
WELCOME
NANJEMOY
BEL ALTON
FAULKNER
SIMPSON'S
CORNER
DENTSVILLE
GLASVA
NEWBURG
WAYSIDE
MT. VICTORIA
MORGANTOWN
TOMPKINSVILLE
SWAN
POINT
ISSUE
ROCK
POINT
COBB
ISLAND
NAVAL SURFACE
WARFARE CENTER
INDIAN HEAD DIV.
BLOSSOM POINT
RESEARCH FACILITY
CEDARVILLE
STATE
FOREST
CHAPMANS
STATE
PARK
MYRTLE GROVE
WILDLIFE
MANAGEMENT
AREA
SMALLWOOD
STATE PARK
DONCASTER
STATE
FOREST
CHAPEL POINT
STATE PARK
FRIENDSHIP
FARM PARK
227
228
229
210
224
225
301
5
488
231
6
425
344
234
257


CHARLES COUNTY, MARYLAND
APPENDIX 2P
ROAD & MAJOR PUBLIC INSTITUTIONS MAP
APPENDIX 2P
LAPLATA INSET
WALDORF INSET
VIRGINIA
VIRGINIA
POTOMAC
RIVER
POTOMAC
RIVER
PRINCE
GEORGE'S
COUNTY
SAINT
MARY'S
COUNTY
INDIAN HEAD
BRYANS ROAD
WALDORF
WHITE PLAINS
LA PLATA
PORT TOBACCO
BRYANTOWN
HUGHESVILLE
BENEDICT
WELCOME
NANJEMOY
DENTSVILLE
BEL ALTON
NEWBURG
SWAN POINT
COBB ISLAND
MATTAWOMAN CREEK
NANJEMOY CREEK
WICOMICO RIVER
20607
20601
20613
20603
20602
20695
20675
20658
20640
20646
20617
20637
20622
20677
20611
20662
20632
20659
20612
20664
20616
LEGEND
Incorporated Town
Park/Forest/Recreation
Federal/Military
CSX Rail Tracks
State Route
Local Route
ROADSIDE CULTURE
Airport
Armory
Athletic Field
Camping Facility
Cemetery
Church/Religious Inst.
City/Town Hall
College (Junior)
College/University
Commuter Station w/ Parking
County Police
Courthouse
Md. Dept. of Agriculture Farmers Market
Fire/Rescue
Garage/SHA/County/Municipal
Golf Course/Country Club
Hospital
Hospital w/ 24 hour Emergency Room
Library
Lighthouse
Light Rail (MTA)
Md. Motor Vehicle Administration Location
Metro (MTA)
Metrorail (WMATA)
Park and Ride Location
Picnic Site
Post Office
Prominent Peak w/ Elevation
Radio/Microwave/TV Tower
Rest Area w/ Restrooms
Salvage Yard
School
Shopping Center/Mall
State Police
Trailer Park
Welcome Center
Wildlife Area (State)
Wildlife Area (Federal)
Yacht Club/Marina
SCALE
Miles
0
2
4
N
CHARLES COUNTY
1658
Prepared By The Charles County Department of Planning and Growth Management
MAY 2021

Charles County, Maryland
Appendix 2P
Major Public Institutions

Institution Type	Institution Name	Address	City
Airport	MD Airport	3900 Livingston Road	Indian Head
Armory National Guard	La Plata National Guard Armory	14 West Hawthorne Drive	La Plata
Campground and/or Facility Private	Aqua Land Campground	9700 Orland Park Road	Newburg
Campground and/or Facility Private	Goose Bay Campground	9365 Goose Bay Lane	Welcome
Campground and/or Facility State	Cedarville State Forest Campground	10201 Bee Oak Road	Brandywine
Campground and/or Facility State	Smallwood State Park & Campground	2750 Sweden Point Road	Marbury
Community College	College of Southern Maryland, Hughesville	6170 Hughesville Station Place	Hughesville
Community College	College of Southern Maryland, La Plata	8730 Mitchell Road	La Plata
County Seat	Charles County- County Seat in La Plata	11 Washington Avenue	La Plata
Courthouse County	Charles County District/Circuit Court	200 Charles Street	La Plata
Fairgrounds	Charles County Fairgrounds	8440 Fairground Road	La Plata
Farmers Market	La Plata Farmers Market	Charles St & Washington Ave	La Plata
Farmers Market	St. Charles Farmers Market	10400 O'Donnell Place	Waldorf
Farmers Market	Waldorf Farmers' Market	Festival Way	Waldorf
Fire and/or Rescue Station Volunteer	10th District VFD - Station No. 8	7035 Poorhouse Road	Pisgah
Fire and/or Rescue Station Volunteer	Bel Alton VFD - Station No. 10	9765 Bel Alton Newton Road	Bel Alton
Fire and/or Rescue Station Volunteer	Benedict VFD Station No. 5	18120 Hyatt Avenue	Benedict
Fire and/or Rescue Station Volunteer	Bryans Road VFD - Station No. 11	3099 Livingston Road	Bryans Road
Fire and/or Rescue Station Volunteer	Charles County Dive Rescue, Inc.	8170 Marshall Corner Road	Pomfret
Fire and/or Rescue Station Volunteer	Charles County Volunteer Rescue Squad - Station No. 51	2 Calvert Street	La Plata
Fire and/or Rescue Station Volunteer	Cobb Island VFD - Station 6	13290 Main Avenue	Cobb Island
Fire and/or Rescue Station Volunteer	Dentsville Volunteer EMS - Station No. 15	12135 Charles Street	La Plata
Fire and/or Rescue Station Volunteer	Hughesville VFD, Station No. 2	15245 Prince Frederick Road	Hughesville
Fire and/or Rescue Station Volunteer	Indian Head VFD - Station No. 9	4095 Indianhead Highway	Indian Head
Fire and/or Rescue Station Volunteer	Ironsides Volunteer Rescue Squad	6120 Port Tobacco Road	Ironsides
Fire and/or Rescue Station Volunteer	La Plata VFD, Station No. 1	911 Washington Avenue	La Plata
Fire and/or Rescue Station Volunteer	Nanjemoy VFD Station No. 4	4260 Port Tobacco Road	Nanjemoy
Fire and/or Rescue Station Volunteer	Newburg Volunteer Rescue Squad & VFD - Station No. 14	12245 Rock Point Road	Newburg
Fire and/or Rescue Station Volunteer	Potomac Heights VFD - Station No. 7	73 Glymont Road	Indian Head
Fire and/or Rescue Station Volunteer	Waldorf Fire Department - EMS Station No. 3	1069 Saint Ignatius Drive	Waldorf
Fire and/or Rescue Station Volunteer	Waldorf Fire Department - Fire & EMS Station No. 12	7000 St. Florian Drive	Waldorf
Fire and/or Rescue Station Volunteer	Waldorf VFD - Fire Station No. 3	3245 Old Washington Road	Waldorf
Golf Course Public	White Plains Golf Course	1015 St. Charles Parkway	White Plains
Golf Course/Country Club Private	Hawthorne Country Club	8760 Hawthorne Road	La Plata

Charles County, Maryland
Appendix 2P
Major Public Institutions

Institution Type	Institution Name	Address	City
Golf Course/Country Club Private	Swan Point Yacht and Country Club	11550 Swan Point Boulevard	Swan Point
Government Offices County	Charles County Government Building	200 Baltimore Street	La Plata
Government Offices County	Southern Maryland Trade Center	101 Catalpa Drive	La Plata
Government Offices County	Charles County Board of Elections	201 Charles Street	La Plata
Highway Garage and/or Shop SHA	La Plata SHA Maintenance Shop	5725 Washington Avenue	La Plata
Historical Site Federal	British Landing War of 1812	Shore of Patuxent River	Benedict
Hospital 24-Hour County	Univeristy of Maryland Charles Regional Medical Center	5 Garrett Avenue	La Plata
Landfill	Charles County Landfill	12305 Billingsley Rd	Waldorf
Library County	Charles County Public Library La Plata Branch	2 Garrett Avenue	La Plata
Library County	Charles County Public Library P.D Brown Memorial Branch	50 Village Street	Waldorf
Library County	Charles County Public Library Potomac Branch	3225 Ruth B. Swann Drive	Indian Head
Lighthouse Commissioned	Lower Cedar Point Lighthouse	Near Potomac River Bridge	Potomac River
Lighthouse Commissioned	Mathias Point Shoal Lighthouse	Near Port Tobacco River	Potomac River
Mall	Festival at Waldorf Mall	2975 Festival Way	Waldorf
Mall	St. Charles Town Center Shopping Center	11110 Mall Circle	Waldorf
Marina and/or Yacht Club	Aqua-Land Marina	301 Potomac River Bridge	Newburg
Marina and/or Yacht Club	Desoto's Landing Marina	301 Desoto Lane	Benedict
Marina and/or Yacht Club	Goose Bay Marina	9365 Goose Bay Lane	Welcome
Marina and/or Yacht Club	PIRATEÆS DEN MARINA	12364 Neale Sound Drive	Cobb Island
Marina and/or Yacht Club	Port Tobacco Marina	7536 Shirley Boulevard	Port Tobacco
Marina and/or Yacht Club	Shymansky's Restaurant & Marina	16320 Cobb Island Rd	Cobb Island
Maryland Dept of Labor	Southern Maryland JobSource	175 Post Office Road	Waldorf
Museum Public	Dr. Samuel A. Mudd Historical House and Museum	3725 Dr Samuel Mudd Rd	Waldorf
Museum Public	Mount Carmel Monastery	5678 Mount Carmel Road	La Plata
Museum Public	Old Durham Church	4380 Dematha Court	Nanjemoy
Museum Public	Piscataway - CoNo.y Museum	5125 Gwynn Road	Pomonkey
Museum Public	Port Tobacco Historic Courthouse	8430 Commerce Street	Port Tobacco
Museum Public	Thomas Stone National Historic Site	6655 Rose Hill Road	Port Tobacco
Museum Public	Maryland Veterans Museum at Partriot Park	11000 Crain Hwy	Newburg
MVA Full Service	Waldorf MVA	11 Industrial Park Drive	Waldorf
Nursing Home	Charles County Nursing and Rehabilitation Center	10200 La Plata Road	La Plata
Park	Bensville Park	6980 Bensville Road	White Plains
Park	Friendship Farm Park	4715 Friendship Landing Road	Nanjemoy
Park	Gilbert Run Park	13140 Charles Street	Charlotte Hall

Charles County, Maryland
Appendix 2P
Major Public Institutions

Institution Type	Institution Name	Address	City
Park	Larel Springs Regional Park	5940 Radio Station Road	La Plata
Park	Mallow's Bay Park	1440 Wilson Landing Road	Nanjemoy
Park	Mattingly Aveune Park	108 Mattingly Avenue	Indian Head
Park	Oak Ridge Park	13675 Oaks Road	Hughesville
Park	Southern Park	15884 Wilson Road	Newburg
Park	Turkey Hill Park	9430 Turkey Hill Road	La Plata
Park	White Plains Regional Park	1015 St. Charles Parkway	White Plains
Park	Indian Head/White Plains Rail Trail	10390 Theodore Green Boulevard	White Plains
Park and Ride SHA	MD 5 Mattawoman/Beantown Road; MTA 905, 913	MD 5 Mattawoman/Beantown Road	Waldorf
Park and Ride SHA	US 301 @ MD 225 La Plata Armory Park and Ride	14 West Hawthorne Drive	La Plata
Police Station County - District 1	Charles County Sheriff, La Plata District 1	6855 Crain Highway	La Plata
Police Station County - District 2	Charles County Police, Bryans Road District 2	3099 Marshall Hall Road	Bryans Road
Police Station County - District 3	Charles County Police, Waldorf District 3	3670 Leonardtown Road	Waldorf
Police Station County - Headquarters	Charles County Sheriff's Office Headquarters	6915 Crain Highway	La Plata
Police Station State	Maryland State Police, Barrack H - La Plata	9500 Mitchell Road	La Plata
Post Office	Bel Alton Main Post Office	9695 Bel Alton Newtown Road	Bel Alton
Post Office	Benedict Main Post Office	7240 Benedict Avenue	Benedict
Post Office	Bryans Road Main Post Office	6960 Indian Head Highway	Bryans Road
Post Office	Bryantown Main Post Office	6425 Leonardtown Road	Bryantown
Post Office	Cobb Island Main Post Office	17009 Cobb Island Road	Cobb Island
Post Office	Faulkner Main Post Office	9977 Faulkner Road	Faulkner
Post Office	Hughesville Main Post Office	15485 Prince Frederick Road	Hughesville
Post Office	Indian Head Main Post Office	4050 Indian Head Hwy	Indian Head
Post Office	Ironsides Main Post Office	6045 Port Tobacco Road	Ironsides
Post Office	Issue Main Post Office	15800 Cobb Island Rd	Issue
Post Office	La Plata Main Post Office	100 Centennial Street	La Plata
Post Office	Marbury Main Post Office	4570 Bicknell Road	Marbury
Post Office	Mount Victoria Main Post Office	12085 Mount Victoria Road	Mount Victoria
Post Office	Nanjemoy Main Post Office	9365 Beaverdam Road	Nanjemoy
Post Office	Newburg Post Office	12179 Rock Point Road	Newburg
Post Office	Pomfret Main Post Office	8205 Marshall Corner Road	Pomfret
Post Office	Port Tobacco Main Post Office	8200 Port Tobacco Road	Port Tobacco
Post Office	Waldorf Main Post Office	150 Post Office Road	Waldorf
Post Office	Welcome Main Post Office	6204 Welcome Road	Welcome

Charles County, Maryland
Appendix 2P
Major Public Institutions

Institution Type	Institution Name	Address	City
Post Office	White Plains Main Post Office	4660 Crain Highway	White Plains
Prison County	Charles County Detention Center	6905 Crain Highway	La Plata
Prison State	Dept. of Corrections-Southern Maryland Pre-Release Unit	14320 Oaks Road	Charlotte Hall
Private School - Elementry/Middle	Archbishop Neale School	104 Port Tobacco Road	La Plata
Private School - Elementry/Middle	Grace Lutheran School	1200 Charles Street	La Plata
Private School - Elementry/Middle	Saint Peters Church School	3310 Saint Peters Drive	Waldorf
Private School - Elementry/Middle	St. Mary's Bryantown Catholic School	13735 No.tre Dame Place	Bryantown
Private School K-12	Grace Christian Academy of Maryland	13000 Zekiah Drive	Waldorf
Private School K-12	New Hope Academy Christian School	4200 Old Washington Road	Waldorf
Private School K-12	Southern Maryland Christian Academy	9805 Faith Baptist Church Road	White Plains
Public Elementary School	Billingsley Elementary School	10069 Bilingsley Road	White Plains
Public Elementary School	Arthur Middleton Elementary School	1109 Copley Avenue	Waldorf
Public Elementary School	Berry Elementary School	10155 Berry Road	Waldorf
Public Elementary School	C. Paul Barnhart Elementary School	4800 Lancaster Circle	Waldorf
Public Elementary School	Daniel of St. Thomas Jenifer Elementary School	2820 Jenifer School Lane	Waldorf
Public Elementary School	Dr. James Craik Elementary School	7725 Marshall Corner Road	Pomfret
Public Elementary School	Dr. Thomas L. Higdon Elementary School	12872 Rock Point Road	Newburg
Public Elementary School	Eva Turner Elementary School	1000 Bannister Circle	Waldorf
Public Elementary School	Gale-Bailey Elementary School	4740 Pisgah Marbury Road	Marbury
Public Elementary School	Gustavus Brown Elementary School	421 University Drive	Waldorf
Public Elementary School	Indian Head Elementary School	4200 Indian Head Highway	Indian Head
Public Elementary School	J. C. Parks Elementary School	3505 Livingston Road	Indian Head
Public Elementary School	J. P. Ryon Elementary School	12140 Vivian Adams Drive	Waldorf
Public Elementary School	Malcolm Elementary School	14760 Poplar Hill Road	Waldorf
Public Elementary School	Mary Burgess Neal Elementary School	12105 St. Georges Drive	Waldorf
Public Elementary School	Mary Matula Elementary School	6025 Radio Station Road	La Plata
Public Elementary School	Mt. Hope / Nanjemoy Elementary School	9275 Ironsides Road	Nanjemoy
Public Elementary School	Samuel A. Mudd Elementary School	820 Stone Avenue	Waldorf
Public Elementary School	T. C. Martin Elementary School	6315 Olivers Shop Road	Bryantown
Public Elementary School	Walter J. Mitchell Elementary School	400 Willow Lane	La Plata
Public Elementary School	William A. Diggs Elementary School	2615 Davis Road	Waldorf
Public Elementary School	William B. Wade Elementary School	2300 Smallwood Drive West	Waldorf
Public High School	Henry E. Lackey High School	3000 Chicamuxen Road	Indian Head
Public High School	La Plata High School	6035 Radio Station Road	La Plata

Charles County, Maryland
Appendix 2P
Major Public Institutions

Institution Type	Institution Name	Address	City
Public High School	Maurice J. McDoNo.ugh High School	7165 Marshall Corner Road	Pomfret
Public High School	No.rth Point High School	2500 Davis Road	Waldorf
Public High School	Saint Charles High School	5305 Piney Church Rd	Waldorf
Public High School	Thomas Stone High School	3785 Leonardtown Road	Waldorf
Public High School	Westlake High School	3300 Middletown Road	Waldorf
Public Middle School	Benjamin Stoddert Middle School	2040 St. Thomas Drive	Waldorf
Public Middle School	General Smallwood Middle School	4990 Indian Head Highway	Indian Head
Public Middle School	John Hanson Middle School	12350 Vivian Adams Drive	Waldorf
Public Middle School	Mattawoman Middle School	10145 Berry Road	Waldorf
Public Middle School	Matthew Henson Middle School	3535 Livingston Road	Indian Head
Public Middle School	Milton M. Somers Middle School	300 Willow Lane	La Plata
Public Middle School	Piccowaxen Middle School	12834 Rock Point Road	Newburg
Public Middle School	Theodore G. Davis Middle School	2495 Davis Road	Waldorf
Radio and/or Television Station	WPRS-FM (Waldorf) Radio Station	Waldorf	Waldorf
Recreation Center	Marshall Hall Boat Ramp	1005 Marshall Hall Road	Bryans Road
Recreation Center	Waldorf Senior & Recreation Center	90 Post Office Road	Waldorf
Recreation Center	Capital Clubhouse	3033 Waldorf Market Place	Waldorf
State Highway Administration	Salt Storage La Plata Shop	5725 Washington Ave	La Plata
Senior Center Town	Indian Head Senior Center	100 Cornwallis Square	Indian Head
Shopping Center	Charles County Plaza Shopping Center	3273 Plaza Drive	Waldorf
Shopping Center	La Plata Shopping Center	6649 Crain Highway	La Plata
Shopping Center	Pinefield Shopping Center	2056 Crain Highway	Waldorf
Shopping Center	Waldorf Shoppers World Shopping Center	3326 Crain Highway	Waldorf
Sports	Southern MD Youth Organization	8210 Marshall Corner Road	Pomfret
Sports Complex	Regency Furniture Stadium	11765 St Linus Drive	Waldorf
Sports Complex	Bryantown Sports Complex	5665 Bryantown Road	Bryantown
Toll Booth and/or Plaza	Harry W. Nice Memorial Bridge Toll	US 301 South	Newburg
Town Hall	Indian Head Town Hall	4195 Indian Head Highway	Indian Head
Town Hall	La Plata Town Hall	305 Queen Anne Street	La Plata
VEIP	Charles County Vehicle Emissions Inspection Site	28 Henry Ford Circle	Waldorf
Vocational/Technical Public	F. B. Gwynn Educational Center	5998 Radio Station Road	La Plata
Vocational/Technical Public	Robert D Stethem Educational Center	7775 Marshall Corner Road	Pomfret
Welcome Center	Crain Memorial Welcome Center	US 301 No.rth, 12480 Crain Hwy	Newburg

Charles County, Maryland
List of Appendices
Chapter 3

Charles County, Maryland
Appendix 3A
Water Supply Demand and Planned Capacity for Private/Community

Map #	Owner / Service Area	2019						2040					
		Population			Gallons			Population			Gallons		
		Total	Served	Not Served	GPCD	Demand	Rated[2]	Total	Served	Not Served	GPCD	Demand	Planned
29	Banks O'Dee Citizens Assoc, Inc	65	65	0	N/A[1]	N/A[1]	0.007	65	65	0	N/A[1]	N/A[1]	0.007
6	Bellewood Water Assoc	128	128	0	51	0.003	0.012	128	128	0	51	0.003	0.012
11	Charles County Gardens Water Co, Inc	551	551	0	23	0.011	0.022	551	551	0	23	0.011	0.022
8	Du-Mar Estates Water Co	150	150	0	53	0.007	0.011	150	150	0	53	0.007	0.011
14	Garden Estates Water Co	55	55	0	91	0.005	0.005	105	105	0	48	0.005	0.005
5	Green Meadows Water Co	68	68	0	81	0.006	0.010	68	68	0	81	0.006	0.010
15	Hawthorne Water Supply	60	60	0	83	0.005	0.005	60	60	0	83	0.005	0.005
6	Idlewood Mobile Home Park	320	320	0	60	0.019	0.025	320	320	0	60	0.019	0.025
16	Independence Village	88	88	0	63	0.006	0.006	88	88	0	63	0.006	0.006
5	Inman Utilities	75	75	0	103	0.009	0.014	75	75	0	103	0.009	0.014
5	Eugene A. Jenkins - Thomas Court	25	25	0	88	0.002	0.003	25	25	0	88	0.002	0.003
5	Laurel Water Supply, Inc	50	50	0	50	0.003	0.004	50	50	0	50	0.003	0.004
	Matthews Water Co	45	45	0	N/A[1]	N/A[1]	0.004	45	45	0	N/A[1]	N/A[1]	0.004
29	Morgantown Water Co	45	45	0	N/A[1]	N/A[1]	0.004	45	45	0	N/A[1]	N/A[1]	0.004
	Mt. Aventine Water Co	30	30	0	N/A[1]	N/A[1]	0.003	30	30	0	N/A[1]	N/A[1]	0.003
15	Newtown Est.(Tip Hill)	110	110	0	71	0.006	0.015	110	110	0	71	0.006	0.015
10	Oak Hill Water Assoc	180	180	0	61	0.009	0.016	180	180	0	61	0.009	0.016
	Parkway Water Co, Inc	50	50	0	N/A[1]	N/A[1]	0.004	50	50	0	N/A[1]	N/A[1]	0.004
11	Pine Hill Water Co	140	140	0	43	0.005	0.016	140	140	0	43	0.005	0.016
9	Pomfret Estates Utility Co (Utilico)	150	150	0	56	0.005	0.013	150	150	0	56	0.005	0.013
4	Pomonkey Water Co, Ford Heights	125	125	0	N/A[1]	N/A[1]	0.006	125	125	0	N/A[1]	N/A[1]	0.006
4	Potomac Heights Mutual HOA	1800	1800	0	40	0.058	0.150	1800	1800	0	40	0.058	0.150
9	Red Hill Water Co	200	200	0	39	0.005	0.010	200	200	0	39	0.005	0.010
29	Southview	61	61	0	N/A[1]	N/A[1]	0.006	61	61	0	N/A[1]	N/A[1]	0.006
6	Trimac Water Co - Forest Park Addition	139	139	0	50	0.007	0.013	139	139	0	50	0.007	0.013
10	Turkey Hill Water Co	150	150	0	53	0.008	0.011	150	150	0	53	0.008	0.011
10	West White Plains Water Co	50	50	0	N/A[1]	N/A[1]	0.004	50	50	0	N/A[1]	N/A[1]	0.004
10	White Plains Water Co - Kings Manor	372	372	0	42	0.013	0.022	372	372	0	42	0.013	0.022

Notes [1] Data not available for systems permittted for less than 10,000 gallons per day.

[2] Rated capacity means the level of appropration granted by the MDE by permit.

Charles County, Maryland
Appendix 3B
Water Supply Demand and Planned Capacity for Public/Municipal

Map #	Owner / Service Area	2019						2040					
		Population			Gallons			Population			Gallons		
		Total	Served	Not Served	GPCD	Demand (MGD)	Rated[1] (MGD)	Total	Served	Not Served	GPCD	Demand (MGD)	Planned (MGD)
10	Avon Crest	79	79	0	63	0.005	0.007	80	80	0	70	0.0053	0.0091
6	Beantown Park	127	127	0	55	0.007	0.014	127	127	0	59	0.0075	0.014
20	Bel Alton	311	311	0	55	0.017	0.026	311	311	0	55	0.017	0.025
17	Benedict (St. Francis)	376	376	0	53	0.02	0.036	876	876	0	66	0.058	0.8
5	Bryans Road	5950	5950	0	69	0.41	0.57	8416	8416	0	84	0.707	1.000
20	Chapel Point Woods	300	280	20	104	0.029	0.08	592	562	30	90	0.047	0.0800
27	Clifton on the Potomac	1004	781	223	64	0.05	0.085	1004	950	54	72	0.095	1.000
15	Ellenwood	229	229	0	48	0.011	0.027	229	229	0	48	0.011	0.027
9	Hunters Brooke	894	614	280	75	0.046	0.116	896	896	0	75	0.067	0.116
4	Indian Head, Town of	4120	4100	20	80	0.326	0.338	6968	6950	18	68	0.474	0.5
10,15	La Plata, Town of	9500	9500	0	98	0.93	1.234	25,000	25,000	0	97	2.5	2.5
15	Mariellen Park	184	184	0	49	0.009	0.018	184	184	0	49	0.0009	0.018
10	Mount Carmel Woods	185	185	0	43	0.008	0.015	175	175	0	46	0.008	0.015
15	Newtown Village	170	170	0	47	0.008	0.015	170	170	0	47	0.008	0.015
9	Oakwood	44	44	0	45	0.002	0.005	45	45	0	45	0.002	0.005
5	Spring Valley	91	91	0	55	0.005	0.0096	91	91	0	59	0.0054	0.0096
29	Swan Point	1150	950	200	64	0.061	0.5	4970	4,970	0	68	0.338	0.5
2,3,6,11	Waldorf & WSSC	87700	87700	0	73	6.4	7.07	126,400	126,400	0	67	8.43	10.00

Note [1] Rated capacity means the level of appropration granted by the MDE by permit. In the case of Waldorf, it includes the 1.4 MGD of surface water committed by the WSSC agreement.

Charles County, Maryland
Appendix 3C
Water Supply Demand and Planned Capacity for Institutional/Government

Map #	Owner / Service Area	2019						2040					
		Population			GPCD			Population			GPCD		
		Total	Served	Unserved	Gallons	Demand (MGD)	Rated (MGD)	Total	Served	Unserved	Gallons	Demand (MGD)	Rated (MGD)
24	* Glasava	60	60	0	21	0.001	0.005	60	60	0	21	0.001	0.005
14	* Landfill	25	25	0	-	-	0.001	25	25	0	-	-	0.001
9	* Mattawoman WWTP	110	110	0	-	-	0.006	110	110	0	-	-	0.006
18	* Nanjemoy Building	30	30	0	-	-	0.000	30	30	0	-	-	0.000
9	**Alternative	39	39	0	8	0.000	0.001	39	39	0	8	0.000	0.001
16	** TC Martin	483	483	0	8	0.004	0.008	483	483	0	8	0.004	0.008
5	** JC Parks	717	717	0	8	0.006	0.004	717	717	0	8	0.006	0.004
9	** Lackey	991	991	0	8	0.008	0.015	991	991	0	8	0.008	0.015
9	** Gale-Bailey	370	370	0	8	0.003	0.002	370	370	0	8	0.003	0.002
10	** VoTech	900	900	0	8	0.007	0.010	900	900	0	8	0.007	0.010
9	** McDonough	910	910	0	8	0.007	0.023	910	910	0	8	0.007	0.023
27	** Piccowaxen	450	450	0	8	0.004	0.015	450	450	0	8	0.004	0.015
7	** Malcolm	483	483	0	8	0.004	0.010	483	483	0	8	0.004	0.010
18	** Mt Hope	261	261	0	8	0.002	0.004	261	261	0	8	0.002	0.004
5	** Henson	637	637	0	8	0.005	0.006	637	637	0	8	0.005	0.006
27	** Hidgon	394	394	0	8	0.003	0.005	394	394	0	8	0.003	0.005
10	** Stethem/Craik	572	572	0	8	0.005	0.006	572	572	0	8	0.005	0.006
10	College of Southern Maryland	6000	6000	0	8	0.048	0.060	9000	9000	0	8	0.072	0.060
4	Naval Support Activity South Potomac - NSFIH	3321	3321	0	220	0.730	2.540	3321	3321	0	220	0.730	2.540
4	Naval Support Activity South Potomac - Stump Neck Annex	495	495	0	77	0.040	0.102	495	495	0	77	0.040	0.102
16	Southern Maryland Pre-Release Center	180	180	0	145	0.026	0.028	0	0	0	0	0.000	0.000

* Stands for Charles County Commissioners

** Stands for Board of Education

Charles County, Maryland
Appendix 3D
Inventory of Existing Community System Wells for Private/Community

Map #	Owner / Service Area	Operating Agency	Well	Aquifer	Well Coordinates North	Well Coordinates East	Depth	Dia.	Pumping Capacity	Water Quality
					1,000'	1,000'	Feet	Inches	GPM	
29	Banks O'Dee Citizens Assoc	Private	1	Aquia	175	825	320	4	20	Good
6	Bellewood Water Assoc	Private	1	Magothy	284	842	600	6	30	Good, Iron & Silt present
		Private	2	Magothy	284	842	615	4	30	Good, Iron & Silt present
11	Charles County Gardens Water Co, Inc	Private	1	Magothy	274	838	491	6	150	Good, Iron Present
		Private	3	Magothy	273	838	495	6	150	Good
8	Du-Mar Estates Water Co	Private	1	Patapsco	268	753	406	6	20	Good
14	Garden Estates Water Co	Private	1	Patapsco	250	771	675	4	25	Good
5	Green Meadows Water Co	Private	1	Patapsco	289	774	300	4	25	Good
		Private	2	Patapsco	288	775	605	4	30	Good
15	Hawthorne Water Supply	Private	1	Patapsco	257	796	650	6	50	Good
6	Idlewood Mobile Home Park	Private	1	Magothy	244	856	560	6	85	Good, Iron Present
		Private	2	Magothy	38.63	-76.88	537	4	10	Good, Iron Present
16	Independence Village	Private	1	Magothy	244	856	540	6	25	Good
5	Inman Utilities	Private	1	Patapsco	289	782	662	6	25	Good
5	Thomas Ct.	Private	1	Patapsco	289	775	N/A	N/A	N/A	Good
5	Laurel Water Supply, Inc	Private	1	Patapsco	283	768	729	4	18	Good
29	Morgantown Water Co	Private	1	Aquia	186	808	300	5	15	Good
15	Newtown Estates Water Company	Private	1	Patapsco	243	817	446	6	50	Good
10	Oak Hill Water Assoc	Private	1	Patapsco	275	804	453	6	50	Good
11	Pine Hill Water Co	Private	1	Magothy	271	828	463	6	25	Good
9	Pomfret Estates Utility Co	Private	1	Patuxent	271	791	1346	6	50	Good
4	Pomonkey Water Co, Ford Heights	Private	1	Patapsco	279	772	639	6	30	Good
4	Potomac Heights Mutual Mutual HOA	Private	1	Patuxent	280	761	540	20	500	Good
		Private	2	Patuxent	281	762	544	18	360	Good
9	Red Hill Water Co	Private	1	Patapsco	260	760	375	4	30	Good
		Private	2	Patapsco	267	762	597	4	45	Good
29	Southview - Southview Wise	Private	1	Patapsco	185	810	297	5	50	Good
6	Trimac Water Co - Forest Park Addition	Private	1	Magothy	278	838	591	4	30	Good
		Private	2	Magothy	278	838	580	4	25	Offline
10	Turkey Hill Water Co	Private	3	Potomac Grp.	38.57	-76.99	988	6	50	Good
		Private	2	Potomac Grp.	271	803	480	4	30	Good

Charles County, Maryland
Appendix 3D
Inventory of Existing Community System Wells for Private/Community

Map #	Owner / Service Area	Operating Agency	Well	Aquifer	Well Coordinates		Depth	Dia.	Pumping Capacity	Water Quality
					North	East				
					1,000'	1,000'	Feet	Inches	GPM	
10	West White Plains Water Co	Private	2	Magothy	274	809	300	4	10	Offline
		Private	1	Magothy	38.59	-76.97	480	4	20	Good
10	White Plains Water Co. - Kings Manor	Private	1	Magothy	273	810	392	6	45	Good
		Private	2	Magothy	274	810	400	6	15	Good

Source: Maryland Department of Environment

Refer to Appendix 3G for Treatment System for Private/Community

Charles County, Maryland
Appendix 3E
Inventory of Existing Community System Wells for Public/Municipal

Map #	Owner / Service Area	Operating Agency	Well	Aquifer	Well Coordinates North 1,000'	Well Coordinates East 1,000'	Depth Feet	Dia. Inches	Pumping Capacity GPM	Water Quality
10	Avon Crest	County	1	Patapsco	274	797	521	6	40	Good
		County	2	Patapsco	274	797	605	8	70	Good
6	Beantown	County	1	Magothy	284	841	605	6	56	Good
		County	2	Magothy	284	841	623	8	200	Good
20	Bel Alton Estates	County	3	Patapsco	234	806	708	-	50	Good
		County	4	Patapsco	234	806	750	6	60	Good
7	Benedict (St. Francis)	County	1	Aquia	248	893	400	6	100	Good
		County	St.Frances	Aquia	247	891	445	10	100	Good
5	Bryans Road	County	`	Patapsco	-	-	500	6	100	Good
		County	2	Patuxent	289	777	795	8	350	Good
		County	6	Patuxent	292	774	800	10	850	Good
20	Chapel Point Woods	County	1	Patapsco	231	800	901	8	130	Good
		County	3	Patapsco	225	802	818	8	50	Good
27	Clifton on the Potomac	County	2	Patapsco	197	811	1215	6	170	Good
		County	St.Annes	Patapsco	197	811	1200	8	275	Good
15	Ellenwood	County	1	Patapsco	250	817	553	6	275	Good
		County	2	Patapsco	250	817	664	6	80	Good
4	Indian Head, Town of	County	3	Patapsco	278	759	-	-	240	Good
		County	4	Patapsco	278	759	-	-	140	Good
		County	6	Patuxent	278	759	-	-	220	Good
20	Hunters Brooke	County	1	Patapsco	-	-	797	6	250	Good, gross alpha
		County	2	Patapsco	-	-	801	6	250	Good, gross alpha
10,15	La Plata, Town of	Town	5	U. Patapsco	250	814	1300	-	120	Good
		Town	8	L. Patapsco	38 32 36.41	76 56 36.9	1440	-	650	Good
		Town	9	L. Patapsco	38 31 12.68	76 57 4.76	1509	-	500	Good
		Town	10	L. Patapsco	38 32 57.22	76 58 38.01	1304	-	600	Good
		Town	11	L. Patapsco	38 33 33.13	76 58 53.31	1252	18	800	Good
15	Mariellen Park	County	1	Patapsco	245	813	660	4	60	Good

Charles County, Maryland
Appendix 3E
Inventory of Existing Community System Wells for Public/Municipal

Map #	Owner / Service Area	Operating Agency	Well	Aquifer	Well Coordinates North	Well Coordinates East	Depth	Dia.	Pumping Capacity	Water Quality
					1,000'	1,000'	Feet	Inches	GPM	
15	Mariellen Park	County	4	Patapsco	245	813	564	6	30	Good
10	Mount Carmel Woods	County	4	Patapsco	267	801	1261	6	75	Good
		County	1	Patapsco	267	801	1278	6	73	Good
15	Newtown Village	County	1	Patapsco	242	816	781	6	60	Good
		County	2	Patapsco	243	817	446	6	30	Good
9	Oakwood	County	1	Patapsco	265	790	1038	6	20	Good
5	Spring Valley	County	1	Patapsco	280	803	407	6	75	Good
1	Strawberry Hills Estates	County	2	Patapsco	296	781	654	20	300	Good
29	Swan Point	County	1	Patapsco	170	824	865	10	300	Good
		County	2	Patapsco	170	824	990	10	400	Good
5	Waldorf (Bensville 1)	County	1	Magothy	-	-	1030	6	240	Good
5	Waldorf (Bensville 2)	County	2	Magothy	-	-	1035	6	240	Good
6	Waldorf (Billingsley) Magothy	County	1	Magothy	-	-	645	8	250	Good
6	Waldorf (Billingsley) Patapsco	County	1	Patapsco	-	-	1173	8	550	Good, Low Hardness
10	Waldorf (Cleveland Park) Magothy	County	1	Magothy	-	-	480	8	250	Good
10	Waldorf (Cleveland Park) Patapsco	County	1	Patapsco	-	-	1405	8	450	Good, Low Hardness
6	Waldorf (John Hanson)	County	1	Magothy	-	-	534	-	700	Good
6	Waldorf (Mattawoman Beantown)	County	1	Magothy	-	-	602	8	450	Good
3	Waldorf (Pinefield)	County	1	Magothy	-	-	700	8	520	Good
5	Waldorf (Piney Church)	County	1	Magothy	-	-	602	12	510	Good
6	Waldorf (Smallwood West)	County	1	Patapsco	286	810	1160	12	550	Good, Low Hardness
6	Waldorf (St Charles)	County	1	Magothy	-	-	511	10	500	Good
11	Waldorf (St. Pauls)	County	1	Patapsco	274	828	1427	12	O/S	Well Abandoned
6	Waldorf (Towne Plaza)	County	1	Magothy	-	-	580	8	500	Good
6	Waldorf (Genevieve Dr)	County	1	Patapsco	283	802	1158	8	200	Good
2	Waldorf (Westwood) Magothy	County	1	Magothy	650	817	700	10	650	Good
2	Waldorf (Westwood) Patapsco	County	1	Patapsco	-	-	1225	-	620	Good, Low Hardness
6	Waldorf (Well 16R, Tower)	County	1	Magothy	-	-	-	8	O/S	Good
3	Waldorf (White Oak)	County	1	Patapsco	298	835	1341	8	550	Good, Low Hardness

Source: Charles County Department of Public Works

Refer to Appendix 3H for Treatment System for Public/Municipal

Charles County, Maryland
Appendix 3F
Inventory of Existing Community System Wells for Institutional/Government

Map #	Owner / Service Area	Operating Agency	Well	Aquifer	Well Coordinates North	Well Coordinates East	Depth	Dia.	Pumping Capacity	Water Quality
					1,000'	1,000'	Feet	Inches	GPM	
24	* Glasava	Governmental	9	Patapsco	210	813	525	4	27	Good
14	* Landfill (Pisgah)	Governmental	1	Patapsco	255	757	-	-	1	Good
9	* Mattawoman WWTP	Governmental	2	Patapsco	272	769	-	-	1	Good
18	* Nanjemoy Building	Governmental	3	Patapsco	228	738	-	-	1	Good
10	Charles County Commissioners	Governmental	4	Magothy	268	823	-	-	1	Good
5	* Pomonkey	Governmental	12	Patapsco	285	778	580	6	22	Good
9	* Alternative	Governmental	1	Patapsco	269	784			1	Good
16	** TC Martin	Governmental	2	Magothy	257	845	620	6	40	Good
5	** JC Parks	Governmental	3	Patuxent	286	778	600	6	37	Good
9	** Lackey	Governmental	4	Patapsco	272	762	335	8	50	Good
9	** Gale-Bailey	Governmental	5	Patapsco	265	757	322	6	60	Good
10	** VoTech	Governmental	6	Patapsco	270	791	500	8	47	Good
9	** McDonough	Governmental	7	Patapsco	264	790	332	6	30	Good
27	** Piccowaxen	Governmental	8	Patapsco	192	818	575	6	60	Good
7	** Malcom	Governmental	10	Magothy	286	858	620	6	60	Good
18	** Mt Hope	Governmental	11	Patapsco	228	748	472	4	30	Good
5	** Henson	Governmental	12	Patapsco	285	777	570	6	35	Good
10	** Stethem/Craik	Governmental	13	Patapsco	270	791	500	6	45	Good
10	College of Southern Maryland	Institutional	1	Patapsco	264	798		6	42	Good
		Institutional	2	Patapsco	264	797	643	6	42	Good
		Institutional	3	Patapsco	264	797	536	8	36	Good
13	Maryland Department of Health	Governmental	1	Patapsco	244	745	-	-	4	Good
10	Maryland State Highway Admin.	Governmental	1	Patapsco	262	805	-	-	1	Good
27	Maryland Transportation Authority	Governmental	1	Patapsco	193	805	-	-	1	Good
4	Naval Support Activity South Potomac - NSFIH	Governmental	1	Patuxent	-	-	715	10	500	Good
		Governmental	15	Patuxent	-	-	285	10	500	Good
		Governmental	16	Patuxent	-	-	483	6	500	Good
		Governmental	17A	Patapsco	-	-	500	10	300	Good
4	Naval Support Activity South Potomac – Stump Neck Annex	Governmental	43A	Patuxent	-	-	500	8	100	Good
		Governmental	2012	Patapsco	-	-	290	10	80	Good
16	Southern Maryland Pre-Release Center	Institutional	1	Magothy	260	856	-	6	40	Good (abandon)
16	Southern Maryland Pre-Release Center	Institutional	2	Magothy	260	856	530	6	60	Good

Charles County, Maryland
Appendix 3F
Inventory of Existing Community System Wells for Institutional/Government

Map #	Owner / Service Area	Operating Agency	Well	Aquifer	Well Coordinates		Depth	Dia.	Pumping Capacity	Water Quality
					North	East				
					1,000'	1,000'	Feet	Inches	GPM	
16	Southern Maryland Pre-Release Center	Institutional	3	Aquia	254	854	557	6	50	Good

* Stands for Charles County Commissioners

** Stands for Board of Education

Refer to Appendix 3I for Treatment System for Institutional/Government

Charles County, Maryland
Appendix 3G
Inventory of Existing Water Treatment Facilities for Private/Community

Map #	Owner / Service Area	Operating Agency	Well	Aquifer	Type of Treatment	Well Coordinates North	Well Coordinates East	Rated Capacity	Actual Production	Max. Peak Flow	Storage Capacity
						1,000'	1,000'	MGD	MGD	MGD	MG
29	Banks O'Dee Citizens Assoc	Private	1	Aquia	Disinfection	175	825	0.007	N/A[1]	-	0.005
6	Bellewood Water Assoc	Private	1	Magothy	Disinfection	284	842	0.012	0.003	-	0.005
		Private	2	Magothy	Disinfection	284	842		-	-	
11	Charles County Gardens Water Co, Inc	Private	1	Magothy	Disinfection & Iron Removal	274	838	0.022	0.011	-	0.010
		Private	3	Magothy	Disinfection & Iron Removal	273	838		-	-	
8	Du-Mar Estates Water Co	Private	1	Patapsco	Disinfection	268	753	0.011	0.007	-	0.015
14	Garden Estates Water Co	Private	1	Patapsco	Disinfection	250	771	0.005	0.005	-	0.005
5	Green Meadows Water Co	Private	1	Patapsco	No treatment	289	774	0.010	0.006	-	0.005
		Private	2	Patapsco	No treatment	288	775		-	-	
15	Hawthorne Water Supply	Private	1	Patapsco	Disinfection	257	796	0.005	0.007	-	0.005
6	Idlewood Mobile Home Park	Private	1	Magothy	Disinfection	244	856	0.025	0.019	0.027	0.005
		Private	2	Magothy	Disinfection	-	-		-	-	
16	Independence Village	Private	1	Magothy	Disinfection	244	856	0.006	0.006	-	0.001
5	Inman Utilities	Private	1	Patapsco	Disinfection	289	782	0.014	0.009	-	0.058
5	Thomas Ct.	Private	1	Patapsco	Disinfection	289	775	0.003	-	-	0.005
5	Laurel Water Supply, Inc	Private	1	Patapsco	Disinfection	283	768	0.004	0.003	-	0.062
29	Morgantown Water Co	Private	1	Aquia	Disinfection	186	808	0.004	0.003	-	0.001
15	Newtown Estates Water Company	Private	1	Patapsco	Disinfection	243	817	0.015	0.006	-	
10	Oak Hill Water Assoc	Private	1	Patapsco	Disinfection	275	804	0.016	0.009	-	0.005
11	Pine Hill Water Co	Private	1	Magothy	Disinfection	271	828	0.016	0.005	-	0.008
9	Pomfret Estates Utility Co	Private	1	Patuxent	Disinfection	271	791	0.013	0.005	-	0.005
4	Pomonkey Water Co, Ford Heights	Private	1	Patapsco	Disinfection	279	772	0.006	0.002	-	0.008
4	Potomac Heights Mutual Mutual HOA	Private	1	Patuxent	Disinfection	280	761	0.150	0.058	-	0.015
		Private	2	Patuxent	Disinfection	281	762		-	-	
9	Red Hill Water Co	Private	1	Patapsco	Disinfection	260	760	0.010	0.005	-	0.005
		Private	2	Patapsco	Disinfection	267	762		-	-	
29	Southview - Southview Wise	Private	1	Patapsco	Disinfection	185	810	0.006	0.003	-	0.001
6	Trimac Water Co - Forest Park Addition	Private	1	Magothy	Disinfection	278	838	0.013	0.007	-	0.005
		Private	2	Magothy	Disinfection	278	838		-	-	

Charles County, Maryland
Appendix 3G
Inventory of Existing Water Treatment Facilities for Private/Community

Map #	Owner / Service Area	Operating Agency	Well	Aquifer	Type of Treatment	Well Coordinates North 1,000'	Well Coordinates East 1,000'	Rated Capacity MGD	Actual Production MGD	Max. Peak Flow MGD	Storage Capacity MG
10	Turkey Hill Water Co	Private	1	Potomac Grp.	Disinfection	38.57	-76.99	0.011	0.008	-	0.010
		Private	2	Potomac Grp.	Disinfection	271	803		-	-	
10	West White Plains Water Co	Private	2	Magothy	Disinfection	274	809	0.004	0.002	-	0.000
		Private	1	Magothy	Disinfection	38.59	-76.97		-	-	
10	White Plains Water Co. - Kings Manor	Private	1	Magothy	Disinfection	273	810	0.022	0.013	-	0.015
		Private	2	Magothy	Disinfection	274	810		-	-	

Source: Maryland Department of Environment

Charles County, Maryland
Appendix 3H
Inventory of Existing Water Treatment Facilities for Public/Municipal

Map #	Owner / Service Area	Operating Agency	Well	Aquifer	Type of Treatment	Well Coordinates North	Well Coordinates East	Rated Capacity	Average Production	Max. Peak Flow	Storage Capacity
						1,000'	1,000'	MGD	MGD	MGD	MG
10	Avon Crest	County	1	Patapsco	Disinfection	274	797	0.007	0.000	0.000	0.001
		County	2	Patapsco	Disinfection	274	797		0.004	0.014	
6	Beantown	County	1	Magothy	CP33	284	841	0.014	0.007	0.012	0.005
		County	2	Magothy	CP33	284	841		0.000	0.000	
20	Bel Alton	County	3	Patapsco	Disinfection	234	806	0.026	0.010	0.018	0.208
		County	4	Patapsco	Disinfection	234	806		0.006	0.014	
17	Benedict (St. Francis)	County	1	Aquia	Disinfection	248	893	0.036	0.015	0.026	0.020
5	Bryans Road	County	1	Patapsco	Disinfection	-	-	0.057	0.001	0.005	0.300
		County	2	Patuxent	Disinfection	289	777		0.003	0.062	
		County	6	Patuxent	Disinfection	292	774		0.372	0.609	
20	Chapel Point Woods	County	1	Patapsco	Disinfection	231	800	0.080	0.012	0.024	0.020
		County	3	Patapsco	Disinfection	225	802		0.011	0.029	
27	Clifton on the Potomac	County	2	Patapsco	Disinfection	197	811	0.085	0.006	0.027	0.050
		County	St.Annes	Patapsco	Disinfection	197	811		0.037	0.059	
15	Ellenwood	County	1	Patapsco	Disinfection	250	817	0.027	0.007	0.011	0.018
		County	2	Patapsco	Disinfection	250	817		0.004	0.007	
4	Indian Head, Town of	County	3	Patapsco	Disinfection	278	759	0.338	0.144	-	0.300
		County	4	Patapsco	Disinfection	278	759		0.071	-	
		County	6	Patuxent	Disinfection	278	759		0.110	-	
20	Jude House	County	1	Patapsco	Disinfection	-	-	0.116	0.000	0.007	0.050
		County	2	Patapsco	Disinfection	-	-		0.000	0.007	
10,15	La Plata, Town of	Town	5	U. Patapsco	Disinfection	250	814	1.234	0..878	1.034	1.000
		Town	8	L. Patapsco	Disinfection	38 32 36.41	76 56 36.9				
		Town	9	L. Patapsco	Disinfection	38 31 12.68	76 57 4.76				
		Town	10	L. Patapsco	Disinfection	38 32 57.22	76 58 38.01				
		Town	11	L. Patapsco	Disinfection	38 33 33.13	76 58 53.31				
15	Mariellen Park	County	1	Patapsco	Disinfection	245	813	0.018	0.008	0.011	0.014
		County	4	Patapsco	Disinfection	245	813		0.004	0.008	

Charles County, Maryland
Appendix 3H
Inventory of Existing Water Treatment Facilities for Public/Municipal

Map #	Owner / Service Area	Operating Agency	Well	Aquifer	Type of Treatment	Well Coordinates North	Well Coordinates East	Rated Capacity	Average Production	Max. Peak Flow	Storage Capacity
						1,000'	1,000'	MGD	MGD	MGD	MG
10	Mount Carmel Woods	County	4	Patapsco	Disinfection	267	801	0.015	0.004	0.009	0.014
		County	1	Patapsco	Disinfection	267	801		0.006	0.012	
15	Newtown Village	County	1	Patapsco	Disinfection	242	816	0.015	0.008	0.020	0.001
9	Oakwood	County	1	Patapsco	Disinfection	265	790	0.005	0.002	0.012	0.002
5	Spring Valley	County	1	Patapsco	CP33	280	803	0.010	0.004	0.007	0.006
1	Strawberry Hills Estates	County	2	Patapsco	Disinfection	296	781	0.017	0.001	0.009	0.100
29	Swan Point	County	1	Patapsco	Disinfection	170	824	0.150	0.030	0.091	0.040
		County	2	Patapsco	Disinfection	170	824		0.029	0.092	
6	Waldorf (Mattawoman Beantown)	County	1	Magothy	CP33	-	-	2..87	0.178	0.423	5.800
6	Waldorf (Billingsley) Magothy	County	2	Magothy	CP33	-	-		0.394	0.495	
6	Waldorf (St Charles)	County	3	Magothy	CP33	-	-		0.258	0.344	
2	Waldorf (Westwood) Magothy	County	4	Magothy	CP33	650	817		0.502	0.725	
6	Waldorf (John Hanson)	County	5	Magothy	CP33	-	-		0.615	0.661	
3	Waldorf (Pinefield)	County	6	Magothy	CP33	-	-		0.154	0.416	
5	Waldorf (Piney Church)	County	7	Magothy	CP33	-	-		0.489	0.647	
6	Waldorf (Towne Plaza)	County	8	Magothy	CP33	-	-		0.223	0.373	
11	Waldorf (St. Pauls)	County	9	Patapsco	Disinfection	274	828	2.600	O/S	O/S	
3	Waldorf (White Oak)	County	10	Patapsco	CP33	298	835		0.529	0.792	
6	Waldorf (Smallwood West)	County	11	Patapsco	CP33	286	810		0.406	0.561	
6	Waldorf (Billingsley) Patapsco	County	12	Patapsco	CP33	-	-		0.564	0.600	
10	Waldorf (Cleveland Park) Magothy	County	13	Magothy	CP33	-	-		0.126	0.303	
10	Waldorf (Cleveland Park) Patapsco	County	14	Patapsco	CP33	-	-		0.480	0.817	
2	Waldorf (Westwood) Patapsco	County	15	Patapsco	CP33	-	-		0.726	0.873	
6	Waldorf (Well 16, Tower)	County	16	Patapsco	Disinfection	-	-		O/S	O/S	
5	Waldorf (Bensville 1)	County	23	Magothy	Disinfection	-	-	0.200	0.060	0.189	
5	Waldorf (Bensville 2)	County	24	Magothy	Disinfection	-	-		0.064	0.178	

Source: Charles County Department of Public Works

Charles County
Appendix 3I
Inventory of Existing Water Treatment Facilities for Institutional/Government

Map #	Owner / Service Area	Operating Agency	Well	Aquifer	Type of Treatment	Well Coordinates North	Well Coordinates East	Average Production	Max. Peak Flow	Storage Capacity
						1,000'	1,000'	MGD	MGD	MG
24	* Glasava	Governmental	9	Patapsco	Disinfection	210	813	0.005	0.006	Unk
14	* Landfill (Pisgah)	Governmental	1	Patapsco	Disinfection	255	757	0.001	0.002	Unk
9	* Mattawoman WWTP	Governmental	2	Patapsco	Disinfection	272	769	0.001	0.002	Unk
18	* Nanjemoy Building	Governmental	3	Patapsco	Disinfection	228	738	0.000	0.001	Unk
10	Charles County Commissioners	Governmental	4	Magothy	Disinfection	268	823			
5	* Pomonkey	Governmental	12	Patapsco	Disinfection	285	778	0.008	0.011	Unk
9	* Alternative	Governmental	1	Patapsco	Disinfection	269	784	0.001	0.002	Unk
16	** TC Martin	Governmental	2	Magothy	Disinfection	257	845	0.008	0.010	Unk
5	** JC Parks	Governmental	3	Patuxent	Disinfection	286	778	0.004	0.005	Unk
9	** Lackey	Governmental	4	Patapsco	Disinfection	272	762	0.010	0.018	Unk
9	** Gale-Bailey	Governmental	5	Patapsco	Disinfection	265	757	0.006	0.008	Unk
10	** VoTech	Governmental	6	Patapsco	Disinfection	270	791	0.010	0.012	Unk
9	** McDonough	Governmental	7	Patapsco	Disinfection	264	790	0.030	0.045	Unk
27	** Piccowaxen	Governmental	8	Patapsco	Disinfection	192	818	0.025	0.035	Unk
7	** Malcom	Governmental	10	Magothy	Disinfection	286	858	0.005	0.006	Unk
18	** Mt Hope	Governmental	11	Patapsco	Disinfection	228	748	0.010	0.012	Unk
5	** Henson	Governmental	12	Patapsco	Disinfection	285	777	0.007	0.009	Unk
10	** Stethem/Craik	Governmental	13	Patapsco	Disinfection	270	791	0.006	0.008	Unk
10	College of Southern Maryland	Institutional	1	Patapsco	Disinfection	264	798			
		Institutional	2	Patapsco	Disinfection	264	797			
		Institutional	3	Patapsco	Disinfection	264	797			
13	Maryland Department of Health	Governmental	1	Patapsco	Disinfection	244	745			
10	Maryland State Highway Admin.	Governmental	1	Patapsco	Disinfection	262	805	0.001	0.001	Unk
27	Maryland Transportation Authority	Governmental	1	Patapsco	Disinfection	193	805			
4	Naval Support Activity South Potomac - NSFIH	Governmental	1	Patuxent	Disinfection	-	-			
		Governmental	15	Patuxent	Disinfection	-	-	0.440	0.800	Unk
		Governmental	16	Patuxent	Disinfection	-	-	1.000	1.240	Unk
		Governmental	17A	Patapsco	Disinfection	-	-	0.440	0.800	Unk
4	Naval Support Activity South Potomac – Stump Neck Annex	Governmental	43A	Patuxent	Disinfection	-	-	0.050	0.065	Unk
		Governmental	2012	Patapsco	Disinfection	-	-	0.025	0.037	Unk
16	Southern Maryland Pre-Release Center	Institutional	1	Magothy	Disinfection	260	856	0.000	0.000	-
16	Southern Maryland Pre-Release Center	Institutional	2	Magothy	Disinfection	260	856	0.000	0.000	-

Charles County
Appendix 3I
Inventory of Existing Water Treatment Facilities for Institutional/Government

Map #	Owner / Service Area	Operating Agency	Well	Aquifer	Type of Treatment	Well Coordinates North	Well Coordinates East	Average Production	Max. Peak Flow	Storage Capacity
						1,000'	1,000'	MGD	MGD	MG
16	Southern Maryland Pre-Release Center	Institutional	3	Aquia	Disinfection	254	854	0.000	0.000	-

* Stands for Charles County Commissioners

** Stands for Board of Education

Charles County, Maryland
Appendix 3J
Inventory of Water Problem Areas for Private/Community

Map #	Owner / Service Area	Location	North 1000'	East 1000'	Population	Description of Problem
8	Morgantown Water Company	Newburg	-	-	39	No treatment; no certified operator. New well in good shape. No hydrant for flushing or emergencies.
4	Parkway Water Co., Inc.	La Plata	261	803	50	Community needs additional help to maintain system. New well in good shape and four (4) new bladder tanks were installed. Distributon system needs to be replaced.
1	Pomfret Estates Utility Co.	Pomfret	271	791	150	Potential interconnection with Pomfret Estates may provide service to W6E areas adjacent to the system.
-	County Wide		-	-	n/a	Maryland Department of Health provided an inventory of Problem Areas. These are noted on the accompanying maps as immediate priority (W3-E).

Maryland Department of the Environment & Charles County Planning and Growth Management, 2021

Charles County, Maryland
Appendix 3K
Inventory of Water Problem Areas for Public/Municipal

Map #	Owner / Service Area	Location	North 1000'	East 1000'	Population	Description of Problem
1	Town of Indian Head	Indian Head	278	753	4100	Water Resourses Administration concerend ebaout saline intrusion in groundwater supply wells.
2	Waldorf	Waldorf	288	832	87700	Drawdown of the Magothy Aquifer continyes to be monitored. Resolution efforts include reduced Magothy pumpage, wells in Patapsco aquifer, WSSC interconnection, and long-term Water Surface Treatment Plant planning.
1	La Plata Town	La Plata	254	807	9500	New development in need of additional water supply. Town and County are working towards an agreement for water-sharing.

Charles County Planning and Growth Management, 2021

Charles County, Maryland

Appendix 3L

Water Supply Problem Area Identification and Priority Ranking

WATER SUPPLY PROBLEM AREA IDENTIFICATION AND PRIORITY RANKING PROCESS

The identification of water supply problem areas is a process involving the County Department of Planning and Growth Management, the Environmental Health Division of the Department of Health, and citizens affected by water supply problem areas. The Charles County Department of Health has identified a number of areas as potential problem areas; these are designated with the "E" suffix. These were based on initial surveys by the Charles County Department of Health, through reports received from the Maryland Department of the Environment; and actual field visits and input from citizens. The Department of Health will determine if the area is failing based on the "failing conditions" categories discussed below. A threshold 30% failure rate is necessary to be eligible for potential correction. The five failing condition categories for water supplies are:

1. Contamination of the aquifer or individual wells by sewerage or any other hazardous or infectious waste;

2. Failure to supply adequate quantities of water to meet demand under the volume and pressure requirements of COMAR 26.04.04;

3. Failure to meet bacteriological and chemical water quality standards of COMAR 26.04.01. This includes excessively high sanitary levels;

4. Insufficient area to replace an existing well in accordance with COMAR 26.04.04; or

5. Deteriorating and failing water supply, treatment, or distribution infrastructure.

In order to objectively evaluate all areas identified as water supply problem areas by the Charles County Department of Health for potential correction, the County has developed a priority matrix system. This priority system enables systems to be compared to each other, should funding be limited. The priority system evaluates 7 factors, which include:

a. Community - The location of the area and the Comprehensive Plan designation of the area.

b. Percentage Failing - Higher failure rates is an importance factor.

c. Identification of the Problem - Ranking according to the factors identified above.

d. Proximity - Proximity to existing infrastructure which could offer potential correction.

e. Cost - Cost necessary to correct problem.

f. Revenue Source - Potential or actual revenue source should be identified. This may include grants, developer contributions, loans, or County funded or subsidized programs.

g. Hardship - The ability of the residents to offset costs.

A priority score is derived and evaluated in light of current conditions. The priority ranking matrix is shown below and is used to objectively evaluate water supply problem areas.

Charles County, Maryland
Water Supply Problem Area
Priority Matrix

Community

- First Priority
  - Existing Commercial/Industrial/Business areas within Development District
- Second Priority
  - Future Commercial/Industrial/Business areas within Development District
- Third Priority
  - Existing residential ERUs within Development District
- Fourth Priority
  - Future residential ERUs within the Development District
- Fifth Priority
  - Existing Commercial/Industrial/Business areas outside Development District
- Sixth Priority
  - Future Commercial/Industrial/Business areas outside Development District
- Seventh Priority
  - Existing residential ERUs outside of the Development District
- Eight Priority
  - Future residential ERUs outside of the Development District

Identification of Problem

- First Priority
  - Contamination of aquifer/wells by sewage or other hazardous or infectious waste
- Second Priority
  - Low system Pressure as per COMAR 26.04.04
- Third Priority
  - Inadequate quality as per COMAR 26.04.04
- Fourth Priority
  - Insufficient area for replacement well as per COMAR 26.04.04

Proximity

- First Priority
  - Areas which can interconnect
- Second Priority
  - Areas requiring an on - site system

Revenue Sources

First Priority
  - Revenue from sources other than the County
- Second Priority
  - Revenue from source to be established and administered by County
- Third Priority
  - Revenue from County funds

Charles County, Maryland
Water Supply Problem Area
Priority Matrix

Area:
Map Number:

		Weighting Factor		Weighted Score
Community				
Development District				
	Yes	______	X 5	______
	No	______	X 1	______
Existing Commercial Business/Industrial ERCs		______	X 5	______
Future Commercial Business /Industrial ERCs		______	X 4	______
Current ERCs		______	X 3	______
Future ERCs		______	X 2	______
			Subtotal	
Percent Failing (check one)				
30% to 40% failing		______	X 5	______
41% to 55% failing		______	X 10	______
56% to 65% failing		______	X 15	______
66% to 75% failing		______	X 20	______
76% to 100% failing		______	X 25	______
			Subtotal	
Identification of Problem (check one)				
Contamination of aquifer/wells		______	X 25	______
Low System Pressure		______	X 20	______
Inadequate quality		______	X 15	______
Insufficient area for replacement well		______	X 10	______
Other		______	X 5	______
			Subtotal	
Proximity (Check one)				
Interconnect				
Closest Central System		______	X 25	______
On Site		______	X 10	______
			Subtotal	
Cost to Remedy Problem				
Cost (in $millions)				______
Revenue Source (percentage available)				
Grants		______	X 25	______
Developer CIAC		______	X 25	______
County R&R fund		______	X 10	______
Owner/Developer/Association approved special assessment		______	X 20	______
Other Funding Source		______	X 15	______
	Subtotal		Subtotal	
Hardship				
Ultimate cost per each existing ERCs				______
Ultimate cost per each existing ERCs < $3,000		______	X 25	______
Ultimate cost per each existing ERCs > $3,000		______	X 10	______

Charles County, Maryland

APPENDIX 3M

Failing/Private Water System Process

Check Sheet

WATER COMPANY

PGM #

1)	Contact made by Utility Company w/ PGM by phone, letter, or meeting requesting acquisition proceedings commence.	
2)	Letter sent to Utility Company acknowledging request and requesting any additional informational needed sent to Utility	
3)	Letter acknowledging receipt of information and requesting any additional information needed sent to Utility.	
4)	Field inspection of facilities to determine condition of existing facilities.	
5)	Evaluation of Facilities Form forwarded to CIP along with preliminary draft of report for estimate.	
6)	Evaluation of Facilities form and schedule returned to Development Services.	
7)	Draft report completed by W&S Engineer.	
8)	Meeting with Department Heads for final comments, etc.	
9)	Finalized report and petition package sent to Utility Company.	
10)	Completed (signed) Petition returned to Development Services by Utility Company.	
11)	Petition, list of all property owners, and Plat forwarded to County Attorney.	
12)	Petition ratified or returned by County Attorney.	
13)	If ratified: contact Commissioner's office for date and time set up public hearing.	
14)	______________________Public hearing scheduled for .	
15)	Place Public Hearing notice in newspaper allowing at least ten (10) days notice before the Hearing.	
16)	A copy of the Public Hearing notice sent to all property owners allowing for at least ten (10) days notice.	
17)	Public Hearing is held.	
18)	Commissioners approve or disapprove the Petition.	
19)	Ordinance Passed.	
20)	All documents, data, etc. forwarded to CIP for design, construction, and acquisition.	

Check Sheet

WATER COMPANY

21)	CIP Manager prepares RPF for the design of the project.	
22)	Design contract put out for bids.	
23)	Design contract awarded.	
24)	A copy of the letter to the successful Design bidder is sent to the property owners.	
25)	Design completed.	
26)	Construction contract put out for bids.	
27)	Construction contract awarded.	
28)	A copy of the letter to the successful Construction bidder is sent to the property owners.	
29)	Documents forwarded to County Attorney thru PGM Director for approval & recordation.	
30)	Recorded Documents forwarded to the R.O.W. office.	
31)	List of property owners, lot numbers, and addresses along with a copy of the subdivision Plat prepared by R.O.W. and forwarded to Fiscal Services.	
32)	Construction begins.	
33)	Construction completed.	
34)	County assumes ownership, O&M of system.	
35)	Property owners notified that County has assumed ownership of system and are notified of meter and billing information.	
36)	Final itemized project cost is determined and ‘per lot’ share calculated by CIP Department.	
37)	CIP Department forwards cost information to the County Treasurer thru the PGM Director for implementation of financing arrangements as adopted in the Ordinance.	
38)	PGM Director forwards cost breakdown, etc. to property owners and notifies them of their share of the project cost.	

Charles County, Maryland
Appendix 3N
Non-Transient Non-Community Systems

Map #	NTNC System	Location	PWSID	County's Decision
17	College Of Southern Maryland - Hughesville Campus	Hughesville	MD1080043	Upon request, the County will review NTNC system to determine if connection to County system is feasible.
10	College Of Southern Maryland - Main Campus	La Plata	MD1080038	Upon request, the County will review NTNC system to determine if connection to County system is feasible.
21	Dentsville Trading Company, Inc.	La Plata	MD1081098	Upon request, the County will review NTNC system to determine if connection to County system is feasible.
27	Dr. Thomas Higdon Elementary	Newburg	MD1080031	Upon request, the County will review NTNC system to determine if connection to County system is feasible.
9	Gale-Bailey Elementary School	Marbury	MD1080007	Upon request, the County will review NTNC system to determine if connection to County system is feasible.
11	Grace Christian Academy	Waldorf	MD1080033	Upon request, the County will review NTNC system to determine if connection to County system is feasible.
9	Henry E. Lackey High School	Indian Head	MD1080015	Upon request, the County will review NTNC system to determine if connection to County system is feasible.
7	Malcolm Elementary School	Waldorf	MD1080016	Upon request, the County will review NTNC system to determine if connection to County system is feasible.
9	Mattawoman WWTP	La Plata	MD1080017	Upon request, the County will review NTNC system to determine if connection to County system is feasible.
10	Maurice J. Mcdonough High School	Pomfret	MD1080019	Upon request, the County will review NTNC system to determine if connection to County system is feasible.
27	Morgantown Generating Station	Newburg	MD1080032	Upon request, the County will review NTNC system to determine if connection to County system is feasible.
18	Mt. Hope/ Nanjemoy Elementary School	Nanjemoy	MD1080021	Upon request, the County will review NTNC system to determine if connection to County system is feasible.
23	Naval Research Laboratory - Blossom Point	Welcome	MD1080022	Upon request, the County will review NTNC system to determine if connection to County system is feasible.
4	Naval Support Facility, Stump Neck Annex	Indian Head	MD1080039	Upon request, the County will review NTNC system to determine if connection to County system is feasible.
27	Piccowaxen Middle School	Newburg	MD1080023	Upon request, the County will review NTNC system to determine if connection to County system is feasible.
15	Port Tobacco Department of Community Services	Port Tobacco	MD0080063	Upon request, the County will review NTNC system to determine if connection to County system is feasible.
15	Port Tobacco RV Resort	Port Tobacco	MD1081072	Upon request, the County will review NTNC system to determine if connection to County system is feasible.

Charles County, Maryland
Appendix 3N
Non-Transient Non-Community Systems

Map #	NTNC System	Location	PWSID	County's Decision
10	Southern Maryland Christian Academy	White Plains	MD1080005	Upon request, the County will review NTNC system to determine if connection to County system is feasible.
11	Southern Maryland Electric Cooperative (SMECO)	Hughesville	MD1080041	Upon request, the County will review NTNC system to determine if connection to County system is feasible.
11	St. Marys Bryantown Catholic School	Bryantown	MD1080026	Upon request, the County will review NTNC system to determine if connection to County system is feasible.
6	St. Peters School	Waldorf	MD1080027	Upon request, the County will review NTNC system to determine if connection to County system is feasible.
10	Stethem Education Center & James Craik Elementary School	Pomfret	MD1080002	Upon request, the County will review NTNC system to determine if connection to County system is feasible.
11	T.C. Martin Elementary School	Bryantown	MD1080030	Upon request, the County will review NTNC system to determine if connection to County system is feasible.
5	Victorious Kids / Master's Child Church	Indian Head	MD1080025	Upon request, the County will review NTNC system to determine if connection to County system is feasible.

Charles County Planning and Growth Management & Maryland Department of the Environment 2022

Charles County, Maryland
Appendix 3O
Transient Non-Community Systems

Map #	NC System	Location	PWSID	County's Decision
5	American Legion Post No. 170	Indian Head	MD1081171	Upon request, the County will review NC system to determine if connection to County system is feasible.
17	American Legion Post No. 238	Hughesville	MD1081001	Upon request, the County will review NC system to determine if connection to County system is feasible.
20	Ape Hangers	Bel Alton	MD1081092	Upon request, the County will review NC system to determine if connection to County system is feasible.
27	Aqualand Marina and Campground	Newburg	MD1081006	Upon request, the County will review NC system to determine if connection to County system is feasible.
6	Beantown Texaco Food -Dash In	Waldorf	MD1081164	Upon request, the County will review NC system to determine if connection to County system is feasible.
20	Bel Alton Motel	Bel Alton	MD1081009	Upon request, the County will review NC system to determine if connection to County system is feasible.
20	Bel Alton VFD	Bel Alton	MD1081118	Upon request, the County will review NC system to determine if connection to County system is feasible.
5	Bensville Park	White Plains	MD1081214	Upon request, the County will review NC system to determine if connection to County system is feasible.
9	Bethel Baptist Church	La Plata	MD1081077	Upon request, the County will review NC system to determine if connection to County system is feasible.
14	Blue Dog Saloon	Port Tobacco	MD1081172	Upon request, the County will review NC system to determine if connection to County system is feasible.
5	Bryantown Mall	Bryantown	MD1081014	Upon request, the County will review NC system to determine if connection to County system is feasible.
5	Bryantown Park	Bryantown	MD1081215	Upon request, the County will review NC system to determine if connection to County system is feasible.
6	Bunker Hill Inn	Waldorf	MD1081097	Upon request, the County will review NC system to determine if connection to County system is feasible.
15	Calvary Grace Assembly	La Plata	MD1081198	Upon request, the County will review NC system to determine if connection to County system is feasible.
31	Camp St Charles- Kitchen (Well #1)	Newburg	MD1081016	Upon request, the County will review NC system to determine if connection to County system is feasible.
31	Camp St. Charles- Health Center (Well #2)	Newburg	MD1081202	Upon request, the County will review NC system to determine if connection to County system is feasible.
17	Camp Winona	Hughesville	MD1081017	Upon request, the County will review NC system to determine if connection to County system is feasible.

Charles County, Maryland
Appendix 3O
Transient Non-Community Systems

Map #	NC System	Location	PWSID	County's Decision
24	Captain Billys Crab House	Newburg	MD1081018	Upon request, the County will review NC system to determine if connection to County system is feasible.
31	Captain Charle's Seafood House	Newburg	MD1081082	Upon request, the County will review NC system to determine if connection to County system is feasible.
31	Captain Johns Crabhouse	Newburg	MD1081019	Upon request, the County will review NC system to determine if connection to County system is feasible.
15	Charles County Fairgrounds	La Plata	MD1081122	Upon request, the County will review NC system to determine if connection to County system is feasible.
27	Christ Church Wayside	Newburg	MD1081180	Upon request, the County will review NC system to determine if connection to County system is feasible.
10	Church Of Latter Day Saints	White Plains	MD1081123	Upon request, the County will review NC system to determine if connection to County system is feasible.
31	Cobb Island Market	Cobb Island	MD1081022	Upon request, the County will review NC system to determine if connection to County system is feasible.
31	Cove At Cobb Island	Cobb Island	MD1081220	Upon request, the County will review NC system to determine if connection to County system is feasible.
27	Dans Store	Newburg	MD1081026	Upon request, the County will review NC system to determine if connection to County system is feasible.
6	Dash In Food Store	Waldorf	MD1081195	Upon request, the County will review NC system to determine if connection to County system is feasible.
4	Dash In Glymont	Indian Head	MD1081027	Upon request, the County will review NC system to determine if connection to County system is feasible.
5	Docs Crabhouse, Big B Liquors, Dominos	Bryans Road	MD1081179	Upon request, the County will review NC system to determine if connection to County system is feasible.
8	Dollar General 19869 Marbury	Marbury	MD1081223	Upon request, the County will review NC system to determine if connection to County system is feasible.
18	Durham Episcopal Church	Nanjemoy	MD1081125	Upon request, the County will review NC system to determine if connection to County system is feasible.
15	First Baptist Church Of Laplata	La Plata	MD1081218	Upon request, the County will review NC system to determine if connection to County system is feasible.
6	Forest Park Baptist Church	Waldorf	MD1081012	Upon request, the County will review NC system to determine if connection to County system is feasible.
10	Fraternal Order Of Police Lodge #24	La Plata	MD1081033	Upon request, the County will review NC system to determine if connection to County system is feasible.

Charles County, Maryland
Appendix 3O
Transient Non-Community Systems

Map #	NC System	Location	PWSID	County's Decision
21	Gilbert Run Park	Charlotte Hall	MD1081099	Upon request, the County will review NC system to determine if connection to County system is feasible.
11	Good Samaritan Presbyterian	Waldorf	MD1081036	Upon request, the County will review NC system to determine if connection to County system is feasible.
19	Goose Bay Marina Camp Ground	Welcome	MD1081037	Upon request, the County will review NC system to determine if connection to County system is feasible.
5	Gospel Union Church	Bryans Road	MD1081038	Upon request, the County will review NC system to determine if connection to County system is feasible.
8	Gray Brothers Grocery Store	Marbury	MD1081129	Upon request, the County will review NC system to determine if connection to County system is feasible.
8	Grinders Liquors	Marbury	MD1081174	Upon request, the County will review NC system to determine if connection to County system is feasible.
30	Holy Ghost Catholic Church	Newburg	MD1081042	Upon request, the County will review NC system to determine if connection to County system is feasible.
17	Hotel Charles	Hughesville	MD1081043	Upon request, the County will review NC system to determine if connection to County system is feasible.
17	Hughesville Baptist Church	Hughesville	MD1081044	Upon request, the County will review NC system to determine if connection to County system is feasible.
17	Hughesville Community Center	Hughesville	MD1081046	Upon request, the County will review NC system to determine if connection to County system is feasible.
17	Hughesville Quik Shop Sunoco	Hughesville	MD1081074	Upon request, the County will review NC system to determine if connection to County system is feasible.
17	Hughesville Shelter/ Angel Watch	Hughesville	MD1081133	Upon request, the County will review NC system to determine if connection to County system is feasible.
10	Huntts Tavern On The Corner	Pomfret	MD1081100	Upon request, the County will review NC system to determine if connection to County system is feasible.
10	Jimmies Paddock And Captain Pells	White Plains	MD1081139	Upon request, the County will review NC system to determine if connection to County system is feasible.
17	Jimmys Corner Store	Hughesville	MD1081047	Upon request, the County will review NC system to determine if connection to County system is feasible.
10	Joes Groceries And Liquors	Pomfret	MD1081048	Upon request, the County will review NC system to determine if connection to County system is feasible.
5	Lamonts Night Club	Indian Head	MD1081136	Upon request, the County will review NC system to determine if connection to County system is feasible.

Charles County, Maryland
Appendix 3O
Transient Non-Community Systems

Map #	NC System	Location	PWSID	County's Decision
15	Laplata Baptist Church	La Plata	MD1081050	Upon request, the County will review NC system to determine if connection to County system is feasible.
10	Laurel Springs Park	La Plata	MD1081137	Upon request, the County will review NC system to determine if connection to County system is feasible.
4	Lees Market	Indian Head	MD1081052	Upon request, the County will review NC system to determine if connection to County system is feasible.
11	Lifestream Church Of Nazarene	Waldorf	MD1081177	Upon request, the County will review NC system to determine if connection to County system is feasible.
15	Lions Camp Merrick	La Plata	MD1081053	Upon request, the County will review NC system to determine if connection to County system is feasible.
24	Loyola Retreat House	Newburg	MD1081141	Upon request, the County will review NC system to determine if connection to County system is feasible.
5	Mama Stellas	Bryans Road	MD1081192	Upon request, the County will review NC system to determine if connection to County system is feasible.
8	Marbury Baptist Church	Marbury	MD1081142	Upon request, the County will review NC system to determine if connection to County system is feasible.
8	Marbury Church Of God	Marbury	MD1081056	Upon request, the County will review NC system to determine if connection to County system is feasible.
9	Mattawoman Restaurant Bbq	Indian Head	MD1081057	Upon request, the County will review NC system to determine if connection to County system is feasible.
18	Melwood Recreation Center/ Camp	Nanjemoy	MD1080020	Upon request, the County will review NC system to determine if connection to County system is feasible.
18	Nanjemoy Community Center	Nanjemoy	MD1080037	Upon request, the County will review NC system to determine if connection to County system is feasible.
10	New Life Wesleyan Church- La Plata	La Plata	MD1081197	Upon request, the County will review NC system to determine if connection to County system is feasible.
27	Newburg Volunteer Rescue Squad Inc	Newburg	MD1081209	Upon request, the County will review NC system to determine if connection to County system is feasible.
22	Oak Grove Baptist Church	Nanjemoy	MD1081066	Upon request, the County will review NC system to determine if connection to County system is feasible.
21	Oak Ridge Park	Charlotte Hall	MD1081166	Upon request, the County will review NC system to determine if connection to County system is feasible.
30	Ole Mcdonnell Country Store	Newburg	MD1081086	Upon request, the County will review NC system to determine if connection to County system is feasible.

Charles County, Maryland
Appendix 3O
Transient Non-Community Systems

Map #	NC System	Location	PWSID	County's Decision
9	Pennys Tavern And Bbq Pit	Indian Head	MD1081067	Upon request, the County will review NC system to determine if connection to County system is feasible.
11	Phils Place	Hughesville	MD1081049	Upon request, the County will review NC system to determine if connection to County system is feasible.
14	Pisgah General Store	Indian Head	MD1081013	Upon request, the County will review NC system to determine if connection to County system is feasible.
14	Pisgah Park	Indian Head	MD1081216	Upon request, the County will review NC system to determine if connection to County system is feasible.
14	Pisgah Seventh Day Adventist Church	Indian Head	MD1081069	Upon request, the County will review NC system to determine if connection to County system is feasible.
14	Pisgah United Methodist Church	Indian Head	MD1081059	Upon request, the County will review NC system to determine if connection to County system is feasible.
5	Potomac Branch Library	Indian Head	MD1081188	Upon request, the County will review NC system to determine if connection to County system is feasible.
14	Redeeming Life Ministries International	Port Tobacco	MD1081219	Upon request, the County will review NC system to determine if connection to County system is feasible.
20	Relax Inn	Bel Alton	MD0080201	Upon request, the County will review NC system to determine if connection to County system is feasible.
11	Robert Stethem Memorial Park	Waldorf	MD1081167	Upon request, the County will review NC system to determine if connection to County system is feasible.
19	Scotts II	Welcome	MD1081105	Upon request, the County will review NC system to determine if connection to County system is feasible.
8	Smallwood St Pk Family Campground (W4)	Marbury	MD1081183	Upon request, the County will review NC system to determine if connection to County system is feasible.
8	Smallwood State Park Barn/ Museum (W10)	Marbury	MD1081189	Upon request, the County will review NC system to determine if connection to County system is feasible.
8	Smallwood State Park Concession Area (W7)	Marbury	MD1081185	Upon request, the County will review NC system to determine if connection to County system is feasible.
8	Smallwood State Pk Discover/ Marina (W5)	Marbury	MD1081112	Upon request, the County will review NC system to determine if connection to County system is feasible.
10	South Potomac Church	White Plains	MD1081217	Upon request, the County will review NC system to determine if connection to County system is feasible.
10	Southern Maryland Youth Organization	Pomfret	MD1081107	Upon request, the County will review NC system to determine if connection to County system is feasible.

Charles County, Maryland
Appendix 3O
Transient Non-Community Systems

Map #	NC System	Location	PWSID	County's Decision
13	Southern Md Criminal Justice Academy	Welcome	MD1080004	Upon request, the County will review NC system to determine if connection to County system is feasible.
14	St Catherines Church Hall	Port Tobacco	MD1081109	Upon request, the County will review NC system to determine if connection to County system is feasible.
20	St Ignatius Church And St Thomas Manor	Port Tobacco	MD1081154	Upon request, the County will review NC system to determine if connection to County system is feasible.
10	St Josephs Catholic Church	Pomfret	MD1081111	Upon request, the County will review NC system to determine if connection to County system is feasible.
20	St. Ignatius Loyola Parish (Hilltop)	Port Tobacco	MD1081110	Upon request, the County will review NC system to determine if connection to County system is feasible.
14	Tenth District Vfd	Indian Head	MD1081156	Upon request, the County will review NC system to determine if connection to County system is feasible.
15	Texas Ribs And Bbq	La Plata	MD1081089	Upon request, the County will review NC system to determine if connection to County system is feasible.
14	Thomas Stone National Historic Site	Pomfret	MD1081165	Upon request, the County will review NC system to determine if connection to County system is feasible.
17	Trinity Episcopal Church	Hughesville	MD1081178	Upon request, the County will review NC system to determine if connection to County system is feasible.
27	Wacs Hughes Lodge , Elks # 1053	Newburg	MD1081091	Upon request, the County will review NC system to determine if connection to County system is feasible.
10	Waldorf Moose Lodge # 1709	Waldorf	MD1081114	Upon request, the County will review NC system to determine if connection to County system is feasible.
27	Welcome Center (Newburg)	Newburg	MD1081095	Upon request, the County will review NC system to determine if connection to County system is feasible.
10	White Plains Park-Concession	White Plains	MD1081162	Upon request, the County will review NC system to determine if connection to County system is feasible.
19	Zion Baptist Church	Welcome	MD1081221	Upon request, the County will review NC system to determine if connection to County system is feasible.

Charles County Planning and Growth Management & Maryland Department of the Environment 2022

Charles County, Maryland
List of Appendices
Chapter 4

Charles County, Maryland
Appendix 4A
Summary of NPDES Permit Discharges

Map No.	Permit Category	Permit Type	Ptype	Treatment Facility	Operating Agency	AI ID	Bay Trib	Permit Subcategory	Permit Mode	Permit #	NPDES #	Effective Start Date	Expiration
20	Municipal	Surface	WMA2	Bel Alton WWTP	Charles County DPW	23637	Port Tobacco River - 02140109	WWTP	Active	16DP0431	MD0050334	5/1/2018	4/30/2023
27	Municipal	Surface	WMA2	Cliffton WWTP	Charles County DPW	21869	Lower Tidal Potomac River - 02140101	WWTP	Active	16DP1457	MD0055557	6/1/2018	5/31/2023
10	Municipal	Surface	WMA2	Mt. Carmel WWTP	Charles County DPW	23438	Port Tobacco River - 02140109	WWTP	Active	12DP1246	MD0053228	8/1/2018	7/31/2023
29	Municipal	Surface	WMA2	Swan Point WWTP	Charles County DPW	21876	Lower Tidal Potomac River - 02140101	WWTP	Active	15DP1674	MD0057525	12/1/2016	11/30/2021
20	Municipal	Surface	WMA2	Jude House	Charles County DPW	17262	-	WWTP	Active	03DP1684	MD0057614	-	-
9	Municipal	Surface-Major	WMA2M	Mattawoman WWTP	Charles County DPW	18954	Middle Tidal Potomac River - 02140102	WWTP	History	08DP0472	MD0021865	02/01/2010	01/31/2015
9	Municipal	Surface-Major	WMA2M	Mattawoman WWTP	Charles County DPW	18954	Middle Tidal Potomac River - 02140102	WWTP	Active	13DP0472	MD0021865	10/1/2017	9/30/2022
31	Municipal	Ground-water	WMA4	Cobb Island WWTP (Breeze Farm)	Charles County DPW	23524	Lower Tidal Potomac River - 02140101	WWTP	Active	16DP2211	MD2211I00	12/1/2027	11/30/2022
9	Municipal	Ground-water	WMA4	Gale-Bailey Elementary School	Institutional	25771	Mattawoman Creek - 02140111	WWTP	History	09DP0742	MD0023175	12/01/2011	11/30/2016
9	Municipal	Ground-water	WMA4	Gale-Bailey Elementary School	Institutional	25771	Mattawoman Creek - 02140111	WWTP	Active	17DP0742	MD0023175	-	-
27	Municipal	Surface	WMA2	Piccowaxen Middle School	Institutional	25781	Lower Tidal Potomac River - 02140101	WWTP	Active	17DP0636	MD0023451	5/1/2020	4/30/2025

Charles County, Maryland
Appendix 4A
Summary of NPDES Permit Discharges

Map No.	Permit Category	Permit Type	Ptype	Treatment Facility	Operating Agency	AI ID	Bay Trib	Permit Subcategory	Permit Mode	Permit #	NPDES #	Effective Start Date	Expiration
27	Municipal	Surface	WMA2	Piccowaxen Middle School	Institutional	25781	Lower Tidal Potomac River - 02140101	WWTP	History	03DP0636	MD0023451	01/01/2007	12/31/2011
10	Municipal	Surface	WMA2	College of Southern Maryland	Institutional	6568	Port Tobacco River - 02140109	WWTP	Active	15DP1107	MD0052311	9/1/2019	8/31/2024
16	Municipal	Ground-water	WMA4	Southern Maryland Pre-Release Unit	Institutional	12482	Gilbert Swamp - 02140107	WWTP	Active	11DP2590	MD0023914	01/01/2013	12/31/2017
16	Municipal	Ground-water	WMA4	Southern Maryland Pre-Release Unit	Institutional	12482	Gilbert Swamp - 02140107	WWTP	History	06DP2590	MD2590I99	05/01/2007	04/30/2012
16	Municipal	Surface	WMA2	Southern Maryland Pre-Release Unit	Institutional	12482	Gilbert Swamp - 02140107	WWTP	Active	14DP0750	MD0023914	9/1/2016	8/31/2021
16	Municipal	Surface	WMA2	Southern Maryland Pre-Release Unit	Institutional	12482	Gilbert Swamp - 02140107	WWTP	History	09DP0750	MD0023914	10/01/2011	09/30/2016
19	General	Discharge	WMA5	Goose Bay Marina, Inc.	Private	22996	Port Tobacco River - 02140109	Marina	Active	10MA9161	MDG999161	6/27/2019	7/31/2022
31	General	Discharge	WMA5	Pirates Den Marina	Private	126843	Mattawoman Creek - 02140111	Marina	Active	10MA9308	MDG999308	10/11/2018	7/31/2022
31	General	Discharge	WMA5	Shymansky, Robert J/bulkhead	Private	93990	Lower Tidal Potomac River - 02140101	Marina	History	10MA9332	MDG999332	12/21/2011	02/28/2016
27	Industrial	Surface	WMA1	Aqualand Marina	Private	70844	Lower Tidal Potomac River - 02140101	Marina	History	10DP3722	MD0071099	01/07/2011	01/06/2016
27	Industrial	Surface	WMA1	Genon - Faulkner Flyash Mgmt Site	Private	23551	Zekiah Swamp - 02140108	Power Plant	Active	01DP1623C	MD0056928	6/1/2020	10/31/2021

Charles County, Maryland
Appendix 4A
Summary of NPDES Permit Discharges

Map No.	Permit Category	Permit Type	Ptype	Treatment Facility	Operating Agency	AI ID	Bay Trib	Permit Subcategory	Permit Mode	Permit #	NPDES #	Effective Start Date	Expiration
27	Industrial	Surface	WMA1	Genon - Morgantown Generating	Private	3101	Lower Tidal Potomac River - 02140101	Power Plant	Active	14DP0841	MD0002674	-	-
15	Industrial	Surface	WMA1	Port Tobacco Marina, Inc.	Private	23554	Port Tobacco River - 02140109	Marina	History	10MA3721	MDG99	1/13/2017	2/28/2016
27	Industrial	Surface - Major	WMA1M	Genon - Morgantown Generating	Private	3101	Lower Tidal Potomac River - 02140101	Cooling Water	History	14DP0841A	MD0002674	-	-
27	Industrial	Surface-Major	WMA1M	Genon - Morgantown Generating	Private	3101	Lower Tidal Potomac River - 02140101	-	Active	12SR3421	MDR003421	4/10/2019	-
8	Industrial	Surface-Major	WMA1M	Naval Support Facility Indian Head	Private	1788	Middle Tidal Potomac River - 02140102	Dewatering Non-Construction	History	03DP2515A	MD0003158	8/2/2007	12/31/2008
8	Industrial	Surface-Major	WMA1M	Naval Support Facility Indian Head	Private	1788	Middle Tidal Potomac River - 02140102	Dewatering Non-Construction	Active	08DP2515	MD0003158	9/1/2012	8/31/2017
17	Municipal	Ground-water	WMA4	Benedict WWTP	Private	82393	Lower Patuxent River - 02131101	-	Active	11DP3757	-	-	-
17	Municipal	Ground-water	WMA4	Camp Winona	Private	31698	Lower Patuxent River - 02131101	WWTP	History	12DP3573	MD3573I07	12/1/2014	11/30/2019
17	Municipal	Ground-water	WMA4	Camp Winona	Private	31698	Lower Patuxent River - 02131101	WWTP	Active	19DP3573	MD3573I07	-	-
26	Municipal	Ground-water	WMA4	Lions Camp Merrick	Private	22236	Nanjemoy Creek - 02140110	Groundwater Discharge	History	11DP3747	MD3747I11	01/01/2013	12/31/2017
18	Municipal	Ground-water	WMA4	Melwood Recreation Center	Private	142834	-	-	Active	14DP3817	MD3817I14	-	-

Charles County, Maryland
Appendix 4A
Summary of NPDES Permit Discharges

Map No.	Permit Category	Permit Type	Ptype	Treatment Facility	Operating Agency	AI ID	Bay Trib	Permit Subcategory	Permit Mode	Permit #	NPDES #	Effective Start Date	Expiration
10	Municipal	Ground-water	WMA4	White Plains Post Office	Private	18306	Zekiah Swamp - 02140108	Composting Toilet	Active	16DP3211	MD3211I02	7/1/2017	6/30/2022
20	Municipal	Surface	WMA2	Relax Inn WWTP	Private	22178	Zekiah Swamp - 02140108	WWTP	Active	14DP1244	MD0053201	8/1/2020	7/31/2025
20	Municipal	Surface	WMA2	Relax Inn WWTP	Private	22178	Zekiah Swamp - 02140108	WWTP	History	07DP1244	MD0053201	08/01/2009	07/31/2014
24	Municipal	Surface	WMA2	Shine Inn WWTP	Private	22936	Wicomico River - 02140106	WWTP	Active	14DP1582	MD0056553	-	-
24	Municipal	Surface	WMA2	Shine Inn WWTP	Private	22936	Wicomico River - 02140106	WWTP	Active	07DP1582	MD0056553	04/01/2009	03/31/2014
24	Municipal	Surface	WMA2	Thunderbird Motel WWTP	Private	21865	Wicomico River - 02140106	WWTP	Active	12DP1239	MD0053155	6/1/2019	5/31/2024
24	Municipal	Surface	WMA2	Thunderbird Motel WWTP	Private	21865	Wicomico River - 02140106	WWTP	History	07DP1239	MD0053155	08/01/2009	07/31/2014
8	Municipal	Surface-Major	WMA2M	Naval Support Facility Indian Head	Private	1788	Middle Tidal Potomac River - 02140102	WWTP	Active	12DP2528	MD0020885	03/01/2014	02/28/2019
8	Municipal	Surface-Major	WMA2M	Naval Support Facility Indian Head	Private	1788	Middle Tidal Potomac River - 02140102	WWTP	Active	17DP2528	MD0020885	-	-
4	Municipal	Surface	WMA2	Indian Head WWTP	Town of Indian Head	23478	Mattawoman Creek - 02140111	WWTP	Active	15DP0590	MD0020052	6/1/2017	5/31/2022
15	Municipal	Surface-Major	WMA2M	La Plata WWTP	Town of La Plata	19072	Port Tobacco River - 02140109	WWTP	Active	13DP0518A	MD0020524	4/1/2016	3/31/2021
15	Municipal	Surface-Major	WMA2M	La Plata WWTP	Town of La Plata	19072	Port Tobacco River - 02140109	WWTP	Active	21DP0518	MD0020524	-	-

Charles County, Maryland
Appendix 4B
Inventory of Existing and Planned SewageTreatment Plants

Map No.	Treatment Facility	Operating Agency	Treatment Type	Coordinates		Occupied	Vacant	Point of Discharge	Max. Site Capacity	Design Capacity	2020 Flow Avg Day	Abandon Date
				N	E	(acres)	(acres)		(mgd)	(mgd)	(mgd)	
20	Bel Alton WWTP	Charles County DPW	Activated Sludge	225	802	0.1	0.1	Wills Branch	-	0.032	0.012	N/A
31	Cobb Island WWTP (Breeze Farm)	Charles County DPW	Lagoon						0.158	0.158	0.045	N/A
27	Cliffton WWTP	Charles County DPW	Activated Sludge & Flow Eq. Pond	198	805	1.5	3.5	Potomac River	4.5	0.07	0.07	N/A
9	Mattawoman WWTP	Charles County DPW	Activated Sludge & Tertiary Treatment	273	768	30	10	Potomac River	15	20	16.8	N/A
10	Mt. Carmel WWTP	Charles County DPW	Activated Sludge	274	825	0.5	0.5	Jenny Run	0.021	0.021	0.006	N/A
29	Swan Point WWTP	Charles County DPW	Activated Sludge & Flow Eq. Pond	173	822	2	2	Cuckold Creek	0.07	0.3	0.096	N/A
4	Indian Head WWTP	Municipal	Activated Sludge & Polishing Ponds	277	754	0.2	0.4	Mattawoman Creek	0.5	0.5	0.371	N/A
15	La Plata WWTP	Municipal	Activated Sludge	254	803	0.2	0.8	Port Tobacco River	1	1.5	1.134	N/A
24	Thunderbird Motel WWTP	Private	-	227	801	-	-	Wills Branch	0.005	0.005	0.001	N/A
10	College of Southern Maryland	State	Activated Sludge & Post Aeration	262	795	-	-	Port Tobacco Creek	0.09	0.08	0.029	N/A
8	Naval Support Facility Indian Head	State	Activated Sludge	281	749	-	-	Potomac River	-	0.5	0.163	N/A
16	Southern Maryland Pre-Release Unit	State	Disinfection	245	853	5	1.5	Gilbert Run	0.1	0.1	0.01	6/1/2020
9	Gale-Bailey Elementary School	BOE	Trickling Filters	265	757	0.4	0.2	Marbury Run	0.015	0.015	0.01	N/A
27	Piccowaxen Middle School	BOE	Secondary	192	817	-	-	Ditchley Pond	-	0.025	0.001	N/A

Charles County, Maryland
Appendix 4C
Flow Data - Wastewater Treatment Plants

Map No.	Treatment Facility	Operating Agency	2018 Flow (mgd)	2019 Flow (mgd)	2020 Flow (mgd)	3-year Average (mgd)	Design Flow (mgd)	Max Peak Flow (MGD)	Max Peak Date	Bay Cap Flow (MGD)	Development Occupancy Units
20	Bel Alton WWTP	Charles County DPW	0.007	0.009	0.012	0.009	0.032	0.020	1/14/2020	0.032	-
27	Cliffton WWTP	Charles County DPW	0.058	0.048	0.072	0.059	0.070	0.157	10/1/2020	0.070	-
29	Cobb Island WWTP	Charles County DPW	0.052	0.025	0.045	0.041	0.158	0.288	11/16/2020	0.158	-
9	Mattawoman WWTP	Charles County DPW	16.5	14.7	16.8	16.0	20.0	33.9	11/12/2020	20.0	-
10	Mt. Carmel WWTP	Charles County DPW	0.008	0.033	0.006	0.016	0.021	0.035	11/12/2020	0.021	-
29	Swan Point WWTP	Charles County DPW	0.140	0.160	0.096	0.132	0.300	0.270	11/11/2020	0.300	-
10	College of Southern Maryland	Institutional	-	0.039	-	0.039	0.060	-	-	0.060	-
9	Gale-Bailey Elementary School	Institutional	-	-	-	-	-	-	-	-	-
8	Naval Support Facility Indian Head	Institutional	0.633	0.502	-	0.568	0.5	-	-	0.5	-
27	Piccowaxen Middle School	Institutional	0.001	0.002	0.001	0.001	-	-	-	0.025	-
16	Southern Maryland Pre-Release Unit	Institutional	0.025	0.029	0.026	0.027	0.020	-	-	0.020	-
17	Camp Winona	Private	-	-	-	-	-	-	-	-	-
26	Lions Camp Merrick	Private	-	-	-	-	-	-	-	-	-
18	Melwood Recreation Center	Private	-	-	-	-	-	-	-	-	-
20	Relax Inn WWTP	Private	0.003	0.003	0.005	0.004	0.005	-	-	0.003	-
24	Shine Inn WWTP	Private	0.004	-	-	0.004	0.005	-	-	0.005	-
24	Thunderbird Motel WWTP	Private	0.002	0.003	0.008	0.004	0.005	-	-	0.005	-
10	White Plains Post Office	Private	-	-	-	-	-	-	-	-	-
4	Indian Head WWTP	Town of Indian Head	0.404	0.431	0.371	0.402	0.500	-	-	0.500	-
15	La Plata WWTP	Town of La Plata	1.081	1.278	1.134	1.164	1.500	-	-	1.500	-

Charles County, Maryland
Appendix 4D
Flow Data - Collector Sewers, Interceptors, Pumping Stations and Force Mains

PS ID	Pump Station Name	Diameter Influent (in)	Diameter Effluent (in)	No. of Pumps	Design Capacity (mgd)	2020 Flow Avg. Day (mgd)	2020 Flow Max Day (mgd)	2020 Flow Max. Date	Corresponding WWTP
PS #60	Adam's Crossing	6	6	2	0.405	0.069	0.089	11/1/2020	Mattawoman
PS #1	Bachelor's Hope	8	2	2	0.058	0.015	0.041	2/14/2020	Swann Point
PS #2	Bar Harbor Pump Station	8	6	2	0.216	0.012	0.068	1/16/2020	Swann Point
PS #3	Bath House Pump Station	-	6	2	0.346	0.000	0.012	6/26/2020	Swann Point
PS #4	Brawner's Estate Pump Station	8	4	2	0.141	0.014	0.068	5/31/2020	Mattawoman
PS #5	Breeze Farm Effluent Pump Station	10	4	2	0.360	-	-	-	Cobb Island
PS #6	Brentwood Pump Station	-	-	2	1.656	0.094	0.132	2/16/2020	Mattawoman
PS #7	Bryans Road Pump Station	8	6	2	0.432	0.075	0.202	3/1/2020	Mattawoman
PS #8	Checkers Pump Station	-	2	2	0.043	-	-	-	Mattawoman
PS #9	Cliffton #1 Pump Station	16	12	2	-	0.080	0.411	8/10/2020	Cliffton
PS #10	Cliffton #2 Pump Station	8	12	2	-	0.017	0.086	4/24/2020	Cliffton
PS #11	Cliffton #3 Pump Station	8	12	2	-	0.050	0.238	4/6/2020	Cliffton
PS #12	Cliffton #4 Pump Station	8	6	2	-	0.003	0.080	3/29/2020	Cliffton
PS #13	Cliffton Effluent Pump Station	8	12	2	-	-	-	-	Cliffton
PS #14	Cobb Island Pump Station	10	8	2	0.547	0.075	0.434	6/11/2020	Cobb Island
PS #15	Cuckold Creek Pump Station	8	2	2	0.058	0.005	0.043	5/22/2020	Swann Point
PS #16	Demarr Pump Station	18	12	2	1.400	0.096	0.184	8/15/2020	Mattawoman
PS #17	Detention Center Pump Station	8	8	2	0.471	0.037	0.191	3/9/2020	Mattawoman
PS #18	Doncaster Police Academy Pump Station	Not operational							Mattawoman
PS #19	Dorchester Pump Station	12	10	2	-	0.214	0.414	3/1/2020	Mattawoman
PS #20	Eutaw Forest Pump Station	-	-	2	0.144	0.013	0.058	7/2/2020	Mattawoman
PS #21	Greenhaven Pump Station	8	6	2	0.760	0.119	0.214	2/16/2020	Mattawoman
PS #22	Hill Road Pump Station	10	8	2	0.734	0.095	0.523	10/29/2020	Mattawoman
PS #23	Indian Head Manor Pump Station	8	6	2	0.261	0.057	0.127	3/2/2020	Mattawoman
PS #24	Laurel Acres Pump Station	8	4	2	0.202	0.008	0.059	2/16/2020	Mattawoman

Charles County, Maryland
Appendix 4D
Flow Data - Collector Sewers, Interceptors, Pumping Stations and Force Mains

PS ID	Pump Station Name	Diameter		No. of Pumps	Design Capacity	2020 Flow			Corresponding WWTP
		Influent	Effluent			Avg. Day	Max Day	Max. Date	
		(in)	(in)		(mgd)	(mgd)	(mgd)		
PS #25	Laurel Branch Pump Station	8	4	2	0.259	0.011	0.049	7/2/2020	Mattawoman
PS #26	Meyers Estates Pump Station	10	8	2	0.504	0.036	0.053	3/1/2020	Mattawoman
PS #27	Mr. Tire Pump Station	-	2	2	0.048	0.005	0.059	9/3/2020	Mattawoman
PS #28	Montomery Lane Pump Station	8	4	2	0.029	0.022	0.061	11/10/2020	Mattawoman
PS #29	Nanjemoy Community Center Pump Station	-	3	2	0.039	-	-	-	Bel Alton
PS #30	Norris Seafood Pump Station	4	4	2	0.184	-	-	-	Cobb Island
PS #31	North Pointe Pump Station	8	6	2	0.518	0.071	0.122	3/1/2020	Mattawoman
PS #32	Pinefield Pump Station	8	8	2	0.302	0.075	0.164	3/1/2020	Mattawoman
PS #33	Pomonkey Pump Station	8	6	2	0.274	0.032	0.160	11/12/2020	Mattawoman
PS #34	Potomac Heights Pump Station	-	-	3	1.210	0.108	1.323	12/24/2020	Mattawoman
PS #35	Public Facilities Pump Station	-	-	2	-	-	-	-	Mattawoman
PS #36	Route 5 Pump Station	-	8	2	0.792	0.125	0.188	4/1/2020	Mattawoman
PS #37	Route 925B Pump Station	8	8	2	0.085	0.071	0.385	4/30/2020	Mattawoman
PS #38	Route 925C Pump Station	Not operational							Mattawoman
PS #39	Ryon Woods Pump Station	8	12	2	0.187	0.029	0.043	1/2/2020	Mattawoman
PS #40	St. Charles 2A Pump Station	Not operational							Mattawoman
PS #41	St. Charles 3A Pump Station	Not operational							Mattawoman
PS #42	St. Charles 3B Pump Station	36		6	17.0	2.110	3.028	2/1/2020	Mattawoman
PS #43	St. Charles 5A Pump Station	12	12	2	2.77	0.296	0.858	5/31/2020	Mattawoman
PS #44	St. Charles 7 Pump Station	24	16	3	-	0.178	0.323	12/16/2020	Mattawoman
PS #45	Sheriff's Office Pump Station	-	-	2	0.06	0.000	0.012	9/29/2020	Mattawoman
PS #46	Southwinds Pump Station	8	6	2	0.58	0.125	0.222	4/1/2020	Mattawoman
PS #47	St. Mark's Pump Station	12	12	2	2.97	0.578	0.816	10/29/2020	Mattawoman
PS #48	Stadium Pump Station	Not operational							Mattawoman
PS #49	Stetham Pump Station	-	2	-	0.144	-	-	-	Mattawoman

Charles County, Maryland
Appendix 4D
Flow Data - Collector Sewers, Interceptors, Pumping Stations and Force Mains

PS ID	Pump Station Name	Diameter Influent (in)	Diameter Effluent (in)	No. of Pumps	Design Capacity (mgd)	2020 Flow Avg. Day (mgd)	2020 Flow Max Day (mgd)	2020 Flow Max. Date	Corresponding WWTP
PS #50	Strawberry Hills Pump Station	8	8	2	1.008	0.132	0.327	3/1/2020	Mattawoman
PS #51	Swan Point Pump Station	-	-	2	1.440	0.070	0.205	6/11/2020	Swann Point
PS #52	Swan Point Vacuum Station	-	-	2	0.312	0.015	0.092	10/8/2020	Swann Point
PS #53	Thomas Stone Pump Station	8	4	2	0.288	0.004	0.016	10/27/2020	Mattawoman
PS #54	Wakefield Pump Station	8	6	2	0.720	0.074	0.121	3/1/2020	Mattawoman
PS #55	White Plains Pump Station	8	4	2	-	0.065	0.123	3/1/2020	Mattawoman
PS #56	White Plains Park Pump Station	8	4	2	0.288	0.002	0.016	8/14/2020	Mattawoman
PS #57	Wisteria Pump Station	8	2	2	0.058	0.012	0.042	1/16/2020	Mattawoman
PS #58	Zekiah Pump Station	16	12	3	2.592	0.543	1.274	4/25/2020	Mattawoman

Source: Maryland Department of the Environment/ Charles County Department of Utilities, 2020

Charles County, Maryland
Appendix 4E
Inventory of Sludge Treatment

Treatment Facility	Operating Agency	Average Flow (mgd)	Treatment Level	Type of Treatment	Sludge Treatment	Collection System	Dry Est. Qty of Sludge (tons/MGal)	Wet Tons/yr (tons)	Percent Solids %	Chemical Additives	Sludge Disposal
La Plata WWTP	Town of La Plata	0.828	Seconday	Activated Sludge	Aerobic Digester, Plate and Frame Press	Separate	0.7	1,812	40	Ferric Chloride	Land Application
Indian Head WWTP	Town of Indian Head	0.431	Seconday	Activated Sludge w/ polishing Ponds	Sludge Holding, Drying Beds	Separate	0.58	3,887	3.5	None	Transported to Mattawoman
Mattawoman WWTP	Charles County DPW	13.5	Tertiary	Activated Sludge	Centrifuges, Lime Stabilization	Separate	0.88	17,137 w/ Lime	25.5	Ferric Chloride, Polymer	Land Application
Cliffton-on-the-Potomac	Charles County DPW	0.057	Tertiary	Activated Sludge & Flow Eq. pond	Haul to Mattawoman	Separate	0.8	872	1.3	Sodium Hypochlorite, Sodium Bisulfite	Transported to Mattawoman
Bel Alton WWTP	Charles County DPW	0.0095	Seconday	Activated Sludge & Flow Eq. pond	Haul to Mattawoman	Separate	1.46	235	2.20%	Sodium Hypochlorite, Sodium Bisulfite	Transported to Mattawoman
Breeze Farm	Charles County DPW	0.018	Primary	Lagoon	Settles in Lagoon	Separate	-	0	-	Sodium Hypochlorite, Sodium Bisulfite	N/A
Cuckold Creek	Charles County DPW	0.024	Primary	Lagoon	Settles in Lagoon	Separate	-	0	-	Sodium Hypochlorite, Sodium Bisulfite	N/A
Potomac Heights	Private	0.217	Primary	RBC's	Anaerobic Digester	Separate	0.7	-	-	None	Transported to Mattawoman
Southern MD Correction	Private	0.0238	Tertiary	-	No Onsite Treatment (Raw)	Separate	5.1	733	0.7	None	Transported to Mattawoman
College of Southern MD	Institutional	0.029	Tertiary	Activated Sludge w/ post aeration	Aerobic Digester, Drying Beds	Separate	0.7	77	40	None	Transported to Mattawoman
Piccowaxen Middle School	Institutional	0.001	Seconday	Sand filter	Aerobic Digester	Separate	0.75	44	3	None	Transported to Mattawoman
Genon (Morgantown)	Private	0.007	Tertiary	Activated Sludge	Anaerobic	Separate	0.76	15.6	4.9	None	Transported to Mattawoman
Swan Point	Charles County DPW	0.09	Tertiary	Activated Sludge & Flow Eq. pond	Gravity Thickener, Haul to Mattawoman	Separate	0.67	1537	2.30%	Aluminum Sulfate	Transported to Mattawoman
Mt. Carmel Woods	Charles County DPW	0.016	Tertiary	Activated Sludge	Haul to Mattawoman.	Separate	1.16	715	0.80%	Sodium Hypochlorite, Sodium Bisulfite	Transported to Mattawoman

Source: Maryland Department of the Environment/ Charles County Department of Utilities, 2020

Charles County, Maryland
Appendix 4F
Inventory of Marinas

Name	Maryland Grid Coordinates		Number of Slips	Hook-ups		Marine Pumpout Facility	Marina Sewage Disposal System		Water Supply System		Bacterio-logical Test	Shortage	Comments
	N	E		Water	Electric		Type	Failure	Type	Condition			
PATUXENT RIVER													
Desoto's Landing	248	893	16	Y	Y	N	SS	N	PW	G	Y	N	
Shorter's Place	248	893	28	N	N	N	SS	N	PW	G	Y	N	
Welch's Marina	247	893	20	N	N	N	SS	Y	PW	G	Y	N	
Patuxent Boat Shop	248	893	3	N	N	N	SS	Y	PW	G	Y	N	
Ray's Pier	248	893	14	Y	Y	N	SS	N	PW	G	Y	N	(1)
Benedict Marina	245	893	46	Y	Y	N	SS	N	PW	G	Y	N	
POTOMAC RIVER													
Cobb Island Marina	167	845	100	Y	Y	Y	PS	N	DR	G	Y	N	(2)(3)
Shymansky's Marina	167	845	75	Y	Y	Y	PS	N	DR	G	Y	Y	(2)(3)
Captain John's	167	845	68	Y	Y	Y	PS	N	DR	G	Y	N	(2)(3)
Saunder's Marina	167	845	30	Y	Y	Y	PS	N	DR	G	Y	N	(2)(3)
Bruce's Marina	167	845	30	Y	Y	Y	PS	N	DR	P	Y	N	
Aqualand Marina	194	804	186	Y	Y	N	SS	N	DR	G	Y	N	(7)
Swan Point Marina	172	825	40	Y	Y	Y	PS	N	PW	G	Y	N	(2)
Sweden Point Marina	262	745	50	Y	Y	Y	SS	N	DR	G	Y	N	(3)(5)
PORT TABACCO RIVER													
Port Tabacco Marina	242	792	250	Y	Y	Y	PT	N	DR	G	Y	N	(6)
Goose Bay Marina	227	785	250	Y	Y	N	SS	N	DR	G	Y	N	

KEY TO SYMBOLS

Marina Sewage Disposal System

SS - Subsurface Discharge
CT - Chemical Toilet
PS - Public Collection System
HT - Holding Tank
PT - Portable Pumpout Unit

Water Supply System

DR - Drilled Well
DU - Dug Well
PW - Public Water

General Symbols

G - Good
P - Poor
Y - Yes
N - No
PC - Pending Construction

Notes

(1) Mound system for disposal of sewage
(2) Public sewage collection system for marina & associated facilities
(3) Pump-out facilities available
(4) Holding tank for marina and associated facilities
(5) Holding tank for pump-out facility
(6) Portable sewage pump in use
(7) Has approached County for connection to public sewer

Charles County, Maryland
Appendix 4G
Inventory of Sewage Problem Areas

Map No.	Name	Operating Agency	Location	Coordinates		Population	Treatment Capacity (mgd)	Treatment Demand (mgd)	Description of Problem
				North	East				
4	Potomac Heights	Private	Indian Head	280.5	760.5	1200	0.2	0.217	High inflow/infiltration. Tower under repair; currently utilizing bladder tanks to maintain pressure and storage.
27	Clifton on the Potomac	Charles County DPW	Cliffton	198	805	1500	0.07	0.05	Insufficient capacity to accommodate all recorded lots
4	Indian Head WWTP	Town of Indian Head	Indian Head	277	754	4000	0.42	0.316	Moderate inflow/infiltration
15	La Plata WWTP	Town of La Plata	La Plata	254	803	7200	1.5	0.828	High inflow/infiltration
9	Gale-Bailey Elementary School	BOE	Marbury	265	757	340	0.015	0.005	NPDES Violation
4	Lackey High School	BOE	Indian Head	272	763	1064	0.028	0.027	NPDES Violation; aging infrastructure

Source: Maryland Department of the Environment, Charles County Department of Planning and Growth Management, Charles County Department

Charles County, Maryland
Appendix 4H
Projected Sewage Demand and Planned Capacity
Public/Municipal

Map #	Name	2019						2040					
		Population			MGD			Population			MGD		
		Total	Served	Not Served	GPCD	Demand	Rated[2]	Total	Served	Not Served	GPCD	Demand	Planned
31	Cobb Island WWTP (Breeze Farm)	846	846	0	57	0.05	0.16	1500	1500	0	105	0.16	0.16
27	Cliffton WWTP	787	787	0	32	0.03	0.07	1000	1000	0	35	0.04	0.07
9	Mattawoman WWTP	86300	86300	0	170	14.7	20.0	113300	113300	0	166	18.8	20.0
10	Mt. Carmel WWTP	200	190	10	175	0.03	0.02	200	200	0	166	0.03	0.02
29	Swan Point WWTP	1000	946	54	169	0.16	0.30	2000	2000	0	97	0.19	0.30
4	Indian Head WWTP	3500	3500	0	123	0.43	0.50	5500	5500	0	91	0.50	0.50
15	La Plata WWTP	9500	9500	0	135	1.28	1.50	25000	25000	0	100	2.50	2.50

Source: Charles County Department of Utilities and Planning and Growth Management, 2020

Appendix 4I

Failing Septic Identification and Priority Ranking

FAILING SEPTIC IDENTIFICATION AND PRIORITY RANKING

The identification of sewerage problem areas is a process involving the County Department of Planning and Growth Management, the Environmental Health Division of the Department of Health, and citizens affected by water supply problem areas. The Charles County Department of Health has identified a number of areas as potential problem areas; these are designated with the "E" suffix on the official Charles County Water and Sewer Maps. These were based on initial surveys by the Charles County Department of Health, through reports received from the Maryland Department of the Environment; and actual field visits and input from citizens. The Department of Health will determine whether an area is failing based on the number of individual septic systems which fall into one or more of the "failing conditions" stated below. A threshold 30% failure rate is necessary to be eligible for potential correction. The six failing condition categories are:

1. Sewerage discharge into an aquifer currently being used as a water source by wells in adjacent areas;

2. Sewerage discharge into surface waters;

3. Sewerage discharge to the ground surface;

4. Sewerage discharge into any groundwater aquifer not designated to receive sewerage by a County groundwater protection report;

5. Insufficient area to replace an existing septic in accordance with COMAR 26.04.02; or

6. Any other cause of septic tank failure.

In order to objectively evaluate all areas identified as sewerage problem areas by the Charles County Department of Health for potential correction, the County has developed a priority system. This priority system enables systems to be compared to each other, if funding is limited. The priority system evaluates 7 factors, which include:

a. Community - The location of the area and the Comprehensive Plan designation of the area.

b. Percentage Failing - Higher failure rates is an importance factor.

c. Identification of the Problem - Ranking according to the factors identified above.

d. Proximity - Proximity to infrastructure which could offer potential correction.

e. Cost - Cost necessary to correct problem.

f. Revenue Source - Potential or actual revenue source should be identified. This may include grants, developer contributions, loans, or County funded or subsidized programs.

g. Hardship - The ability of the residents to affect costs.

A priority score is derived and evaluated in light of current conditions. These are used to objectively evaluate failing septic areas.

Charles County, Maryland
Sewerage Problem Area
Priority Matrix

Community

First Priority
- Existing Commercial/Industrial/Business areas within Development District

Second Priority
- Future Commercial/Industrial/Business areas within Development District

Third Priority
- Existing residential ERUs within Development District

Fourth Priority
- Future residential ERUs within the Development District

Fifth Priority
- Existing Commercial/Industrial/Business areas outside Development District

Sixth Priority
- Future Commercial/Industrial/Business areas outside Development District

Seventh Priority
- Existing residential ERUs outside of the Development District

Eighth Priority
- Future residential ERUs outside of the Development District

Identification of Problem

First Priority
- Discharge to adjacent water source aquifers

Second Priority
- Discharge to aquifers

Third Priority
- Discharge to the ground surface

Fourth Priority
- Discharge to aquifers not designated to receive sewage, as per County's groundwater protection report

Fifth Priority
- Any other cause of failure

Sixth Priority

Proximity

- Insufficient area to repair/replace as per COMAR 26.04.02

First Priority
- Areas which can interconnect

Second Priority
- Areas requiring an on - site system

Revenue Sources

First Priority
- Revenue from sources other than the County

Second Priority
- Revenue from source to be established and administered by County

Third Priority
- Revenue from County funds

Charles County, Maryland
Sewerage Problem Area
Priority Matrix

Area:
Map Number:

	Weighting Factor		Weighted Score
Community			
Development District			
Yes		X 5	
No		X 1	
Existing Commercial Business/Industrial ERCs		X 5	
Future Commercial Business /Industrial ERCs		X 4	
Current ERCs		X 3	
Future ERCs		X 2	
		Subtotal	
Percent Failing (check one)			
30% to 40% failing		X 5	
41% to 55% failing		X 10	
56% to 65% failing		X 15	
66% to 75% failing		X 20	
76% to 100% failing		X 25	
		Subtotal	
Identification of Problem (check one)			
Discharge to adjacent water source aquifers		X 25	
Discharge to aquifers		X 20	
Discharge to the ground surface		X 15	
Discharge to aquifers not designated to receive sewage		X 10	
Any other cause of failure		X 5	
Insufficient area to repair/replace		X 5	
		Subtotal	
Proximity (Check one)			
Interconnect			
Closest Central System		X 25	
On Site		X 10	
		Subtotal	
Cost to Remedy Problem			
Cost (in $millions)			
Revenue Source (percentage available)			
Grants		X 25	
Developer CIAC		X 25	
County R&R fund		X 10	
Owner/Developer/Association approved special assessment		X 25	
Other Funding Source		X 15	
Subtotal		Subtotal	
Hardship			
Ultimate cost per each existing ERCs			
Ultimate cost per each existing ERCs < $3,000		X 25	
Ultimate cost per each existing ERCs > $3,000		X 10	

APPENDIX 4 J

Failing Septic Petition Process

FAILING SEPTIC PETITION PROCESS

The County Commissioners of Charles County, Maryland, on adopting this Comprehensive Water and Sewerage Plan, establish a policy framework for a petition process for the correction of failing septic systems, and conversion to the public sewerage systems operated by the County. This policy applies only to designated failing septic areas within the Mattawoman Sewer Service Area (MSSA). This Water and Sewer Plan provides additional guidance for other areas outside the MSSA.

This policy framework is patterned after the process used to provide public sewer service to four areas in the County - Glymont, Brookshaven, Laurel Drive, and Sun Valley/Stavors Road. This process is also similar, in form, to the water supply petition process. Both these processes have been given legal authority by the Governor's signature of House Bill 656 "Authority to Construct, Extend, and Acquire Water or Sewer Systems or Stormwater Management Areas". It has been assigned Chapter No. 464 in the Charles County Code. The Act took effect October 1, 1997.

This policy framework will be further detailed and administrative procedures developed upon adoption of the Water and Sewer Plan. The Act allows the County to develop a method of determining the annual benefit assessments to be levied against the properties served by the constructed water and/or sewer lines. The procedures shall specify the time and manner of payment, which may not exceed fifteen (15) years. The County Commissioners can determine the amount of interest to be charged. It should be noted that this process can receive funding from a variety of sources. These include grants, low interest loans, developer contributions in conjunction with the development guidance system, the County's failing septic correction fund, a pro-rated share of paid by the affected residents, and other sources. In most cases the cost of construction will be offset by a benefit assessment charged to the property owner benefiting from the service extension and augmented with whatever assistance the County may receive. This policy framework is as follows:

1. Contact made by citizens with the County by phone, letter, or meeting. The citizens (petitioners) shall own property which is to be served by the constructed or extended sewer system.

2. Field inspection by County staff of the designated failing septic area and examination of existing and planned facilities in the area.

3. Staff reports to the County Commissioners on the status of the failing septic area, local facilities, and scenarios for correction.

4. If the Commissioners decide to proceed with the correction of the designated failing septic area, affected residents are informed of a public information meeting.

5. Public information meeting is held. Residents are informed of: proposed process to correct the failing septic area; preliminary costs associated with the work; funding source to be used; benefits of the program; and other information, as directed by the County

Commissioners.

6. Preliminary report, proposed construction timetable, and petition package released to the public. A public hearing will be held on these materials.

7. Public hearing held.

8. Commissioners approve or disapprove the petition.

9. All documents, data, drawings forwarded to the County Capital Improvement Planning Division. The design, construction, and organization processes are initiated at this point.

10. Design contract put out to bid.

11. Design Contract awarded.

12. Construction contract put out to bid.

13. Construction contract awarded.

14. Construction begins.

15. Construction completed.

16. System dedicated to County.

17. County assumes ownership, operation and maintenance of system.

Charles County, Maryland
List of Appendices
Chapter 5

Appendix Number	Appendix Title	Subheading
5A	Water Supply Capacity Management Plan	Town of La Plata
5B	Wastewater Capacity Management Plan	Town of La Plata

WATER SUPPLY CAPACITY MANAGEMENT PLAN
TOWN OF LA PLATA 1-1-2020
Table of Contents

Figures Tables and Appendices

WATER SUPPLY CAPACITY MANAGEMENT PLAN
September 1, 2020

Based on Environmental Regulations, The Maryland Department of the Environment (MDE) has issued a requirement that the operator of a public water system must adopt a Water Supply Capacity Management Plan (WSCMP) and submit certain reports when the flow through the system reaches 80% of its water appropriation permit. According to Table 7.2 in this plan, the average daily consumption in La Plata during 2019 was 878,300, 76.77% of its permitted withdrawal based on the Ground Water Appropriation Permit (GAP) issued by MDE . Prior to 2008, the GAP only allowed the Town to withdraw 1.335 million gallons per day (MGD) during the month of maximum use. (MMU), The average consumption during June of 2019 increased to 1,053,200, 61.38% of the amount permitted during the month of maximum use The Town had already applied for an increase in its GAP. Due to the limitations of the Lower Patapsco Aquifer, MDE refused to increase La Plata's GAP, but did agree to increase the permitted withdrawal in the month of maximum use to 1,716,000. Even though the average production in June of 2019 was 1,053,200, it was still only 61.38 % of the permitted withdrawal during the MMU. The average flow is still not high enough to require the Town to prepare a WSCMP based on MDE requirements. MDE has some serious concerns about the ability of the Lower Patapsco Aquifer to provide enough water to support the anticipated growth in La Plata and Charles County. The Town is very concerned about its ability to provide enough water to supply the anticipated growth over the next ten years. This WSCMP is intended to help justify the need for an additional appropriation. La Plata has the potential to more than double the existing population in the next 15 or 20 years and this plan is intended to insure that there will be an adequate supply of potable water when it is needed.

1.0 BACKGROUND

La Plata is the County Seat of Charles County, Md. The Town was incorporated in 1888 and grew slowly until the 1960's. Through a series of annexations, the Town became one of the fastest growing municipalities in Maryland and the population according to the 2010 census was 8,753.

The La Plata water system was built in 1927. The original system was designed to serve a population of less than 1,000 people. It included one elevated storage tank with a capacity of 75,000 gallons and two wells. The distribution system was equipped with fire hydrants throughout the built up area of the Town. The water system, as it was constructed, served the entire town and it has been expanded as needed to continue to serve the entire Town as its borders have been extended.

As their performance deteriorated, both of the original wells were abandoned and the original elevated tank was lost when a tornado destroyed much of the Town's business district on April 28, 2002. Over the years, the water system has been expanded, as shown in Table 7.2, to serve a population of nearly 10,000 people. There were a total of 3,609 accounts and connections to the system as of September 1, 2020.

In addition to five production wells, the system has three elevated storage tanks distributed throughout the Town with a combined capacity of 1.3 million gallons. The system also includes a 750,000 gallon ground level tank with two 750 gallon per minute (GPM) booster pumps to provide additional flow and pressure to the northeast quadrant of Town. All of the expansion that has taken place is consistent with the Town's Comprehensive Plan and the Charles County Water and Sewer Plan. The system is also in compliance with all regulations imposed by the Safe Drinking Water Act.

There are four major housing developments under construction or in the planning stages within the Town at the present time. The population projections and growth projections shown in Table 6.2 seem to indicate that the Town will need to supply about 2.5 million gallons per day (MGD) when the buildout has been completed, probably some time around 2030. The water system as it is now constituted will supply up to 2 MGD but the maximum permitted by the Town's Groundwater Appropriation Permit (GAP) will have to be increased to make use of the production capability MDE has permitted and the Town has provided. Two additional wells and two more elevated storage tanks may eventually be needed to provide an adequate reserve and maintain pressure as the Town continues to grow.

The La Plata Wastewater Treatment Plant (WWTP) been upgraded to meet Enhanced Nutrient Reduction (ENR) standards. McCrone Engineering is currently working on designing another upgrade that will increase the capacity to 2 mgd. In view of the number of building permits the Town expects to issue in the next few years, there may be a limited amount of available capacity left in the treatment plant by the time the upgrade is completed. Indications are that the anticipated growth will continue until about 2032. Table 1.1 shows the average flow and available capacity in the WWTP as of 1-1-2020'

TABLE 1.1 WWTP CAPACITY 2019	
Capacity of WWTP 1-1-19	1,500,000
Average daily effluent 2019	1,134,600
Average daily sewage generation August and October, 2019	928,800
Three year average effluent, 2017, 2018 and 2019	1,164,833
Average daily I and I 2019	205,800
Percent of I and I 2019	22.2%
Three year average I and I	180,200
Three year average percent of I and I	15.5%
Available Capacity edu's 1-1-20	1510
Available Capacity edu's 1-1-20 less average I and I	1290

After extensive discussions with MDE, the decision was made to upgrade and expand the treatment plant in phases. The first phase began in July of 2011 and only involved the conversion to ENR standards with the rated capacity remaining at 1.5 MGD. This project was completed in 2014. In order to reduce the I&I and increase the available capacity of the plant, a 1.5 Million Equalization tank is under construction and should be in service before the end of 2020.

Phase 2 will increase the capacity to 2.0 MGD. Based on the anticipated growth, McCrone Engineering has been contracted to make use of the existing plant to increase the capacity on a staged basis to ultimately reach 2.5 MGD. . Based on projections and existing zoning, it appears that phase 2 should begin as soon as possible

2.0 REGULATIONS

The Environmental Article of the Annotated Code of Maryland makes it clear that the Town of La Plata must ensure that adequate water supply capacity is, or will be, available before issuing building permits or approving subdivision plats. House Bill 1141, adopted by the Maryland State Legislature in 2007, required the Town to add a Water Resources Element(WRE) to its comprehensive plan to insure that the planned land use does not exceed the Town's ability to provide the potable water needed to serve the new residents. This WSCMP is part of the strategy the Town has adopted to implement the concepts included in that document.

These regulations and the Comprehensive Plan require that before approving building permits, subdivision plats or site development plans, the Town must meet certain requirements.

2.1 BUILDING PERMITS AND SITE DEVELOPMENT PLANS

In order to issue a building permit or approve a site development plan, the Town is required to verify both of the following:

1. The water supply system is adequate to serve the proposed construction, taking into account all existing and approved developments in the service area.

2. The development described in the application will not overload the existing system for conveying, pumping and producing potable water or exceed the Groundwater Appropriation Permit.

2.2 SUBDIVISION PLATS

Before approving a subdivision plat, the Town is required to verify the following:

1. Any approved facility for conveying, pumping or producing the amount of potable water that will be needed to serve the proposed development exists, or will be completed by the time it is needed, and will be adequate to serve the proposed development without overloading the existing system.

2. The system conforms to the Charles County Comprehensive Water and Sewer Plan and the Town's Comprehensive Plan, including the growth and water

resources elements. This WSCMP will also take into consideration all previously approved and recorded subdivision plats and building permits.

2.3 REQUIRED REPORTS

The “Water Supply Capacity Management Plan” (WSCMP) should be submitted to MDE prior to January 31st each year. The information in the WSCMP will form the basis for the water allocation system adopted by the Town: This report will include information about the subdivision plats that have been approved and recorded, site development plans that have been approved, developer agreements that have been made and building permits issued.

A WSCMP was initially created in 2008 and has been updated periodically since that time. The 2012 update was delayed by the major changes that were under way in upgrading the Town’s infra-structure. Two major projects began in July of 2011. An automated metering infra-structure system was installed to enable the Town to obtain meter readings over the inter-net instead of sending an employee to each meter in Town four times a year for billing purposes. The Mueller MiNet system as it was installed included more than 1500 new Remote Disconnect Meters that should have the ability to turn the water on and off to any of these connections, without interrupting the supply to any sprinkler systems that have been installed for fire protection. The RDM meters used a new technology that is still under development and reliability has been disappointing. The ENR upgrade project at the WWTP also began in July of 2011.

3.0 CONTROLLING ALLOCATION OF NEW CONNECTIONS

The Town has established a policy covering infra-structure requirements and a control and accounting system to manage the allocation of available water supply capacity. Copies of the accounting system, along with periodic tracking reports concerning the allocation of water supply capacity, are part of this document..

The allocation system includes the following:

1. A current record of the remaining capacity available in the system. A complete review of the available capacity and potential requirements will be made at the beginning of each calendar year.
2. A technical review team has been established and will review each application for water and sewer service.
3. Public Works Agreements and bonds for construction will be required before final approvals are given If improvements are needed to serve a proposed development adequately,
4. Notes will be included on the subdivision plat, where applicable, that there may not be a water allocation for construction available immediately.
5. Unless the allocation has been extended, allocations will revert to the Town’s unallocated capacity after three years if construction has not begun.

6. A note will be made on the plans as part of the approval process that specifies when the allocation will lapse.
7. An appeal process that allows the Town to extend the time to begin construction if the situation justifies it.

4.0 LOCAL PROCESS REQUIREMENTS

The Town has adopted an allocation policy and a detailed tracking system to manage the remaining water supply capacity of the storage tanks, the distribution system and the wells that supply them. The La Plata Planning Department will maintain this system and administer this policy.

Water supply capacity for a new subdivision will be allocated and reserved when the final subdivision plat is approved, signed and recorded. According to MDE guidelines, “Prospective approval is permissible if there is a very strong indication that any improvements will be available in time”. If capacity in the distribution system and/or the production capability is not available or under construction at the time the plat is approved, it will be clearly marked with the information that “water supply capacity may not be available immediately for construction”.

Water supply allocations will have a “sunset provision”. On site construction, either on the lot or within the area covered by the subdivision must begin within three years of the time the allocation is made and each final plat will be clearly marked with the expiration date. If the start of construction is delayed beyond the three year expiration date of the allocation, the property owner will have an opportunity to appeal to the Town for an extension. If the Town decides that an extension is justified, the expiration date can be delayed up to 12 months at a time. If an extension is not requested and granted before the allocation expires, the applicant will have to apply for a new allocation and go through the regular process before building permits will be issued.

Portions of the Town’s distribution system may not have enough capacity to furnish the required flow at a workable pressure for proposed subdivisions. No subdivision plats for these service areas will be approved and recorded until a public works agreement has been signed or other arrangements have been made to provide the necessary off site infra-structure to provide the needed flow.

When a preliminary plat is received, the Planning Department will initiate a project status worksheet similar to Figure 5.2. This worksheet will be used to track the progress of the development and verify that there will be adequate capacity in the water and sewer systems to accommodate the additional flow without reducing the operating pressure below acceptable limits.

5.0 DISTRIBUTION SYSTEM CAPACITY

Each of the major developers, or potential developers, in La Plata has employed an engineering firm to design improvements that will enable them to provide an adequate supply of water at an acceptable operating pressure to their development. In September of 2006, the Town appointed an advisory committee composed of five experienced resident professionals to analyze the needs of the water and sewer systems in La Plata and co-ordinate the efforts of each of these engineering firms. The Town has also established a Technical Review Team (TRT) consisting of representatives from planning, inspection, operations and the finance department. Each new subdivision or major commercial development will be referred to the TRT for review and recommendations before the preliminary plats or site plans are approved and recorded.

There is some concern that the operating pressure in some sections of Town may be too low for effective operation of the sprinkler systems that the Town requires in all new construction. Portions of the system have been included in models that various engineering firms have developed in connection with new construction, but there is no overall model of the water system in La Plata. The advisory committee has recommended that a model be created and the Town Council has expressed a desire to have accurate maps and capacity information for both the water and sewer systems.

To meet this need, Spatial Systems of Columbia, Maryland has created a web site for the Town based on existing maps and drawings of both the water and sewer systems using GIS co-ordinates. The Town has been divided into eleven sewer service areas with a number of utility zones as shown in figure 5.1. A standard numbering system is used to locate fire hydrants, valves, and pipes in the water distribution system. These numbers have been co-ordinated with the sewer collection system and storm water management system within the Town limits. A detailed map of the Town's infra-structure that can be used by Town Staff for maintenance, replacement and planning purposes is available on the web site.

6.0 DETERMINING EXISTING WATER DEMANDS

Demands being made on the water system change rapidly in a jurisdiction growing at the rate the Town of La Plata has experienced. There are a number of ways to determine the amount of water that is needed to meet the demands of the existing users and estimate what will be needed to serve the Town in the future. Four different methods are included in this plan. The first and most basic involves counting the number of users and estimating how much water each of them requires. Another method of determining existing demand is by analyzing the Monthly Operations Reports (MOR) covering how much the wells pumped. This report not only covers the amount of water that is used for domestic purposes, it includes the water used at the Wastewater Treatment Plant and other unbilled usage as part of the process, as well as any water that may be lost through leaks in the system or other unmeasured losses. A similar method involves using the billing records to determine how much water has gone through the water meters. Finally, a comparison of past population compared with water consumption can be projected into the future based on population projections. Table 6.1 combines the results obtained from all of these approaches.

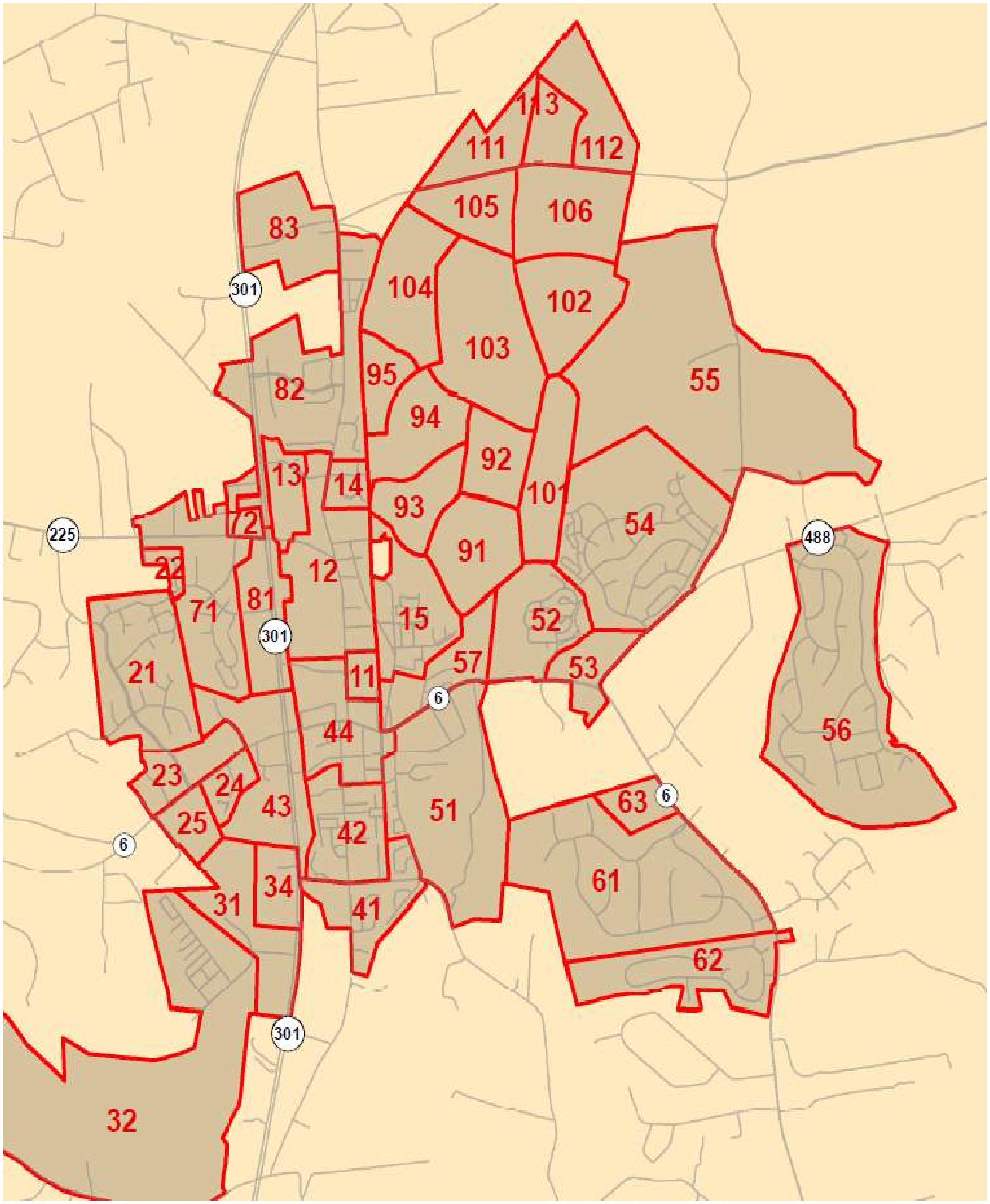


FIGURE 5.1 UTILITY ZONE MAP

Figure 5.2 ALLOCATION WORKSHEET

Project:____

Owner:__________________________**Date of application**___________________________

Contact Person___________________**Address**___________________________________

Telephone___________________**Fax**________________**Email**______________________

WATER AND SEWER ALLOCATIONS – TOWN OF LA PLATA								
NUMBER OF EQUIVALENT DWELLING UNITS (222 GPD)								
PROJECT	PRELIMINARY		FINAL PLAT		BLDG PERMIT		UNDER CONST	OCCUP
	SUB	APP	SUB	REC	SUB	ISSUED		

TABLE 6.1 SUMMARY FLOW TABLE - LA PLATA WATER SYSTEM DEMAND(edu=222 gpd)								
SERVICE AREA	**ANNUAL**	**DAILY**	**EDU'S**	**GPM**	**EDU INVENTORY**			
EXISTING OR UNDER CONSTRUCTION 1-1-12					**RES**	**COM**	**INST**	**TOTAL**
Sewer Service Area No. 1 - Old Town North	34,484,713	115,699	521	80	371	11	103	485
Sewer Service Area No. 2 – Quailwood	15,318,100	51,393	232	36	293		47	340
Sewer Service Area No. 3 - Rt 301 South	3,933,100	13,196	59	9	44	14		58
Sewer Service Area No. 4 - Old Town South	64,636,807	216,861	977	151	452	103	214	769
Sewer Service Area No. 5 -Willow Lane PS	85,168,700	285,747	1,287	198	1,011	22	279	1312
Sewer Service Area No. 6 - Clark's Run	16,888,400	56,662	255	39	317			317
Sewer Service Area No. 7 – Hawthorne	15,808,700	53,039	239	37	211	41	16	268
Sewer Service Area No. 8 - Wash. Ave. North	31,663,350	106,233	479	74	65	332	2	399
Total Water Demand Existing 8-1-2012	267,901,870	898,829	4,049	624	2,764	523	661	3,948
PLANNING STAGES								
SERVICE AREA	**ANNUAL**	**DAILY**	**EDU'S**	**GPM**	**RES**	**COM**	**INST**	**TOTAL**
Sewer Service Area No. 1 - Old Town North	0	0	0	0	0			0
Sewer Service Area No. 2 – Quailwood	0	0	0	0	0			0
Sewer Service Area No. 3 - Rt 301 South	43,918,260	120,324	542	84	462	80		542
Sewer Service Area No. 4 - Old Town South	11,587,290	31,746	143	22	63	80		143
Sewer Service Area No. 5 -Willow Lane PS	34,113,630	93,462	421	65	421			421
Sewer Service Area No. 6 - Clark's Run	1,701,630	4,662	21	3	21			21
Sewer Service Area No. 7 - Hawthorne + PS	12,640,680	34,632	156	24	156			156
Sewer Service Area No. 8 - Wash. Ave. North	16,844,750	46,150	208	32		208		208
Sewer Service Area No. 9 – Heritage Green Section 1	78,260,746	214,413	966	149	1,003		9	1012
Sewer Service Area No. 10 - Heritage Green Section 2	96,399,419	264,108	1,190	183	1,334	15	2	1352
Sewer Service Area No. 11 - Heritage Green Section 3	63,059,298	172,765	778	120	513	498		1011
Potential future growth	154,362,150	422,910	1,905	294	1,905			1905
Total Water Demand from Projected Growth	468,969,593	1,284,848	5,788	892	5,416	801	11	6,229

TABLE 6.1 SUMMARY FLOW TABLE - LA PLATA WATER SYSTEM DEMAND(edu=222 gpd)								
ULTIMATE WATER DEMAND TABLE								
	ANNUAL	**DAILY**	**EDU'S**	**GPM**	**RES**	**COM**	**INST**	**TOTAL**
Sewer Service Area No. 1 - Old Town North	34,484,713	115,699	521	80	371	11	103	485
Sewer Service Area No. 2 – Quailwood	15,318,100	51,393	232	36	293	0	47	340
Sewer Service Area No. 3 - Rt 301 South	47,851,360	133,520	601	93	506	94	0	600
Sewer Service Area No. 4 - Old Town South	76,224,097	248,607	1,120	173	515	183	214	912
Sewer Service Area No. 5 -Willow Lane PS	119,282,330	379,209	1,708	263	1,432	22	279	1,733
Sewer Service Area No. 6 - Clark's Run	18,590,030	61,324	276	43	338	0	0	338
Sewer Service Area No. 7 - Hawthorne + PS	28,449,380	87,671	395	61	367	41	16	424
Sewer Service Area No. 8 - Wash. Ave. North	48,508,100	152,383	686	106	65	540	2	607
Sewer Service Area No. 9 – Heritage Green Section 1	78,260,746	214,413	966	149	1,003	0	9	1,012
Sewer Service Area No. 10 - Heritage Green Section 2	96,399,419	264,108	1,190	183	1,334	15	2	1,352
Sewer Service Area No. 11 - Heritage Green Section 3	63,059,298	172,765	778	120	513	498	0	1,011
Potential future growth	154,362,150	422,910	1,905	294	1,905	0	0	1,905
Total Projected Water Demand	780,789,723	2,304,001	10,378	1,600	8,642	1,404	672	10,719
TOTAL PROJECTED WATER DEMAND FOR LA PLATA								
Total projected demand	780,789,723	2,304,001	10,378	1,600	8,642	1,404	672	10,719
Projected demand from Heritage Green	237,719,463	651,286	2,934	452	2,850	513	11	3,375
Percent of demand from Heritage Green	**30.4%**	**28.3%**	**28.3%**	**28.3%**	**33.0%**	**36.6%**	**1.7%**	**31.5%**

6.1 CALCULATING EXISTING FLOWS AND FUTURE NEEDS BASED ON USER INVENTORY AND WATER METER RECORDS

The Town has been divided into 11 sewer service areas (SSA) each of them with an access point to the overall sewer collection and water distribution systems designated for each one. Each SSA has been further divided into Utility Zones UTZ. An inventory has been completed of the number of dwelling units in each of them using water billing records to determine actual usage through each connection. Experience has showed that the average flow per equivalent dwelling unit (edu) in La Plata is 222 gallons per day (GPD). The number of single family dwellings in each of the SSA's was counted. The average water usage was used to estimate the number of edu's assigned to commercial, institutional and multi-family buildings. The water supply demand figures on Table 6.1 were based on these calculation. It also contains an estimate of future growth in each SSA and the anticipated water demands both now and in the future based on the anticipated number of edu's to be added. Table 6.1 is a summary of this inventory and the available capacity in the water system that will be required for each of the SSA's. Table 6.3 on page 15 compares the actual flow at the present time with the anticipated flow over the next twelve years as the Town is built out based on final plats and concept plans that have been approved.

Based on Table 6.2, the average amount of water produced by the wells was 863,657.GPD during fiscal 2019. The total measured flow was 688,883 GPD, assuming one edu equals 222 GPD. The measured dry weather flow through the sewer plant during August and October of 2019 as shown in Table 1.1 was 928,800 GPD . All of this is consistent with the 222 GPM per EDU figure.

6.2 CALCULATING EXISTING FLOW BASED ON WATER METER READINGS

The flow through each of the connections to the La Plata water system is measured by a water meter. Nearly all of these have been read by Town Public Works employees quarterly and the users were billed on the amount of water used during the preceding three month period. Table 6.2 shows the amount of water metered each quarter for the last 7 years.

The largest single user that is not included in the billing is the Town's Wastewater Treatment Plant. This plant uses potable water for some of the treatment processes as well as for clean-up around the facility. While the usage is measured, the meter was not read and recorded by the Town on a regular basis until 2007. During March of 2007, it was discovered that there was a problem with the grit removal system and an average of 65,000 GPD of potable water was going through the system unrecorded. The problem was repaired, and the operator at the WWTP began to record the reading on the water meter daily. Since that time, the average flow through the plant has averaged less than 2,000 GPD. All of the unbilled water meters are now read and recorded on a regular basis by the Mueller MiNet AMI system..

6.3 CALCULATING EXISTING FLOW BASED ON MONTHLY OPERATING REPORTS

Maryland Environmental Services (MES) personnel record the amount of water each of the existing wells pumps every day. A monthly operating report (MOR) derived from these daily readings is submitted to MDE by MES every month. Table 7.1 on page 20 contains a summary of the MORs for 2019. One advantage to using the MOR versus the billing reports is the fact that the MOR shows the flow each day in addition to the monthly average. Table 6.2 includes the year end data from these reports for the last seven years. According to the MORs , the Town wells produced an average of 855,100 gpd in 2019 and a seven year average of 864,657 gpd. This is significantly more than the billing report shows.

6.4 DIFFERENCES IN FLOW READINGS

Even allowing for some inaccuracies, there is a significant difference between the information on the MORs and the billing records. Comparing MORs and billing records with the flow through the WWTP during periods of dry weather seems to indicate that the production figures are closer to right than the billing reports. The most likely cause for this discrepancy is the accuracy of the water meters. Many of the Town's meters were quite old, and are likely to have shown less than actually flowed through them. The Town began a program in 2008 to replace the direct read type device with radio read meters. More than 1,000 of the 3,100 meters had been replaced as of 1-1-11. In order to get the maximum benefit from the investment, the oldest meters were replaced first. This program was placed on hold in 2010 when the Town applied for a grant to install an Automatic Meter Reading system.

As part of the AMI installation, all of the meters that were more than five years old were replaced by Hersey 420 RDM meters. One improvement that should have come the combination of replacing all of the older meters and providing real time flow data should enabled the Town to reduce the gap between billed usage and actual production in the future. With the installation of the new system, there was a big improvement in the first few years. Unfortunately, there have been problems with the new meters, and the gap has been increasing again. The Town has been working with Mueller, and the hope is that the accuracy of the system can be improved at least to what it was when it was originally installed.

TABLE 6.2 SUMMARY OF CHANGES IN PRODUCTION COMPAREDWITH USAGE								
PERIOD	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**AVG**
1st Quarter	768,205	793,115	774,187	790,007	794,417	752,807	678,019	*764,394*
2nd Quarter	672,262	649,733	659,116	661,941	667,211	635,486	552,083	*642,547*
3rd Quarter	721,301	665,409	639,351	654,357	632,802	588,283	577,448	*626,275*
4th Quarter	735,723	747,848	731,297	737,863	720,324	625,078	679,616	*707,004*
AVERAGE	720,234	714,026	700,988	711,042	703,689	650,414	621,792	*688,883*
% change	1.00%	-0.86%	-1.83%	1.43%	-1.03%	-7.57%	-4.40%	-4.35%
PRODUCTION	892,600	843,900	849,700	845,000	917,900	841,400	855,100	*863,657*
% PROD/lost	**19.31%**	**15.39%**	**17.50%**	**15.85%**	**23.34%**	**22.70%**	**27.28%**	**20.24%**
% change overall	1.00%	8.20%	8.00%	2.20%	4.30%	-10.60%	-10.60%	-0.40%
Est. Population	9,029	8,988	9,125	9,239	9,365	9,453	9,631	*8,203*
Annual increase	70	-137	137	114	126	88	178	*176*
% annual change	1.00%	-1.52%	1.50%	3.20%	5.00%	4.00%	4.00%	1.00%
Usage per person	*79.8*	*79.4*	*76.8*	*77.0*	*75.1*	*68.8*	*64.6*	*84.0*
Est Accounts	*3,274*	2,995	3,110	3,202	3,140	3,022	3,604	*3,091*
Usage per account	220.0	238.4	225.4	222.1	224.1	215.2	172.5	222.9

TABLE 6.3 NUMBER OF BUILDING PERMITS ISSUED, ALLOCATED OR ANTICIPATED														
Project	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**
Agricopia	**32**	**22**	**30**	**30**	**30**	**30**	**30**	**30**	**30**	**30**	**30**	**30**	**30**	**30**
Steeplechase	**28**	**24**	**36**	**66**	**66**	**54**	**30**	**30**	**30**	**3**	0	0	0	0
Hawthorne Greene SII PI	**19**	**19**	0	0	0	0	0	0	0	0	0	0	0	0
Hawthorne Greene SII PII	0	0	**19**	**20**	0	0	0	0	0	0	0	0	0	0
Willow Woods	**8**	0	0	0	0	0	0	0	0	0	0	0	0	0
Willow Woods Sect. 2	0	0	**8**	0	0	0	0	0	0	0	0	0	0	0
Oak Avenue (Multi-Family Dwelling)	**1**	0	0	0	0	0	0	0	0	0	0	0	0	0
Heritage Green*	0	0	0	**300**	**300**	**300**	**300**	**300**	**300**	**300**	**300**	**300**	**300**	**170**
Townhomes Potomac Sqaure	0	0	0	**22**	0	0	0	0	0	0	0	0	0	0
Stagecoach Crossing (Concept)	0	0	0	0	**50**	**50**	**50**	**50**	**50**	**50**	**50**	**50**	**50**	**50**
The Hub (TDX)	0	0	0	0	0	0	**94**	**94**	**94**	**94**	**94**	**94**	**94**	**94**
Hawthorne Yards	0	0	0	0	**30**	**30**	**30**	**30**	**30**	**30**	**3**	0	0	0
Baldus Farm	0	0	0	0	0	**30**	**30**	**30**	**30**	**30**	**30**	**30**	**30**	**30**
Wash Ave Apartments (72)	0	0	0	0	**72**	0	0	0	0	0	0	0	0	0
Villages of Rosewick	0	0	0	0	0	**32**	**30**	**30**	**30**	**30**	**30**	**30**	**20**	0
Yearly Total	**88**	**65**	**93**	**438**	**476**	**464**	**534**	**534**	**534**	**507**	**477**	**474**	**474**	**344**
Cumulative Total EDU	88	153	246	684	1160	1624	2158	2692	3226	3733	4210	4684	5158	5502
Existing edu	**1000**	**935**	**842**	**404**	**-72**	**-536**	**-1070**	**-1604**	**-2138**	**-2645**	**-3122**	**-3596**	**-4070**	**-4414**
Existing Gpm Sewage Capacity	**250,000**	**233,750**	**210,500**	**101,000**	**-18,000**	**-134,000**	**-267,500**	**-401,000**	**-534,500**	**-661,250**	**-780,500**	**-899,000**	**-1,017,500**	**-1,103,500**
Existing Gpm Water Capacity	**222,000**	**207,570**	**186,924**	**89,688**	**-15,984**	**-118,992**	**-237,540**	**-356,088**	**-474,636**	**-587,190**	**-693,084**	**-798,312**	**-903,540**	**-979,908**

Another reason for the difference between the two readings might be in the flow meters at the wells. Well 11 was placed in service during 2009 with a new flow meter that should be more accurate than the existing meters. Well 8 has also been completely reconfigured with a new electronic flow monitoring system. There should be a significant increase in the amount of water being billed over the next two years and production records will be more accurate as the new meters all go in service.

During 2009, the Town installed a “Mission” SCADA system that remotely monitors the production from each well. As a check on the accuracy of the MOR, the figures from the SCADA system were compared with the manual readings by MES personnel. Table 6.4 compares the data recorded by MES with the data from the Mission system during 2019.

TABLE 6.4 MISSION DATA December 2019				
WELL8	**WELL 9**	**WELL 10**	**WELL 11**	**TOTAL**
19,034,872	136,351	204,000	5,469,800	24,845,023
DECEMBER RECORDED DATA W/O WELL 5				
18,476,000	122,000	204,000	5,134,000	24,652,098
DECEMBER DIFFERENCE FROM RECORDED				
558,872	14,351	0	335,800	192,925
2.9%	10.5%	0.0%	6.1%	0.8%

Since the manual readings are taken at different times from day to day, some difference on a daily basis can be anticipated, The numbers won’t come out the same since the flow from well 5 is included in the Recorded Data, but there is no Mission Unit at that location.. Overall, the flow readings from the Mission system are less than 0.5% different from the readings that were taken manually each day.

6.5 PROJECTING FLOW FROM EXISTING INVENTORY

In addition to the existing users, an estimate was made of the amount of undeveloped property still remaining in the Town and the maximum amount of edu’s that would be permitted under the existing zoning. The biggest variable is the fact that the largest impending development is zoned for mixed use and a certain amount of commercial development will be included when it is built. The developers have not made any determination at the present time as to what will go into those commercial areas. The projected edu inventory for these, and the undeveloped highway commercial properties, was made by comparison with the usage at existing properties that appear to be most similar to the proposed development. Table 6.1 provides an estimate of existing users and the anticipated water usage from each of the Sewer Service Areas and Utility Zones after construction has been completed. Table 6.4 provides an estimate of additional water demand that can be expected during the next twelve years. Adding the planned development to the current users showed that the water system will have to be expanded to supply nearly 2.5 mgd to meet the needs of the Town at build out, probably some time around 2030.

6.6 PROJECTING FUTURE FLOW FROM PAST HISTORY

Tables 6.2, 6.3 and 6.4 contain information that can be used to project the future water supply needs based on past history. Average daily production, average billing or population trends can be used to estimate future flow.

Using population as a planning tool involves estimating the anticipated population growth on an annual basis. The estimated population and the amount of change was based on the number of building permits the Town issued each year for the past seven years adjusted by the results of the census between 2013 and 2020. These figures show that the average population growth in La Plata between 2013 and 2020 results was 174, 1.0% annually. If that level of average growth continued until 2030, the needed flow would increase to 1.283 MGD.

6.7 PROJECTING FLOW FROM PLANNED FUTURE DEVELOPMENT

Considering the fact that the Town has four large residential developments under construction or in the planning stages, there is some question how much weight to place on past experience when planning for the future. The La Plata Planning Department has attempted to predict the demands that will be placed on the system from these developments and the time frame when the additional water will be needed. The result of their efforts is included in Table 6.3, “Number of Building Permits” anticipated until 2032. These projections would indicate that the Town will have to serve another 5,500 edu’s by 2032. A bigger problem seems to be that by 2023, the Town’s WWTP will have to be expanded to 2.0 MGD and the GAP will have to be increased as well. The Town’s wells have the capability of producing the needed water, but up to this point, MDE has refused to increase the GAP beyond where it is now. All of these figures will be impacted by economic conditions and are based on the maximum flow that may be required.

6.8 FIRE PROTECTION

During the last Insurance Services Office (ISO) Evaluation in January 2009, 12 fire hydrants were tested. The needed fire flow from these hydrants ranged from 1000 to 3000 gallons per minute (GPM). The available flow from 5 of them was somewhat less than needed because of the limitations of the distribution mains. Portions of the distribution system in the old town were originally built with lines that are too small for the structures that have been built in later years. Some larger water mains have been installed and the Town has “looped” the system to compensate for these deficiencies and increase the available fire flow wherever possible when new construction has taken place.

The highest needed fire flow the ISO identified was 3000 GPM and that was only at one location. The needed flow is not likely to increase. The Town requires that all new buildings be fully sprinklered and the ISO only requires a maximum of 1000 GPM available flow in addition to the sprinkler system for these buildings. The ISO recommends that the water system should be able to supply the 3000 GPM flow for at least three hours. To meet that criteria, the Town would need to have at least 540,000 gallons of water in reserve at all times. When the system is full, 1.3 million gallons are stored in 3 elevated tanks and 750,000 gallons in a ground level tank. The level in the tanks rarely drops below the 90% mark. The pumps associated with the ground level tank can supply 1500 GPM by themselves if both pumps are operating simultaneously.

As a result of the 2009 survey, the ISO has awarded the Town of La Plata a Class 4 Public Protection Classification on a scale of 1 to 10 with 1 being the best possible. The Water Supply portion of the rating would have supported a Class 3 rating, but the overall rating including the handling of alarms and the Fire Department Evaluation came out as Class 4. In summary, the Town has enough water in storage to meet the needed reserve, but needs to take advantage of every opportunity to upgrade the distribution system.

7.0 AVAILABLE CAPACITY

Table 7.1 shows the daily production and Table 7.2 shows the production capabilities of La Plata's water system. MDE bases its requirements on the ability of a water system to deliver the needed flow with the largest producer out of service and none of the wells operating more than 16 hours per day. The Town's wells are able to produce almost 1.8 mgd with well 11, the largest producer, out of service and none of the other wells operating more than 16 hours. With all production wells operating, the Town would be able to produce more than 2.5 mgd in 16 hours, or as much as 3.8 mgd with all wells operating 24 hours. Rather than the production ability, the primary limitation on La Plata's ability to supply water for growth is the Groundwater Appropriation.

7.1 WATER AUDIT

In connection with its request for an increase in the GAP, the Town performed an audit to compare the amount of water produced with the amount being billed. All of La Plata's connections go through a water meter with the exception of what is used from a fire hydrant. The Town has portable meters that can be used for bulk water sales and the only unmetered water that should be used from fire hydrants would be for testing, fire suppression and fire department training activities. One of the portable meters has been assigned to the La Plata Fire Department that can be left on one of the fire hydrants at the Fire Department Building to record water that is used to fill tankers or any other fire department usage.

SUMMARY OF MONTHLY OPERATING REPORTS 2019												
	JAN	FEB	MARCH	APRIL	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC
DATE	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER
1	0.8140	0.7690	0.5810	0.8410	1.0800	0.9140	0.9880	0.9000	0.9750	0.7570	0.7570	0.7650
2	0.9190	0.7090	0.7700	0.5660	0.9180	1.2190	1.0570	0.9350	1.1360	0.7260	0.7260	0.8680
3	0.8070	1.1200	1.0680	0.8330	0.6870	0.8930	0.9000	0.9740	0.8870	1.0160	0.9510	0.8720
4	0.5390	0.8920	0.7300	0.8810	0.9840	0.9710	0.9700	1.2350	1.1730	0.7621	0.6400	0.7610
5	0.8150	0.7740	0.8980	0.7580	0.8870	1.0700	1.0340	0.9270	0.8320	0.8940	0.8610	0.8720
6	0.9260	0.6920	0.8500	0.6080	0.9110	1.0580	1.0800	0.9240	0.8250	1.0600	0.9130	0.6184
7	0.6900	0.7980	0.7670	0.8120	0.9180	0.7830	1.0930	0.9670	0.9550	0.7760	0.7640	0.7710
8	0.9920	0.6220	0.5840	1.0660	0.9440	0.9620	1.1210	1.0570	1.0910	1.0920	0.6879	1.0000
9	0.6860	0.7820	0.7450	0.6940	0.8410	0.9910	1.0230	1.0870	0.9590	0.7970	0.7040	0.6720
10	0.9130	1.1090	0.9570	0.6950	0.6650	0.9640	0.9930	1.0660	1.0130	0.8650	0.7650	0.7040
11	0.6090	0.7770	0.7740	0.9200	0.8660	1.0040	0.8920	1.1570	0.9130	0.7790	0.8540	0.6970
12	0.8670	0.6800	0.8710	0.6130	0.7910	0.8160	0.7810	1.0270	1.0500	0.8870	0.8410	0.7370
13	0.8550	0.8090	0.7490	0.7170	0.8460	0.8720	1.0090	1.1680	0.7896	0.9380	0.6870	0.9168
14	1.0010	0.8380	0.7480	0.9250	0.9110	1.0220	1.1940	1.0750	0.8710	0.8350	0.7110	0.6350
15	0.8150	0.6700	0.6420	0.8560	0.7770	0.9240	0.8930	1.2380	1.0910	0.9050	0.6605	1.1080
16	0.9680	0.8590	0.8500	0.9210	1.1060	0.9040	1.0370	0.8950	1.1870	0.7620	0.7750	0.7340
17	0.7900	0.7000	0.9700	0.8960	0.7740	0.9310	1.0180	1.0880	0.9290	0.8080	0.8020	0.8080
18	0.6640	0.9970	0.8490	0.6250	0.8830	0.8580	1.0450	1.2210	1.0030	0.6857	0.7800	0.8480
19	0.8280	0.7270	0.7560	0.8790	1.1700	0.9230	1.1050	1.0800	0.7880	0.8340	0.7530	0.7340
20	0.7820	0.6800	0.7610	0.8400	1.0070	1.0740	1.2640	1.1240	0.9740	0.8980	0.8250	0.8480
21	1.2010	0.7600	0.6780	0.9300	0.7570	0.8490	0.9660	0.9990	1.0150	0.7260	0.7680	0.8210
22	0.8360	0.5830	0.6020	0.8770	1.1860	0.9610	1.1520	0.9240	0.9360	0.8700	0.6359	0.9660
23	0.7960	0.8300	0.7910	0.9060	0.8030	1.1080	1.0230	1.0000	1.3460	0.6410	0.7190	0.7110
24	0.8160	0.8990	1.0230	0.9310	0.8140	0.9880	0.9920	0.7530	0.9970	0.9270	1.0300	0.7410
25	0.6380	0.8190	0.6650	0.9420	0.9280	1.0230	1.1250	0.8310	0.9870	0.6310	0.9130	0.8960
26	0.8070	0.8260	1.0210	0.6080	0.9930	0.8990	0.7780	0.9570	1.0300	0.7950	0.7640	0.8010
27	1.0640	0.8420	0.7820	0.8520	1.2430	1.2080	1.1100	0.8550	0.9862	0.8000	0.6210	0.6830
28	0.7990	0.8200	0.7250	0.8380	0.8470	0.8840	1.3360	1.0070	0.9070	0.9480	0.7300	0.7320
29	0.7630		0.6690	1.0410	1.2630	1.0530	0.7800	0.9870	1.1820	0.8190	0.7760	1.0160
30	0.8320		0.7710	0.7440	0.9760	1.1550	1.1840	0.9470	0.7350	0.7290	0.7860	0.6900
31	0.7340		1.0210		0.7050		1.1110	1.0320		0.7820		0.6810
AVGE	**0.8247**	**0.7994**	**0.7957**	**0.8205**	**0.9187**	**0.9760**	**1.0340**	**1.0141**	**0.9854**	**0.8305**	**0.7733**	**0.7970**

7.2 GAP LIMITATIONS

La Plata's GAP allows the Town to withdraw an average of 1.234 MGD from two aquifers with an average of 1.841 MGD during the month of highest usage. The average usage in 2019 was 876,300, 76.77% of the permitted flow. June was the month of highest flow in 2019 with an average of 1.053 MGD, 61.38% of the permitted flow.

The Town applied in March of 2006 for an increased GAP of 1.5 MGD average with 2.1 MGD in the highest month. Due to some delays in connection with construction of well 11, no action was ever taken on that application. Since well 11 has been completed and has been producing 800 GPM, the Town has modified that request and applied for a GAP of 2.0 mgd with 2.5 in the highest month. The projected water requirements in Table 6.3 indicate that the Town will need 2.5 MGD to meet the needs in 2032 at the end of the 12 year period MDE uses in determining the appropriate GAP. At the current rate of growth, La Plata's consumption will probably be between 1.2 and 1.3 MGD in 2025 at the end of five years. Current projections indicate that the Town will reach its maximum withdrawal rate with the existing permit sometime in 2023. The Town is planning an expansion of the Wastewater Treatment Plant to 2 mgd at the present time and the amount of effluent that can be discharged under the current NPDES permit will increase to 2 MGD when the WWTP is upgraded., probably in 2023. Both of these reasons make an increase of the GAP for La Plata to 2.0 mgd imperative and it is needed as soon as possible.

Due to limitations in the potential yield from the Lower Patapsco Aquifer, MDE has been reluctant to issue a GAP higher than 1.5 mgd for the Town. In estimating the anticipated needs of the Town, MDE has based their calculations on the historical increase in consumption and population instead of anticipated growth in the future. The Town has every reason to believe that the rate of growth will be much greater during the next twelve years than it was in the last nine years.

Two of the major developments currently under construction experienced some delays over the last few years due to the economic situation. Sales have increased and the developers have said that they expect to proceed somewhere near the rate projected in Table 6.3 to this plan. The economic downturn also has delayed the start of development of two major projects within the Town that are currently in the planning phases, Heritage Green and Stagecoach Crossing. A six million dollar sewer upgrade project that was completed in April of 2011 provides the sewer capacity needed to begin construction in Heritage Green without any further construction of off-site water or sewer lines. Heritage Green is a 1200 acre mixed use project with Traditional Neighborhood Zoning and a potential of up to 3,170 dwelling units. While there have been some delays due to financial problems, the Town has committed as many as 300 dwelling units per year to this project. The GAP will have to be increased to enable the Town to meet its commitment to these property owners and for the developers to meet their commitment to the lending agencies that are financing this project.

TABLE 7.2 - WATER SYSTEM CAPACITY 2020 - LOWER PATAPSCO			
	YIELD	16 HOURS	24 HOURS
Well 8 - Box Elder Road	650	624,000	936,000
Well 9 - Silver Linden Park	500	480,000	720,000
Well 10 - Washington Avenue	600	576,000	864,000
Well 11 - Rosewick Crossing	800	768,000	1,152,000
TOTAL PRODUCTION	2,550	2,448,000	3,672,000
TOTAL PRODUCTION WITHOUT WELL 11	1,750	1,680,000	2,520,000
PEMITTED DAILY WITHDRAWAL			
Average daily usage on annual basis	1,144,000		
Average daily usage highest month	1,716,000		
AVERAGE DAILY CONSUMPTION 2019	878,300		
AVERAGE CONSUMPTION JUNE, HIGHEST MONTH 2019	1,053,200		
Percent of permitted withdrawal on appropriation permit	76.77%		
Percent of permitted withdrawal during the highest month	61.38%		
AVAILABLE CAPACITY (Average month) 1-1-20	265,700		
AVAILABLE CAPACITY IN EDU'S 1-1-20	1,197		
AVAILABLE CAPACITY (Highest month) 1-1-20	662,800		
AVAILABLE CAPACITY IN EDU'S 1-1-20	2,986		

7.3 PRODUCTION WELLS

Five of the Town’s wells are in the Lower Patapsco Aquifer. Well 5 is in the Upper Patapsco Aquifer, but has a limited capacity and is used primarily as a supplemental source of supply if one or more of the big production wells is out of service or taken down for maintenance. The newest one, well 11, also appears to be the most productive. Well 6 was drilled into the Lower Patapsco in 1965, but it has never lived up to its potential. Not only has it failed to deliver the 250 gpm it was intended to provide, but it has had a problem with pumping sand. The Town made an attempt to rehabilitate this well, but tests indicated that it would not be cost effective to do so, especially considering the fact that the Town now has four other wells in that aquifer that produce far more than well 6 is ever likely to provide. Accordingly, the decision was made to abandon well 6 and the pump has been removed. The Town has offered it as an observation well for DNR. If they don’t take advantage of the offer, it will be abandoned and the pump house removed.

Well 8 and well 10 were converted from turbine pumps to submersibles in 2009 and new pumps were installed in both of them. A new well house was built for well 8 and a sophisticated control and monitoring system installed to go with the 750,000 gallon ground level tank and high service pumps used to maintain pressure in the system. This installation also included a new generator with automatic changeover equipment to maintain a reliable source of water. The old generator from well 8 was overhauled and installed at well 10. An emergency generator has also been installed at Well 11. As a result, the Town is able to produce as much as 2000 GPM, almost 3 MGD, on emergency power

7.4 WATER SOURCE

Groundwater aquifers in the Coastal Plain are the primary source of water for Charles County and the Town of Indian Head as well as the Town of La Plata. A report generated by Charles County in 2005 estimates that 11.5 to 14 million gallons of water was withdrawn from these aquifers on a daily basis at that time. With the projected increase in population, groundwater withdrawals could increase to 19.6 million gallons per day county-wide.

In September of 2005, the Maryland Geological Survey (MGS) gave the Charles County Commissioners a briefing on the Southern Maryland Study which evaluated the impact of future growth on groundwater aquifers in Charles, Calvert and St. Mary's Counties. MGS reported that certain areas of Charles County may experience groundwater levels dropping below minimum acceptable levels. A Water Resources Advisory Committee (WRAC) was appointed in the spring of 2006, and was charged with providing the County Commissioners with an evaluation and recommendations of potential sustainable water resources that are available for County water systems. The Town participated as a member of this Committee, but no final report was ever received.

All of La Plata's high production wells are in the Lower Patapso confined aquifer. None of the other aquifers that are accessible in the central Charles County area are capable of supplying wells that will provide a viable source for the Town of La Plata. Charles County originally took most of its water from the Magothy aquifer. Because of a decline in the static level in the Magothy aquifer and its impact on private wells during the 1980's, the Maryland Department of Natural Resources required the County to shift to using water from the Lower Patapsco instead to allow the Magothy to recover. At the present time, Charles County obtains approximately 50% of its water, about 3 mgd, from the Lower Patapsco aquifer. The level in the Lower Patapsco is steadily declining in Charles County. The Town has had to lower the pump in its production wells from 450 feet to 500 feet below the surface to compensate and there is concern about the future of this aquifer. Charles County the ability to purchase up to 1.4 MGD of surface water from the Washington Suburban Sanitary Commission to reduce the drain on the Lower Patapsco aquifer. The Town of Indian Head, the NSWC station in Indian Head and Charles County have also been shifting some of their consumption from the Lower Patapsco to the Patuxent Aquifer to allow the water level in the Lower Patapsco to recover. There has also been some discussion about the possibility of constructing a facility to use surface water to supply Charles County and the Southern Maryland area. None of these options is available to the Town of La Plata. The Town drilled a test well into the Patuxent aquifer when Well 11 was drilled. The well drillers found that the maximum flow from that aquifer in the La Plata area would be less than 30 GPM. An increase in the Town's GAP from the Lower Patapsco Aquifer is the only way the Town can support the type of population density Smart Growth requires.

7.5 RESOURCE AVAILABILITY DURING DROUGHT

The aquifers that La Plata uses are not very susceptible to droughts. The Patapsco aquifers are so deep in the La Plata area that the recharge takes a very long time and the effect of rainfall variations is not felt on a real time basis. The static level in La Plata's wells does not drop drastically during periods of drought. The primary impact on La Plata is the tendency of users to water lawns and landscaping areas during periods of prolonged dry spells. There was very little rainfall during the last 7 months of 2007 and the month of September 2007 represents the most recent drought of record. The average usage during the five summer months when the drought was most severe was 1.16 mgd, 14.6% higher than the average.

7.6 WELL FIELD CAPACITY

During the planning process for Well 11, Earthdata of Centerville, Md. made extensive tests and calculations concerning well field capacity in order to determine where a new well could be drilled without having a serious effect on existing wells. While the level in the Lower Patapsco aquifer is declining, there is no indication that the location of the wells in La Plata's system is having a detrimental effect or drawing down the level significantly. The new Well 11 is located well within the La Plata well field and extensive tests were made in connection with testing and developing this well. This well has not had a significant effect on the wells in the La Plata well field or other existing wells drawing from the Lower Patapsco Aquifer. MDE's reluctance to issue an increased GAP for La Plata seems to stem from the fact that the 80% management level has been reached in the Lower Patapsco Aquifer on the western side of Charles County in the Indian Head area. Studies made by the Maryland Geological Survey Department show that increasing the consumption in La Plata from 1.14 MGD to 2.0 MGD would only move the 80% management level line approximately 600 feet further into Charles County. Completely eliminating all use of this aquifer by La Plata would move that line less than 1 mile from where it is projected to be when the Town is fully built out and La Plata increases its usage to as much as 2.5 MGD.

7.7 REDUCED CONSUMPTION

It appears that the most serious limitation to the amount of growth that Southern Maryland will be able to sustain is the lack of potable water supply. While it will not solve the problem, it is imperative that consumption of this precious resource be reduced to prolong the life of the aquifers. The Town of La Plata is approaching this problem in two ways. The Mayor and Council have instituted a number of measures to promote water conservation by the existing population and the Town is working on several measures to reduce water consumption in new construction. As a long term solution, the Town has created a Water Conservation Plan and is working with MDE to find ways to re-use the effluent from the upgraded WWTP to replace potable water in irrigation systems and other potential uses.

7.7.1 WATER CONSERVATION

The Town has adopted a water conservation plan to reduce its consumption to a bare minimum. One of the most important aspects of the plan has been to introduce tiered billing to influence people to use less water. The overall effect of all this has been to reduce the amount of water used from 916,000 GPD in 2008 to 911,000 GPD in 2010, even though the number of people being served increased..

Some of the newer subdivisions use twice as much water in the summer months as they do in the winter. The primary reason is the in-ground automatic sprinkler systems that have been installed to irrigate their lawns and landscaping areas. The Mayor and Council have considered enacting an ordinance that prohibits the use of potable water for this purpose. They are also encouraging the residents and property owners to install containers to capture rain water from their roof drain systems and use that for watering lawns etc. The Town has installed a 10,000 gallon storage tank to capture rain water from the Town Hall rain gutters as a demonstration project to supply the in ground irrigation system at the Town Hall to reduce the amount of potable water needed for that purpose.

The Planning Commission is considering stricter requirements to save water in new construction. Appliances that operate with less water and plants that require a minimum amount of water as well as capturing rain water runoff are some of the ways the amount of water used by new construction can be reduced.

7.7.2 EFFLUENT RE-USE

Due to a TMDL, (total maximum daily loading limit) placed by MDE on the amount of nutrients the La Plata WWTP will be allowed to discharge into surface water, the Town needs to find some other way to get rid of the effluent as the capacity of the WWTP is increased. Land application is one of the preferred ways to do this, but very little land is available within the Town Limits where this could be done.

At the present time, MDE will not allow the use of treated effluent within 200 feet of a residence. The Town is working with MDE to attempt to find a way to use this gray water for irrigation of individual lawns and common areas, both to get rid of some of the surplus effluent from the WWTP and to reduce the amount of potable water used to water lawns and landscaped areas.

8.0 ALLOCATION OF AVAILABLE CAPACITY

There are four major developments in the Town that are either under construction or in the planning stages. To determine the requirements at the final buildout, the number of potential lots and other edu's within the Town was added to the existing flow. Based on this information, it appears that the Town will eventually require at least 2.5 mgd of water. None of these calculations include any potential annexations and all of them are based on the Town Limits as of 1-1-20 rather than the growth area as specified in the Comprehensive Plan.

8.1 AVAILABLE CAPACITY

At the beginning of each calendar year, the planning department will evaluate how much capacity is available in the water system at that time. Table 6.2 and 6.3 include the latest capacity projections as of September 1, 2020. The base line for estimating available capacity will be the average flow over the last year and the ability of the Town's wells to produce it within the limits imposed by the GAP. To determine how much available capacity remains in the system, the number of edu's that have been allocated, but the buildings are not yet occupied, will be added to the average flow. When a project is submitted to the Town or the Design Review Board for its consideration, it should be listed on the allocation worksheet under pending projects. Table 6.3 shows the Town's Planning Department's best estimates of the projects that will be submitted and construction that will take place over the next 12 years. A historical perspective on the anticipated growth, based on population, water bills and measured production over the last nine years has also been included with these projections. When a preliminary plat has been submitted to the Town for approval, an allocation worksheet, similar to Figure 5.2, will be initiated and the progress of the project tracked. If the distribution system is adequate to supply the proposed development at the required flow and pressure, the Water Allocation Records show that sufficient capacity is available within the appropriation permit and the project meets all the other requirements of the Town, the preliminary plat can be submitted to the Planning Commission and the normal permitting process followed. At that point it moves from the category of pending project to actual projects. None of the available capacity in the water system will be committed until the final subdivision plat, site development plan or building permit is approved and recorded.

When the final subdivision plat, site development plan or building permit is approved and recorded, capacity in the water system will be reserved for it and the project moves into the allocated category on the Allocation Worksheet. The anticipated number of edu's that the project will generate is subtracted from the available capacity remaining. A final plat will not be approved and recorded unless the records show that there is enough capacity available to serve the development without causing deterioration in the level of service received by existing property owners.

To retain the allocation, the first building permit must be issued and construction begun within three years of the time the sewer allocation is approved. When the final subdivision plat or building permit is issued, the expiration date of the water allocation should be clearly marked on the plans. The property owner can apply to the Town for an extension of the allocation. If the Town determines that the delay was not the fault of the owner, or will be to the benefit of the Town, they can issue an extension, one year at a time. If the application for an extension is not made before the expiration of the allocation, the property owner will have to go through the normal process to receive another allocation of water capacity to qualify for another building permit

The average daily flow during the preceding year, based on the monthly operating records, as they were submitted to MDE, will be used to calculate the available capacity in the water system at the beginning of each year. The anticipated flow in EDU's from structures that have received an allocation, but have not received an occupancy permit, is added to the previous year's usage. When an occupancy permit has been issued, the flow from that structure or structures becomes part of the measured production and is no longer part of the estimated available capacity. The available capacity will be tracked on a form similar to table 6.3 to determine whether the Town has enough capacity to serve the project when a preliminary subdivision plat, site development plan or building permit application is received.

The average daily flow during the preceding year, based on the monthly operating records, as they were submitted to MDE, will be used to calculate the available capacity in the water system at the beginning of each year. Table 7.1 is a copy of the monthly operating record for 2019. The anticipated flow in EDU's from structures that have received an allocation, but have not received an occupancy permit, is added to the previous year's usage. When an occupancy permit has been issued, the flow from that structure or structures becomes part of the measured production and is no longer part of the available capacity calculations. The available capacity will be tracked on a form similar to table 6.3 to determine whether there is enough capacity available to serve the project when a preliminary subdivision plat, site development plan or building permit application is received.

8.2 SUBDIVISON APPROVALS

Preliminary plats or site development plans will not be submitted to the planning commission or approved unless the water distribution system has enough available capacity to provide the needed flow and pressure for the proposed project. If the distribution system is not adequate, the property owner will have to present a plan to provide the needed capacity before the preliminary plat or site development plan will be processed.

Subdivision final plats will not be recorded unless the water distribution system, production wells and the Town's GAP have enough available capacity to accommodate the proposed usage. A final plat can be approved and recorded before infra-structure has been completed, providing the plans have been approved, a public works agreement signed by the developer, a performance bond provided to the Town and a commitment that the improvements will be completed before any structures can be occupied.. Construction of the improvements will begin as soon as funding arrangements have been completed and permits issued.

Off-site improvements to the distribution system or expansion of the well field must be in progress with the anticipated completion date within one year before the final subdivision plat can be approved and recorded. Each subdivision plat will contain a sunset provision so that the allocation will be lost if the buildings are not under construction within three years or the expiration date is extended by an appeal.

When an allocation is made, it will be recorded on a form similar to Table 8.1. Once an allocation has been made, the edu's that have been allocated will be subtracted from the amount of capacity that is available for allocation.

8.3 BUILDING PERMITS

Building permits will be issued according to the allocations assigned to the subdivision at the time the final plat was recorded. Minor subdivisions and Infill development or re-development will receive an allocation at the time the building permits are issued. The planning department will maintain an on-going record of plats recorded and permits issued to determine the availability of capacity in the system. When an occupancy permit is issued, the anticipated usage will be subtracted from the available capacity in the system.

9.0 ANNUAL REPORTS

At the beginning of each calendar year, all of the worksheets should be brought up to date. The information on the Water Allocation Worksheets, Table 6.3 in this report, should be tabulated and the information compared with allocations, building permits and occupancy permits. The available capacity in the water system will be adjusted by including the flow that will result when all the development that is in progress has been completed and the buildings occupied. The SSA inventories should be corrected to include the edu's from structures that have had occupancy permits issued. The water projection worksheets should also be corrected to reflect the amount of allocations that have been committed during the previous year. The Water Supply Capacity Management Plan will be updated to reflect the changes that have been made during the year.

The following actions are to be taken each year by the Town:

Update the available capacity records in the water system.

Submit a revised version of the "Water Supply Capacity Management Plan" to MDE.

10.0 CONTACT INFORMATION

The following people will be responsible for the maintenance and implementation of the Plan:

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WASTE WATER CAPACITY MANAGEMENT PLAN
TOWN OF LA PLATA 1-1-2020
Table of Contents

Figures Tables and Appendices

WASTE WATER CAPACITY MANAGEMENT PLAN
TOWN OF LA PLATA

Based on Environmental Regulations, the Maryland Department of the Environment (MDE) has issued a requirement that the operator of a municipal waste-water plant has to adopt a plan and submit certain reports when the plant reaches 75 to 80% of its rated capacity. According to MDE figures, La Plata's treatment plant is approaching that level. An initial plan was created in 2008. It was updated since then and has been revised as of January 1, 2019

1.0 BACKGROUND

The La Plata sewer system was originally built in 1955. It included a trickling filter treatment plant and a collection system with a capacity of 350,000 gallons per day (gpd) designed to serve a population of approximately 1500 people. As the Town grew, the treatment plant was expanded and upgraded. In 1970, the original plant was replaced with two activated sludge modules and the capacity of the; treatment plant was increased to 1 million gallons per day (mgd). In 2002, the plant was modified to include Biological Nutrient Reduction (BNR) and another module was added to increase the treatment capacity to 1.5 mgd average with a peak flow capacity of 3 mgd. In 2007, Stearns and Wheeler conducted a feasibility study to find the most cost effective way to bring the plant up to Enhanced Nutrient Reduction (ENR) standards and to eventually increase the capacity to 2.5 mgd to serve the Town of La Plata as it builds out. Expansion of the treatment plant will be in compliance with the County Comprehensive Water and Sewer Plan. It will also be in compliance with the growth element, the land use element and the water resources element of the Town's Comprehensive Plan. Stearns and Wheeler, now known as GHD, has provided a copy of the final results of the feasibility study to the Town and to MDE. MDE recommended doing the work in phases and has agreed to use the Chesapeake Bay Restoration Fund to pay for an upgrade to ENR standards while maintaining the rated capacity at 1.5 MGD. A contract was awarded to Johnston Construction Company of Dover, Pennsylvania and work began on July 1, 2011. The final completion date was August 31, 2013, later extended to April 16, 2014. The upgrade will enable the WWTP to help the Town and Charles County meet their total maximum daily loading limits (TMDL), Tributary strategies and to protect Tier II streams. A new NPDES permit has been issued that initially limits the permitted flow to 1.5 mgd. After the plant has been modified to meet ENR standards, the permitted flow may be increased to 2.0 mgd.

Some of the trunk lines and interceptors in the core collection system have not been upgraded enough to handle the increased sewage being generated as the size of the Town has grown and the treatment plant has been expanded. There have been a number of overflows during major rain events. The original system used pipes made of concrete and cast iron that have deteriorated over the years. Due to the terrain and development patterns, the collection system uses 19 pump stations including Willow Lane which is designed to handle 65% of the sewage generated in Town when the population reaches 2.5 mgd. Some of these pump stations have very long pressurized force mains, one of them more than a mile long, and generate a lot of sodium hydroxide that causes the manholes and gravity mains to deteriorate rapidly.

There is a significant amount of high peak flow caused by Inflow and Infiltration (I&I) that is allowing ground water and rain water to get into the system. The problem was aggravated by the fact that the original trunk lines going into the treatment plant were not large enough to handle the I&I, in addition to the sewage being generated, as the Town grew in area and population. There are three major housing developments in the planning stages, or under construction, within the Town at the present time and nearly all of the collection system has been expanded to handle the additional sewage as well as the flow from I&I during major rain events. Sanitary Sewer Overflows from the La Plata collection system now only occur occasionally during major rain events when the peak flow exceeds the treatment plant's capacity to handle it. 2018 was the wettest year on record in Southern Maryland and the performance of the WWTP has suffered from the frequent rain events and excessive flow from the accompanying I & I.

2.0 REGULATIONS (Guidance page 6)

The Maryland Environmental Article makes it clear that the Town of La Plata must ensure that adequate sewer capacity is, or will be, available before issuing building permits or approving subdivision plats. These regulations require that before approving building permits or subdivision plats, the Town must meet certain requirements:

2.1 BUILDING PERMIT

In order to issue a building permit, the Town is required to determine the following:

1. The sewerage system is adequate to serve the proposed construction, taking into account all existing and approved developments in the service area.

2. The development described in the application will not overload the Town's facilities for conveying, pumping or treating sewage.

2.2 SUBDIVISION PLATS (Guidance page 6)

In order to approve a subdivision plat, the Town is required to determine the following:

1. Any approved facility for conveying, pumping or treating sewage that will be needed to serve the proposed development exists, or will be completed, before an occupancy permit is issued, and will be adequate to serve the proposed development without overloading the sewer system.

2. The sewer system conforms to the County Comprehensive Water and Sewer Plan, the Town Comprehensive Plan, including the growth and water resources elements, and takes into consideration all previously approved and recorded subdivision plats and building permits.

2.3 REQUIRED REPORTS (Guidance page 7, 8 and 9)

The following reports must be submitted prior to January 31st each year and the information in them will form the basis for this plan and the sewer allocation system adopted by the Town:

"Available Capacity Report" (ACR) to the Charles County Health Director (figure 2.1)

"Municipal Sewage Capacity Report" (MSCR) to MDE (figure 2.2)

"Wastewater Capacity Management Report" (WWCMP) to MDE (WWCMP)

These reports will include information on the subdivision plats that have been approved and recorded, developer agreements that have been made and building permits that were issued.

Figure 2.1 (Guidance page 8)

WASTEWATER TREATMENT FACILITY
AVAILABLE CAPACITY REPORT

Name of facility: **Town of La Plata Wastewater Treatment Plant**

Date: **January 1, 2018**

Treatment Plant Design Capacity (MGD) **1.5 mgd**

Permitted Flow Capacity (MGD): **1.5 mgd**

Less: Estimated I & I (MGD): **.167 mgd (Included in 3 year average flow)**

Gross Available Capacity (MGD): **1.333mgd**

Less: Plant's Previous 3 Year Average flow (MGD**): 1.155367 mgd**

Less: Outstanding Service Commitments (MGD): **,3303 mgd**

Available Capacity as of January 1, 2019

1. As determined by MDE: **.4061 mgd**

1. Based on recording of final plats: **.0764 mgd**

2. Percentage of available capacity to be allocated to any one applicant, property, subdivision or project**:** **Not applicable**

3. Current number of vacant residential lots of record: **645**

4. Current number of vacant commercial lots of record**:** **5**

5. Current number of vacant industrial lots: **None**

Figure 2.2 (Guidance page 9)

MUNICIPAL SEWAGE FLOW CAPACITY REPORT

REPORTING

___X__First report due January 31, 2008 for all of calendar year 2007 to establish a current "base line" for WWTPs at or exceeding 75% of permitted capacity.
_____WWTP under Consent Order with EPA/DOJ and/or MDE
_____NPDES Permit renewal

Date of this report **January 1, 2019**

Municipal wastewater treatment plant name: **Town of La Plata Wastewater Treatment Plant**

Permit issued to: **Town of La Plata**

County where plant is located: **Charles County**

NPDES wastewater discharge permit number: **MD0020524**

State wastewater discharge permit number: **08-DP-0518**

Facility address: **6505 Curley Hall Road, La Plata, Charles County, Maryland 20646**

Name/title of individual completing form**: William F. Eckman**

Name/title of individual certifying form: **Robert F. Stahl**

Contact person's name and telephone number: **301 934 8421**

Mailing address **Town of La Plata**
305 Queen Anne Street
Post Office Box 2268
La Plata, Md. 20646

<u>QUESTIONS</u>

1, Rated/Design Flow: **1.5 MGD** and Current Permitted Flow: **1.5 MGD**

2. Annual average flow in MGD for each of three (3) complete previous calendar years:

   2016 Flow/MGD **1.106200** 2017 Flow/MGD 1**.0810** 2018/Flow.MGD **1.2789**
   Three year average flow/MGD **1.1553**

3. Gallons and EDUs used to determine the; flow contribution for building permits issued per structure **222 gpd per EDU based on historical data from Town of La Plata with an 11% allowance for I&I**

4. Number of building permits currently approved but not connected to the WWTP: **11**

5. Total amount of additional flow in gallons represented by approved building permits that; have not been connected to date: **2,711 GPD**

6. Potential flow when the flow from approved building permits is added to the actual annual average plant flow in MGD for the last three complete years: **1.005 MGD**

7. Number of residential lots on approved final plats that have not applied for building permits and associated flow: **634**

8. Estimated flow from commercial lots that have been approved, but have not applied for building permits: **3,830 GPD**

9. Three year average annual flow **1.0023 MGD** + potential building permit flow **.006541 MGD** + potential flow from final plats: **.16461 MGD = 1.17345 MGD**

10. Were there any effluent violations, overflows, bypasses and causes reported to MDE (DMRs), Violations Notices and 5 day Letters) associated with excessive flow at the WWTP and/or with the sewer system that occurred during this reporting period:

    Sanitary sewer overflows have been a consistent problem due to an excessive amount of i&I and a 64 year old collection system that has not kept up with the growth in the Town. The Town has been successful in reducing the I&I significantly, but the only way to prevent overflows during major rain events would be to add a large equalization tank to handle peak flows The Town has hired McCrone engineering to design a large tank and

has approved the construction during the 2020 budget year that should prevent future overflows during all but the most extreme rain event.

11. Are there any planned WWTP or sewer system upgrades, expansions or improvements decided on during this reporting period:

    1. **The Town's long range plan is to increase the capacity of the Treatment Plant to 2.5 MGD. The capacity will be increased in two or three phases when it is needed after the ENR upgrade has been completed.**

    2. **The Town completed some major revisions to the collection system. This project seems to have eliminated nearly all of the Sanitary Sewer Overflows from the collection system. Unfortunately, the plant has been unable to handle the increased flow from the upgraded collection system at times and there was an overflow from the plant when 8 inches of rain fell within 24 hours. The Town is preparing an RFP to begin planning to increase the capacity of the Plant to meet the proposed expansion of the Town.**

12. Number of proposed future connections during this reporting period

    The number of projected connections is covered in Table 5.3 in the Town's Wastewater Capacity Management Plan.

13. Amount of additional flow represented by proposed future connections described above:

14. Available treatment plant flow capacity remaining upon completion of proposed future connections described above:

15. Do flows from future connections and existing flow exceed determined flow?

    Based on projections, the capacity of the existing WWTP may be exhausted near the end of 2020, depending on the economic situation in the next few years. After completing the upgrade to ENR, the Town will enter into phase 2 and develop plans to increase the capacity to at least 2.0 MGD by the time it is needed

16. Are there any moratoriums or limitations on new building permit approvals currently in place?

    There are no moratoriums currently in effect,

17. What is the "ultimate" flow capacity required if "build-out" of the town would occur based on the latest approved land use/zoning in the adopted master plan (as amended) for this reporting period? **2.5 MGD**

3.0 CONTROLLING ALLOCATION OF NEW CONNECTIONS (Guidance page 14)

The Town has adopted a policy that established infra-structure requirements and a control and accounting system to manage the allocation of wastewater capacity. Copies of the accounting system, along with periodic tracking reports concerning the allocation of wastewater capacity, are included in this document and are being submitted to MDE for their review.

The allocation system includes the following:

1. An ongoing record of the remaining capacity available in the system. A complete review of the available capacity and potential requirements will be made at the beginning of each calendar year.
2. Public Works Agreements and bonds for construction will be required before final approvals are given if improvements are needed.
3. Notes will be included on the subdivision plat, where applicable, that there may not be an allocation immediately available to begin construction.
4. Allocations will revert to the Town’s unallocated capacity after three years if construction has not begun unless the allocation has been extended.
5. A note will be made on the plans as part of the approval process that specifies when the allocation will lapse.
6. An appeal process that allows the Town to extend the time to begin construction if the situation justifies it.

4.0 WASTEWATER CAPACITY OVERLOAD (Guidance page 16)

If any portion of the system meets one of the following conditions, it is considered by MDE to be overloaded:

Condition 1: A sewage overflow or bypass occurs due to hydraulic limitations during Condition 2: The three year average daily flow rate exceeds the permitted capacity of the treatment plant.

Condition 3: The three year average daily flow rate is more than 90% of the permitted flow and there have been effluent violations, bypasses, or overflows attributed to high flows or spikes during storm events. dry weather conditions or four times during the previous six-month period.

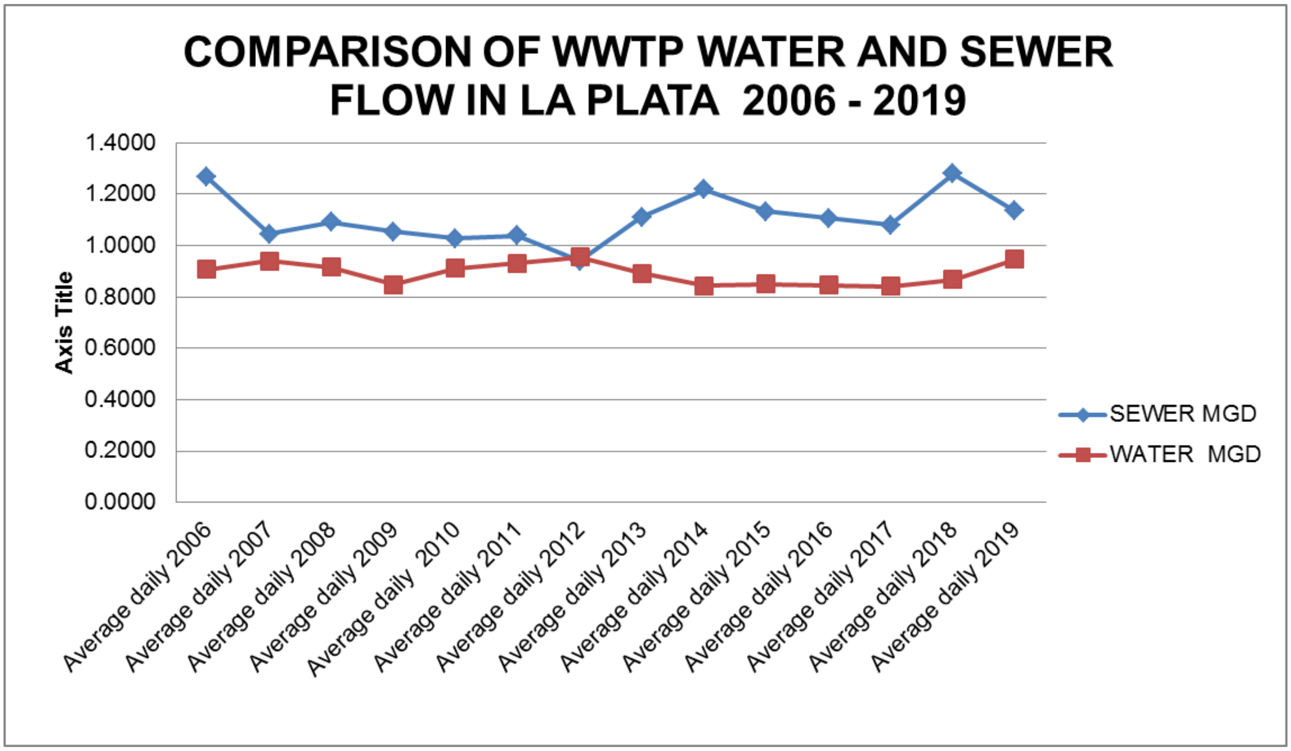

TABLE 1 AVERAGE FLOW THROUGH WWTP

	SEWER MGD	WATER MGD	INCHES RAIN Monthly	INCHES RAIN Yearly
Average daily 2006	1.2670	0.9068		
Average daily 2007	1.0450	0.9410	3.12	37.4
Average daily 2008	1.0911	0.9160	4.27	51.2
Average daily 2009	1.0550	0.8473	4.12	49.4
Average daily 2010	1.0283	0.9110	2.42	29.05
Average daily 2011	1.0390	0.9305	5.77	69.2
Average daily 2012	0.9397	0.9544	3.09	37.1
Average daily 2013	1.1113	0.8926	3.63	43.55
Average daily 2014	1.2190	0.8439	3.60	43.2
Average daily 2015	1.1333	0.8497	3.17	38.06
Average daily 2016	1.1062	0.8450	3.06	36.7
Average daily 2017	1.0810	0.8414	3.13	37.56
Average daily 2018	1.2789	0.8670	5.88	70.55
Average daily 2019	1.1346	0.9456	3.58	35.76

Based on these standards, no portion of the La Plata system would be classified as overloaded at this time. Based on past experience, an excessive amount of rain water and ground water from I & I has been getting into La Plata's sewer system. There have been times when the peak flow into the plant during major rain events was more than 3.0 MGD. The Willow Lane pump station has been replaced by an entirely new facility with new force mains, interceptors and trunk lines to the treatment plant. Since that work was completed in April of 2011, there have been no SSO's from the collection system other than the 1000 year storm in the fall of 2011. That storm would undoubtedly be classified as a "force majeur" and be beyond the capability of even a well designed system to handle without any overflow.

4.1 POTENTIAL OVERLOAD (Guidance page 16,17)

The Town has contracted with McCrone Engineers to develop a corrective action plan to design, finance, construct and operate all of its sewer system in a way that will comply with environmental standards and provide enough capacity to meet anticipated demands as the Town develops. The plan includes detailed activities, schedules and the projected time frame for completion of each one. The overall goal of the plan is to upgrade the treatment plant and collection system as needed to accommodate the 2.5 MGD total flow that the Town will generate when it has been completely built out according to the corporate limits and zoning regulations that will be enacted to meet the goals and objective of the latest Comprehensive Plan. Any improvements that are made to increase the capacity of the existing sewer system will also be designed to reduce the amount of I&I currently getting into the system.

An agreement and consent decree to upgrade the system in the Willow Lane sewer shed to eliminate SSO's in that basin was entered into with MDE in 2006. In an effort to comply with that consent decree, more than 4000 feet of sewer line was cleaned and lined, 13 manholes in the vicinity of the Willow Lane pump station were rehabbed and 125 inserts placed in manholes to reduce the amount of I & I. In spite of these efforts, MH140 on Willow Lane overflowed the day after the work was completed on January 1, 2007 during a very heavy rain event. After further analysis, the Town brought in a contractor to rehab three additional manholes and the two wet wells at the Willow Lane pump station. Several abandoned lines were plugged and one of them was filled with concrete slurry. After that work was done, there were no SSO's in the Willow Lane sewer shed for a year until seven inches of rain fell in less than 12 hours in May of 2008. As the result of that very heavy rainfall, there was severe flooding in the storm water system, the treatment plant had to bypass the sand filter and both MH13 and MH43 at the WWTP overflowed. All of the other overflows occurred during major rain events when the treatment plant was unable to accommodate the amount of stormwater from I&I getting into the collection system.

5.0 LOCAL PROCESS REQUIREMENTS (Guidance page 13)

The Town has adopted an allocation policy and a detailed tracking system to manage wastewater capacity in both the collection system and the treatment facility. The Town's Planning Department will maintain this system and enforce this policy.

Sewage capacity for a new subdivision will be allocated and reserved when the final subdivision plat is approved, signed and recorded. According to MDE guidelines, "Prospective approval is permissible if there is a very strong indication that any improvements will be available in time". If capacity in the collection system and/or the treatment plant is not available, or under construction at the time the final plat is approved, it will be clearly marked with the information that "sewage capacity may not be available for construction".

Sewage allocations will have a "sunset provision". On site construction, either on the lot or within the area covered by the subdivision must begin within three years of the time the sewage allocation is made and each final plat will be clearly marked with the expiration date. If the start of construction is delayed beyond the three year expiration date of the sewage allocation, the property owner will have an opportunity to appeal to the Town for an extension. If the Town decides that an extension is justified, the expiration date can be delayed up to 12 months at a time. If an extension is not requested and granted before the allocation expires, the applicant will have to apply for a new allocation and go through the regular process before the permits will be re-issued.

Portions of the Town's collection system may not have enough capacity to handle the sewage from proposed subdivisions. No subdivision plats for these service areas will be approved and recorded until a public works agreement has been signed, or other arrangements have been made, to provide the necessary off site infra-structure to handle the anticipated flow without overloading any portion of the system...

When a preliminary plat is received, the Planning Department will initiate a project status worksheet similar to Figure 5.1. This worksheet will be used to track the progress of the development and verify that there is adequate capacity in the sewer system to accommodate the additional flow without causing any overloads.

5.1 COLLECTION SYSTEM CAPACITY

Each of the four major developers, or potential developers, in La Plata had employed an engineering firm to design improvements that would enable them to transport sewage from their developments to the Wastewater Treatment Plant. In September of 2006, the Town organized a sewer improvement team and appointed an advisory committee composed of five experienced professionals to analyze the needs of the water and sewer systems and co-ordinate the efforts of each of these engineering firms.

5.2 CALCULATING EXISTING FLOWS (Guidance page 11)

The Town has been divided into 10 sewer service areas (SSA) with an access point to the overall collection system designated for each one. Each of these SSA's has been further divided into utility zones, based on the terrain, stormwater system, water and sewer lines and pump stations. An inventory has been completed of the number of dwelling units in each of them. Appendix 2 to this plan is a detailed inventory of each SSA and includes an estimate of the maximum flow that is anticipated from each of them. Table 5.1 is a summary of the inventory and the available capacity in the system between the access point and the treatment plant for each SSA. It compares the actual flow at the present time with the anticipated flow when the Town is completely built out.

Experience has showed that the average flow per equivalent dwelling unit (edu) in La Plata has been 222 gpd. The number of single family dwellings in each of the SSA's was counted. The average water usage, as billed in fiscal 2011, was used to estimate the number of edu's assigned to commercial, institutional and multi-family buildings as well as subdivisions predominately composed of single family dwellings. The total estimated usage was 831,229 gpd assuming an edu equals 222 gpd. If a 12% I and I allowance is applied, the anticipated flow would be 930,977 gpd. The measured dry weather flow through the plant for July and August of 2012 was 860,200 gpd and the overall average for 2011 was 1,039,000. The average daily production from La Plata's wells in 2011 was 930,200. These numbers seem to validate the methodology used to create the inventory and estimated flow. Each SSA was assigned an access point and the capacity of the existing lines compared to the estimated flow from that SSA. Table 5.1 shows the results of these comparisons.

5.3 PROJECTING FLOW FROM FUTURE DEVELOPMENT (Guidance page 15)

In addition to the existing users, the amount of undeveloped property still remaining in the Town and the maximum amount of edu's that would be permitted under the existing zoning was estimated. Appendix 3 includes the best current view of the anticipated growth and capacity requirements over the next ten years. Adding the planned development to the current users showed that the sewer system will have to transport approximately 2.5 mgd to the treatment plant when the Town is completely built out. With the improvements that have been made to the collection system, it should be adequate to handle the projected flow.

5.4 VERIFY CAPACITY OF COLLECTION SYSTEM (Guidance page 18)

When an application has been received, the Town will identify which SSA the property is in. The Town will verify that the onsite sewer system, as it is designed, will handle all the sewage that will be generated when the site is fully developed at the maximum density the zoning will permit and deliver it to the access point from that SSA without overloading the system. Before the preliminary plat is approved, the Town will verify that all of the trunk lines, interceptors and any existing pump stations between the access point and the treatment plant are large enough to accommodate the peak flow from the new development in addition to the existing flow in the line.

Table 5.1 in this report lists metered usage in each SSA and the daily average flow into the Wastewater Treatment Plant. The daily average influent to the WWTP is 13.25% higher than the daily metered usage and the daily projected flow has been adjusted to compensate for the difference. The average flow through the interceptors and force mains has been estimated and the available capacity remaining in each of the major sewer lines is included in this table. If there is not enough capacity in any of the trunk lines between the access point and the treatment plant to accommodate the proposed development, the applicant will have to develop a plan to upgrade the existing line or pump station to prevent any overloading of the Town's system. The plan should include only the absolute minimum number of additional pump stations to minimize the amount of hydrogen sulfide generated and the potential damage to the system. The developer will have to reach agreement with the Town on the design of any required upgrades and post a bond before the final plat or site plan can be approved and recorded.

Table 5.2 lists all of the pump stations and their capabilities. Only two of the pump stations have an average operating time in excess of 4 hours a day. King's Grant 1 Pump Station operates nearly ten hours every day, but this development is completely built out and it is unlikely that any more flow will be added. The pumps at Willow Lane have variable frequency speed controls and have been throttled down to the minimum to limit peak flows at the treatment plant. As the flow Increases, the pumps can be adjusted to handle it.

Figure 5.1

ALLOCATION WORKSHEET

Project: ____

Owner: ____________________________ **Date of application**____________________________

Contact Person____________________ **Address**______________________________________

Telephone____________________ **Fax**_________________ **Email**________________________

SEWER ALLOCATIONS – TOWN OF LA PLATA									
NUMBER OF EQUIVALENT DWELLING UNITS (222 GPD)									
PROJECT	PRELIMINARY		FINAL PLAT		BLDG PERMIT		UNDER CONST	OCCUP
	SUB	APP	SUB	REC	SUB	ISSUED		

ESTIMATED FLOW TABLE - LA PLATA SEWER SYSTEM (edu=222 GPD, 246.5 GPD WITH 11% i&i)								
SERVICE AREA	**ANNUAL**	**DAILY**	**EDU'S**	**GPM**	**ANNUAL**	**DAILY**	**EDU'S**	**GPM**
EXISTING OR UNDER CONSTRUCTION 3-1-2013					**TOTAL EXISTING WITH 11% I&I**			
Sewer Service Area No. 1 - Old Town North	30,978,110	84,872	382	59	34,385,702	94,207	424	65
Sewer Service Area No. 2 – Quailwood	17,346,316	47,524	214	33	19,254,410	52,752	238	37
Sewer Service Area No. 3 - Rt 301 South	4,454,159	12,203	55	8	4,944,116	13,546	61	9
Sewer Service Area No. 4 - Old Town South	73,199,918	200,548	903	139	81,251,909	222,608	1,003	155
Sewer Service Area No. 5 -Willow Lane PS	104,527,036	286,375	1,290	199	116,025,010	317,877	1,432	221
Sewer Service Area No. 6 - Clark's Run	19,125,782	52,399	236	36	21,229,618	58,163	262	40
Sewer Service Area No. 7 - Hawthorne + PS	17,880,733	48,988	221	34	19,847,614	54,377	245	38
Sewer Service Area No. 8 - Wash. Ave. North	35,858,124	98,241	443	68	39,802,517	109,048	491	76
TOTAL FLOW	**303,370,177**	**831,151**	**3,744**	**577**	**336,740,897**	**922,578**	**4,156**	**641**
	EXISTING WITH 11% i&I 3-1-2013				**PROJECTED AFTER FULL BUILDOUT WITH I&I**			
SERVICE AREA	**ANNUAL**	**DAILY**	**EDU'S**	**GPM**	**ANNUAL**	**DAILY**	**EDU'S**	**GPM**
SSA1 - Existing 24" gravity line from Wash. Ave.	34,385,702	94,207	424	65	35,824,795	98,150	442	68
SSA2 - Existing 8" to 43MH0063	19,254,410	52,752	238	37	22,852,142	62,609	282	43
SSA3 - Existing 4" force main to 43MH0062	4,944,116	13,546	61	9	224,495,711	615,057	2,771	427
SSA4 -Existing 12" gravity to 43MH0036	81,251,909	222,608	1,003	155	94,113,800	257,846	1,161	179
SSA5 - Existing pump station, 12" FM, 21" Gravity	116,025,010	317,877	1,432	221	157,129,098	430,491	1,939	299
SSA6 - Existing 6"FM to 51MH0044	21,229,618	58,163	262	40	23,118,427	63,338	285	44
SSA7 - Existing 30" gravity to WWTP	19,847,614	54,377	245	38	33,878,769	92,819	418	64
SSA8 - Existing FM to 81MH0019 8" Gravity Line	39,802,517	109,048	491	76	58,500,190	160,274	722	111
SSA9 - Heritage Green Phase 1					86,869,428	237,998	1,072	165
SSA10 - Heritage Green Phase 2					107,003,355	293,160	1,321	204
SSA11 - Heritage Green Phase 3					69,995,821	191,769	864	133
TOTAL	**336,740,897**	**922,578**	**4,156**	**641**	**913,781,537**	**2,503,511**	**11,277**	**1,739**

PROJECTED FLOW THROUGH COLLECTION SYSTEM								
SERVICE AREA	ANNUAL	DAILY	EDU'S	GPM	ANNUAL	DAILY	EDU'S	GPM
30" gravity line to WWTP	317,486,486	869,826	3,918	604	890,929,394	2,440,902	10,995	1,695
24" gravity line from 81MH0002 to 30" line	297,638,872	815,449	3,673	566	857,050,626	2,348,084	10,577	1,631
24" gravity line from Wash. Ave to Rt301	171,640,330	470,247	2,118	327	479,940,924	1,314,907	5,923	913
21" gravity line from Kent Ave to Wash Ave	137,254,628	376,040	1,694	261	444,116,129	1,216,757	5,481	845
12" force main from Willow PS to Kent Ave	137,254,628	376,040	1,694	261	444,116,129	1,216,757	5,481	845
12" gravity line from 43MH0036 to 81MH0019	86,196,025	236,153	1,064	164	318,609,512	872,903	3,932	606
8" gravity line from 43MH0002 to 81MH0019	39,802,517	109,048	491	76	58,500,190	160,274	722	111
4" force main from Buckeye Circle	4,944,116	13,546	61	9	224,495,711	615,057	2,771	427
MAXIMUM CAPACITY OF EXISTING SYSTEM IN GPM Including 11% I&I								
	AVERAGE GPM EXISTING FLOW				**ESTIMATED GPM FLOW AFTER FULL BUILDOUT**			
	CAP	**AVG 3-1-13**	**AVAIL**	**PEAK**	**CAP**	**AVG**	**AVAIL**	**PEAK**
30" gravity line to WWTP	4,404	604	3,800	1,740	4,404	1,695	2,709	4,882
24" gravity line from MH5 to 30" line	2818	566	2,252	1,631	2,818	1,631	1,187	4,696
24" gravity line from Wash. Ave to Rt301	2818	327	2,491	940	2,818	913	1,905	2,630
21" gravity line from Kent Ave to Wash Ave	2158	261	1,897	752	2,158	845	1,313	2,434
12" force main from Willow PS to Kent Ave	1762	261	1,501	752	1,762	845	917	2,434
12" gravity line on 301 from 43MH0036 to 81MH0019	705	164	541	472	705	606	99	1,746
8" gravity line on 301 from 43MH0002 to 81MH0019	313	76	237	218	313	111	202	321
4" force main from Buckeye Circle	397	9	388	27	397	427	-30	1,230
Total daily flow measurements are adjusted by 13.25% for sewer to compensate for the difference between metered flow and actual flow								
11% has been added to the measured flow to compensate for the 3 year average amount of I&I								
The peak flow is based on 3.2 times the average flow, both existing and at maximum flow								
The Willow Lane PS will accommodate maximum peak flows but a second 12" force main may be required for full buildout of Heritage Green								

PUMP STATION INFORMATION - March 2019

PUMP STATION	FORCE MAIN		EDU'S			PUMP INFORMATION						
LOCATION	SIZE	LENGTH	EST	CAL	DET TIME	AVG	24 HR	DAILY RUN TIME		GPM	ALARM	HP AND EMERGENCY
	DIA.	FEET			HOURS	GPM	FLOW	PEAK	AVG	RATING	TYPE	POWER AVAILABILITY
Willowgate	4”	450	32	21	1.6	3.5	5,100	3.6	1.0	85	Mission	5 HP, GEN
Haldane	2”	1,650	17	12	2.6	2.1	2,985	23.0	2.0	25	Autodial	NO EMGCY POWER
Quailwood Parkway	4”	950	173	61	1.2	10.4	14,976	2.2	1.6	156	Mission	5 HP,1800 RPM 40 KW
Commerce Center	4”	950	44	78	0.9	13.3	19,140	0.7	1.1	290	Autodial	15 HP, 1800 RPM, 20 KW
Diggs Circle	4”	475	123	55	0.6	9.5	13,680	1.8	1.5	152	Mission	7.5HP, 1750 RPM, 20 KW
Patuxent Court	6”	700	139	66	1.8	11.3	16,200	4.1	2.7	100	Mission	5 HP,1200 RPM, 15 KW.
Kings Grant #2	4”	345	22	23	1.1	3.9	5,640	2.5	0.9	100	Autodial	3 HP,1200 RPM, 30 KW
Kings Grant #1	6”	7,500	360	159	8.1	27.3	39,294	7.6	5.9	111	Mission	30 HP, 1760 RPM, 100 KW
Hickory Ridge	6”	1,575	99	30	8.9	5.2	7,470	2.1	1.5	83	Mission	5 HP, 1800 RPM, 20 KW
Willow Lane	12"	2,878	1,499	1,508	1.3	258.2	371,818	24.0	23.1	1750/300	Mission	100 HP 400 KW Generator
Clarks Run #2	4”	600	108	158	0.3	27.0	38,868	8.4	4.1	158	Mission	3 HP, 1200 RPM, 20 KW
Clarks Run #1	6”	1,640	317	241	1.2	41.3	59,400	8.4	3.3	300	Mission	15 HP, 1800 RPM 60KW.
Washington Square	4”	1,325	78	53	1.9	9.0	13,026	2.1	1.3	167	Mission	7.5 HP,1155 RPM,30 KW
Mary Ball Drury Dr.	6”	2,900	245	458	1.1	78.3	112,800	8.3	4.7	400	Mission	1800 RPM, 50 KW
Mary Ball backup	4"		1	0		0.0	0			225	Mission	10 HP, 1800 RPM
Rosewick Crossing	3”	5,487	35	130	2.0	22.3	32,040	10.4	8.9	60	Mission	50 kw
L.K.Farrall		1,052	1	0		0.0	0			25	None	NO EMGCY POWER
Maples		96	23	9	0.8	1.6	2,250	NA	1.2	25	None	NO EMGCY POWER
TOTAL PUMP STATIONS			**2,297**	**2,268**		**419.5**	**604,015**		**49.1**			
WWTP INFLUENT PS				**5,658**		**968.5**	**1,394,600**		**21.5**	**2350/767**	**SCADA**	**93HP, 750 KW Generator**
FLOW - TANDEM PUMP STATIONS				**794**		**135.9**	**195,738**					**Onan 500 KW Generator**

5.5 INFLOW AND INFILTRATION (Guidance page 11)

The original sewer system in La Plata was constructed primarily of concrete or cast iron pipes. These pipes have deteriorated over the years. The original system had two pump stations to overcome the differences in elevation throughout the Town. Because of the terrain, 15 more pump stations have been added. Both of the original pump stations have been eliminated and there are a total of 18 at the present time. One of the problems that come with sewer pump stations is their tendency to generate hydrogen sulfide gas. Concrete pipes are especially vulnerable to hydrogen sulfide. The original pipes on St. Mary's Avenue, Charles Street and portions of Howard Street were in such bad shape that they have been replaced or lined to prevent failures and reduce the amount of I&I getting into the system.

In connection with the sanitary sewer survey done by URS in 2005/2006, an effort was made to measure the amount of I&I entering the Town's collection system. To further isolate the source and amount of I and I, the Town has done an in depth analysis of pump station time of operations. A SCADA system now monitors pump run times and wet well levels at eight of the most critical pump stations and the Wastewater Treatment Plant. Seven Teledyne-Isco portable flow meters have also been purchased and installed at a number of different locations in the system from time to time to isolate problems. Based on the difference between dry weather flow and the three year average flow from 2009 to 2011,a factor of 12% additional for I and I is added to each edu when the allocation is made. When the I&I factor is added, each edu generates an average of 249 gpd of sewage.

5.6 TREATMENT PLANT CAPACITY (Guidance page 12)

The Town of La Plata's treatment plant was upgraded to BNR standards in 2001 and to ENR standards in 2014. A sewer study of the Town's potential growth was done in the late 1990's. Indications were that when the Town is completely built out, the total sewage flow will be about 2.5 mgd. The plant upgrade in 2001 was designed with an ultimate flow capacity of 2.5 mgd. Only enough tankage was built at that time for a rated capacity of 1.5 mgd with a peak flow capacity of 3.0 mgd. Many of the common portions of the plant were designed to be increased to 2.5 mgd as the Town population increases.

The average flow during 2007 was 1.045 mgd and the three year average was 1.156 mgd. Based on the three year average, the available capacity in the plant at the end of 2007 was .344 mgd. The amount of sewage capacity available for allocation at that time was 1,549 edu's based on an average flow per edu of 222 gpd. Adding 14% for I and I reduced the available capacity to 1360 edu's.

The average flow during 2011 was 1.039 mgd and the three year average was reduced to 1.0408 mgd. The available capacity in the plant as of 1-1-12 was .459 mgd. The amount of sewage capacity available for allocation at that time was 2068 edu's.

WWTP CAPACITY 2017	
Capacity of WWTP 1-1-17	1,500,000
Average daily effluent 2017	1,081,000
Average daily sewage generation October and December, 2017	929,300
Three year average efflluent, 2015, 2016 and 2017	1,050,733
Average daily I and I 2017	151,700
Percent of I and I 2017	16.3%
Three year average I and I	174,233
Three year average percent of I and I	16.6%
Available Capacity edu's 1-1-18	2024
Available Capacity edu's 1-1-18 less average I and I	1730
WWTP CAPACITY 2018	
Capacity of WWTP 1-1-18	1,500,000
Average daily effluent 2018	1,278,900
Average daily sewage generation January and July, 2018	1,095,800
Three year average efflluent, 2016, 2017 and 2018	1,155,367
Average daily I and I 2018	183,100
Percent of I and I 2018	16.7%
Three year average I and I	167,033
Three year average percent of I and I	14.5%
Available Capacity edu's 1-1-19	1552
Available Capacity edu's 1-1-19 less average I and I	1327
WWTP CAPACITY 2019	
Capacity of WWTP 1-1-19	1,500,000
Average daily effluent 2019	1,134,600
Average daily sewage generation August and October, 2019	928,800
Three year average efflluent, 2017, 2018 and 2019	1,164,833
Average daily I and I 2019	205,800
Percent of I and I 2019	22.2%
Three year average I and I	180,200
Three year average percent of I and I	15.5%
Available Capacity edu's 1-1-20	1510
Available Capacity edu's 1-1-20 less average I and I	1290

The La Plata treatment plant was scheduled to be upgraded to meet ENR standards by the end of 2011. In 2007, there was a concern that considering the number of building permits the Town expected to issue, there would be very little available capacity left in the treatment plant by that time. Because of the economic downturn, it appears that at least two of the planned subdivisions will be delayed and the number of units built in Steeplechase and Agricopia each year will be less than originally projected. Long term indications are that construction in Heritage Green will begin in 2014 or 2015 instead of 2009 as originally planned. Stagecoach Crossing has changed hands. The new owner has not given any indication to the Town as to when construction of that development will begin and the plat approvals have expired. With both of these developments delayed, the Town's buildout will probably continue until 2030 or later. Appendix 3 to this plan estimates the demands that will be placed on the Town's treatment plant between now and 2022. Table 5.4 illustrates the tracking work sheet and methodology the Planning Department will use in allocating capacity in the Treatment plant in the future as part of the approval process of all final plats.

Stearns and Wheler was contracted to do a feasibility study of the most cost effective way to expand the capacity of the plant to 2.5 mgd as part of the project to upgrade it to meet ENR standards. The final report was presented to the Town in March of 2008 and submitted to MDE for approval.

After extensive discussions with MDE, the decision was made to do the upgrade and expansion of the plant in phases. The first phase began in 2009 and will only involve the conversion to ENR standards. This project should be completed before the deadline of 12-31-2013. MDE has agreed to pay the full cost of upgrading the WWTP from the Bay Restoration Fund, providing the rated capacity is not increased above the current rating of 1.5 MGD. The upgrade will involve adding another treatment module to increase the retention time in the plant, installing a SCADA system to control all aspects of plant operation automatically to improve consistency of treatment and installing a carbon feed system to reduce the total nitrogen content of the effluent from 4 ppm to 3 ppm. Stearns and Wheler completed the design of the upgrade and it was approved by MDE. The Town advertised for bids and the contract was awarded to Johnston Construction Company. Work began on July 1, 2011 and the final completion is due by August 31, 2013. Construction will be staged and the Town's plan is to try to meet the requirements of the new NPDES permit by December 31, 2013.

Phase 2 will increase the capacity to 2.0 MGD. The design of phase 2 will begin when the average flow through the plant reaches 1.35 MGD, 90% of its rated capacity.

A new NPDES permit has been issued with a rated capacity of the WWTP of 1.5 MGD until the ENR upgrade has been completed and in service. At that time, the permitted capacity will be increased to 2.0 MGD with the maximum nitrogen in the effluent reduced from four parts per million to three. The high peak flows during major rain events may make it difficult to meet ENR limits even after the upgrade has been completed. As part of the SSES report, URS recommended that equalization tanks be added to handle peak flows. Since that time, the Town applied for a "green grant" to install two 750,000 gallon equalization tanks. The grant was denied and has been resubmitted as part of the 2013 funding cycle. There was some thought that installation of the equalization tanks would actually be the beginning of the expansion of the plant and could be financed as part of the SRF authorization. The Town is still paying for the

BNR upgrade of the plant that took place in 2002 and may incur as much as $500,000 additional long term debt in connection with the ENR upgrade.. The Town will continue to make every effort to reduce the amount of I&I getting into the sewer system, but the construction of additional equalization tanks will have to wait until a source of funding can be obtained.

Phase 3 will involve increasing the capacity to 2.5 MGD or whatever is required to treat the sewage that will be generated as the Town approaches its maximum buildout. Because of the TMDL limits that have been assigned to La Plata, increasing the capacity beyond 2 MGD will probably involve two separate NPDES permits, one for surface discharge of 2 MGD. The other will be for an alternative method of handling the additional 500,000 GPD that will be discharged from the plant. The options for doing this may be further limited by the Watershed Implementation Plan (WIP) Phase II being created by the State of Maryland at the present time. Whatever the method chosen, the second discharge permit will have to be issued to the Town before phase 3 of the expansion can begin.

5.7 ALLOCATION OF AVAILABLE CAPACITY (Guidance page 14)

There are three major developments in the Town that are either under construction or in the planning stages. The maximum flow for each service area has been estimated and any additional construction will be measured against the ability of the sewage system to handle the increased flow. To determine the requirements at final buildout, the number of potential lots and other edu's within the Town was added to the existing flow. Based on this information found in Appendix 2, it appears that the ultimate flow will be as much as 2.7 mgd using 222 gpd as an equivalent dwelling unit with q 11% I&I factor added in. None of these calculations include any potential annexations and all of them are based on the Town Limits as of 1-1-2013 rather than the growth area that has been included in the most recent Comprehensive Plan, adopted in the fall of 2009. In addition, the peak flow, as shown in Table 5.1, was considered in planning the size of the lines from each access point to the treatment plant.

5.8 AVAILABLE TREATMENT CAPACITY (Guidance page 14)

At the beginning of each calendar year, the planning department of the Town will evaluate how much capacity is available in the wastewater treatment plant at that time. The base line for estimating available capacity will be the average flow over the last three years. To determine how much available capacity remains in the plant, the number of edu's that have been allocated, but the buildings are not yet occupied, will be added to the average flow. Table 5.3 illustrates the methodology that was used in determining the available capacity as of January 1, 2013. When a project is submitted to the Town or the Design Review Board for its consideration, it should be listed on the allocation worksheet under pending projects. Appendix 3 shows the Town's best estimates of the construction that will take place over the next 10 years.

When a preliminary plat has been submitted to the Town for approval, an allocation worksheet, similar to Figure 5.1, will be initiated and the progress of the project tracked. If the collection system is adequate to handle the anticipated sewage, the Sewer Allocation Records show that sufficient capacity is available in the WWTP, and the project meets all the other requirements of the Town, the preliminary plat can be submitted to the Planning Commission and the normal permitting process followed. At that point it moves from the category of pending project to actual projects. None of the available capacity in the treatment plant will be committed until the final subdivision plat or building permit is approved and recorded.

TABLE 5.4 SEWER ALLOCATIONS - LA PLATA 222 gpd per edu with 11% I & I

	PROJECTED						ACTUAL APPROVALS					
PROJECT	2012	2013	2014	2015	I & I RED	AVAIL EDU'S	2012	2013	2014	2015	I & I RED	AVAIL EDU'S
1/1/2012						**2014.0**						**2014.0**
Agricopia	78				8.6	1927.4	78				8.6	1927.4
Edelen Station	5				0.6	1921.9	10				1.1	1916.3
Kent Knolls	5				0.6	1916.3	5				0.6	1910.8
Marshall's Choice	21				2.3	1893.0	21				2.3	1887.5
Steeplechase	164				18.0	1711.0	164				18.0	1705.4
Commercial	6				0.7	1704.3	2				0.2	1703.2
La Plata Crossing					0.0	1704.3					0.0	1703.2
1/1/2013					0.0	1704.3					0.0	1703.2
Agricopia		26			2.9	1675.5		53			5.8	1644.4
Edelen Station		10			1.1	1664.4		10			1.1	1633.3
St. Mary's Villas		6			0.7	1657.7		6			0.7	1626.6
Hawthorne Green S 2					0.0	1657.7					0.0	1626.6
Heritage Green S1			293		32.2	1625.5			293		32.2	1301.4
Steeplechase					0.0	1625.5					0.0	1301.4
La Plata Crossing					0.0	1625.5					0.0	1301.4
1/1/2014					0.0	1625.5					0.0	1301.4
Agricopia			26		2.9	1596.6			27		3.0	1271.4
Edelen Station			10		1.1	1585.5			10		1.1	1260.3
Hawthorne Green 2					0.0	1585.5					0.0	1260.3
Heritage Green 1					0.0	1585.5					0.0	1260.3
St. Mary's Villas					0.0	1585.5					0.0	1260.3
Steeplechase					0.0	1585.5					0.0	1260.3
1/1/2015					0.0	1585.5					0.0	1260.3
Agricopia					0.0	1585.5					0.0	1260.3
Edelen Station					0.0	1585.5					0.0	1260.3
St. Mary's Villas					0.0	1585.5					0.0	1260.3

TABLE 5.4 SEWER ALLOCATIONS - LA PLATA 222 gpd per edu with 11% I & I												
	PROJECTED						ACTUAL APPROVALS					
PROJECT	2012	2013	2014	2015	I & I RED	AVAIL EDU'S	2012	2013	2014	2015	I & I RED	AVAIL EDU'S
Hawthorne Green S 2					0.0	1585.5					0.0	1260.3
Heritage Green S 1				250	27.5	1308.0					0.0	1260.3
Steeplechase					0.0	1308.0					0.0	1260.3
ANNUAL TOTALS	279	42	329	250	99		280	69	330	0	74.69	

TABLE 5.4 SEWER ALLOCATIONS - LA PLATA 222 gpd per edu with 11% I & I												
	ALLOCATED						BLDG PERMITS ISSUED					
PROJECT	2012	2013	2014	2015	I & I RED	AVAIL EDU'S	2012	2013	2014	2015	I & I RED	AVAIL EDU'S
1/1/2012						2014.0						2014.0
Agricopia	78				8.6	1927.4	7				0.8	2006.2
Edelen Station	10				1.1	1916.3					0.0	2006.2
Kent Knolls	5				0.6	1910.8					0.0	2006.2
Marshall's Choice	21				2.3	1887.5					0.0	2006.2
Steeplechase	164				18.0	1705.4					0.0	2006.2
Commercial	2				0.2	1703.2	4				0.4	2001.8
La Plata Crossing					0.0	1703.2					0.0	2001.8
1/1/2013					0.0	1703.2					0.0	2001.8
Agricopia		53			5.8	1644.4					0.0	2001.8
Edelen Station		10			1.1	1633.3					0.0	2001.8
St. Mary's Villas		6			0.7	1626.6					0.0	2001.8
Hawthorne Green S 2					0.0	1626.6					0.0	2001.8
Heritage Green S 1			293		32.2	1301.4					0.0	2001.8
Steeplechase					0.0	1301.4	5				0.6	1996.2
La Plata Crossing					0.0	1301.4					0.0	1996.2
1/1/2014					0.0	1301.4					0.0	1996.2
Agricopia			27		3.0	1271.4					0.0	1996.2
Edelen Station			10		1.1	1260.3					0.0	1996.2
Hawthorne Green 2					0.0	1260.3					0.0	1996.2
Heritage Green 1					0.0	1260.3					0.0	1996.2
St. Mary's Villas					0.0	1260.3					0.0	1996.2
Steeplechase					0.0	1260.3					0.0	1996.2
1/1/2015					0.0	1260.3					0.0	1996.2
Agricopia					0.0	1260.3					0.0	1996.2

TABLE 5.4 SEWER ALLOCATIONS - LA PLATA 222 gpd per edu with 11% I & I												
	ALLOCATED						BLDG PERMITS ISSUED					
PROJECT	2012	2013	2014	2015	I & I RED	AVAIL EDU'S	2012	2013	2014	2015	I & I RED	AVAIL EDU'S
Edelen Station					0.0	1260.3					0.0	1996.2
St. Mary's Villas					0.0	1260.3					0.0	1996.2
Hawthorne Green Section 2					0.0	1260.3					0.0	1996.2
Heritage Green Section 1					0.0	1260.3					0.0	1996.2
Steeplechase					0.0	1260.3					0.0	1996.2
ANNUAL TOTALS	280	69	330	0	74.69		16	0	0	0	1.76	

TABLE 5.4 SEWER ALLOCATIONS - LA PLATA 222 gpd per edu with 11% I & I SEWER												
	BLDG PERMITS ISSUED						OCCUPANCY PERMITS ISSUED					
PROJECT	2012	2013	2014	2015	I & I ADD	ADDED FLOW	2012	2013	2014	2015	I & I ADD	ADDED FLOW
1/1/2012												
Agricopia	7				0.77	1,725	1				0.11	246
Edelen Station					0.00	1,725					0.00	246
Kent Knolls					0.00	1,725					0.00	246
Marshall's Choice					0.00	1,725					0.00	246
Steeplechase					0.00	1,725	3				0.33	986
Commercial	4				0.44	2,711	1				0.11	1,232
La Plata Crossing					0.00	2,711					0.00	1,232
1/1/2013	10				1.10	5,175					0.00	1,232
Agricopia					0.00	5,175					0.00	1,232
Edelen Station					0.00	5,175					0.00	1,232
St. Mary's Villas	12				1.32	8,132					0.00	1,232
Hawthorne Green S 2	4				0.44	9,118					0.00	1,232
Heritage Green S 1					0.00	9,118					0.00	1,232
Steeplechase	5				0.55	10,350					0.00	1,232
La Plata Crossing					0.00	10,350					0.00	1,232
1/1/2014					0.00	10,350					0.00	1,232
Agricopia					0.00	10,350					0.00	1,232
Edelen Station					0.00	10,350					0.00	1,232
Hawthorne Green 2					0.00	10,350					0.00	1,232
Heritage Green 1					0.00	10,350					0.00	1,232
St. Mary's Villas					0.00	10,350					0.00	1,232

TABLE 5.4 SEWER ALLOCATIONS - LA PLATA 222 gpd per edu with 11% I & I SEWER												
	BLDG PERMITS ISSUED						**OCCUPANCY PERMITS ISSUED**					
					I & I	**ADDED**					**I & I**	**ADDED**
PROJECT	**2012**	**2013**	**2014**	**2015**	**ADD**	**FLOW**	**2012**	**2013**	**2014**	**2015**	**ADD**	**FLOW**
Steeplechase					0.00	10,350					0.00	1,232
1/1/2015					0.00	10,350					0.00	1,232
Agricopia					0.00	10,350					0.00	1,232
Edelen Station					0.00	10,350					0.00	1,232
St. Mary's Villas					0.00	10,350					0.00	1,232
Hawthorne Green Section 2					0.00	10,350					0.00	1,232
Heritage Green Section 1					0.00	10,350					0.00	1,232
Steeplechase					0.00	10,350	5	0	0	0	0.55	2,464
1/1/2013 TOTAL	42	0	0	0	4.62		10	0	0	0	1.1	

When the final subdivision plat or building permit for a commercial, industrial or institutional building is approved and recorded, capacity in the treatment plant will be reserved for it and the project moves into the allocated category on the Allocation Worksheet. The anticipated number of edu's that the project will generate is subtracted from the available capacity remaining in the plant. A final plat will not be approved and recorded unless the records show that there is enough capacity available in the treatment plant to serve the development.

To retain the allocation, the first building permit must be issued and construction begun within three years of the time the sewer allocation is approved. When the final subdivision plat or building permit is issued, the expiration date of the sewer allocation should be clearly marked on the plans. The property owner can apply to the Town for an extension of the allocation. If the Town determines that the delay was not the fault of the owner or is to the benefit of the Town, they can issue a one year extension. If the application for an extension is not made before the expiration of the allocation, the property owner will have to go through the normal process to receive another allocation of sewer capacity to qualify for another building permit.

When the annual municipal sewer capacity report is submitted to MDE, the anticipated flow from structures that have active building permits is added to the three year average flow through the treatment plant to determine the available capacity at that time. The number of edu's that have been committed, but the building permits have not yet been issued, will also be subtracted from the available capacity for allocation purposes. When an occupancy permit has been issued, the flow from that structure or structures becomes part of the measured flow through the plant and is no longer part of the anticipated flow increase.

6.0 SUBDIVISON APPROVALS (Guidance page 15)

Subdivision final plats should not be recorded unless both the treatment plant and the collection system have enough available capacity to prevent an overload condition. A final plat can be approved and recorded before infra-structure has been completed, providing the plans have been approved, a public works agreement signed by the developer and a performance bond provided to the Town. Construction of the improvements will begin as soon as funding arrangements have been completed and permits issued.

Any off-site improvements to the collection system, or expansion of the treatment plant, that are required must be in progress with the anticipated completion date within one year before the subdivision plat can be approved and recorded. Each subdivision plat will contain a sunset provision so that the allocation will be lost if the buildings are not under construction within three years unless the expiration date is extended by an appeal.

Since several departments of the Town will be involved in the capacity management program, a technical review team (TRT) has been organized to co-ordinate the activities of all of them. This review team includes the Director of Planning, the Manager of Inspections, Director of Operations, Superintendent of Public Works, the Town Treasurer and other officials that may be involved in approving and implementing the plan. This group meets monthly and as needed to review all of the subdivision plats and site plans before they are submitted to the Planning Commission for their approval to insure that they meet all of the requirements in the Town Code and that there is sufficient capacity in the Sewer System to meet the needs of the proposed development.

7.0 BUILDING PERMITS (Guidance page 6)

Building permits will be issued according to the allocations assigned to the subdivision at the time the final plat was recorded. Minor subdivisions, Commercial, Industrial, Institutional, Infill development or re-development will receive an allocation at the time the building permits are issued. The planning department will maintain an ongoing record of plats recorded and permits issued to determine the availability of capacity in the system. When an occupancy permit is issued, the anticipated usage will be subtracted from the available capacity in the system.

8.0 ANNUAL REPORTS (Guidance page 8)

At the beginning of each calendar year, all of the worksheets should be brought up to date. The information on the Sewer Allocation Worksheets, Table 5.4 in this report, should be tabulated and the information needed to fill out the Annual Capacity Report and Municipal Capacity Report forms obtained by comparing allocations with building permits and occupancy permits. The three year average annual flow at the treatment plant should be adjusted by including the flow that will result when all the development that is in progress has been completed and the buildings occupied. The SSA inventories should also be corrected to include the edu's from structures that have had occupancy permits issued. The sewer projection worksheets should also be corrected to reflect the amount of allocations that have been committed during the previous year.

The following actions are to be taken each year by the Town:

Submit the "Available Capacity Report" to the Health Director by January 31st.

Submit the "Municipal Sewage Capacity Report" and the latest copy of the "Wastewater Capacity Management Plan" to MDE.

9.0 CONTACT INFORMATION

The following people will be responsible for the maintenance and implementation of the Plan:

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