

CALVERT COUNTY
COMPREHENSIVE WATER &
SEWERAGE PLAN

2008

PREPARED BY THE CALVERT COUNTY
DEPARTMENT OF PLANNING & ZONING

January 2008



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CALVERT COUNTY
COMPREHENSIVE WATER & SEWERAGE PLAN

2008

Prepared for

Board of County Commissioners

by the

CALVERT COUNTY DEPARTMENT OF
PLANNING AND ZONING

COURTHOUSE
PRINCE FREDERICK, MD 20678

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Barry King, Chief

and by

Consultant
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Staff Support:

Ray Alvey

Plan was prepared to fulfill the requirements of Maryland Department of Environment Regulations 26.03.01 and to implement county growth management and planning policies. This Plan supersedes the County Comprehensive Water and Sewerage Plan originally adopted November 4, 1975, updated August 2, 1994 and September 29, 1998, and amended regularly thereafter. A list of Plan updates and amendments can be found in Appendix A.

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WATER AND SEWER PLAN MAPS

Map 1 - Water
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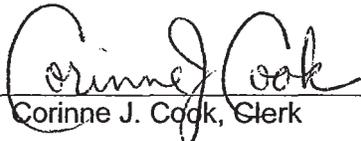
CERTIFICATES

Calvert County Water and Sewerage Plan Triennial Update and 2007 Amendments

CERTIFICATE OF ADOPTION, BOARD OF COUNTY COMMISSIONERS

The County Commissioners of Calvert County, Maryland, on March 25, 2008 following public hearings on January 29, 2008 and March 25, 2008, did by motion duly made, seconded and carried, adopt this amendment to the County Water and Sewerage Plan as required by Title 9, Subtitle 5 of the Annotated Code of Maryland, for submission to the Maryland Department of the Environment for approval.

ATTEST:


Corinne J. Cook, Clerk

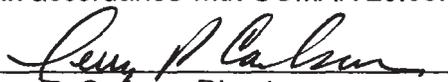
BOARD OF COUNTY COMMISSIONERS OF
CALVERT COUNTY, MARYLAND

Wilson H. Parran, President

Date: 4-15-08

CERTIFICATE BY ENGINEER

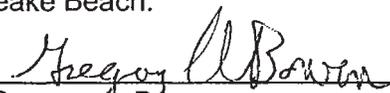
Sections of this Plan covering engineering aspects of water and sewerage projects have been examined and reviewed for adequacy and cost effectiveness to meet defined needs in the State of Maryland in accordance with COMAR 26.03.01.04 B(3)

Attest: 
Terry P. Carlson, Director
Department of Public Works

Date: 4-15-08

CERTIFICATE OF CONSULTATION WITH PLANNING AGENCIES

All known official planning agencies in Calvert County and other known State and Federal planning agencies having an interest in Calvert County have been consulted regarding this County Water and Sewerage Plan and have been given opportunity to submit information and comments for review and consideration as to consistency of the proposed programs with the plans and planning for all affected areas. The Department of Planning and Zoning certifies that the 2008 Update to the Calvert County Water and Sewerage Plan has been submitted to the Department of the Environment and meets the requirements of COMAR Title 26.03.01.04 and is consistent with the Calvert County Comprehensive Plan and with the Comprehensive Plans of the municipalities of North Beach and Chesapeake Beach.

Attest: 
Gregory A. Bowen
Director, Department of Planning & Zoning

Date: 4-15-08



MARYLAND DEPARTMENT OF THE ENVIRONMENT

1800 Washington Boulevard • Baltimore MD 21230
410-537-3000 • 1-800-633-6101

Martin O'Malley
Governor

Shari T. Wilson
Secretary

Anthony G. Brown
Lieutenant Governor

Robert M. Summers, Ph.D.
Deputy Secretary

JUL 29 2008

The Honorable Wilson H. Parran
President
Board of County Commissioners of Calvert County, Maryland
Courthouse
175 Main Street
Prince Frederick MD 20678

Dear Mr. Parran:

The Maryland Department of the Environment (MDE) has completed its review of the **2008 Calvert County Water and Sewerage Plan (Plan)**. During MDE's review, no adverse comments were received. The Maryland Department of Planning had advised your staff in a letter dated January 16, 2008 that the Plan is well aligned to implement the growth management concepts of the 2004 Calvert County Comprehensive Plan (comments enclosed). The Plan is approved.

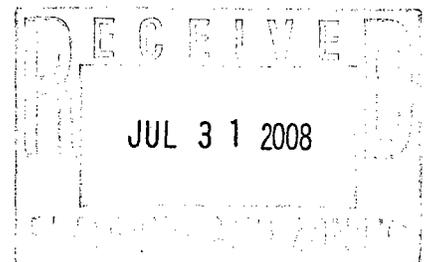
The next update of your 2008 Plan is due in this office by April 15, 2011. Also, please be advised that COMAR requires that the County provide a copy of your draft 2011 Plan to MDE, prior to adoption. This action will ensure that MDE's comments can be incorporated, as appropriate, into the County's final Plan.

This action completes our review, as required by Section 9-507 of the Environment Article, Annotated Code of Maryland. For you need further assistance, please contact Virginia F. Kearney, Deputy Director, at 410-537-3512, toll-free at 800-633-6101 or by e-mail at vkearney@mde.state.md.us.

Sincerely,

Jay G. Sakai, Director
Water Management Administration

Enclosures



- cc: Mr. Greg Bowen, Director, Calvert County Department of Planning and Zoning
- Mr. Paul McFaden, Director, Division of Environmental Health
- Ms. La Verne Gray, MDP
- Ms. Virginia F. Kearney, Deputy Director

CHAPTER ONE

COUNTY GOALS, OBJECTIVES, AND ACTIONS

The Comprehensive Water and Sewerage Plan (the Plan) is a planning document which provides a framework for County water supply and sewerage disposal. State laws and regulations require that each County in Maryland adopt and update a plan which establishes guidelines for the provision of water and sewerage facilities. Also, recent state “Smart Growth” policies are playing a major role in when and how water and sewerage facilities are planned. Moreover, goals and objectives are established to ensure that not only state regulations are adhered to but that Calvert County’s growth management policies are achieved.

Calvert County growth management policies are found in the Comprehensive Plan. Adopted in 2004, the Comprehensive Plan establishes the following overarching goals:

1. Maintain and/or improve the overall quality of life for all citizens of Calvert County by:
 - a. promoting sustainable development,
 - b. encouraging a stable and enduring economic base,
 - c. providing for safety, health, and education, and
 - d. preserving the natural, cultural, and historic assets of Calvert County.
2. Use the Comprehensive Plan as the County's primary guiding policy document.
3. Implement the Plan using the following procedures:
 - a. Department Heads: Prepare annual reports to the Board of County Commissioners on progress implementing assigned action items.
 - b. Planning Commission: Determine whether ordinances or special plans need to be prepared or revised.
 - c. Board of County Commissioners:
 - Appoint special blue ribbon committees to investigate and report on specific aspects of the Plan as needed.
 - Maintain a 10-year Capital Improvement Plan (CIP) which reflects the actions called for in this Plan. Place high priority on providing needed infrastructure in the Town Centers, as called for in Town Center Master Plans, and identify funding sources to help implement the CIP.
 - Require additional research as needed.
 - Make copies of all reports and actions available to the public.
 - d. Citizens: Remain informed and active participants.

County Comprehensive Plan objectives pertinent to land use, growth management, wastewater management and water supply and conservation are listed below. The purpose in formulating the objectives is to provide the County with guidelines that will help decision making both now and in the future.

All applicable state and federal plans, programs and regulations, which may impact or be impacted by the goals, objectives and philosophies of the Comprehensive Water and Sewerage Plan have been considered, to the best of our knowledge, in the formulation of this Plan.

A. LAND USE AND GROWTH MANAGEMENT OBJECTIVES

1. As an alternative to functioning primarily as a "bedroom community", adopt policies that will promote the County as a desirable location for high-technology industries, vacation destination, farming and aquaculture region, resource protection area (i.e., "greenbelt"), and retirement community.
2. Manage the amount and rate of residential growth.
3. Preserve the rural character of the County, its prime farmland, contiguous forests, historic resources, and environmentally sensitive areas.
4. Develop Town Centers as attractive, pleasant, and convenient places to live, work, and shop.
5. Direct commercial and industrial uses to appropriate locations; provide necessary infrastructure.
6. Direct residential growth to appropriate locations; ensure a wide range of housing opportunities for all incomes and ages; maintain and enhance the quality of residential communities.

B. WASTE MANAGEMENT OBJECTIVES

1. Ensure the safe and environmentally sound disposal of solid waste, wastewater, and hazardous waste generated in Calvert County.
2. Reduce nutrient pollution from sewage treatment facilities and septic systems.
3. Promote conservation of resources; e.g., solid waste source reduction, reuse and recycling of waste, and water conservation.
4. Investigate efficiency and effectiveness of regional approaches to waste management.
5. Allow for sewage treatment facilities for Town Centers.
6. Identify and require correction of malfunctioning septic systems.

C. PUBLIC FACILITIES AND GENERAL SERVICES

1. Provide public facilities to support planned growth.
2. Ensure that new public buildings and grounds are built with multiple public uses in mind.
3. Ensure that public facilities are energy- and cost-efficient and easy to maintain.
4. Whenever appropriate, locate public buildings in Town Centers.
5. Provide and/or plan the development of infrastructure, such as roads, communications, water and sewer, sidewalks, etc., to enable designated towns to develop.

D. WATER AND SEWER GOALS AND ACTION PLAN

To implement the goals and objectives of the Comprehensive Plan, a Goals and Action Plan list was developed as part of this Water and Sewerage 2007 Update. The Plan calls for the following :

Water Goal – Maintain a potable and adequate supply of water.

Action Plan: (Please refer to Chapter Three for more details on the planning for water service.)

1. Continue to participate with the Tri-County Council in the study of aquifers which serve Calvert County.
2. Continue to enforce the residential build-out limit of 37,000 households.
3. Achieve the federal arsenic standards in all public water systems.
4. Establish criteria for when a water system is required outside of Town Centers.
5. Provide public education on water conservation to reduce demands on our aquifers and reduce demands for wastewater disposal.
6. Establish a wellhead protection plan.
7. Implement findings of the Patapsco Regional Water Study.

Sewerage Goal – Reduce the impact of wastewater on the environment.

Action Plan: (Please refer to Chapter Four for more details on the planning for sewerage service.)

1. Continue to show preference for land application of wastewater effluent.
2. Encourage or require the use of nitrogen removing technologies for new on-site disposal systems and shared facilities to reduce nutrient pollution of our waterways. Encourage the use of nitrogen removing technologies for replacement systems.
3. For existing problem areas (failing septic systems), search for funding and means to correct the problem. This could include installation of a community wastewater system, nitrogen removing septic systems, a shared facility system, or reuse of treated wastewater.
4. Promote public education on the use and care of septic systems, such as the “Pump for the Bay Contest” sponsored by the Environmental Commission, and displays at Patuxent River Appreciation Days.
5. Work closely with the Calvert County Environmental Health Department on documenting failing septic areas.
6. Continue to conduct watershed studies to determine the source of pollutants impacting waterways and begin to determine the assimilative capacity of waterways as required by the Water Resources Element of Article 66B.

Town Center Goal – Facilitate Economic and Town Center Development.

Action Plan:

1. Develop allocation policies for all major Town Centers served by public water and/or sewer.
2. Permit water and sewer in all Town Centers when needed to support environmental health and/or support County identified economic development goals, when and if cost effective and economically feasible, and consistent with town center master plans.
3. Provide water and/or sewerage in a timely fashion to all designated Town Centers in coordination with other County Capital Improvement Plans and development.

E. ORGANIZATION OF AGENCIES AND COMMISSIONS RESPONSIBLE FOR PLAN DEVELOPMENT, ADMINISTRATION AND IMPLEMENTATION

Several agencies and commissions at various levels of government are included in the organizational structure for the County's Water and Sewerage Plan. The different levels of government include county, town and state agencies and politically appointed commissions.

1. County

- i. **The Calvert County Board of County Commissioners** act as the local approving authority for the comprehensive water and sewerage plan. The Board of County Commissioners (BOCC) enact and amend resolutions which direct water and sewerage policies within the County and approve amendments to the Plan. The BOCC oversees the development and administration of the adopted Water and Sewerage Plan as well as implementation of its policies (see Appendix B). The BOCC adopts the Plan and forwards it to the State for approval.
- ii. **The Calvert County Planning Commission** makes recommendations to the BOCC on water and sewerage planning issues. The Commission is also responsible under Title 9, Subtitle 5, Section 506, Paragraph (a) (3) (iii). of the Annotated Code of Maryland to hold public hearings for proposed new water and sewerage systems or expansions of existing systems.
- iii. **The Department of Planning and Zoning (P&Z)** is responsible for preparation of the Comprehensive Water and Sewerage Plan for approval by the Board of County Commissioners and subject to policies set by the state. The P&Z ensures a thorough review by local and state agencies, as well as individuals.
- iv. **The Department of Public Works (DPW), Bureau of Facilities, Division of Water and Sewerage** is responsible for implementation of the Comprehensive Water and Sewerage Plan. DPW designs, constructs and operates the County's public water and sewer systems. Allocation of water and sewerage treatment capacity is the responsibility of the Department of Public Works (DPW).
- v. **The Calvert County Health Department, Environmental Health Services** enforces health standards, issues permits for on site septic systems and individual wells, recommends areas for water supply and sewerage systems and advises regarding proposed amendments to the Plan. Health Officer approval is required for all subdivisions, site plans and building permits.

2. Towns of North Beach and Chesapeake Beach

- i. The two incorporated towns operate and own their water systems. The County and the Towns share the ownership of the Wastewater Treatment facilities. Water service is allocated pursuant to current town policies. Sewer service is allocated from the Chesapeake Beach treatment plant in accordance with an inter-jurisdictional agreement. Comments were solicited from the Towns as part of the Water and Sewerage Plan preparation process.

3. State of Maryland

- i. *The Maryland Department of the Environment (MDE), Water Management Administration* approves the Plan and regulates the construction of water and sewerage facilities. A person may not install, materially alter or extend a water supply system or sewerage system unless a water appropriation and a water and sewer construction permit has been issued by MDE.
- ii. Prior to approving the Plan, MDE submits the Plan to the Maryland Department of Natural Resources (MDNR), the Maryland Department of Planning (MDP), and the Maryland Department of Agriculture (MDA) for comment.

F. AUTHORITY

1. Title 9, Subtitle 5 of the Environment Article of the Annotated Code of Maryland: County Plans for Public Water Supply, Sewerage and Solid Waste Disposal Systems:

Pursuant to Section 9-503, each county governing body shall adopt and submit to the Maryland Department of the Environment a County Plan, and shall from time to time adopt and submit to the Department a revision or amendment to its County Plan. Before a county governing body adopts any revision or amendment to its County Plan or adopts a new County Plan, the governing body shall conduct a public hearing pursuant to 9-503(d) of the Environment Article. The governing body may, through ordinance or resolution, create an authority to acquire, construct, reconstruct, extend, repair, improve, maintain, and operate any project.

2. Calvert County Board of Commissioners Resolution No. 19-80:

A resolution adopted July 18, 1980 which transfers all physical assets and responsibilities, obligations, and any and all other assets and liabilities of whatever nature, from the Calvert County Sanitary District, Inc., to the County Commissioners of Calvert County.

3. Section 16-201, Public Local Laws of Calvert County:

The County Commissioners shall exercise the powers of a sanitary commission and a water and sewer authority under Title 9, Subtitles 6 and 9 of the Environment Article of the Annotated Code of Maryland, including the powers to:

- (a) adopt regulations for water and sewerage management;
- (b) acquire, construct, maintain, or operate any water and sewerage system that the County Commissioners consider to be in the public interest and necessary to protect the general health and welfare of the residents of the county; and

- (c) impose assessments, fees and rates for water and sewerage services.
This section, enacted in 1992, continues the powers granted to the County Commissioners by Chapter 516 of the Laws of Maryland, 1980, which provided for the abolition of the Calvert County Sanitary District, Inc. and the transfer of its powers and authority to the County Commissioners. Those powers were delegated to the Division of Water and Sewerage, which in 1991, was moved from the Department of Public Facilities and Services to the renamed Department of Public Works.

G. TRIENNIAL CYCLE FOR REVISION OF PLAN

Section 9-503(b) of the Environment Article requires that county plans be reviewed triennially, and that amendments or revisions of the plan as adopted by the county government be submitted to the Maryland Department of the Environment for approval. Proposed amendments and/or revisions must be coordinated with adjoining jurisdictions, and with appropriate State and regional comprehensive planning agencies. Provisions shall be made, by use of news media, legal notices and public presentations and hearings, for inputs and comments by local citizens and citizens' groups.

As per COMAR 26.03.01.02.C, the County will review the Plan annually, in September. A report will be submitted to MDE following the review and the information will be used to update the County Capital Improvement Plan (CIP).

H. AMENDMENT OF THE PLAN

Any individual, agency, party or firm may request an amendment of the Calvert County Water and Sewage Plan by submitting an application on the form provided by the Planning Department. The application will be processed as follows:

1. As per COMAR 26.03.01.02.D, the Department of Planning and Zoning will obtain comments from municipalities and appropriate planning and reviewing agencies including the County Health Department, the Department of Public Works, Department of Economic Development, Department of General Services, the Tri-County Council, and the County Planning Commission.
2. A draft Plan amendment will be submitted to the Planning Commission when the application is complete. The Planning Commission will hold a public hearing, and make findings and recommendations to the Board of County Commissioners.
3. The Calvert County Board of County Commissioners will conduct a Public Hearing and will then officially adopt or disapprove the amendment. The Planning Commission and Board of County Commissioners may hold a joint public hearing to fulfill the public hearing requirements.
4. After adoption, the amended plan will be submitted to the Maryland Department of the Environment for approval as per COMAR 26.03.01.03. One copy is forwarded to MDNR and one copy is forwarded to MDP.
5. Errors, Omissions and Corrections. The following will be amended as part of the annual review of the Plan:

- Update of data in tables, and
 - Editorial corrections that do not change the intent of the Plan.
6. Map Amendments will be made as part of the annual review of the Plan by the Department of Planning and Zoning upon hookup of a project to water or sewerage, subject to approval by MDE.

I. CONSTRUCTION OR MODIFICATION OF COMMUNITY AND MULTI-USE SYSTEMS

Application for construction or modification of a community or multi-use water and sewerage system shall be submitted to the Calvert County Division of Water and Sewerage, in accordance with adopted regulations.

The area for which the system is requested must be included in the current County Water and Sewerage Plan in Planning Category I through 3. (If not in such category, amendment of the Plan must be obtained). Multi-use systems which are proposed in a planned sewerage service area will not require a water and sewerage plan amendment prior to construction if they are in compliance with the requirements of Chapter 4, J, "New Sewerage Plan Policies."

Prior to final approval by the Calvert County Division of Water and Sewerage, the applicant shall obtain certification from the Department of Planning and Zoning that the proposed system is consistent with the approved County Water and Sewerage Plan, and receive approval from:

1. the Maryland Department of the Environment,
2. the Maryland Department of Natural Resources as appropriate for water appropriations, and
3. the Calvert County Health Officer.

Under provisions of Section 20.73.01.01 of COMAR, a person may not commence the construction of a privately owned water system or sewage disposal (sewerage) system for public use without the prior authorization of the Public Service Commission pursuant to Public Utility Companies Article, §5-204, Annotated Code of Maryland, and the provisions of this subtitle.

J. CONFORMANCE WITH MARYLAND'S WATER CONSERVATION PLUMBING FIXTURE ACT REQUIREMENT (MWCPFA)

The Water and Sewerage Plan shall contain documentation that compliance with the MWCPFA is being achieved. The documentation shall include:

1. Designation of the county agency responsible for the enforcement of MWCPFA;
2. A summary of county programs to assure implementation of and compliance with MWCPFA, including a description of:

- (a) A procedure which assures compliance with MWCPFA before the issuance of a certificate of occupancy,
- (b) Local actions taken to assure compliance with the prohibition of the sale of non-water-conserving plumbing fixtures,
- (c) The local procedures used to ensure that agreements between a developer and a builder to assure compliance with MWCPFA are made part of the record plat process or a part of a county building, plumbing, or occupancy permit, or bill of sale.

3. Chapter 3, Section F details the County's efforts in water conservation.

K. POLICY ON THE ALLOCATION OF WATER SUPPLY AND SEWERAGE TREATMENT CAPACITY

In an effort to provide for the orderly expansion of community water supply and sewerage systems, the County is establishing guidelines for allocation of treatment capacity for all County-operated water and sewer systems or systems where the County has a share of the capacity. The development of allocation policies will be done in a manner to be consistent with applicable county and local comprehensive plans and policies. The water and sewer allocation policies are designed to:

- Plan responsibly for future growth of Calvert County.
- Provide public knowledge of available capacity.
- Establish a procedure which is equitable and establish priorities that meet the County's land-use objectives.
- Manage the water and sewerage treatment resources in Calvert County.

An allocation can be required for any project located within a County Sanitary District requiring water and sewer service if there is system capacity and appropriate service category. A project is defined as a development, subdivision, un-subdivided property, parcel, individual lot or unit, regardless of whether use is residential, commercial, industrial or institutional/government. Priority for service is in the following order:

- Failing well or septic systems determined to be a public hazard by the Health Department.
- Projects in the Capital Improvement Program.
- Target industries as per the Five Year Economic Development Plan.
- Affordable housing projects given Transferable Development Rights or Excise Tax Waivers.
- Other failing well or septic systems.

An allocation is site specific and can not be transferred to another property and is valid for an eighteen (18) month period.

This Plan recommends the establishment of supplemental allocation policies for certain water and sewer systems. Each allocation policy will be specific to each system. These systems include:

- North Beach and Chesapeake Beach
- Lusby
- Prince Frederick
- Solomons

The allocation policy will utilize the following procedure for the granting of water and sewer allocations:

- _____ Current Capacity (Water Supply or Sewage Treatment Capacity)
- _____ Current Demand (Water pumpage or sewage flows)
- _____ High priority projects (CIP, failing wells or septic systems, affordable housing projects, etc.)
- _____ Previously Approved Development (Residential and Commercial)
- = _____ Water Supply or Sewage Treatment Capacity Available for New Projects

If the current water supply or sewerage treatment capacity is in a deficit, then an allocation can not be granted. All requests for allocation shall be made in writing to the County's Department of Public Works. To be considered for water or sewer allocation, a property requesting an allocation shall be designated as W3/S3 on the Plan's Water and Sewer Maps.

L. APPROVAL OF SUBDIVISION PLATS AND BUILDING PERMITS

For approval of a subdivision plat or a building permit, an appropriate certificate, as shown below must be completed.

1. CERTIFICATE FOR SUBDIVISION PLATS

This subdivision satisfies the requirements of the Maryland Department of the Environment Regulation COMAR 26.04.03 allowing for individual/ community/ multi-use water systems and individual/community/multi-use sewerage systems in the subdivision of land, and it is in conformance with the current Calvert County Water and Sewerage Plan for Water Planning Category W__(insert category) and Sewerage Planning Category S__ (insert category).

This Health Department approval certifies that the lots shown hereon are in consonance with pertinent Health Department laws and regulations as of the approval date, however, this approval is subject to changes in such laws and regulations. Changes in topography or site designations may void this approval. The designated percolation area is the only percolation area approved by the Calvert County Health Department for sewage disposal purposes. The approved lot includes an approved area of at least 10,000 square feet for sewage disposal purposes as required by current Maryland Department of the Environment law. Improvements of any nature, including, but not limited to the installation of other utility lines in this area, may render the lot undevelopable. To determine exact area of the lot approved for such purposes, you should contact the Calvert County Health Department, Office of Environmental Health.

(Date) (County Health Officer)

2. CERTIFICATES FOR BUILDING PERMITS

- a. For permits involving installation, modification, repair or enlargement of an individual water supply system or individual sewerage system:

The building or addition applied for by this permit satisfies the requirements of COMAR 26.04.02 of the State Department of the Environment governing individual water supply and individual sewerage disposal systems and is in conformance with the current Calvert County Comprehensive Water & Sewerage Plans for Water Planning Category W__ (insert category) and Sewerage Planning Category S__ (insert category).

(Date) (County Health Officer)

- b. For permits utilizing a community/multi-use water or sewerage system:

"The community/multi-use water and/or sewerage system serving this lot satisfies the requirements of COMAR 26.04.05 and adequate water and sewerage service has been reserved for the proposed construction."

(Date) (Calvert Water & Sewerage

(Date) (County Health Officer)

(Date) (Owner of System)

M. DEFINITIONS USED IN THIS PLAN

1. "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 Title 9, Subtitle 5 of the Environment Article to take certain actions as part of implementing these regulations.
2. Capital Improvement Program (CIP) means an annual process conducted by Calvert County government which identifies and budgets for future capital projects such as roads, schools, parks, water and sewerage facilities and other public facilities and amenities.
3. "Community sewerage system" means a system, whether publicly or privately owned, serving two or more individual lots or parcels for the collection and disposal of sewage or industrial wastes of a liquid nature, including various devices for the treatment of such sewage and industrial wastes.
4. "Community water supply system" means a source of water and a distribution system, including treatment facilities and storage facilities, whether publicly or privately owned, serving two or more individual lots or parcels.

5. "County plan" means a comprehensive plan and all amendments and revisions thereof for the provision of adequate water supply systems and sewerage systems throughout the county whether publicly or privately owned to include all towns, municipal corporations, and sanitary districts therein.
6. "Department" means the Maryland Department of the Environment.
7. "Existing service area" means that area that is currently served.
8. "Final planning stages" means a work of community water supply and community sewerage system for which contract plans and specifications have been completed.
9. "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 industrial wastes of a liquid nature, in whole or in part, on or in the soil of the property, into any waters of this State, or by other methods.
10. "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.
11. "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.
12. "Multi-use sewerage system" means a 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 gallons per day.
13. "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 5,000 gallons per day.
14. "Non-point source" means pollution originating from land run-off where no specific outfall can be identified.
15. "Priority Funding Area" means an area that is designated to receive priority for state and local funding on the basis of its suitability to accommodate growth and economic development. It is part of Maryland's Smart Growth initiative.
16. "Sanitary District" means:
 - a. The defined geographic area established as a service area for public water and/or sewerage, within which the Board of County Commissioners, acting through the Division of Water and Sewerage, Department of Public Works, is authorized to require the connection of water or sewer, subject to the Plan conditions.

- b. A public corporate body governed by a sanitary commission that exercises public and essential government functions for the public health and welfare. For public water and/or sewerage service area's within Calvert County, excluding incorporated towns, the Board of County Commissioners exercises the powers of a sanitary commission and a water and sewer authority, powers which are delegated to the Division of Water and Sewerage, Department of Public Works.
17. "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.
 18. "Shared facility" means a water or sewerage system which serves more than one lot of land or more than one user on a single lot of land with sewerage systems located on the individual lots or on parcels owned in common by the users or the controlling authority and regulated by COMAR 26.04.05.01 "Shared Facilities."
 19. "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 of the plan, its amendment or revision.
 20. "Water Service area" means that area served, or potentially served, by a single distribution system under control of a single utility, or, in very large systems, sub-areas as delineated by the county.

CHAPTER TWO BACKGROUND INFORMATION

A. PHYSICAL CHARACTERISTICS

1. Location

Calvert County is a peninsula within southern Maryland located between the Chesapeake Bay and the Patuxent River. It is situated between the parallels of 38 19' and 38 47' north latitude and between meridians 76 24' and 76 43' west longitude. The County is approximately thirty-five miles long, averages nine miles in width, and contains approximately 219 square miles or 140,320 acres. The Patuxent River flows along its western boundary and the Chesapeake Bay forms the County's southern and eastern boundaries. Anne Arundel County to the north shares Calvert County's only land boundary. Directly across the Patuxent River are Prince George's, Charles and St. Mary's Counties. Calvert, Charles and St. Mary's Counties form the Tri-County region of Southern Maryland and comprise the Tri-County Council for Southern Maryland, a regional policy planning body.

2. Topography

The topography of Calvert County is variable and rugged (see figure 1). An upland plain runs generally in a northwest - southeast direction and forms a central spine for the County. This ridge has a slope upward from the Solomons area (approximately 180 feet above sea level). A few flat-topped narrow areas in the upland remain as the only remnants of the original plain which erosion has not yet destroyed. On the Chesapeake Bay (east) side of the County, the upland terminates in high cliffs of clay, sand and gravel rising from the water's edge to a maximum of approximately 137 feet in height. All streams in this area have eroded deep ravines in the cliff line. On the west, or Patuxent River boundary, the upland area slopes toward the river in several long narrow divides. Along most of the Patuxent River there is a level terrace commonly called "bottom land" that varies in width and elevation. This "bottom land" is widest in the vicinity of Solomons Island and at the mouth of Hunting Creek. The elevation here varies from approximately 10 feet to 40 feet.

Approximately 55% of the County is relatively flat and un-dissected, rendering development easy. The rest of the County's land area is either sensitive enough to make development rather difficult, or extremely sensitive, making development unwise.

The "sensitive" areas of the County are those areas which have slopes in excess of 15% and/or soils with seasonally high water tables. Some 28% of the County falls in the "sensitive" category.

About 17% of the County is in the "extremely sensitive" category, i.e., tidal marshes, freshwater swamps, escarpments, coastal beaches, and 50 and 100 year flood plains.

3. Shoreline

The total shoreline of Calvert County is more than 110 miles in its length. The Chesapeake Bay shoreline is approximately 32 miles in length and the Patuxent River shoreline is approximately 78 miles in length. A note-worthy feature of the bay

shoreline is the Cliffs of Calvert, ranging in height from 40 to 137 feet above sea level. The river shoreline consists of a series of gentle plateaus generally running parallel to the Patuxent River. These are the result of many centuries of erosion and buildup along the river bank. The bay shore line is continuing to erode at a rate of up to six feet per year.

4. Drainage

From a regional viewpoint, Calvert County is part of two major drainage basins: the West Chesapeake Bay basin and the Patuxent River basin. The main drainage divide separating the County into these two basins runs in a north-southeast direction from the Anne Arundel County border in the north to the Solomons Area in the South. The drainage divide lies generally on the East and South of Routes 2/4. In most places the divide occurs very close to the Bay shoreline, but it enlarges more to the west near Prince Frederick and at the Chesapeake Beach area.

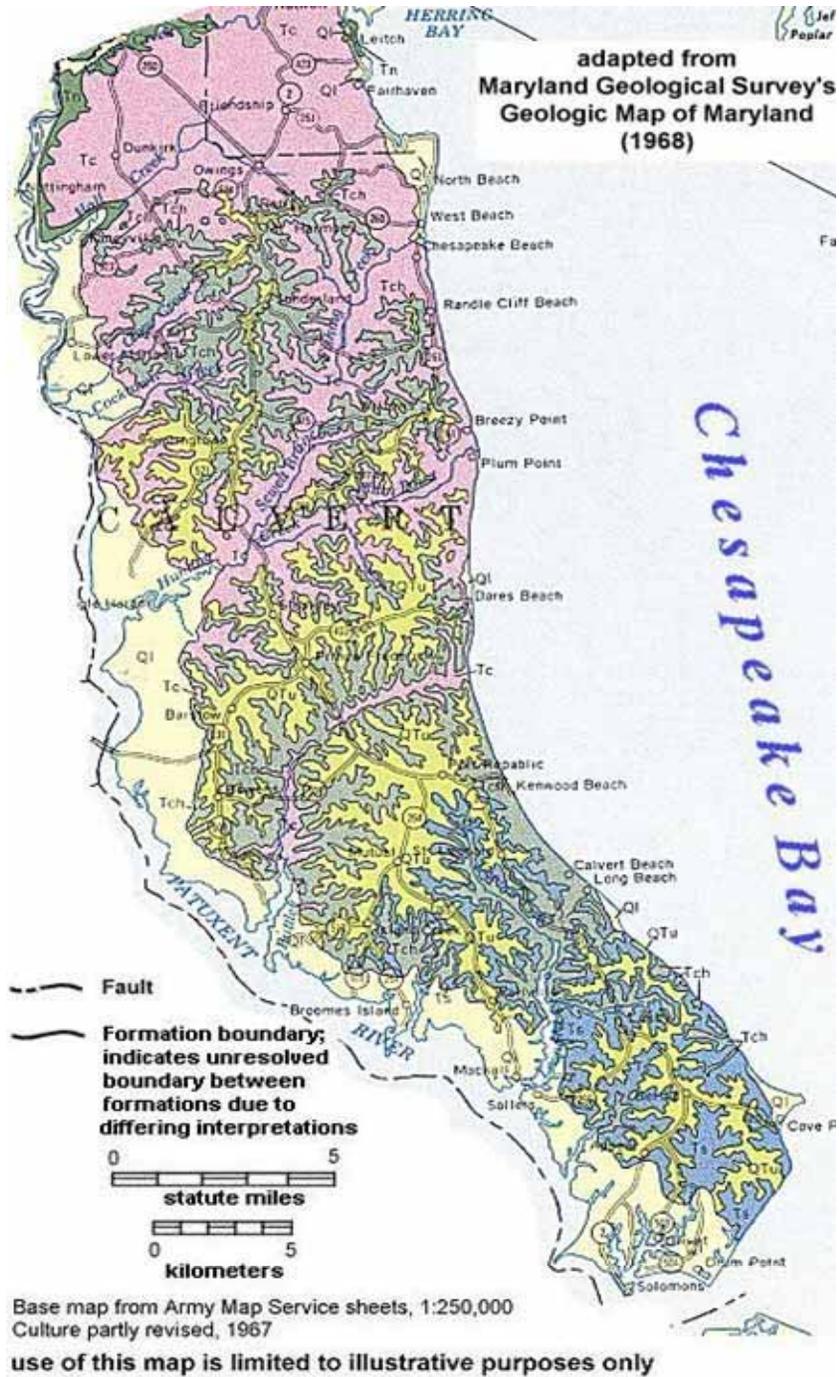
There are five main watersheds west of the major ridge line which drain into the Patuxent River basin: Lyons Creek, Hall Creek, Hunting Creek, Battle Creek, and St. Leonard's Creek. To the east of the drainage divide, or draining into the West Chesapeake Basin, are two main watersheds: Fishing Creek and Parker's Creek. (See Water and Sewer Maps for boundaries of watersheds). Nontidal wetlands of special State concern that are located in Calvert County are: Battle Creek Cypress Swamp, Calvert Cliffs State Park, Patuxent Highlands, Port Republic watershed and West Governor Run watershed.

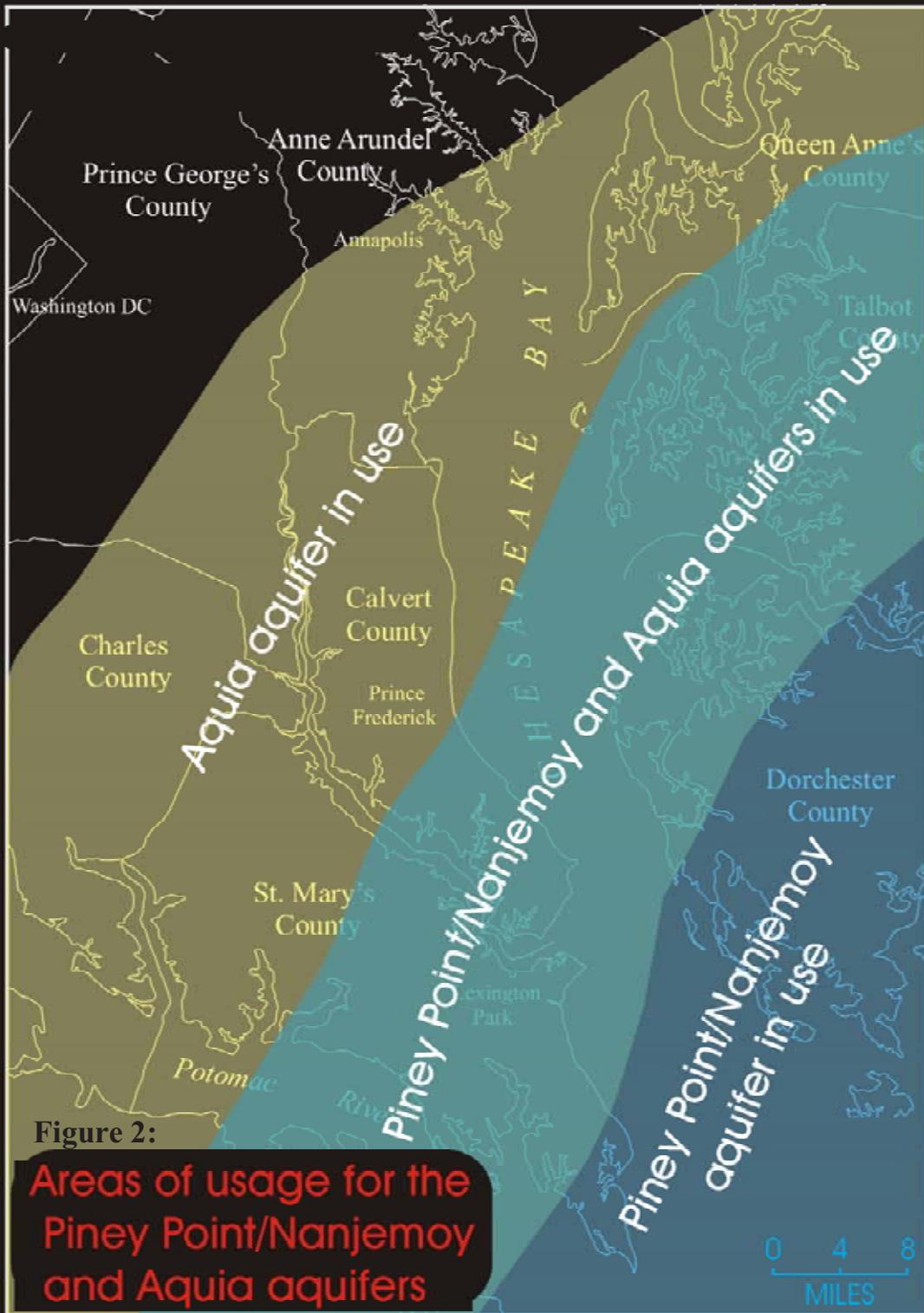
All County streams are relatively short in length and almost all streams have both their sources and mouths within the County. The slopes of the streams are generally flat, and are marked by swampy areas along their lengths as the streams overflow their banks during periods of high flow and inundate the flood plains.

State delineated watersheds are identified on maps 1 and 2. Subwatershed studies are being conducted for the preparation of the Water Resources Element of the Comprehensive Plan.

Figure 1:
Geological
Survey

-  Ts- St. Mary Formation
-  Tch – Choptank Formation
-  Tc – Calvert Formation
-  Tn -Nanjemoy Formation
-  QTu – Upland Deposits
-  QI – Lowland Deposits





Source: Maryland Geological Survey 2001

5. Vegetation

The County was almost totally covered by woodlands at the time of the visit of Captain John Smith, but is now only 57% covered in woodland. Most of the existing cover today is second and third growth trees. The principal species (from most common to least common) are: Loblolly Pine, Oak, Hickory, Gum, Poplar, Elm, Ash and Red Maple.

6. Climate

Calvert County enjoys a continental type climate with four well-defined seasons. The County is located in a zone of the U.S. in which both tropical and polar air masses play an important role. The Patuxent River, Chesapeake Bay, Atlantic Ocean, plus the Appalachian Mountains, tend to modify the extremes in temperatures and precipitation.

The average daily temperature ranges from 77° F in the summer (July) and to 36° F in the winter (January).

Average snow accumulation rarely exceeds a yearly total of 16 inches, and rainfall, which averages approximately 44 inches annually, is reasonably uniformly distributed throughout the year with maximum rainfall in July and August and minimum rainfall from November to February. Across the County the frost depth is about two feet.

7. Soils

An examination of soil characteristics is important to this Water and Sewerage Plan for principally three reasons: (1) to help in the routing of pipelines so that difficult areas might be avoided whenever possible, (2) to examine the favorable and unfavorable qualities of soils that may enter into the selection of sites for dams, reservoirs, or other storage facilities (if this should ever become necessary in Calvert), and (3) to assist in the evaluation of potential sewage effluent disposal sites.

When selecting the route for a pipeline, primary consideration should be given to the natural stability of the soils it must cross and the height and seasonal variation of the water table. The problem is that if the water table is high, it is difficult to lay sewer, water, or gas lines, and ditch banks are likely to collapse. In some soils, ditch banks lack good stability even where the water table is not high.

The choice of a soil for a dam, reservoir or other storage function depends mainly on the amount of seepage that can be expected, particularly through the bottom of the reservoir. Seepage can differ in the same location, depending on whether the reservoir floor consists of subsoil material or substratum material. Another important factor to consider is the seasonal fluctuation of the water table in the particular soil being studied.

Features that affect design of sewage effluent disposal systems are the rate that applied water infiltrates into the soil, the capacity of the soil to retain moisture, the degree of natural drainage, the depth to a seasonal high water table, the hazard of flooding, the depth to an impervious layer, the slope condition, and in some soils, the hazard of water pollution.

The Soil Conservation Service has developed a comprehensive system for classifying soils. Part of the classification system includes data about the soils. These data are for engineering applications and interpretations in projects concerning water supply storage, and sewage effluent disposal. Those seeking more detailed soil mapping or statistical information on soil types should consult Soil Survey, Calvert County, Maryland, by U.S. Department of Agriculture Soil Conservation Service and the Maryland Agricultural Experiment Station, U.S. Government Printing Office, Washington, D.C., July 1971 issue.

8. Aquifers.

Calvert County is fortunate to be located over several aquifers with potable water (see figure 2). Currently, the Aquia is the main source of water. More about the aquifers is included in Chapter Three.

B. WATER QUALITY CRITERIA

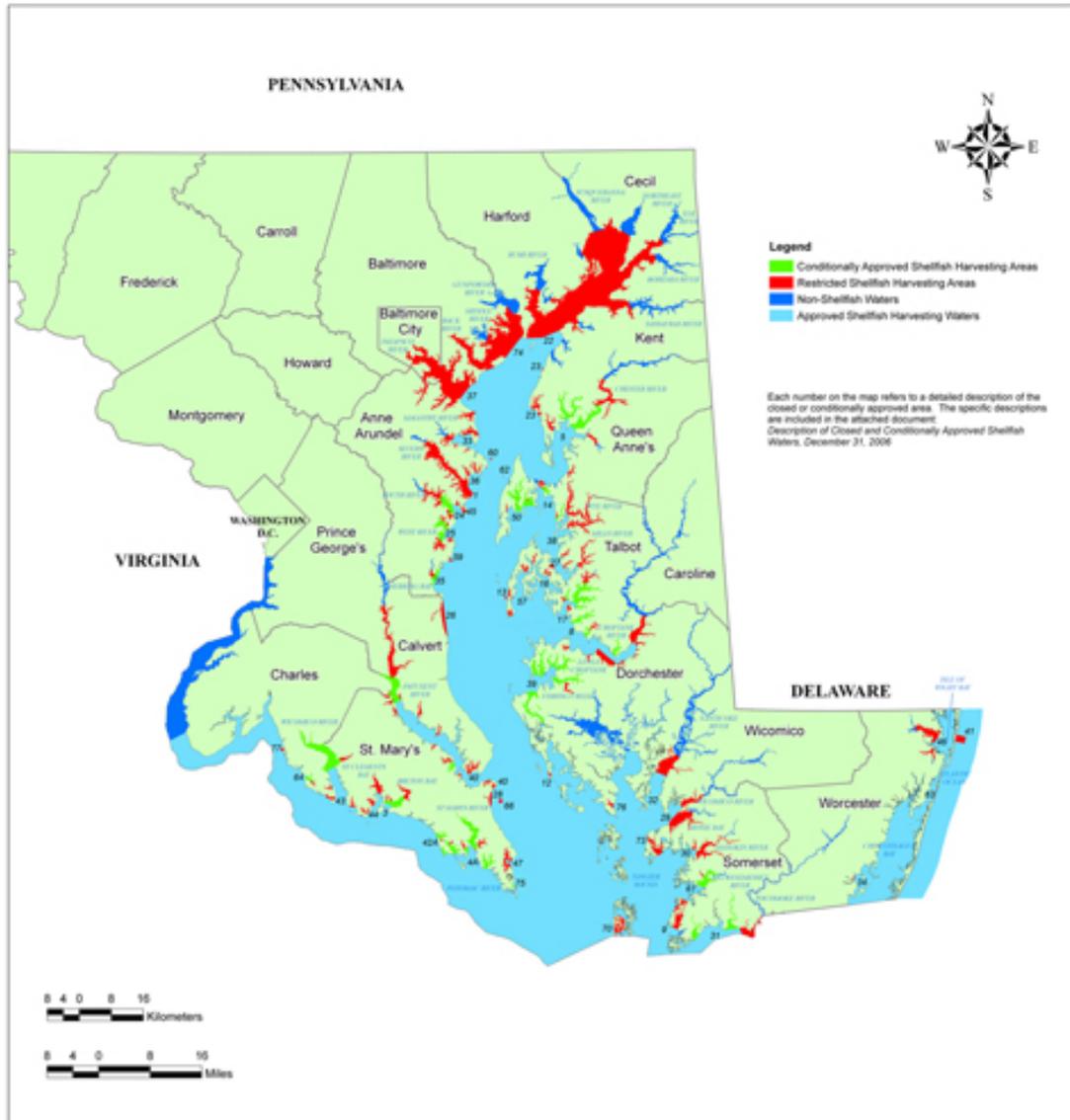
Water quality standards and regulations are established by the Maryland Department of the Environment (COMAR 26.08). Shellfish harvesting is restricted above Chalk Point in the Patuxent and conditionally approved for harvesting between Chalk Point and Buzzard Island (see figure 3). Portions of Battle Creek, Island Creek and all of Mill Creek are restricted for shellfish harvesting, as are the inland waters along the Bay in the Northeast area of the County.

A primary cause of the bacteriological problems, nutrification, and sedimentation in state waters is believed to be runoff and drainage from non-point sources. Failing septic systems can contribute to closures of areas for shellfish harvesting. Another cause in the main stem of the Patuxent is effluent from upstream sources. All conventional septic systems contribute nitrogen loading to groundwater which eventually flows to surface waters such as creeks, streams, and lakes, as well as the Patuxent River and Chesapeake Bay.

Directing growth to Town Centers and proper treatment of septage will help to improve water quality in local waters. The County Comprehensive Plan gives preference to land application of wastewater effluent rather than direct discharge. It also calls for considering mandatory nitrogen-removing septic systems near sensitive areas. The County has received a Bay Restoration Grant to pay for the installation of some nitrogen removing on-site treatment systems.

With the update in 2009, the County will look into methods to regulate the total maximum daily loads of pollutants.

Figure 3: Water Quality Conditions
Maryland Oyster & Clam Harvesting Waters



Maryland Department of the Environment (MDE)
 Technical and Regulatory Services Administration
 December 31, 2006

Please contact MDE at 410-537-3906 for current information. The county coverage was obtained from Maryland Department of Planning, and the shoreline data from Maryland Department of Natural Resources.

This map is a summary of the status of oyster and clam harvesting waters as of this date. It should not be used to determine current information because harvesting status are continuously monitored and the status can change at any time.

The map scale does not resolve small and/or nearshore areas that are not represented by current monitoring stations or where historically no harvesting has occurred. If or when the potential for harvesting exists in such areas, monitoring needs to be established prior to harvesting.



C. POPULATION

Between 1970 and 1980 Calvert County's population increased from 20,682 to 34,638 - an average annual increase of 5.19% and an overall increase of 67.5% for the decade. By 1990, the population had increased to 51,370, indicating a similar (5.01%) average annual increase for the 1980's. The average annual growth rate for the State for that period was only 1.03%. The U. S. Census Bureau reported a population of 74,563 by the year 2000. The County estimates that population will reach nearly 91,000 by the year 2010. Population growth by election district is shown in Table 1.

Growth management is necessary to direct the overall development in the county. The 2004 Comprehensive Plan calls for new development to be directed to existing Town Centers (Dunkirk, Owings, Chesapeake Beach and North Beach, Huntingtown, Prince Frederick, St. Leonard, Lusby, and Solomons), which will allow for increased commercial, industrial and residential uses and provide for maximum utilization of services and facilities and ultimately reduce county expense.

Continued growth in Calvert County is expected. There are a number of forces stimulating growth which are likely to continue into the foreseeable future, which include the following:

1. Taxes are high in the Washington/Baltimore metropolitan area compared to the outer fringes, or suburbs, such as Calvert County.
2. There is a continuing desire for Calvert County's rural lifestyle and property with water access.
3. Access to the urban/suburban job market is relatively good.
4. Growth management practices in adjacent counties may result in a spill-over effect to Calvert County.
5. Calvert County is an attractive retirement area for some in the metropolitan area.
6. Calvert County has a good school system.

Due to growth management tools in place, population is not projected to grow at as rapid or steady a rate as it did between 1970 & 2000; however, early fluctuations can be expected as a response to economic forces affecting the entire country. It is likely, however, that Calvert County will continue to grow as long as it is perceived to be a pleasant and well functioning alternative to more urban or suburban communities.

For planning purposes, the official population projections which will be used are those prepared by the Calvert County Planning Department shown in Table 1 (See also Figures 4 and 5.)

Calvert County Population

Present and Projected by Transportation Area Zone (TAZ)

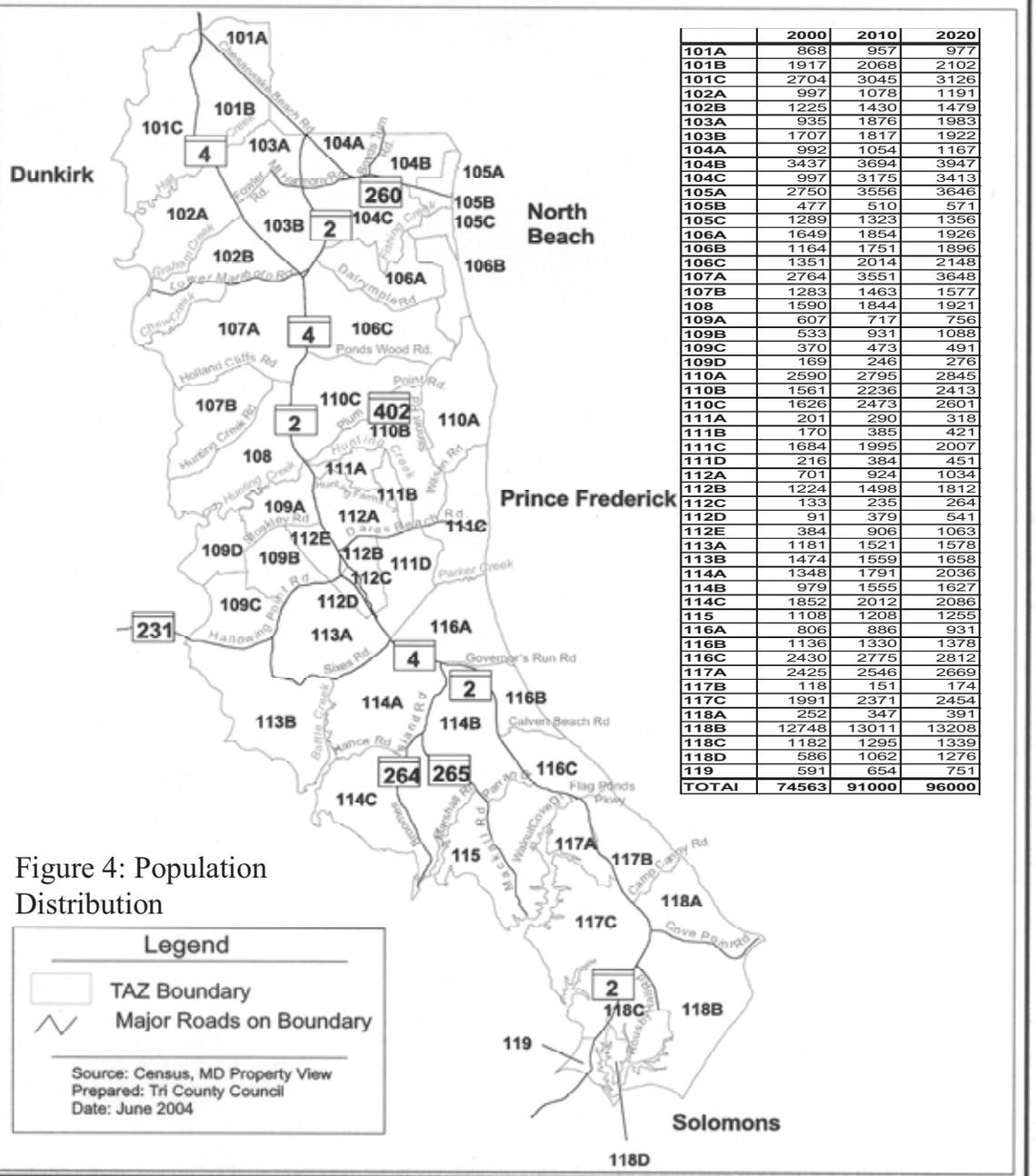
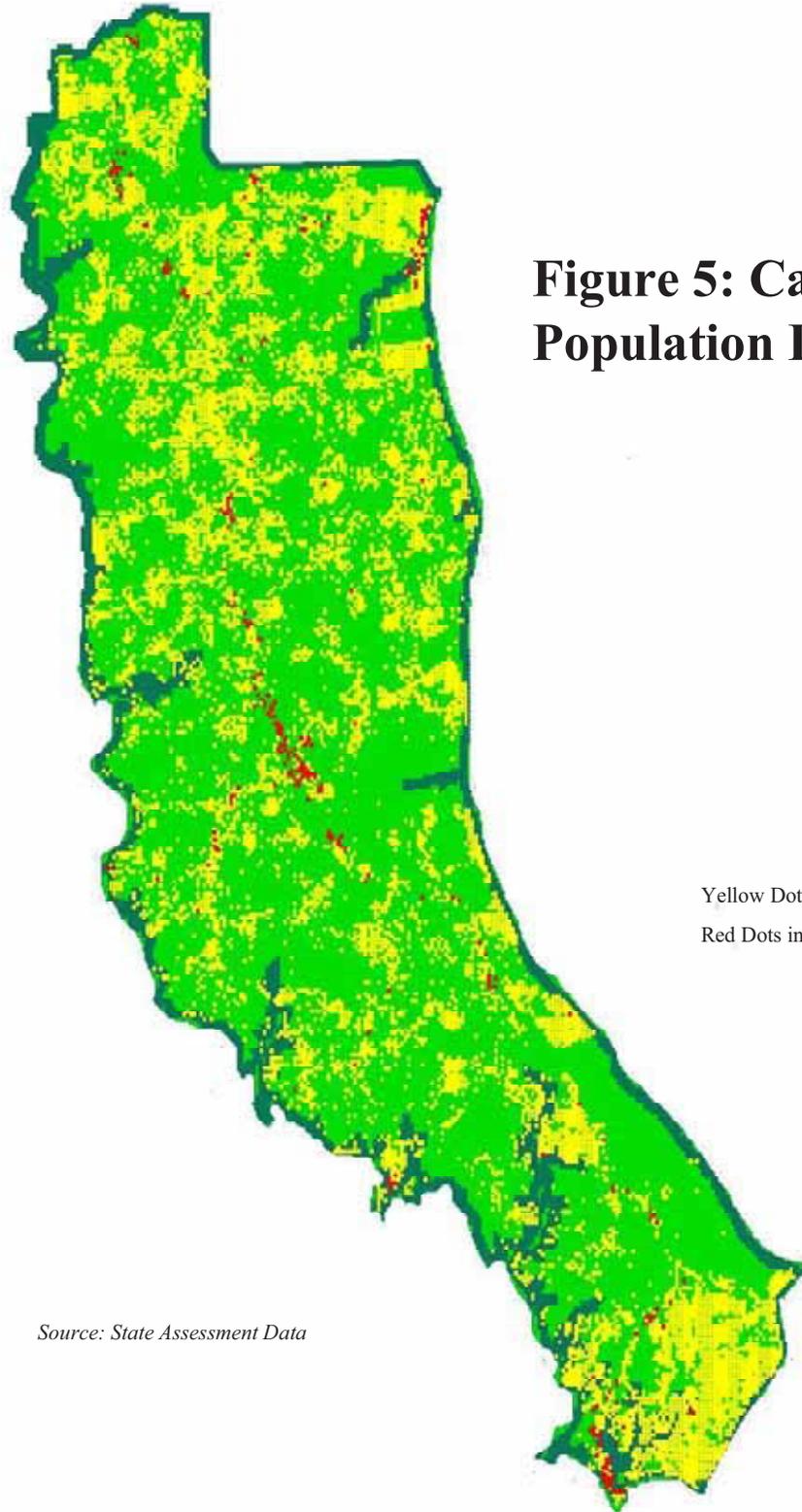


Figure 4: Population Distribution

Legend

TAZ Boundary
 Major Roads on Boundary

Source: Census, MD Property View
 Prepared: Tri County Council
 Date: June 2004



**Figure 5: Calvert County
Population Density 2000**

Yellow Dots indicate dwelling units
Red Dots indicate commercial development

Source: State Assessment Data

Table No. 1 Population Projections				
Year	County Projections ¹ <i>(January 2006)</i>		State Projections ² <i>(September 2005)</i>	
2000	74,563	Election Districts³		74,563
		1st	24,310	
		2nd	25,111	
		3rd	25,142	
2005	85,200			87,500
2010	90,900	1st	29,000	95,700
		2nd	31,000	
		3rd	30,900	
2020	96,000	1st	31,500	100,700
		2nd	32,500	
		3rd	32,000	
2030	100,000	1st	33,000	106,300
		2nd	33,500	
		3rd	33,500	

D. LAND USE

From colonial times, the predominant land use in Calvert County has been agriculture and forestry. Beginning in the 1960's, significant changes began to occur in land use patterns, and in developments affecting land use. Major highway improvements (dualization of Route 2/4) were started, several major residential subdivisions were opened, in-migration accelerated, plans were formulated for a County Industrial Park and other economic developments. The Calvert Cliffs Nuclear Power Plant began operation in 1975. In addition, construction of a plant for processing imported liquified natural gas (LNG) was completed in 1978 and operated between 1978 and 1980. The plant has recently reopened and is at full operation.

The Calvert County Comprehensive Plan identifies specific land use categories and addresses ways and means of controlling or directing growth in these areas.

1 Source: Calvert County Department of Planning and Zoning, January, 2007
 2 Source: Maryland Department of Planning, September, 2006
 3 Election District boundaries are shown on maps 1 and 2.

Table No. 2A Zoned Land In Calvert County ¹ 2006		
Zoning District	Acres	Percentage (%)
Farm and Forest District (FFD)	57,000	43.58
Rural Community District (RCD)	50,000	38.22
Residential (RD)	12,000	9.17
Industrial (I-1)	2,700	2.06
Rural Commercial (RC)	200	0.15
Marine Commercial (MC)	20	0.02
Town Centers (TC)	5,100	3.90
Employment Center(EC)	800	0.61
Zoned Tidal Wetlands (WL)	3,000	2.29
Total	130,820	100

Table 2A shows current zoning in Calvert County. A land use map is shown as Figure 7 and Zoning map is shown as Figure 8. Primary growth areas are the County's designated Town Centers. Major Town centers are identified as North Beach, Chesapeake Beach, Prince Frederick and Solomons. The minor town centers are Dunkirk, Huntingtown, Lusby, Owings and St. Leonard.

According to the "Smart Growth" Areas Act of 1997, Chapter 759 of the Laws of Maryland, the State must target funding for 'growth related' projects to Priority Funding Areas (PFAs). Growth related projects include most State programs which encourage or support growth and development such as highways, economic development assistance, and State leases and construction of new office facilities. They would include road improvements such as overpasses for MD 4 at Ward Road in Dunkirk. To qualify as a PFA, towns centers must be in a locally designated growth area in the comprehensive plan, must meet certain density, and must be designated as being planned for sewer service within 10 years.

Sewer systems don't have to be 'public' to meet the criteria for PFAs. For example, the existing system in Dunkirk which serves the Calvert Gateway shopping center is private.

¹ Source: Calvert County Department of Planning and Zoning

In addition to being designated major Town Centers, North Beach and Chesapeake Beach are municipalities. One of the primary objectives in the North Beach Comprehensive Plan is to provide for “appropriate and adequate public facilities and services”, including water and sewer. The Comprehensive Plan for Chesapeake Beach also recognizes the need to plan for growth by providing adequate water and sewerage facilities. These policies are discussed in more detail in Chapters 3 and 4.

Farm and Forest Districts (FFDs) are designated as Priority Protection Areas (PPAs) on the Comprehensive Development Plan map in the Comprehensive Plan (see figure 6). While the vast majority of the land is farm and forestland, some residential development occurred in the FFDs dating as far back as the 1960s. Residential lots in those subdivisions typically average two acres or more in size, and use individual water and sewerage systems. A major objective in the Comprehensive Plan is to minimize future residential development in the Farm and Forest District. Through a combination of comprehensive rezonings and increased funding for land preservation, growth has been substantially curtailed within this district in recent years. Consistent with this policy, there is no water and sewer service planned for these areas.

However, the Service Area maps show some existing systems in the FFD, such as the water and sewerage systems serving Patterson Park, a state park and research facility. Such systems should be allowed to remain and be expanded, as needed, to serve nonconforming uses.

In the Rural Community District (RCD), the land uses are principally farming, forestry and low-density residential. With the use of Transferable Development Rights, there is the ability to increase density. Community and shared sewer service is not planned for residential development in these areas, except to complete a system already partially underway at Marley Run, where the system needs to serve more houses to function properly.

Community and shared facility sewer service areas are not planned for Residential Districts (RDs), except where there is the opportunity for Affordable Housing Agencies to provide housing within a mile of major town centers. Most beach front communities, such as Chesapeake Ranch Estates, Drum Point, Long Beach, Calvert Beach, White Sands, Kenwood Beach and the Willows are zoned RD and are in “Rural Village” PFAs. Many of the lots are smaller than permitted by current zoning regulations, but are buildable because they were legally recorded prior to adoption of a county zoning ordinance, and meet minimum requirements of current Maryland Department of the Environment Regulations. To avoid creating sewerage problems due to development of these older subdivisions, the Board of County Commissioners require that these old lots provide two backup septic fields and require the use of multi-chambered tanks for the installation of any new or replacement septic systems. The County also maintains the lots-to-TDRs program (section 5-1.09 H, of the Zoning Ordinance) to convert some of these lots to open space and works with the Southern Calvert Land Trust and community associations via tax credits to do the same. Community water systems are appropriate when feasible.

For the zones Light Industrial (I-1), Rural Commercial (RC), Marine Commercial (MC), and Employment Center (EC), community water and/or sewer may be needed to facilitate economic development.

The Comprehensive Plan calls for public institutions to be located in growth areas in or near the town centers and these may need multi-use systems. Public institutions are identified in Figure 9.

Table No. 2B Land Use		
Land Use	Acres	% Total Acreage
Residential, Commercial, Light Industry	36,680	28
Heavy Industry	0	0
Agriculture and Open Space	87,790	67
Institutional & Utilities	3,870	3
Mines & Quarries	0	0
Surface Water	2,480 (wetlands)	2
Total	130,820	100

Comprehensive Development Plan

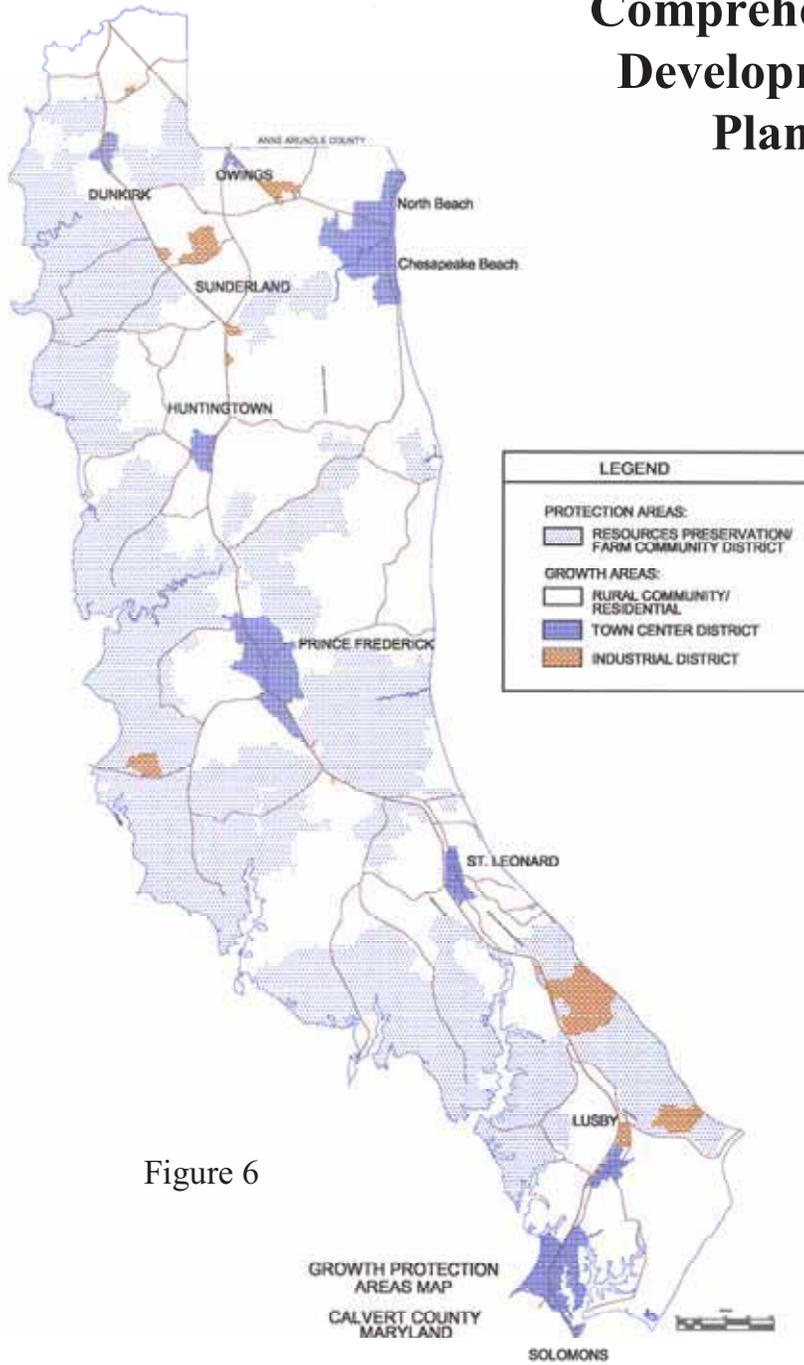


Figure 6

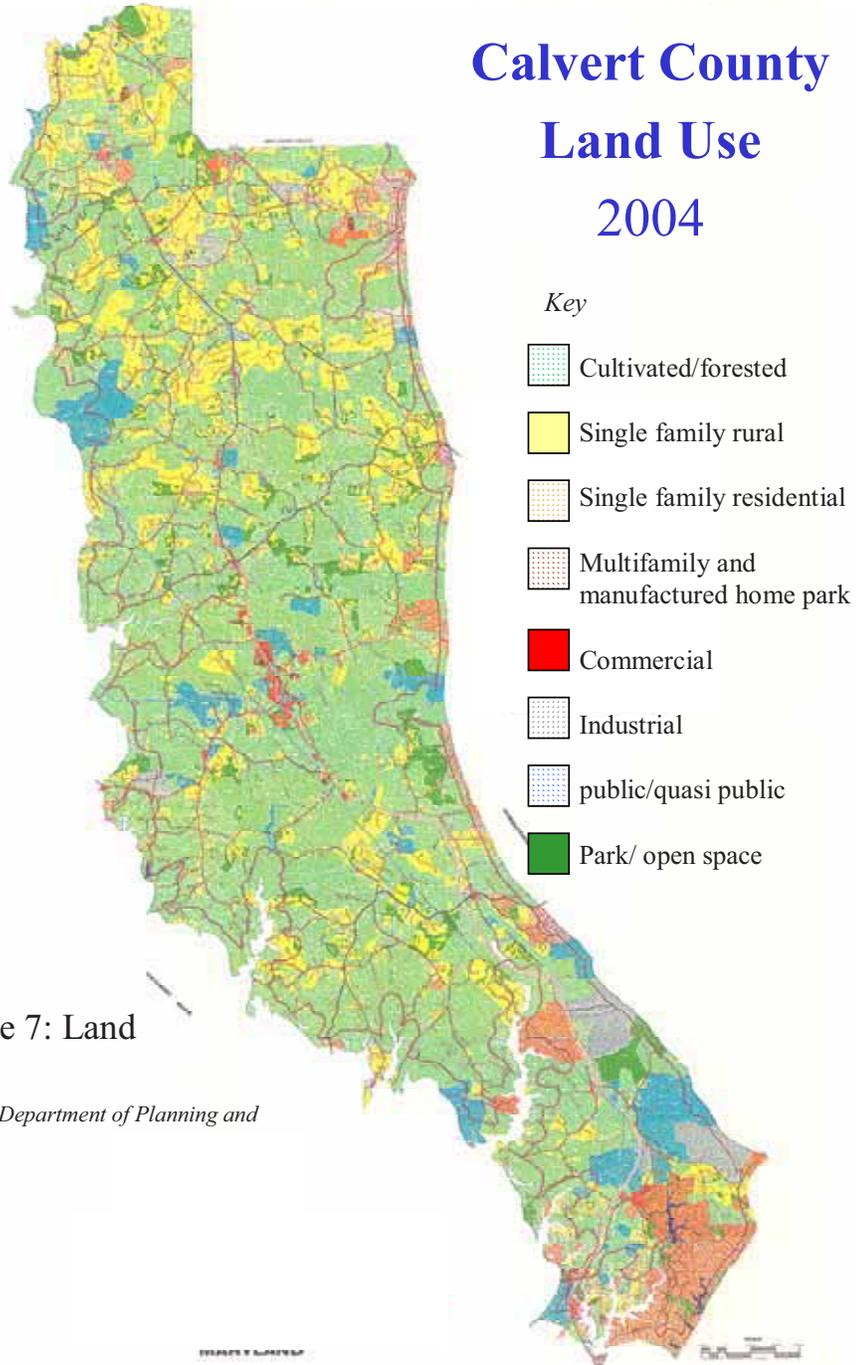
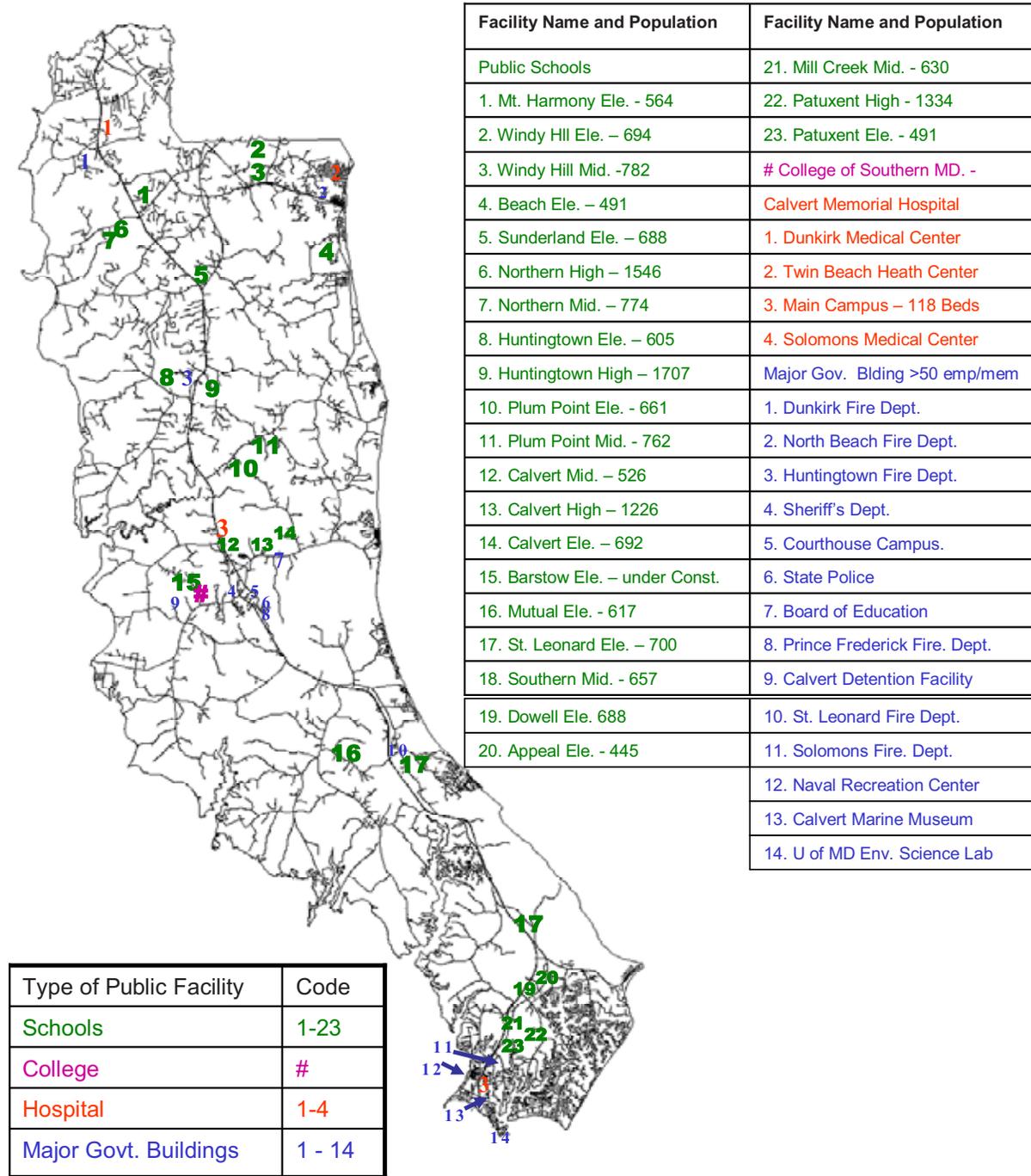


Figure 7: Land Use
Source: Department of Planning and Zoning

Figure 9: Major Public Institutions



Key

Prepared by the Dept. of Planning and Zoning - 2007 data

CHAPTER THREE WATER SERVICE PLAN

A. PHILOSOPHY

It is the purpose and intent of the Board of County Commissioners, to ensure that adequate and safe water is available to meet the expanding needs of residential, commercial and industrial users through the planning period (year 2017) covered by this document. The water goal and action plan is described in Chapter One, section D.

County Water Objectives:

1. Plan and construct water facilities, including well and storage sites, in town centers to meet the water demand anticipated by new growth in these areas.
2. Amend water categories within Priority Funding Areas (PFA) as needed to facilitate appropriate development
3. Actively participate with state, federal and regional agencies in programs designed to monitor quality and quantity of ground water resources.
4. Maintain an aggressive water conservation program to reduce overall water demands and expand to areas outside existing sanitary districts.
5. Develop a well head protection program that covers all municipal wells.
6. Develop a ground water protection plan.
7. Utilize all available aquifers efficiently and effectively.

Chesapeake Beach objectives (as identified in the Chesapeake Beach Comprehensive Plan):

1. Continue to improve the Town's public water and sewer systems.
2. Expand public water supply and wastewater treatment capacity and infrastructure to serve anticipated development as warranted by demand.

North Beach objectives (as identified in the North Beach Comprehensive Plan):

1. Insure a sufficient and potable water supply for consumption and fire protection.
2. Encourage water conservation policies among users.
3. Work with the County and State to develop and enforce a well-head protection plan that addresses protection of the Town water systems.

B. GROUND WATER

Ground water is Calvert County's primary water source and is readily obtainable in sufficient quantities to supply current private and commercial requirements. Recent aquifer studies indicate that sufficient ground water should be available for County needs beyond the year 2030.

Calvert County is situated over a favorable geological formation of groundwater resources. Four major aquifers (Piney Point, Nanjemoy, Aquia, and Magothy) supply nearly all of the County's potable water (See Figure 10). In the central region of the County, these aquifers reside 150-250 (Nanjemoy), 400-500 (Aquia), and 650-700 (Magothy) feet below sea level. The Piney Point aquifer develops further South in the County and around the Calvert Cliffs Nuclear Power Plant, it resides at about 150-300 feet below sea level. At this location, the Nanjemoy and Piney Point formations are hydrologically connected and difficult to distinguish (DNR, 1987). The Maryland Geological Survey (MGS) came out with a report in June, 2005 entitled *Water-Supply Potential of the Coastal Plain Aquifers in Calvert, Charles, and St. Mary's Counties, Maryland, with emphasis on the Upper Patapsco and Lower Patapsco Aquifers*. According to the study "projected water demand in Calvert and St. Mary's Counties through 2030 could be met by increased pumpage in the Aquia aquifer (without shifting withdrawals to deeper aquifers) without reducing water levels below the 80-percent management level. Shifting a portion of public-supply withdrawals from the Aquia aquifer to the Upper Patapsco aquifer would result in an increase in available drawdown in the Aquia aquifer in many areas of the counties."

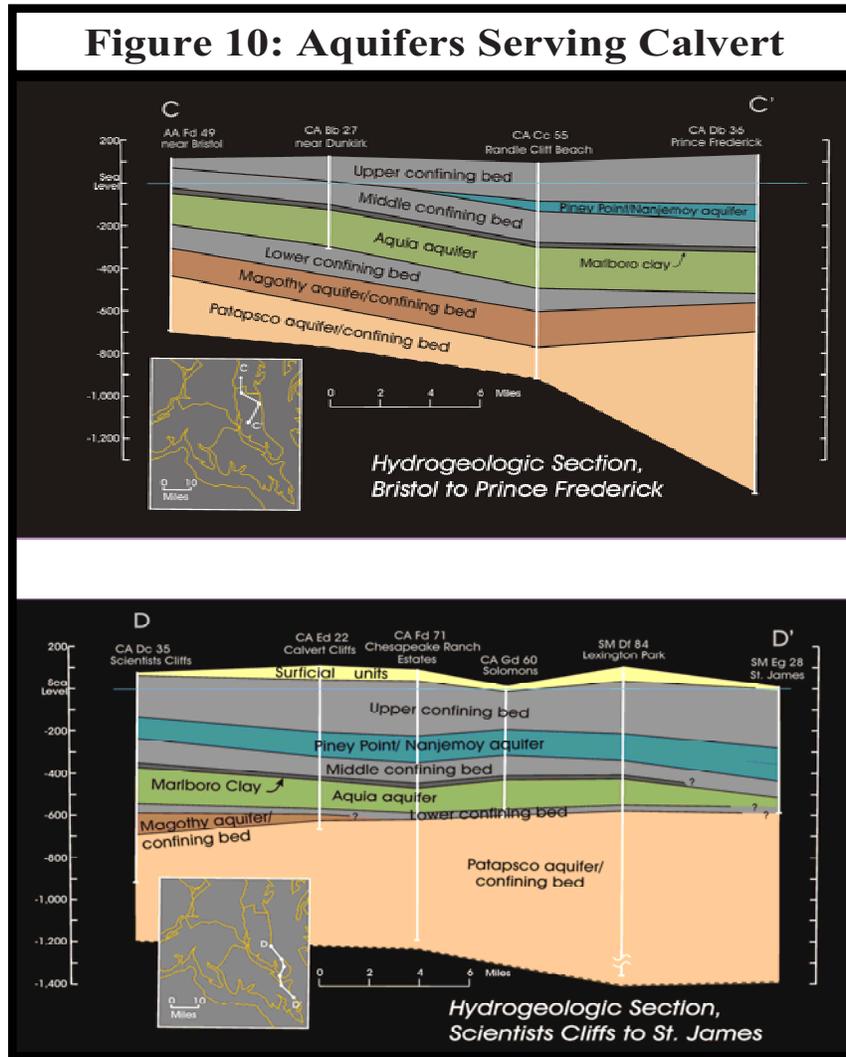
The outcrop regions for these aquifers reside mostly in Anne Arundel County to the North. Lower Cretaceous rocks underlying the County are another possible source of water for deep wells.

The Maryland Department of the Environment does not permit increased usage of groundwater from a particular aquifer if the aquifer is at or below the management level. When an aquifer is at 80% of its capacity it is considered at its management level. According to the 2005 report by the Maryland Geological Survey (MGS), projected water levels for Calvert County should be adequate to the year 2030.

A previous MGS study had raised concerns about water supply by 2025. The 2005 results indicate the importance of the 50% reduction in future residential density that the BOCC adopted in 1999 and 2003 and the importance of directing future large users of water to the deeper aquifers. MGS is currently investigating the water supplies in the deeper Patapsco aquifer in Southern Maryland. These results will be very important to our future water planning efforts.

Ground water usage in Calvert County is confined mainly to residential and small commercial units. Exceptions are the industrial demands of the Calvert Cliffs Nuclear Power Plant and the Cove Point LNG Plant.

In 2006, the state adopted a new county requirement that counties amend their Comprehensive Plans to include a Water Resources Element by October, 2009. Further changes in water policy will need to be considered at that time.



Maryland Geological Survey 2001

C. SURFACE WATER

In Calvert County there is only one surface water impoundment of significant size located in Election District #1 in the Chesapeake Ranch Estates. This impoundment is used for recreational purposes only, the development relies on ground water for its potable water supply. The specifications for this reservoir are as follows:

Reservoir:	Lake Lariat
Owner:	Chesapeake Ranch Estates
Crest elevation (above sea level):	Approximately 40 feet (MSL)
Spillway length:	176 feet
Total length of dam:	650 feet
Height of crest above stream bed:	28 feet
Flooded area of crest elevation:	approximately 100 acres (designed for 96.8)

Length of shoreline at crest elevation: 7 miles
Water overflowed crest for first time: 1967
Capacity of reservoir: 1,800 acre feet
Safe yield MGD: N/A
Average daily withdrawal MGD: Minimal for service areas

There are no current plans to use this lake for potable water.

D. WELL DRILLING & WATER ALLOCATIONS

It is necessary to obtain a well drilling permit from Environmental Health Services (Division of the Calvert County Health Department) before any well can be drilled. Application for a permit to drill a well must be submitted by a master well driller or well driver, licensed by the State Board of Well Drillers. Such permit is required for construction of every well and every test hole which the well driller intends to construct. Well construction work cannot be started until a permit has been issued. In order to protect ground water supplies from contamination, abandoned wells are required to be filled when new ones are drilled.

The well's site and well driller's construction procedures must be approved by the Maryland Department of the Environment (MDE) for all community water systems. In addition, a groundwater appropriation permit must be secured from MDE. Details of the requirements for these permits are contained in COMAR 26.17.06. 03.

E. PROJECTED WATER SUPPLY DEMANDS

Assuming that policies adopted in the Comprehensive Master Plan are implemented, it is possible to project probable future water supply demand by volume and location. By comparing future projections with existing demand volumes and locations, it is possible to establish water servicing priorities for the County in the years ahead.

Per capita water use for the existing Calvert population is estimated to be 90 gallons per day due to the rural nature of the County. Adoption of water saving devices and techniques, and consumer consciousness of the critical nature of water supply should preclude higher per capita consumption. (See Tables 3 & 4 for Demand and Capacities). Also, users of metered water systems tend to use less water.

**Table No. 3A
Overall Water Demand**

Year	1970	1980	1985	1990	2000	2010	2015	2020	2030
County Population¹	20,682	34,638	40,300	52,000	74,563 ²	90,900	94,000	96,000	100,000
Projected Daily Demand Rate Per Capita (In Gallons Per Capita Per Day)	75	80	90	90	90	90	90	90	90
Resulting Total Countywide Daily Demand Generated (In Millions Of Gallons Per Day)³	1.55	2.77	3.63	4.68	6.71	8.18	8.46	8.64	9.0

1 Population figures projected by Calvert County Planning Department November 2004.

2 Census 2000 numbers

3 Increasing rate reflects urbanization and development of commercial and industrial facilities through the period 1970-1990. By 1990 water saving measures, devices and controls have stabilized per capita consumption.

**Table No. 3B - Municipal (Public)
Present and Projected Water Supply Demands and Planned Capacity**

Service Area	Present (2007)						Projected (2017)					
	Population (Residential) ¹			GPCD (gals)	Capacity (GPD)		Population (Residential)			GPCD (gals)	Capacity (GPD) ¹	
	Total	Served	Unserved		Demand	Planned ²	Total	Served	Unserved		Demand	Planned ²
Cavalier Country	402	402	0	74	29,750	50,000	408	408	0	83	37,250	50,000
Chesapeake Beach Munic.	Footnote ³	5,433	Footnote ³	79	501,000	630,000	Footnote ³	6,075	Footnote ³	83	604,250	630,000
Chesapeake Heights	Footnote ³	852	Footnote ³	60	51,500	75,000	Footnote ³	900	Footnote ³	67	60,250	75,000
Chesapeake Lighthouse	Footnote ³	402	Footnote ³	57	23,000	Footnote ⁴ 37,000 ⁵	Footnote ³	450	Footnote ³	67	30,250	Footnote ²
Cross Point	Footnote ³	462	Footnote ³	99	45,750		Footnote ³	500	Footnote ³	100	50,000	37,000
Dares Beach	Footnote ³	564	Footnote ³	50	28,250	50,000	Footnote ³	600	Footnote ³	83	49,750	50,000
Highlands \ Summit ⁶	Footnote ³	777	Footnote ³	57	44,250	128,600	Footnote ³	850	Footnote ³	67	57,000	128,600
Hunting Hills	132	129	3	50	7,250	20,000	Footnote ³	140	Footnote ³	67	11,500	20,000
Kenwood Beach	Footnote ³	351	Footnote ³	36	12,500	25,000	Footnote ³	375	Footnote ³	67	25,250	25,000
Lakewood	231	207	24	75	15,500	16,000	Footnote ³	225	Footnote ³	83	18,750	16,000
Marley Run	0	159	0	70	13,000	38,200	0	300	0	83	27,000	38,200
Mason Road ⁷	-	96	-	52	5,000	9,500	<i>Water System Connected To Prince Frederick System in Jan. 2007</i>					
North Beach Municipality	Footnote ³	2,193	Footnote ³	54	130,750	200,000	Footnote ³	2,500	Footnote ³	83	232,500	200,000
Paris Oaks	Footnote ³	264	Footnote ³	68	22,250	29,000	Footnote ³	270	Footnote ³	83	27,250	29,000
Prince Frederick	Footnote ³	2,775	Footnote ³	67	234,000	245,000 ⁸	Footnote ³	3,100	Footnote ³	83	337,500	600,000
Shores of Calvert	405	381	24	85	32,500	35,000	Footnote ³	425	Footnote ³	100	42,500	35,000
Solomons Island	Footnote ³	3,000	Footnote ³	67	363,750	550,000	Footnote ³	3,350	Footnote ³	83	478,000	550,000
So. Pines Sr. Center ⁹	-	-	-	67	5,000	Footnote ⁷	-	-	-	67	9,000	Footnote ⁷
St. Leonard	330	255	75	67	27,150	30,000	Footnote ³	285	Footnote ³	83	38,750	30,000
Tara	75	72	3	103	7,400	6,000 ¹⁰	75	75	0	100	7,500	6000 ⁸
Walnut Creek	168	168	0	86	14,500	14,700	175	175	0	100	17,500	14,700

1 Differences between the "Population (Residential) Served" for the same systems shown on both Table 3 and Table 9 are due to the fact that properties exist where connections were made to the public water supply systems but remained on private septic systems.

2 "Planned Capacity" shown is equal to the most recent Maryland Department of the Environment Water Appropriation and Use Permit Allocation (annual average daily limit), unless otherwise noted.

3 Data confirmation in progress at the time of current plan update finalization, final data to be provided in the next plan update.

4 Chesapeake Lighthouse Service Area supplied by Highlands \ Summit wells, accordingly, Chesapeake Lighthouse system capacity is determined by capacity of the Highlands \ Summit System.

5 Cross Point Water Supply capacity is 144,000 GPD with the best-producing well not in operation.

6 Chesapeake Lighthouse Service Area supplied by Highlands \ Summit wells, accordingly, Chesapeake Lighthouse system capacity is determined by capacity of the Highlands \ Summit System.

7 Mason Road Service Area was connected to the Prince Frederick Service Area in January 2007 subsequent to well failure.

8 Application in to increase Water Appropriation and Use Permit Allocation to 600,000 GPD (daily average on a yearly basis)

9 Southern Pine Senior Center Water System is operated by Calvert County Division of Water & Sewerage. Well is currently offline, planned for usage as a standby well for Solomons Service Area.

10 Tara Water Supply capacity is 43,200 GPD with the best-producing well not in operation.

Table No. 3C - Industrial Present and Projected Water Supply Demands and Planned Capacity

SERVICE AREA	Present (2007)				Projected (2017)			
			Capacity				Capacity	
	Population (Residential) Served	GPCD (gals)	Demand	Planned	Population (Residential) Served	GPCD (gals)	Demand	Planned
Calvert Cliffs Nuclear Power Plant ¹	-	-	41,000	450,000	-	-	41,000	450,000
Industrial Park (IPA)	-	-	49,250	460,800	-	-	60,000	460,800
Randle Cliffs Naval Res. Facility	150 ²	59	8,824	25,000	150 ⁴	60	9,000	25,000

1 Prior data projections, source unconfirmed, left unchanged.

2 No residential population, daily employees only (150)

Table No. 3D – Private Community / Institutional Present and Projected Water Supply Demands and Planned Capacity

SERVICE AREA	Present (2007)				Projected (2017)			
			Capacity				Capacity	
	Population (Residential) Served	GPCD (gals)	Demand	Planned	Population (Residential) Served	GPCD (gals)	Demand	Planned
Anchorage Mobile Home Park	100	75	7,500	10,800	100	77	7,700	10,800
Beaches Water	2,160	67	145,000	576,000	2,300	100	230,000	576,000
Buckler Mobile Home Park ¹	93	80	7,440		100	70	7,000	
Calvert Beach Water	450	59	26,500	54,000	450	59	26,550	54,000
Ches. Ranch Est. ²	11,700	54	636,000	1.8 million	15,000	70	1.75 million	3.8 million
Detention Center ³	-	67	21,500	T.B.D.	-	67	24,000	T.B.D.
Parkers Creek Knoll ⁴	39	64	2,500	57,000	40	100	4,000	57,000
Regency Manor Mobile Home Park	225	125	28,000	10,800	225	125	28,125	10,800
Scientists Cliffs	729	49	35,650	200,000	750	80	62,000	200,000
Tapestry North ⁵	66	38	2,500	T.B.D.	70	38	2,660	T.B.D.
Wallville Acres (Johnson Acres)	30	362	10,750	57,000	40	100	4,000	57,000
Western Shores	156	119	18,500	48,400	175	120	21,000	79,000

1 Estimated, system unmeasured.

2 Projected population and capacity (demanded and planned) were estimates previously provided by the private water company. See Appendix C for Subsidiary Plan.

3 Calvert County Detention Center Water System operated but not owned by Calvert County Division of Water & Sewerage.

4 Estimated, actual data unavailable

5 System operated by Calvert County Division of Water & Sewerage.

F. WATER CONSERVATION

Providing water services to present users and expanding that service to meet the needs of new users involves significant public expenditures. In the long run, costs of planning, designing and constructing new facilities may be reduced by a number of techniques to delay, or lengthen the interval between major water facility expansion. Such techniques include the provision of a reasonable excess capacity to meet later expansion needs, and adoption of policies to limit population growth rates and concentrate growth in appropriate areas.

Demand modification is another significant technique for reducing expansion costs which has recently received serious attention. The gallons of water a system must collect, treat and distribute is determined by the number of users and the gallons consumed by each user. Demand modification techniques would include approaches to reduce the number of gallons used by each consuming unit.

In 1988, Calvert County initiated a Comprehensive, County-wide Water Conservation Program. The program was designed to reduce the per capita consumption of water by initiating a public information/public awareness campaign.

In addition, all new development within any sanitary district or in any community system owned and operated by the County must use water conserving devices in accordance with the County plan. State regulations were established that require that all new or replacement plumbing fixtures be water conserving devices (see COMAR 26.03.01.07.) These standards are enforced by the Division of Inspections and Permits.

More efficient water use resulting from this plan has and will continue to reduce water system expansion costs, and costs in related services such as sewerage systems, and is consistent with national policies of resource conservation. While Calvert County does not foresee a shortage of potable water in the near future, the potential economic and conservation benefits of demand modification indicate that careful consideration should be given these measures.

Per capita consumption is expected to continue to increase as the County makes the rural to suburban transition; however, as this transition is accomplished, demand modification may be one method of stabilizing or reducing per capita water consumption in areas served by community water systems.

The majority of Calvert residents are dependent upon individual water systems. As future population concentrates in the development nodes, it will become increasingly important for community water systems to be built.

G. QUALITY OF DRINKING WATER

Regulations governing the quality of drinking water in the State of Maryland are published in COMAR 26.04.01. The regulations set maximum contamination levels (MCL's); establish the monitoring frequency for certain bacteria, radiation, organic and inorganic chemicals; establish reporting procedures and require public notification in event of MCL violation by water suppliers as prescribed by the Federal Safe Drinking Water Act (FSDWA).

Few problems have been encountered in the County with reference to the quantity and quality of potable water available. Ground water is used exclusively for this purpose. According to a Maryland Geological Survey's Study of the Patapsco Aquifer conducted in 2005, Calvert County will have supply adequate ground water for projected population growth through 2030, with ground water potentially coming from increasing pumpage from the Aquia aquifer or shifting pumpage from the Aquia aquifer to the Patapsco aquifers.

There are in scattered instances traces of H₂S odor, iron and other minerals in the water. Removal of these traces is practical and feasible. Concerns with levels of arsenic have been raised recently by water operators, water system customers and by the general public. Recent amendments to the FSDWA adopted new regulations (referenced as the "Arsenic Rule" [66 Federal Register 6976, 2001]) making the arsenic maximum contaminant level (MCL) more stringent, by lowering the permissible arsenic limit from 0.050 micrograms per liter (mg/L or 50 parts per billion [ppb]) to 0.010 mg/L (10 ppb), effective January 22, 2006 for community water systems.

Wells withdrawing from the Aquia and Piney Point aquifer formation have an increased potential of withdrawing water with some level of naturally occurring arsenic. Currently, no data exists that can help predict the occurrence, concentration and distribution of arsenic in the Aquia aquifer. Recent studies by the Maryland Geological Survey of seventeen (17) wells in the Aquia aquifer formation in Calvert County indicated that only two had levels higher than the new MCL standards:¹ The County's community water systems (private and public) will need to upgrade their treatment capability to meet the new FSDWA requirements and to ensure a safe source of drinking water.

Based on the historic arsenic sampling to date, arsenic concentrations for all but two of the Calvert County Public Water System wells currently meet the EPA's standard for arsenic, with arsenic levels varying from non-detect to 5 ppb in the finished water. These systems should continue to be able to meet the arsenic MCL for the foreseeable future unless water quality suddenly changes for an unknown reason or the MCL is further reduced by the EPA, at which point Calvert County will need to further evaluate arsenic removal techniques and install arsenic removal systems on any well where the level of arsenic exceeds the current arsenic MCL (on a running annual average basis).

The three water systems that have naturally occurring arsenic present at a level exceeding the current arsenic MCL are Dares Beach, Chesapeake Heights and Chesapeake Ranch Estates Water Systems (a private system). Currently, Calvert County is researching alternative arsenic removal options to identify the best alternative technology balanced with the expense of the treatment system. The EPA's standard balances the current understanding of arsenic's possible health effects against the costs of removing arsenic from drinking water. Installation of arsenic removal systems for these two water systems was previously placed in the County's Capital Improvement Plan. The County has given consideration to alternative treatment options including blending the water from the high arsenic wells with other adjacent wells to produce a finished product with a low level of arsenic, but such opportunity does not exist.

¹ Maryland Geological Survey – Southern Maryland Aquifer Study / Report to the Southern Maryland Tri-County Council, April 23, 2003

H. EXISTING WATER SYSTEMS

Records of the State and County indicate there are 19 privately owned residential community water systems, 22 municipally (public) owned water systems, and 24 water systems owned by corporations or institutions (e.g. Board of Education). The major municipal systems are operated by the Calvert County Department of Public Works, Division of Water and Sewerage, in the Prince Frederick and Solomons Island Sanitary districts. The water system in Chesapeake Beach is owned and operated by the town of Chesapeake Beach, and there is a community water system in the municipality of North Beach. Supplemental maps, including maps of existing water and sewerage systems and maps of water and sewerage planning categories for Calvert County, are available for review in the County Division of Water and Sewerage. Water systems are identified in Tables 3A-3D and on the supplemental maps.

The larger municipally owned water systems provide fire protection. They include the Beaches area, Prince Frederick and Solomons. Of the 19 privately owned community water systems, six provide fire protection. They include: Beaches Water Company, Chesapeake Ranch Estates, the Naval Research Laboratory at Randle Cliffs, the Naval Laboratory at Solomons and the Calvert Cliffs Nuclear Power Plant. Scientist Cliffs has limited fire protection (five fire hydrants - one at each gate).

Table 4 is an inventory of existing major wells and well fields with DNR approved groundwater allocation permits in the county. The inventory shows the water system name, USGS well number, State Permit number, DNR Permit number, aquifer, depth, maximum safe yield, pumping capacity and water quality. Table 6 is an inventory of existing water treatment facilities in the County. This inventory shows the name of the system, owner, source, treatment, and average demand. Water system Owner name and system name, water source, the type of treatment, the rated water plant capacity (MGD), the average production (MGD), the maximum peak flow (MGD), the storage capacity (MGD) and the planned expansion capacity (MGD) and dates and the operating agency name.

Table No. 4				
Inventory of Existing Community System Wells				
Name	Well Name or Number (State Permit #) [DNR Permit #] {USGS Well #}	Aquifer	Pumping Capacity	Water Quality Issues
Municipal (Public)				
Cavalier County	1 2	Magothy Magothy	360,000	
Chesapeake Beach	(CA-72-0064) [CA72G003] {CABC31} (CA-73-4240)	Aquia Aquia	864,000	
Chesapeake Heights	(CA-03-4123) [CA59G002] {CADC34} (CA-73-1780)	Aquia Aquia	468,000	
Cross Point	#1 - (CA-94-1098) #2 - (CA-941098)	Aquia Aquia	216,000	
Dares Beach	1	Aquia	144,000	

Table No. 4 Inventory of Existing Community System Wells				
Name	Well Name or Number (State Permit #) [DNR Permit #] {USGS Well #}	Aquifer	Pumping Capacity	Water Quality Issues
	2	Nanjemoy		
Highlands/Summit	#1 - (CA-81-4173) #2 - (CA-81-4174) #4 - (CA-88-0592) #3 - (CA-88-0595)	Aquia Aquia Aquia Aquia	1,152,000	Iron
Hunting Hills	1 2	Aquia Nanjemoy	53,280	
Kenwood Beach	1 2	Piney Pt. Piney Pt.	122,400	
Lakewood	1 2	Aquia Aquia	86,400	
Marley Run	1 2	Aquia Aquia	144,000	
Mason Road	<i>Mason Road Water System Connected To Prince Frederick in Jan. 2007, Existing Well Abandoned in July 2007.</i>			
North Beach	1 - (CA-88-1829) [CA88G009] 2 - (CA-88-1828)	Aquia Aquia	432,000	
Paris Oaks	1 - (CA-88-071#) 2	Aquia Aquia	90,720	Iron
Prince Frederick	1 - (CA882573) {CA74G005} 2 - (CA882253) 3 - (CA732879) [CADB46] 4 - (CA690164) [CADB41] 5 - (CA730631) 6 7	Aquia Aquia Aquia Aquia Aquia Aquia	1,036,800	
Shores of Calvert	1 2	Magothy Magothy	432,000	
Solomons Island	1 - (CA811497) {CA84G003} 2 - (CA811496)	Aquia Aquia	1,051,200	
Southern Pines Senior Center	1	Piney Pt.		
St. Leonard	1 (CA-94-2436) 2	Aquia Aquia	131,040	
Tara	1 2	Aquia Aquia	86,400	
Walnut Creek	1 (CA-94-0615) 2	Aquia Aquia	144,000	
White Sands	1 (CA-94-4749) 2	Piney Pt. Piney Pt.	24,480	

Table No. 4 Inventory of Existing Community System Wells				
Name	Well Name or Number (State Permit #) [DNR Permit #] {USGS Well #}	Aquifer	Pumping Capacity	Water Quality Issues
Industrial				
Calvert Cliffs Nuclear Power Plant ¹	1	1	1	1
Industrial Park (IPA)	1 2	Aquia Aquia		
Naval Res. Facility, Randle Cliff	[CA32G001] {CAGD36}	Aquia	150,000	
Private Community/Institutional				
Anchorage Mobile Home Park	1	1	1	1
Beaches Water (Long Beach)	Ca1962G001 (Najemory) & CA1962G201 (Aquia)	Aquia Najemory	197,100	
Buckler Mobile Home Park	1	1	1	1
Calvert Beach Water	1	1	1	1
Chesapeake Ranch Est.	(CA-81-1754)	Aquia Aquia Aquia Aquia	900,000	
Detention Center	1 2	Aquia Aquia		
Parkers Creek Knoll	1	1	1	1
Regency Manor Mobile Home Park	1	1	1	1
Scientists Cliffs	1	1	1	1
Tapestry North	1	Aquia		
Wallville Acres (Johnson Acres)	1	1	1	1
Western Shores	1	1	1	1

Table No. 5 Inventory Of Existing Impounded Supplies
<p>There are no Existing Impounded Supplies in Calvert (this table is required by COMAR 26.03.01.04)</p>

¹ Data unavailable at time of plan.

**Table No. 6
Inventory Of Existing Water Treatment Facilities**

Owner	Water Source	Type Treatment ¹	Average Production (MGD)	Storage Capacity (Tank) [MGD]	Planned Expansion (MGD / Dates)	Operating Agency
Municipal (Public)						
Calvert County (Cavalier County)	2 wells in the Magothy Aquifer	DI	0.02975	0.02 (0.015)	None	Ca. Co. Div. of Water & Sewerage
Town of Ches. Beach (Ches. Beach)	2 wells in the Aquia Aquifer	DI, SE	0.501	0.5	0.35 / FY09	Town of Ches. Beach DPW
Calvert County (Ches. Heights)	2 wells in the Aquia Aquifer	DI	0.0515	0.2 (0.1575)	None	Ca. Co. Div. of Water & Sewerage
Calvert County (Cross Point)	2 wells in the Aquia Aquifer	DI, SE	0.04575	0.13 (0.095)	None	Ca. Co. Div. of Water & Sewerage
Calvert County (Dares Beach)	2 wells: 1 in the Aquia and 1 in Nanjemoy	DI	0.02825	0.125 (0.07)	None	Ca. Co. Div. of Water & Sewerage
Calvert County (Highlands/ Summit)	4 wells in the Aquia Aquifer	DI, SE	0.04425	0.19 (0.158)	None	Ca. Co. Div. of Water & Sewerage
Calvert County (Hunting Hills)	2 wells: 1 in the Aquia and 1 in Nanjemoy	DI	0.00725	0.008 (0.005)	None	Ca. Co. Div. of Water & Sewerage
Calvert County (Kenwood Beach)	2 wells in the Piney Pt. Aquifer	DI	0.0125	0.09 (0.075)	None	Ca. Co. Div. of Water & Sewerage
Calvert County (Lakewood)	2 wells in the Aquia Aquifer	DI	0.0155	0.0075 (0.005)	None	Ca. Co. Div. of Water & Sewerage
Calvert County (Marley Run)	2 wells in the Aquia Aquifer	DI	0.013	0.1 (0.075)	None	Ca. Co. Div. of Water & Sewerage
Town of North Beach (North Beach)	2 wells in the Aquia Aquifer	DI	0.13075	0.2 (0.15)	None	Town of North Beach DPW
Calvert County (Paris Oaks)	2 wells in the Aquia Aquifer	DI, SE	0.02225	0.165 (0.15)	None	Ca. Co. Div. of Water & Sewerage
Calvert County (Prince Frederick)	7 wells in the Aquia Aquifer	DI	0.234	0.8 (0.5)	0.355 / FY08	Ca. Co. Div. of Water & Sewerage
Calvert County (Shores of Calvert)	2 wells in the Magothy Aquifer	DI	0.0325	0.06 (0.01)	None	Ca. Co. Div. of Water & Sewerage
Calvert County (Solomons Island)	2 wells in the Aquia Aquifer	DI	0.36375	2.0 (1.5)	None	Ca. Co. Div. of Water & Sewerage
Calvert County (Southern Pines Senior Center)	1 well in the Piney Pt. Aquifer	DI	0.005	1	None	Ca. Co. Div. of Water &

1 Treatment: DI – Disinfection, SE – Sequestering for Iron

**Table No. 6
Inventory Of Existing Water Treatment Facilities**

Owner	Water Source	Type Treatment ¹	Average Production (MGD)	Storage Capacity (Tank) [MGD]	Planned Expansion (MGD / Dates)	Operating Agency
						Sewerage
Calvert County (St. Leonard)	2 wells in the Aquia Aquifer	DI	0.02715	0.08 (0.07)	0.072 / FY08	Ca. Co. Div. of Water & Sewerage
Calvert County (Tara)	2 wells in the Aquia Aquifer	DI	0.0074	0.015 (0.01)	None	Ca. Co. Div. of Water & Sewerage
Calvert County (Walnut Creek)	2 wells in the Aquia Aquifer	DI	0.0145	0.03 (0.02)	None	Ca. Co. Div. of Water & Sewerage
Calvert County (White Sands)	2 wells in the Piney Point Aquifer	DI	0.0035	0.01 (0.008)	None	Ca. Co. Div. of Water & Sewerage
Industrial						
Constellation Energy (Calvert Cliffs Nuclear Power Plant) ¹	1	1	1	1	None	Maryland Envir. Services
Calvert County / Industrial Park Association [IPA] (Industrial Park)	2 wells in the Aquia Aquifer	DI	0.04925	0.65 (0.41)	None	Ca. Co. Div. of Water & Sewerage
U.S. Navy (Naval Research Facility, Randle Cliff)	1 well in the Aquia Aquifer	1	0.0088	1	None	U.S. Government
Private Community/Institutional						
Anchorage Mobile Home Park	1	1	0.0075	1	None	Contact: Page Stallings
Beaches Water	5 Wells (Nanjemory) and 3 wells (Aquia)	DI	0.118	.125	None	Beaches Water Company
Buckler Mobile Home Park	1	1	0.00744	1	None	1
Calvert Beach Water	1	1	0.0266	1	1	Utility Services, Inc.
Chesapeake Ranch Est.	4 wells in the Aquia Aquifer	1	0.636	0.9	1	Chesapeake Water Co.
Calvert County (Detention Center)	2 wells in the Aquia Aquifer	DI	0.0215		None	Ca. Co. Div. of Water & Sewerage
Parkers Creek (Parkers Creek Knoll)	1	DI	0.0025	1	None	Independent Licensed Operator
Regency Manor Mobile Home Park	1	1	0.028	1	None	Independent Licensed Operator
Scientists' Cliffs Association (Scientists' Cliffs)	1	DI	0.035	1	None	Scientists' Cliffs Association

¹ Data unavailable at time of plan.

**Table No. 6
Inventory Of Existing Water Treatment Facilities**

Owner	Water Source	Type Treatment ¹	Average Production (MGD)	Storage Capacity (Tank) [MGD]	Planned Expansion (MGD / Dates)	Operating Agency
Tapestry North Condominium Association of Unit Owners (Tapestry North Condominiums)	1 well in the Aquia Aquifer	DI	0.0025	1	None	Ca. Co. Div. of Water & Sewerage
Wallville Acres [Johnson Acres]	1	DI	0.01075	1	None	Johnson Acres Water Co.
Utility Services, Inc. (Western Shores)	1	DI	0.0185	1	¹ / FY08	Utility Services, Inc.

I. THE WATER SERVICE PLAN

This updated Comprehensive Water Service Plan was derived through study of both the existing water service needs and the projected future service requirements. The boundaries and area of water service planning categories are designated on the supplemental maps. This updated plan was developed in accordance with COMAR 26.03.01.

Stages or categories of water planning are indicated below by capital letter "W" followed by a numeral value, in accordance with Maryland Department of the Environment regulations COMAR 26.03.01.04.

NOTE: Planning categories W-1 through W-5 only indicate that community water systems and/or multi-use water systems are planned; not that they will be built or that they will be available for maximum development for each parcel of land within the planning category.

The actual amount of water available will determine when development may occur.

J. PLANNING CATEGORIES OF WATER SERVICE AREAS

Category Description

W-1 Areas served by community and/or multi-use water systems which are either existing or are under construction. An individual water system may not be permitted to be installed where adequate community water facility is available. Developing properties with more than three (3) homes must apply for a sanitary district and water category change if adjacent to an existing water system. If an existing community water facility is inadequate or is not available (no lines serve lot and system owner certifies that lines cannot be extended to serve lot), an interim individual water system may be used, subject to the following conditions:

- (1) Such interim system is judged by the Calvert County Health Department to be adequate and in compliance with pertinent State regulations, including minimum lot ownership as set forth in COMAR 26.04.03.02 and 26.04.03.03

- (2) Permits for such interim systems shall bear a notice regarding the interim nature of the permit and stating that connection to a future community system shall be made within one year or less after such system becomes available;
- (3) If interim systems are used, provisions shall be made, whenever possible, to locate such systems so as to permit connection to the public facilities in a most economical and convenient manner.

- W-2 Areas where improvements to, or construction of, new community and/or multi-use water supply systems are in the final planning stages. The installation of an interim individual water supply system may be permitted subject to the same three conditions enumerated for the W-1 category area.
- W-3 Areas where improvements to, or construction of, new community and/or multi-use water supply systems will be given immediate priority. The installation of an interim individual water supply system may be permitted subject to the same three conditions enumerated for the W-1 category area.
- W-4 Areas where improvements to, or construction of, a new community and/or multi-use water supply system is programmed for inclusion within the following 3 through 5/6 year period. Individual water supply systems, not of an interim nature, shall be permitted to be installed in this planning category.
- W-5 Areas where improvements to, or construction of, a new community and/or multi-use water supply system is programmed for inclusion within the following 6/7 through 10 year period. Individual water supply systems, not of an interim nature, shall be permitted to be installed in this planning category. Such installations shall be governed by COMAR 26.04 as minimum requirements.
- W-6 Areas of the County for which no water service is planned or programmed. Individual water supply systems may be approved in the W-6 category areas by the Calvert County Health Officer.

K. POLICIES FOR NEW COMMUNITY WATER SYSTEMS AND SYSTEM EXTENSIONS

The following policy provisions are to be taken into consideration when a new community water system or extension of a community water system is contemplated. The policy considerations notwithstanding, a private community water system shall not be expanded or extended without an expansion of its franchise area by resolution of the Board of County Commissioners to include the area in which service is proposed. The decision as to whether the franchise area of a private water system should be expanded shall be within the sound discretion of the Board of County Commissioners. Nothing in the policies set forth herein or in any other policy statement or plan adopted by the Board of County Commissioners shall be construed as requiring the Board of County Commissioner to approve expansion or extension of a franchise area.

1. In Town Centers:

Community water systems are permitted in all town centers.

2. Outside Town Centers:

Community water systems and system extensions are permitted on land zoned Light Industrial (I-I), Employment Center (EC), Rural Commercial (RC) and Marine Commercial (MC).

In the Residential District (RD) and Rural Community District (RCD), connection to an existing system is required for a new subdivision if the new subdivision:

- a. is adjacent to an existing water system with capacity and;
- b. contains more than 3 lots, *and*
- c. the service area of the existing system has been modified at the request of the existing system to include the new subdivision.

Subdivisions in the RD and RCD that contain 50 lots or more shall be served by a community system. New community water systems are not permitted in the Farm and Forest District.

3. General County Requirements:

- a. The Division of Water and Sewerage shall require all new community water systems to:
 - i. be designed and constructed in accordance with the Calvert County specifications and design standards for community water systems;
 - ii. be economically feasible to install, maintain and operate as determined by a feasibility study prepared in accordance with County guidelines; and
 - iii. have a public works agreement for completion, maintenance and operation, when privately owned.
- b. When community water systems are retained by the developer, individuals, or corporations other than the County, a bond will be posted with the County which guarantees perpetual maintenance of the system.
- c. An existing structure on an individual well in a W-1 or W-3 area may be required by the Division of Water and Sewerage to connect to the existing Community water system if:
 - i. the individual well must be replaced or
 - ii. the use is changing to a more intensive use or the use is being expanded.

4. Maryland Department of the Environment Requirements. The Maryland Department of the Environment (MDE) developed several requirements to assure safe and adequate start-up, operation and maintenance of individually-owned and privately-owned water supply systems. These must be met before construction can begin.

The Maryland Department of Environment appropriates ground waters of the State. This plan recommends that major water users of 20,000 gallons per day or more, request assignment to the deepest available aquifer.

L. CRITERIA FOR COMMUNITY WATER SYSTEMS

New community water systems shall be designed and constructed to meet the criteria and standards adopted by the Calvert County Division of Water and Sewerage of the Department of Public Works and the State Department of the Environment.

All new community water systems in the County must provide adequately sized water mains to provide fire protection for the service area. Refer to Chapter 44, Fire Prevention in the County Code for fire prevention requirements for new and expanded systems.

Plans and specifications for constructing a community water system must be approved by the Calvert County Division of Water and Sewerage. In addition, the plans and specifications must be submitted to the Maryland Department of the Environment for approval and they will issue the required construction permit.

M. WATER SUPPLY PROBLEM AREAS

Table 7 designates the Water Supply Problem Areas in the County. Water systems with small diameter mains are considered problem areas based on the fact that adequate fire flow could not be delivered to the area. The limited distribution problem is a result of the small diameter mains where it is anticipated that severe low pressure problems would occur if all subdivided lots were developed and homes lived in year round. The limited capacity problems are areas where additional well and storage capacity must be provided to serve the remaining undeveloped lots.

The Maryland Department of the Environment has taken actions in several cases to require owners to take appropriate action to assure provision of public water supply in several areas. The orders of the Department cite as a menace to public health and comfort, not only such items as low pressure and complete loss of pressure; but also, possible abandonment of the system(s) by private owners due to financial loss.

Solutions to these problems are not simple, and will require funding, regulations, administrative/legislative action, and management procedures. Initiative must be exercised by the owners and indirectly by the Calvert County Board of Commissioners to solve the problems in ways which will protect public health, safety and welfare and can be financially supported. Funding sources are listed in Chapter 5. Staff is available to discuss solutions with private companies. Immediate, 5 and 10 year priorities for water development are found in Table 8.

Owners of existing water systems are required to collect adequate connection charges to provide escrowed funds for any necessary maintenance, or upgrading of the systems. Communities with existing systems may petition the Board of County Commissioners for establishment of special taxing districts to finance needed water system improvements.

**Table No. 7
Inventory of Water Supply Problem Areas**

Area Name	Location	Population	Nature of Problem	Planned Correction
Cavalier Country	Dunkirk	402	Not metered	Metering in FY 08
Hunting Hills	Huntingtown	150	Inadequate main sizes for fire flow Not metered	Upgrading system in FY08 Metering in FY 08
Kenwood Beach	Port Republic	255	Limited distribution, inadequate main sizes for fire flow	Replace old inadequate mains
Western Shores	Port Republic	175	Limited capacity - 50 homes on a single community well: no more connections allowed, inadequate main sizes for fire flow	Replace old inadequate mains in progress
Apple Green	Dunkirk	500	No fire protection, on-site wells limit septic system replacements.	Construct public water system and interconnect with existing wells
Randle Cliffs	Chesapeake Beach	150	Limited distribution, inadequate main sizes for fire flow	None
White Sands	Lusby	120	Limited distribution, inadequate main sizes for fire flow	None
Prince Frederick Town Center	Prince Frederick	1700	Exceeds Ground Water Appropriation Permit	Construct new elevated water storage in FY08/FY09
Lakewood Estates	Dunkirk		Inadequate main size for fire flow	Replace old inadequate mains
Beaches Water Co.	St. Leonard	2000	Inadequate main size for fire flow, inadequate storage, No metering	Upgrade main, add storage, add meters

**Table No. 8
Immediate, 5 and 10 Year Priorities for Water Development**

			Estimated Costs ¹			Project Status / Construction Start	
Fiscal Year and Project Number	County Priority Assigned	Description	Total	Federal and/or State	Local	Immediate Priority Projects	5 and 10 Year Period Projects
FY08 Proj. #4807	1	East Prince Frederick Water Tower and Well	1.540	1.0 (MDE Loan)	0.540 (Cap Conn.)	In Progress (Preliminary Design + Permit) / Summer 2008	-
FY08 Proj. # -	2	Chesapeake Heights / Dares Beach Water Treatment	0.1625		0.1625 (Loan)	In Progress (Pilot Program + Design) / Fall 2007	-
FY08 (Prior) Proj. #4804	3	St. Leonard Well	0.103		0.103 (Loan)	In Progress (Preliminary Design) / Spring 2008	-
FY08 (+ Prior) Proj. #4808	4A	Shores of Calvert Water Tank	0.125		0.125 (Loan)	In Progress (Final Design) / Fall 2007	-
FY08 (Prior) Proj. #4800	4B	Hunting Hills Water System Upgrade	0.319		0.319 (Loan)	In Progress (Preliminary Design) / Spring 2008	-
FY08 (+ Prior) Proj. #4801	4C	Lakewood Water System Upgrade (Tank Replacement) ²	0.040		0.040 (Loan)	In Progress (Preliminary Design) / Summer 2008	-
FY08 (+ Prior) Proj. #4805	5	Dares Beach Water Line Replacement / Tank Painting	0.140		0.140 (Loan)	In Progress (Final Design) / Summer 2007	-
FY08 to FY11 Proj. # -	6	Water Meter Replacement Project	1.650		0.290 (Cap Conn.)	In Progress (Planning) / Summer 2007	-
FY09 Proj. #4801	7	Lakewood Water System Upgrade (Water Distribution System)	0.250		0.250 (Loan)	In Progress (Preliminary Design) / Summer 2009	-

N. GROUNDWATER PROTECTION PLAN

The goal of this ground water protection plan is to prevent and/or minimize the pollution of the ground waters of Calvert County. Protection of groundwater from pollution achieves two purposes: (1) protection of drinking water quality and (2) protection of surface water quality, given the fact that near surface groundwater often outcrops into streams, rivers and wetlands.

¹ Preliminary cost estimates based on dollar values as of effective date of plan where applicable, in millions of dollars

² Lakewood Project split into two subprojects due to different tasks and funding spanning two fiscal years with one year gap in between funding

Drinking water protection. Most of Calvert County's drinking water supply is from deep confined aquifers (see section B above). The confining layers consisting of very fine sediments which seal off the aquifer and protect it from surface contamination. The major threat to our drinking water quality is thus from abandoned wells that have penetrated these confining layers and provide an opportunity for pollutants to reach the aquifers directly. To protect drinking water quality, abandoned wells must be sealed and active well heads must be protected from contamination.

It is therefore required that any well that is not being used for potable water (and meets potable water quality standards) shall be sealed and grouted, except those being used for agricultural purposes. In addition, the separation distance between well and septic system which is set by the Calvert County Health Department must be maintained. A wellhead protection plan will be developed for the next comprehensive review that addresses protection of all municipal and community water systems.

Surface water protection. By protecting near surface groundwater from contamination, surface water quality is protected. To protect near surface groundwater, the bottom of all septic systems must be greater than four feet above ground water. In addition, all new and replacement septic tanks shall be chambered and of a minimum size set by the Calvert County Health Department. The chambered tanks prevent failing septic system from emptying untreated septage into drainfields and thus polluting ground and surface water.

CHAPTER FOUR SEWERAGE SERVICE PLAN

A. PHILOSOPHY

Calvert County is fortunate to be bordered by the Patuxent River to the west and the Chesapeake Bay to the east. Both of these estuaries provide recreational and economic resources (recreational boating and fishing, and commercial fishing). The Board of County Commissioners realize the value of these resources and are striving not only to halt any further degradation, but to return water quality to levels of previous years.

Major sources of pollutants in the Bay region include discharged disposal of treated sewage wastes and septic system effluent, sediment from agricultural uses and construction, toxins in the form of herbicides and insecticides, and airborne pollutants from vehicles and power plants.

The water quality goal and action plan is described in Chapter One, section D. The following objectives have been established by the County to protect valuable water resources, and provide current and future sewage disposal needs:

B. PUBLIC FACILITIES - COUNTY SEWAGE SERVICES

County Sewerage Objectives:

1. Place first priority on alternatives to discharging effluent into bodies of water (e.g. ground disposal and septic tank effluent pump systems, etc.).
2. Assure that effluent discharges into bodies of water are designed and located to minimize any adverse environmental impacts on oyster beds, spawning areas and fishing areas.
3. Encourage development in town center areas scheduled to be provided with sewage service.
4. Require marinas to provide adequate toilet facilities to eliminate the discharge of raw sewage from water craft. In addition, new marinas and expansion of existing marinas (greater than 10 new slips) are required to provide pump-out facilities to receive raw sewage from water craft.
5. Provide adequate public sewage treatment facilities for Solomons, North Beach, Chesapeake Beach, Prince Frederick and Lusby Town Centers. Permit sewer in all Town Centers when needed to support environmental health and/or support County identified economic development goals, when and if cost effective and economically feasible, and when consistent with the town center master plans.
6. Provide for County operated septage treatment and disposal and require all septage to be disposed of at this site.
7. Provide for landfill leachate treatment and disposal at the Solomons Waste Water Treatment Plant (WWTP).

8. Require multi-use or shared facility sewerage systems to provide at least 60% nitrogen removal.
9. Begin to address nitrogen pollution from septic systems.

Chesapeake Beach Objectives (as identified in the Chesapeake Beach Comprehensive Plan):

1. Continue to improve the Town's public water and sewer systems.
2. Expand public water supply and wastewater treatment capacity and infrastructure to serve anticipated development as warranted by demand.
3. Concerning the wastewater treatment plant, continue to work with Calvert County and the other jurisdictional partners to ensure that capacity is available to Chesapeake Beach as it accommodates a larger share of County growth and development.

North Beach Objectives (as identified in the North Beach Comprehensive Plan):

1. Maintain a safe and efficient collection and treatment of sewerage, as well as the disposal of sludge and effluent.
2. Continue to coordinate with neighboring jurisdictions to ensure the adequacy and efficiency of wastewater treatment in the Town of North Beach.

C. POLLUTION, TREATMENT AND DISPOSAL

1. Pollution

This plan addresses pollution which may result from disposal of sewage effluent. A few of the pollutants found in sewage effluent are organic matter, nutrients and a variety of other organic material and synthetic organic chemicals. The organic matter is naturally broken down by using the oxygen found in the watercourse. Watercourses have a certain amount of assimilative capacity to break down some of these pollutants. If too many nutrients are put into the watercourses it robs the water of its oxygen, creating an oxygen deficiency that may virtually suffocate marine life. Pollutants can reach water courses from either sewage treatment plants or septic systems.

Typically, a sewage treatment plant is intended to remove sufficient amounts of pollutants so as not to overburden the watercourse. The organic matter is naturally broken down by using the oxygen found in the watercourse.

Nutrients also leak out of even functioning septic systems, about nine pounds per person per year. With 90% of the households in Calvert on septic, this presents a problem for the environment.

Nutrients, namely nitrogen and phosphorous, also put an oxygen demand on the watercourse. Nitrogen in sewage effluent will oxidize to its more stable nitrate and nitrite forms. In addition, nitrogen and phosphorous are key elements required for the growth of algae. Algae will grow and then die settling to the bottom of the

watercourse and decay. The decay process depletes the oxygen supply in the water, again causing an oxygen deficiency.

Synthetic organic chemicals such as pesticides, insecticides, herbicides, solvents, surfactants and benzenes are not easily removed by wastewater treatment plants or by natural purification in watercourses. These substances can be highly toxic to marine life and discharge should be prohibited from entering sewage collection systems.

In 2006, the state amended Article 66B of the Annotated Code of Maryland to require that all counties include a Water Resources Element (WRE) in their comprehensive plans. The WRE will set new goals, procedures and actions needed so that receiving waters and land areas can meet wastewater and disposal needs. As part of the revisions to the Calvert County Comprehensive Plan, this document will be revised.

2. Treatment Method

Tertiary or advanced treatment of waste effluents from secondary treatment plants generally involves nutrient removal treatment or additional solids removal and is used to produce effluents 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) which escaped biochemical decomposition and part of this BOD is exerted by the suspended solids in the effluent. The effluent still has a considerable 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 of decomposition and recomposition. All County systems provide tertiary treatment.

3. Disposal Methods

Up until the past two decades, 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 become stressed and water quality has slowly deteriorated. The general philosophy was that each jurisdiction had rid itself of its sewage effluent problem by putting it into a river which carried it out of their jurisdiction. Once it left one jurisdiction, it unfortunately became a problem for the next county or town downstream. This is exemplified in Calvert County in the Patuxent River, where the water quality has been steadily declining as development continues upstream in the vicinity of Washington, D.C. Part of this problem is attributable to sewage effluent discharges upstream but some is attributable to storm water runoff and other sources of pollution previously mentioned. Calvert County is now striving to prohibit any new sewage effluent discharges into the Patuxent River.

The alternative to discharge of sewage effluent into a watercourse is land application. Rather than using the watercourse as a convenient method of disposal, 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 serve to recharge groundwater supplies, allows recovery and reuse of nutrients and may provide an economic return if used for some agricultural purposes or recreational purposes (e.g. watering ball fields).

Land treatment of waste water may involve a wide variety of techniques and in some cases combinations of several. These include irrigation, rapid infiltration, over land flow, landscape irrigation, woodland irrigation, and wetland treatment.

Land treatment systems will vary depending on the overall design and the particular site selected. Major design parameters include topography, permeability of the soils, depth to the groundwater table, and location of nearby residences.

No new discharge points are proposed with this plan and extensive studies are needed before any would be considered.

Nearly all County marinas have pump-out facilities and on-land bathroom facilities, to prevent boat owners from discharging waste from boats. The local Health Department is encouraging the remaining small operators to come into compliance with the use of state grants.

D. PRESENT AND PROJECTED SEWAGE DEMANDS AND PLANNED CAPACITIES

As mentioned, the majority of County residents are not served by community sewerage systems. Most residents of the County use on-site sewerage disposal systems.

Where an area is scheduled to be provided with sewerage service, scattered or low density development should be discouraged for reason of inefficient public servicing. A concentration of development usually can be serviced in the least expensive and most efficient manner. For example, multi-unit housing can accommodate a large portion of the market demand for moderate rentals and/or moderate cost ownership, and such development in or near town centers could be serviced from expansion of existing sewerage facilities much easier than scattered single family houses. Likewise, town centers, industrial parks and office parks are preferable to strip commercial development since the latter is inefficient to service.

The provision of community water and sewerage service is a helpful tool in directing growth away from sensitive areas and to land better suited for development. A policy for servicing the highest priority areas could help reduce development costs, public servicing costs, and raise the County's environmental standards. Projections of sewerage service demands and sewerage service capacities are shown in Table 9.

The future design capacities may be adequate to accommodate the residential build-out limit of 37,000 households as called for in the Comprehensive plan. Currently, the County is at 30,500 households, leaving 6,500 to be constructed.

**Table No. 9
Present and Projected Sewerage Demands and Planned Capacity**

SERVICE AREA	Present (2007)						Projected (2017)					
	Population (Residential) ¹			GPCD (gals)	Capacity		Population (Residential) ¹			GPCD (gals)	Capacity	
	Total	Served	Unserved		Demand	Planned ²	Total	Served	Unserved		Demand	Planned ²
Calvert Cliffs Nuclear Power Plant ³	0	0	0	11	12,640	66,500	0	0	0	11	12,640	66,500
Calvert County Industrial Park	0	0	0	-	16,000	30,000/ 60,000	0	0	0	-	25,000	60,000
Chesapeake Bch. Inter- jurisdiction ⁴	5	9,750	5	75	850,000	1,180,000/ 1,180,000 ⁶	5	11,500	5	75	1,000,000	1,500,000
Chesapeake Bch. Municip.	-	5,070	-	85	517,000	-	-	5,675	-	85	580,000	-
North Beach Municipality	-	2,050	-	58	134,500	-	-	2,300	-	58	150,750	-
Calvert Co. (Twin Beaches, Ches. Lgt.hse.)	-	1,540	-	69	113,300	-	-	1,725	-	69	127,000	-
Anne Arundel Co. (Rose Haven)	-	1,090	-	71	85,200	-	-	1,220	-	71	95,500	-
Huntingtown High School	-	1,550	-	2	2,400	11,000/ 11,500	-	1,550	-	2	2,400	11,500
Marley Run	0	155	0	70	11,000	15,000/ 15,000	0	400	0	70	30,000	40,000
Naval Ordnance Lab, Solomons	<i>Served by the Solmons Island Sanitary District</i>											
Naval Res. Facility, Randle Cliff	0	0	0	80	30,000	75,000	0	0	0	80	30,000	75,000
Northern High School	-	1,725	-	10	17,000	40,000/ 40,000	-	1,750	-	10	17,500	40,000
Prince Frederick Sanitary District	5	2,775	5	70	440,000	750,000/ 750,000	5	5,500	5	70	873,000	1,250,000
Solomons Island Sanitary District	5	3,000	5	67	335,000	700,000/ 1,017,000	5	5,400	5	67	603,000	1,250,000

1 Differences between the "Population (Residential) Served" for the same systems shown on both Table 3 and Table 9 are due to the fact that properties exist where connections were made to the public water supply systems but remained on private septic systems.
 2 2007 "Planned Capacity" shown is equal to the most recent Maryland Department of the Environment Discharge Permit Limit (annual average daily flow limit) followed by the actual plant design or rated flow capacity, unless otherwise noted. 2017 "Planned Capacity" shown is equal to the projected plant design flow capacity.
 3 Prior data projections for year 2000, source unconfirmed, left unchanged.
 4 "Population (Residential) Served" is based on average household size of 2.8 persons per dwelling in 2000 Census for Twin Beaches. "Planned Capacity" shown pertains to all four flow contributing jurisdictions.
 5 Data confirmation in progress at the time of current plan update finalization, final data to be provided in the next plan update.
 6 Projects in progress as of July 2007 to increase WWWT capacity to 1,500,000.

E. DEMAND AND DESIGN MODIFICATION (SEWAGE)

Demand modification in the context of sewerage facilities has many of the same economic and environmental considerations that have been discussed in the preceding chapter dealing with water facilities. A large number of residents of Calvert County depend upon individual sewerage treatment systems and there will be continued heavy reliance on individual systems in the future. While proper design and maintenance of individual septic systems may extend their operational life, numerous problems may be associated with improperly functioning septic systems.

Steps may be taken to modify the quality of influent a septic system must handle. For example, a reduction in the amounts of harsh detergents or volume of water may extend septic system life. However, in some cases the nature of the soil or the water table may mean that continual septic system problems can be expected. One remedy for such problems is construction of a community sewerage system, but where population densities are low this is an expensive last resort.

Several innovative sewage treatment systems have been developed and are being approved by the Maryland Department of the Environment which may offer a less expensive remedy than a traditional community system. Most of these experimental systems accelerate the biological breakdown and nitrogen removal by aeration, mixing and other techniques before discharging into a drainage field. Some of these systems include redesigned effluent discharge fields which may operate satisfactorily even in areas where high water tables are present. In large residential areas, it is possible to design systems that serve only problem areas.

As alternative individual systems are more thoroughly tested and proven, steps should be taken at the State and local levels to make provision for their use in areas where they are a viable remedy to existing problems. In addition, if such systems are proven to be superior to conventional septic systems, steps should be taken to initiate their general use in areas not served by community sewage treatment systems, particularly in the critical area.

In 2004, the state adopted new fees for septic systems and community sewer systems with the revenues to go toward reducing nutrients that enter the Bay. The County is pursuing grants for nutrient removal systems. With the first grant, the County plans to give priority to upgrading failing septic systems in the Critical Area, the 1000 ft. area of land surrounding tidal waters and wetlands.

F. EXISTING SEWAGE SYSTEMS

Calvert County has eight existing community sewerage systems identified on the Sewer Plan Map and are described below:

1. Chesapeake Beach Interjurisdiction:

The Chesapeake Beach Municipal System was initially built in 1969. This WWTP was modified through a series of upgrade projects in 1982, 1991 and 1999. This plant was upgraded to 1.0 million gallons per day (MGD) in 1991 and tertiary treatment was implemented. In 1999, the WWTP was approved for expansion up to 1.5 million gallons per day. In 1999, as part of the Biological Nutrient Removal (BNR) upgrades, the Chesapeake Beach WWTP increased its capacity to 1.180

MGD, the current permitted capacity, and implemented tertiary treatment. The plant uses an "oxidation ditch" to perform biological nitrogen removal. Phosphorus removal is accomplished by chemical precipitation. The facility has stand-by methanol feed in case the denitrification process requires additional carbon. The facility is designed to meet a 7 milligram per liter total nitrogen limit during the spring, summer and fall months.

Treated effluent is discharged into the Chesapeake Bay by means of a 12-inch gravity line at a point approximately 500 feet from the shore line in approximately 6 feet of water. This existing outfall was replaced with a new 30-inch gravity pipeline that extends into the Chesapeake Bay to a point approximately 200 feet from the seawall in July 2007. A problem with inflow/infiltration (I/I) has been identified in sections of this system. A consultant study is currently underway to evaluate the Town's system for I/I.

Sludge produced is belt pressed and the resulting dewatered sludge is transported from the Chesapeake Beach WWTP to the Appeal Landfill for collection, where it is loaded into a sludge trailer for transportation to dispose at the King George Landfill in Virginia, and is reported to be beneficially used as supplemental landfill cover.

The Chesapeake Beach Wastewater Treatment Plant services all portions of the Towns of Chesapeake Beach and North Beach, part of Calvert County outside the municipalities (referenced as "Twin Beaches", as well as the Chesapeake Lighthouse) and portions of Anne Arundel County (Rose Haven and Holland Point). The Chesapeake Beach WWTP land and equipment is owned by the Town of Chesapeake Beach and the facility is operated by Calvert County Division of Water and Sewerage. The capacity of the facility is jointly-owned by the Town of Chesapeake Beach, the Town of North Beach, and Calvert County. The "Chesapeake Beach Interjurisdictional Agreement" was finalized in 1980 and amended in 1989 and 1996.

All fixed expenses (non-variable), including capital project costs, incurred in the operation and maintenance of the Chesapeake Beach WWTP are proportionally shared by the respective parties to the interjurisdictional agreement. Each jurisdiction received a fixed allocation (or percentage) of the total treatment plant design capacity of 1.18 MGD based on each jurisdiction's then agreed upon required capacity for anticipated ultimate flow contribution. This allocation is referred to as a number of "taps" (or "EDU's" or "capital connections"), whereby one tap is equal to 200 GPD. According to this agreement, the flow allocation breakdown is as follows:

<u>Jurisdiction</u>	<u>Allocation [Flow in GPD (# of Taps)</u>	<u>Percentage</u>
Calvert County	302,325 (1,512 Taps)	25.6%
North Beach	250,200 (1,251 Taps)	21.2%
Chesapeake Beach	489,975 (2,450 Taps)	41.5%
<u>Anne Arundel</u>	<u>137,500 (550 Taps)</u>	<u>11.7%</u>
Total Flow	1,180,000 (5,763 Taps)	100.0%

Several major capital projects are under design or construction at this time. A project identified as the “Chesapeake Beach Screw Pumps/Emergency Holding Project” consists of the full rehabilitation of the deteriorated influent pump station and the construction of a new shellfish protection holding tank. The influent pump station rehabilitation includes the removal of four existing influent screw lift pumps (installed in 1982) and the installation of a new influent submersible pump with piping modifications. The construction of a new emergency holding tank will permit the CBWWTP to meet the Water Pollution regulations in Code of Maryland Regulation (COMAR) 26.08.04.04.C(2)(c) that requires all Sewage Treatment Works (WWTPs) that discharge into shellfish harvesting waters (Chesapeake Bay) to have a minimum 24-hour emergency holding facility for temporary storing of influent flow.

A project identified as the “Chesapeake Beach ENR Upgrade & Reconstruction” project consists of the replacement and upgrade of existing equipment and ENR modifications to the treatment plant. Due to the spatial constraints of the CBWWTP site (being located on essentially an “island”, confined by wetlands on three sides and existing plant infrastructure filling much of the available space), the CBWWTP Screw Pumps/Emergency Holding Project must be complete before construction can begin on the ENR Upgrade & Reconstruction Project. The scope of the ENR Upgrade & Reconstruction project consists of a replacement of remaining deteriorated equipment and rehabilitation of infrastructure at the end of its useful life and modifications to enable the plant to meet the ENR limits for effluent.

2. Prince Frederick:

The original Prince Frederick Wastewater Treatment Plant (located on Tobacco Ridge Road in Prince Frederick) was placed in operation in 1973 with the treated (tertiary) effluent directly discharging into Parkers Creek. This original plant was taken off line subsequent to the completion of the construction of a new wastewater treatment facility located on Sugar Notch Lane in Barstow in April of 1991. The replacement facility, referenced as Prince Frederick Wastewater Treatment Plant I, utilized aerated lagoon system treatment technology and slow rate land application (spray irrigation) of treated effluent, rated at a capacity of 450,000 gallons per day. The treated effluent is delivered to approximately 100 acres of spray irrigation fields, split up into 5 fields to allow for rotation and drying time where the treated effluent is land applied. This facility eliminated the original Prince Frederick Wastewater Treatment Plant’s direct discharge into Parkers Creek.

Subsequently in September 2002, construction was completed on the Prince Frederick Wastewater Treatment Plant II on the site of the original decommissioned Prince Frederick Wastewater Treatment Plant on Tobacco Ridge Road utilizing BNR (Biological Nutrient Removal) technology. This new facility provided additional wastewater capacity for the Prince Frederick Sanitary District with a rated capacity of 300,000 gallons per day. This plant is a Sequencing Batch Reactor (SBR) system utilizing the activated sludge treatment process and slow rate land application (spray irrigation) for discharge of the treated effluent. The treated effluent is delivered to approximately 70 acres of spray irrigation fields, split up into 14 fields to allow for rotation and drying time

where the treated effluent is land applied. The construction of an 18 million-gallon storage/holding pond on 4 acres with an additional 3.8 million-gallons of emergency storage provides 60 days of additional wet-weather effluent holding space. The facility is located approximately 7 miles east of Prince Frederick Wastewater Treatment Plant I. Approximately 18 dry tons of sludge is transported per week to the Appeal Landfill for collection, loading, transportation and ultimate disposal at an out-of-state landfill in Virginia, and is reported to be beneficially used as supplemental landfill cover.

Prince Frederick Wastewater Treatment Plants I and II are interconnected via a force main that allows these facilities to work in tandem providing a combined capacity of 750,000 gallons per day of sewage disposal for the Prince Frederick customers. Prince Frederick Wastewater Treatment Plants I and II service both the Prince Frederick and Dares Beach Sanitary Districts.

3. Solomons Island:

The Solomons Island WWTP currently has 1.052 MGD of capacity, with an actual flow of 0.335 MGD (CY 2006). Substantially all septage collected in the County by scavengers (e.g., septic tank pumpers) is taken to the County septage receiving facility located at the Solomons Island WWTP. Currently, approximately 1,737 dry tons per year of sludge is transported by the County from the Solomons Island WWTP to the Appeal Landfill for collection, where it is loaded into a sludge trailer by Solid Waste Division staff for final transportation by Duffield Hauling, Inc. for disposal at the King George Landfill in Virginia, and is reported to be beneficially used as supplemental landfill cover.

The Solomons Island Wastewater Treatment Plant was constructed west of the Appeal Landfill site on Sweetwater Lane in Lusby and was placed in operation in May 1986. This facility services the Solomons Island Sanitary District, including Solomons Island Town Center, areas in the vicinity of Back Creek (tributaries to Solomons Harbor) and Department of the Navy facilities (including the Naval Ordinance Research Facility) located in Solomons. In June 2003, the Solomons Sanitary district was extended to service the Lusby Town Center and Patuxent Business Park.

The Solomons Island Wastewater Treatment Plant is a rapid infiltration plant with a design capacity of 700,000 gallons per day. The Solomons Island WWTP was expanded and upgraded to a BNR system process in approximately 2003, capable of handling 1.017 MGD of wastewater. The plant contains the following unit process:

- a. Commutation and surge flow control at the Headworks Site in Solomons.
- b. High service pumps to pump from Solomons Headworks to the Solomons Wastewater Treatment Plant Land Treatment Site.
- c. Primary Clarifiers/Sludge Digestion Tanks.
- d. Rapid Infiltration Basins.
- e. Belt Filter Press.

Rapid infiltration is an innovative type of treatment which uses large infiltration basins as a media for growing particular types of bacteria for nitrogen removal. It is a two-step process resulting in an effluent which is of groundwater quality. Basically, the effluent from the primary clarifiers is dosed to a basin and the

nitrogen compounds are nitrified within the aerobic portion of the basin (top 2 - 4 inches). Below the aerobic portion is the anoxic areas which denitrifies the fully nitrified compounds using the carbon within the primary effluent resulting in a fully treated effluent.

The construction of the County's landfill adjacent to the site had raised the need to treat the leachate from the landfill at the Solomons WWTP. Furthermore, the Solomons WWTP is the sole location for receiving all septage collected in the County by scavengers (e.g., septic tank pumpers). All septage to be disposed of within Calvert County must be taken to the septage receiving facility located at the Solomons Island WWTP. The existing wastewater treatment plant has a BNR (Biological Nutrient Removal) system capable of handling the septage from various sources, the leachate from the Appeal Landfill and approximately 1.017 million gallons per day of wastewater.

In 2004, upgrades were completed including the addition of a bar screen and improvements to the Septage Receiving Facility, including construction of a septage acceptance plant. In 2005, a screen system upgrade project was completed to add a fully automatic self-cleaning influent screen and rotary screening compactor at the secondary clarifiers.

This site is isolated from the rest of the landfill activities. There is intended to be no public access to this location. The road, approaching the site, is separate from the rest of the system and available to County staff and sludge haulers only.

4. Calvert Cliffs Nuclear Power Plant:

The sewage treatment plant for the Calvert Cliffs Nuclear Power Plant was built for the benefit of the plant employees and guests. The plant has a design capacity of 0.0665 MGD.

The sewage treatment plant is an oxidation ditch type plant with nitrogen and phosphorous removal (tertiary treatment). Although the effluent is discharged into the Bay, it is of excellent quality where the discharge is in deep water.

5. Calvert County Industrial Park:

The Calvert County Industrial Park sewage plant was completed in 1977. The site, consisting of 11.5 acres, is located southwest of Prince Frederick on Maryland Route 231 and is a part of the County Industrial Park. The flow for the original plant was 0.060 MGD with an expansion that was planned to go to 0.36 MGD by 1999. Secondary treatment of the sewage is provided, prior to discharge to underground drainfields. A new discharge permit has been approved by MDE for an additional 30,000 gallons per day.

6. Northern High School:

The Northern High School sewage treatment plant in Chaneyville was placed in operation in 1972 to serve a population of 2,500 at the new school site. The design capacity of the plant is 0.040 MGD. The site, of approximately one acre, is located west of Maryland Route 4 on Chaneyville Road. The plant is restricted

to the processing of sewage generated by Northern Middle and High School and provides secondary and tertiary treatment. Ultra violet disinfection is applied before discharge of treated effluent into a wetland system that leads to Graham Creek. The Calvert County Board of Education has a capital project to maintain and repair the current plant during the 2008 Fiscal Year.

7. Randle Cliffs:

The Randle Cliffs facility has a design flow of 0.075 MGD and population loading of approximately 200. The plant was constructed in 1954 and discharges into the Chesapeake Bay. The operation of the treatment facility is under the supervision of the U.S. Navy. The system provides secondary sewage treatment by means of commutation of raw sewage, primary settling, rotor distribution of settled effluent on a trickling filter bed, and unheated sludge digestion with provisions for open sludge drying beds. Ultra Violet disinfection before discharge of treated effluent. No nutrient removal (tertiary treatment) facilities are provided.

8. Marley Run:

The Marley Run Wastewater Treatment facility is currently a shared experimental community system that was intended to pretreat sewage for homes in the Marley Run Subdivision and discharge the treated effluent into a pressurized shallow underground pipe system. The existing WWTP is a Smith & Loveless FAST® (Fixed Activated Sludge Treatment) System that consists of a distribution box, primary septic tank, denitrification tank, Smith & Loveless FAST treatment tank, two equalization tanks and an effluent pump station with effluent filters. The WWTP also has a 900,000-gallon wet weather holding lagoon located on site. Effluent from the facility is pumped to an underground drip irrigation system located near the WWTP for disposal. The current permitted capacity of the treatment facility is 15,000 gpd. When necessary, wet sludge is transported to the Solomons Island WWTP by scavenger haulers contracted by the County for disposal at the Septage Receiving Station through the approved sludge transport permit.

The Marley Run Subdivision (located in Huntingtown) currently in the first phase of construction, consists of 60 homes, of which approximately 57 are complete as of this revision. The current capacity limit of the WWTP as per the NPDES discharge limit is 15,000 GPD. With two more phases with a combined total of approximately 100 additional houses, the permit was staged to increase to a capacity limit of 40,000 GPD under Phase 3 build-out. The capacity of drip irrigation system is 40,000 GPD.

At the time the wastewater treatment method was selected for the Marley Run Subdivision, the system ultimately selected for the Marley Run Wastewater Treatment Plant was considered to be the latest progressive step in addressing the Chesapeake Bay environmental health and pollution issues associated with residential communities continuing to be built on individual septic systems. The County, the Maryland Department of the Environment and prospective developers hoped this treatment method would be the answer to small flow wastewater disposal for new residential subdivisions in Calvert County.

Subsequently, MDE approved the treatment concept and facility plans, as well as issued the permit to the developer for construction of the WWTP. The Marley Run WWTP was constructed by late 2001 by Marrick Properties, Inc. (developer for Marley Run) and ownership was later transferred to Calvert County subsequent to construction completion in accordance with the public works agreement. Subsequent start-up of this facility was in November 2001, at which point the Division of Water and Sewerage undertook full daily operations. The existing WWTP is a Smith & Loveless FAST® (Fixed Activated Sludge Treatment) System that consists of a distribution box, primary septic tank, denitrification tank, Smith & Loveless FAST treatment tank, two equalization tanks and an effluent pump station with effluent filters. The WWTP also has a 900,000-gallon wet weather holding lagoon located on site. Effluent from the facility is pumped to an underground drip irrigation system located near the WWTP for disposal. The current permitted capacity of the treatment facility is 15,000 gpd.

Subsequent to commencing operation of the existing WWTP, problems with effective, adequate and consistent treatment were realized. These problems were believed to be associated with low wastewater influent flow into the treatment system, higher nitrogen levels resulting from the low water flows (water saving fixtures) and cold temperature impacts on the microbiological activity. In August 2004, Marrick Properties, Inc. contracted Stearns & Wheeler, LLC to help Calvert County attempt to improve the performance of the existing WWTP. From August 2004 through January 2007, Calvert County, Marrick Properties and S&W had conducted data reviews, sample collection and analysis, and ongoing operational modifications to attempt to improve the performance of this plant. All parties examined and studied the known and suspected contributing factors preventing the successful performance of this system including investigating all treatment processes, the effects of the quantity and composition of the influent wastewater flow, the effects of cold temperature and the presence of several chemicals not typical in residential wastewater (including QAC [Quaternary Ammonium Compounds]) that were identified within the Marley Run collection system. To date, the plant is unable to meet the requirements of the permit regardless of the changes in operations and studies that have been made. Daily Monitoring Reports submitted from December 1, 2001 through November 30, 2005 to the MDE revealed that the Plant failed to meet the permit effluent limitations for total nitrogen, BOD and TSS.

With no clear problem(s) or solution(s) identifiable for improvement and/or modification of the existing treatment system, MDE requested the County enter into a Consent Order with the State of Maryland regarding water pollution control for the effluent released from the Marley Run WWTP. The Consent Order was executed by the Board of County Commissioners on December 6, 2006. The Consent Order required the County to perform an activated sludge pilot test on the Marley Run Wastewater Treatment Plant influent to evaluate alternative biological processes. In January of 2007, Calvert County and S&W with the direct support of Marrick Properties, Inc. initiated the activated sludge pilot testing program which was completed in July of 2007. A plan and schedule for corrective actions that will allow the plant to consistently comply with the current permit effluent limitations will be drafted and submitted to MDE for approval. Subsequently, all corrective actions will be completed in accordance with the

MDE approved plan and schedule, which will lead to the successful design and construction of a replacement treatment system that will ensure the county's ability to comply with MDE effluent limits at Marley Run.

Marrick Properties, Inc. has continued to support the County by contracting with S&W to perform the engineering design for the replacement Wastewater Treatment Plant. The replacement treatment system is anticipated to be a sequencing batch reactor (SBR) that will aid in achieving a successful activated sludge treatment process. A SBR system would provide the County with an economical biological treatment system where nitrification/denitrification, mixing, and clarification are achieved within a single reactor. Existing infrastructure that can be reutilized during the reconstruction will be, such as existing concrete tank structures, effluent pump station, effluent filters, 900,000-gallon wet weather holding lagoon and underground drip irrigation system fields.

9. Tapestry North Condominium Association:

The Tapestry North Condominium Association facility is a shared septic facility for 22 customers that is operated by the County under contract. This facility is a FAST® system manufactured by Smith & Loveless, Inc. In this small "FAST" (Fixed Activated Sludge Treatment) system design, the system is intended to treat and denitrify wastewater via a compartmentalized two zone septic tank containing a submerged media bed and aeration blower. A pump discharges the treated effluent into two subsurface drain fields via a shallow underground pipe leach field system, with alternating field usage every six months. Solids collected in the first zone are pumped once a year and transported to the septage receiving station at the Solomons Wastewater Treatment Plant.

**Table No. 10
Inventory of Existing Sewage Treatment Plants**

Name (Owner)	Type Treatment	Occupied / Vacant Acres	Point of Discharge	Max Site Capacity Secondary / Advanced (MGD)	Existing Capacity (MGD)	Flows (MGD) Average Peak	Operating Agency
Municipal [Public]							
Chesapeake Beach (Town of Chesapeake Beach)	Screening, degritting, activated sludge treatment with nitrification/denitrification, clarification, disinfection, dechlorination, post aeration	Approx. 32 acres / 29 acres	Direct discharge - outfall (Chesapeake Bay)	1.5	1.18	0.85	Calvert County DPW – Division of Water and Sewerage
Marley Run (Calvert County)	Fast Activated Sludge Treatment (FAST) System ¹	²	Underground (drip irrigation system)	0.04 (Phase III)	0.015	0.011	Calvert County DPW – Division of Water and Sewerage
Prince Frederick (Calvert County)	PF I: Screening, aerated lagoon, chlorination, storage PF II: Screening, Sequencing Batch Reactor (settling, activated sludge treatment with aeration, nitrification/denitrification, clarification), chlorination	Approx. 240 acres / 35 acres 199 acres / 70 acres	PF I: Spray irrigation PF II: Spray irrigation	0.50 PF II	0.75 Total (0.45 PF I) (0.30 PF II)	0.44 (0.185 PF I) (0.255 PF II)	Calvert County DPW – Division of Water and Sewerage
Solomons Island (Calvert County)	Communitation, degritting, activated sludge treatment with nitrification/denitrification, clarification	Approx. 40 acres / 224 acres	Rapid infiltration discharge (basins)	1.017	1.017	0.335	Calvert County DPW – Division of Water and Sewerage
Industrial							
Calvert Cliffs (Constellation Energy)	Activated sludge (tertiary system), oxidation ditch, nitrification/denitrification	²	Direct discharge (Chesapeake Bay)	²	0.0665	0.0126	Maryland Environmental Service (MES)

¹ As of July 2007, the current WWTP treatment system is under re-design to take it from a Fast Activated Sludge Treatment (FAST) System to an activated sludge system.

² Data outstanding at time of plan.

<p align="center">Table No. 10 Inventory of Existing Sewage Treatment Plants</p>							
Name (Owner)	Type Treatment	Occupied / Vacant Acres	Point of Discharge	Max Site Capacity Secondary / Advanced (MGD)	Existing Capacity (MGD)	Flows (MGD) Average Peak	Operating Agency
Calvert County Industrial Park (Calvert County)	Communitation, contact stabilization, clarification	Approx. 11.5 acres / 0 acres	Underground discharge (drain fields)	0.060	0.060	0.016	Calvert County DPW – Division of Water and Sewerage
Naval Research Facility, Randle Cliffs (US Navy)	Communitation, pre-chlorination, primary sedimentation, chlorination, filtration	²	Direct discharge - effluent cascade (Chesapeake Bay)	²	0.075	0.03	US Navy (Federal Government)
Private Community ¹ / Institutional							
Calvert Gateway Shopping Center	Package treatment system	²	Underground				Maryland Environmental Service (MES)
Huntingtown High School	Extended aeration, clarification, nitrification/denitrification		Underground discharge (drain field)		0.0115	0.0024	Calvert County DPW – Division of Water and Sewerage
Northern High School	Bar screening, extended aeration, clarification, filtration, UV disinfection	1 acres	Direct discharge (wetlands to Graham Stream)		0.040	0.017	Calvert County DPW – Division of Water and Sewerage
Tapestry North	Fast Activated Sludge Treatment (FAST) System		Underground discharge (drain fields)				Calvert County DPW – Division of Water and Sewerage

G. SEPTAGE AND SLUDGE DISPOSAL

1. Septage

Most of the homes in the County utilize individual septic tanks. These tanks should have regular service including the pump-out of solid and liquid waste. The Calvert County Health Department issues permits for scavenger service operators under provisions of Maryland Department of the Environment Regulation, COMAR 26.04.02.08. The permit allows scavenger services in accordance with applicable regulations, and specifies the location and method of waste disposal. Calvert County operates a septage treatment and disposal facility at the Solomons Wastewater Treatment Plant, a facility identified as the Septage Receiving Station which is the receiving point for all septage that is being disposed of within Calvert County.

¹ If transfer to public ownership is recommended, date represents expected date of transfer.

² Data outstanding at time of plan.

2. Sludge

Calvert County has three wastewater treatment plants which produce dewatered sludge which must be disposed of in a landfill. Sludge produced is belt pressed. These plants include Chesapeake Beach WWTP, Prince Frederick II WWTP and Solomons WWTP). Six other wastewater treatment plants in Calvert County including the Calvert Cliffs Nuclear Power Plant, Calvert County Industrial Park, Marley Run, Huntingtown High School, Northern High School and the Tapestry North Condominium wastewater treatment plants process liquid sludge from their respective facilities through the Solomons WWTP Septage Receiving Station. The liquid sludge disposed of at the Solomons WWTP Septage Receiving Station originating from the other WWTPs is ultimately processed and dewatered as part of the Solomons WWTP sludge generation. The dewatered sludge that is transported to the Appeal Landfill is accumulated, collected and subsequently transported via trailer to its final destination, an approved landfill (King George Landfill) in Virginia where it is reportedly beneficially used as supplemental landfill cover.

The other three facilities in Calvert County, including Calvert Gateway Shopping Center, the Naval Research Facility (Randle Cliffs) and Prince Frederick WWTP I each transport their liquid sludge generated to other facilities outside of Calvert County directly.

Sewage Sludge Utilization (Transportation and Disposal) Permits for wastewater treatment plants dewatering, transporting and disposing of sludge at the Appeal Landfill are:

- Chesapeake Beach Wastewater Treatment Plant (Permit #S-01-04-3206-L) dewateres aerobically digested sludge to approximately 13% solids on a belt filter press and transports and disposes of an annual average of 1,492 wet tons/year [194 dry tons/year] of sludge at the Appeal Landfill (Calendar Year [CY] 2006). Note, the Chesapeake Beach WWTP also maintains a Sewage Sludge Utilization Permit to transport wet sludge (Permit #S-06-04-4171-T) to the Solomons WWTP Septage Receiving Station for disposal, if necessary.
- Prince Frederick Wastewater Treatment Plant II – Tobacco Ridge (Permit #S-03-04-4951-T) dewateres sludge to approximately 13% solids on a belt filter press and transported an annual average of 734 wet tons/year [95.4 dry tons/year] of sludge to the Appeal Landfill for CY 2006.
- Solomons Island Wastewater Treatment Plant (Permit #S-06-04-3259-L) generates sludge that is aerobically digested in spirogestors, dewatered to approximately 15% solids and is transported and disposed of at the Appeal Landfill. Solomons WWTP's estimated sludge production was 2,092 wet tons/year [314 dry tons/year] for CY 2006.

Sewage Sludge Utilization (Transportation) Permits for wastewater treatment plants transporting wet sludge to the Solomons Wastewater Treatment Plant Septage Receiving Station include:

- The Calvert Cliffs Nuclear Power Plant (Permit #5-83-04-932-BE) has its own wastewater treatment plant that produces approximately 132,000 gallons/year of liquid sludge which is transported wet to the Solomons wastewater treatment plant (sewage sludge utilization permit #5-83-04-932-BE).
- Calvert County Industrial Park Wastewater Treatment Plant (Permit #S-02-04-3108-T1) has an estimated sludge production of 100 wet tons/year [3.6 dry tons/year] (approx. 3.6% solids) that is transported when necessary to the Solomons WWTP Septage Receiving Station. Practice as described will continue.
- Huntingtown High School Wastewater Treatment Plant (Permit #S-02-04-3108-T1) has an estimated sludge production of 12.5 wet tons/year [1.25 dry tons/year] (approx. 1% solids) that is transported intermittently to the Solomons WWTP Septage Receiving Station. Practice as described will continue.
- Marley Run Wastewater Treatment Plant (Permit #S-03-04-4934-T) did not have any sludge transported during CY 2006. When necessary, sludge from the WWTP will be transported intermittently to the Solomons WWTP Septage Receiving Station.
- Naval Research Laboratory in Randle Cliffs (Permit #5-86-04-1308-BE) has an estimated sludge production of approximately 9.75 wet tons/year of sludge which is dried in open air sludge beds and subsequently disposes of the dried sludge at the Appeal Landfill.
- Northern High School Wastewater Treatment Plant (Permit #S-02-04-3108-T1) had an estimated sludge production of 33 wet tons/year [3.3 dry tons/year] (approx. 1% solids) during CY 2006 that is transported intermittently to the Solomons WWTP Septage Receiving Station. Practice as described will continue.

Dewatered sludge that is disposed of at the Appeal Landfill is transported by a contract hauler for the County out of state to a landfill in Virginia (King George Landfill). During CY 2006, a total of 4,592 tons of sludge was hauled out of state to King George Landfill under Sewage Sludge Utilization (Transportation) Permit #S-02-30-4776T

H. THE SEWER SERVICE PLAN

The updated Comprehensive Sewer Service Plan is developed from an analysis of existing and projected service needs, consideration of existing systems, ecological constraints, land use policies and engineering feasibility (see also Section J. New Sewerage Plan Policies.) The boundaries and areas of sewer service areas are shown on Map 2. More detailed boundaries of sewerage service planning areas and sewerage system facilities are also available.

Stages or categories of sewerage planning are indicated below by capital letter "S" followed by a numeral, in accordance with Maryland Department of the Environment 26.03.01. The category may be changed administratively by the Department of Planning and Zoning to S-1 upon completion of the hook-up of a project.

Note: Planning categories S-1 through S-5 only indicate that community sewerage systems and/or multi-use sewerage systems are planned; not that they will be built or that they will be available for maximum development for each parcel of land within the planning category.

The actual amount of sewerage service available and the County allocation policy will determine when development may occur.

I. PLANNING CATEGORIES OF SEWERAGE SERVICE AREAS

<u>Category</u>	<u>Description</u>
S-1	<p>Areas served by shared facility, community and/or multi-use sewerage systems, which are either existing or are under construction.</p> <p>An individual sewerage system may not be permitted to be installed where adequate community sewerage facility is available. If an existing community sewerage facility is inadequate or is not available (no lines serve lot and system owner certifies that lines cannot be extended to serve lot), an interim individual sewerage system may be used, subject to the following conditions:</p> <ol style="list-style-type: none"> 1. Such interim system is judged by the Calvert County Health Department to be adequate and in compliance with pertinent State and local regulations, including minimum lot ownership as set forth in COMAR 26.04.03. 03. 2. Permits for such interim systems shall bear a notice regarding the interim nature of the permit and stating that connection to a future community system shall be made within one year or less after such system becomes available; 3. If interim systems are used, provisions shall be made, whenever possible, to locate such systems so as to permit connection to the public facilities in a most economical and convenient manner.
S-2	<p>Areas where improvements to, or construction of, new shared facility, community and/or multi-use sewerage systems are in the final planning stages. The installation of an interim individual sewerage system may be permitted subject to the same three conditions enumerated for the S-1 category area.</p>
S-3	<p>Areas where improvements to, or construction of, new shared facility, community and/or multi-use sewerage systems will be given immediate priority. The installation of an interim individual sewerage system may be permitted subject to the same three conditions enumerated for the S-1 category area.</p>

- S-4 Areas where improvements to, or construction of, new shared facility, community and/or multi-use sewerage systems are programmed for inclusion within the following 3 through 5/6 year period. Individual sewerage systems, not of an interim nature, shall be permitted to be installed in this planning category. Such installations shall be governed by the Maryland Department of the Environment Regulations, COMAR 26.04.02 as minimum requirements.
- S-5 Areas where improvements to, or construction of, new shared facility, community and/or multi-use sewerage systems are programmed for inclusion within the following 6/7 through 10 year period. Individual sewerage systems, not of an interim nature, shall be permitted to be installed in this planning category. Such installations shall be governed by the Maryland Department of the Environment Regulations, COMAR 26.04.02 as minimum requirements.
- S-6 Areas of Calvert County for which no sewerage service is planned or programmed.
- Individual sewerage systems may be approved in the category areas by the Calvert County Health Officer.

Areas of Concern are areas that have a high record of septic system failure or areas suspected of nutrient pollution.

J. NEW SEWERAGE PLAN POLICIES

1. Town Centers

Community, multi-use, and shared facility sewer systems will be permitted in all Town Centers when needed to support environmental health and/or support County identified economic development goals, when and if cost effective and economically feasible, and when consistent with town center master plans.

Interim multi-use systems that propose land (surface or subsurface) application and that have a capacity not exceeding 25,000 gallons per day may proceed without a Plan amendment. However, County approval (see below) as well as the State's Water and Sewerage Construction Permit and NPDES Permit must be obtained before construction. Systems which are in service during the biennial update of the plan must be discussed in the plan. All community sewerage systems and multi-use sewerage systems that either do not include land treatment or have a capacity to discharge greater than 5,000 gallons per day will require an amendment to the Plan before any State or County permits can be issued.

2. Community, Multi-use, and Shared Facility Systems Outside Town Centers

New community, multi-use, and shared facility service areas and sewerage systems and system extensions are permitted on land zoned Light Industrial (I-I), Employment Center (EC), Rural Commercial (RC) and Marine Commercial (MC).

Community and shared facility service areas are only allowed on land zoned Residential District (RD) or Rural Community District (RCD) if:

- a. an area is experiencing septic failures and a community sewerage system or shared facility system is deemed by the Calvert County Health Department and Department of Public Works to be the most appropriate and economically feasible method for correcting the problem. No connections for undeveloped lots are permitted.
- b. In the RD, Affordable Housing Agencies may apply to extend sewer lines to serve new development if the land is within one-mile of the perimeter of a major town center.

Multi-use sewerage systems are only allowed on land zoned Residential District (RD) or Rural Community District (RCD) if the use is commercial or institutional (for public or quasi-public uses).

New community, multi-use, or shared facility service areas are not allowed on land zoned Farm and Forest District (FFD), as this is the County's Priority Preservation Area, as per the Comprehensive Plan. Expansions of existing systems may be permitted.

3. On-site Disposal systems on lots created after the adoption of this Plan.

The Planning Commission shall encourage all new lots not served by community, multi-use, or shared facility sewerage systems to be served by nitrogen removing systems approved by the Maryland Department of the Environment. The new systems shall have maintenance and monitoring plans. County staff will also encourage owners of existing systems to replace with nitrogen removing systems. The County Health Department and/or the Board of Appeals may require new and /or replacement systems in the Critical area and Areas of Concern to be nitrogen removing systems approved by the Maryland Department of the Environment.

4. General Standards for Community, Multi-use, or Shared Facility Sewerage Systems.

Multi-use systems in a planned service area with land (surface or subsurface) application and a capacity of less than 5,000 gallons per day discharge may proceed without plan amendment. However, County approval of these systems is contingent upon the review and approval of the Department of Planning and Zoning, Department of Public Works, Division of Water and Sewerage, and Calvert County Health Department

Community and multi-use sewerage systems which either are not land application or have the capacity to discharge 5,000 gallons per day or more will require an amendment to the Plan prior to receiving State and County permits. All multi-use systems with a capacity over 10,000 gallons per day must be operated by a certified operator. All multi-use systems must be listed in the biennial update of the Plan.

Shared facilities must have nitrogen removing technology (60% or greater removal efficiency) and must be a land disposal system.

For all federally funded projects land treatment and other innovative methods for renovation and treatment of sewage are encouraged and shall be considered in the facility planning process and shall be required if found cost effective.

For all proposed sewage treatment systems not federally funded (new and expansions):

- A land treatment feasibility study shall be required if the sewage design capacity is 100,000 gallons per day or more.
- The Board of County Commissioners may require a land treatment feasibility study if the sewage design capacity is less than 100,000 gallons per day.

Proposed sewage treatment systems shall comply with State and Federal criteria. County criteria consists of but is not limited to review and approval by:

- Department of Planning and Zoning;
- Calvert County Health Department; and
- Department of Public Works, Division of Water and Sewerage.

Each privately-owned system with a capacity above 10,000 gallons per day shall be operated by a certified plant operator.

K. SEWAGE PROBLEM AREAS

Major problem areas are identified in Table 11. Most of the residential problems involve a small number of lots served by individual septic systems established during the 1960's or earlier. Economic feasibility of community sewage treatment systems in such cases is questionable. Specific study of each area is necessary to determine the best practical course of action for each area. Possible actions include: denial of additional building permits dependent upon individual septic systems; frequent inspection and servicing of individual septic systems; installation and maintenance of innovative type individual systems; or construction of a community system.

Apple Green, Breezy Point, Broomes Island, Cavalier Country, Cove Point, Dares Beach, Plum Point and Neeld Estate are all areas that experience problems with failing septic systems due to high groundwater and poor percolation. Presently, scattered failures are repairable on individual lots but further development will necessitate alternate methods of sewage disposal. For new development in areas having high water table or poor percolation, wet weather percolation testing is required. Studies should be conducted on each area and further development monitored closely.

The Board of County Commissioners appointed a "Small-lot Subcommittee" to investigate the potential problems caused by septic systems on small lots. The committee's recommendations were that every lot must have sufficient suitable space for one primary and two secondary drain fields and that only multi-chambered septic tanks of 1500 gallons or more would be allowed for new construction and replacement systems. Those recommendations were adopted in January, 1993 and are still in force.

Table No. 11 Problem Areas Inventory – Individual and Community (Water Pollution & Sewage Problem Areas)						
Service Area	Problem Description	Location	Population	Acres	Treatment Capacity / Demand	Planned Correction (Date if Known)
N/A	Poor percolation	Apple Green	N/A	N/A	N/A	#2
N/A	Seasonally high water table	Breezy Point	N/A	N/A	N/A	#1, #2, #3 Improve stormwater drainage.
N/A	Seasonally high water table, poor percolation	Broomes Island	N/A	N/A	N/A	#1, #2, #3
N/A	Poor percolation	Cavalier Country	N/A	N/A	N/A	#2
N/A	Seasonally high water table and small lots (to the west of Lighthouse Boulevard)	Cove Point	N/A	N/A	N/A	#1, #2, #3
Dares Beach	Poor percolation, seasonally high water table	Dares Beach	N/A	N/A	N/A	Sewerage system for Northern portion of area previously completed. #2, #3
N/A	Seasonally high water table	Neeld's Estates	N/A	N/A	N/A	#1, #2, #3
N/A	Poor percolation in some areas, small subdivided lots not developed yet. Problems anticipated as future development progresses.	Olivet-Drum Point	N/A	N/A	N/A	#1, #2, #3 Approve construction of area multi-use systems to serve existing homes only if other options don't work.
Mill Creek near Solomons	High fecal coliform bacterial counts, high Chlorophyll-A concentrations, and low dissolved oxygen in summer	Mill Creek	N/A	N/A	N/A	Continue monitoring every year to establish trends in water quality parameters.

- #1 For new development in areas having a high water table or poor percolation, wet percolation testing will be required.
- #2. Calvert County Health Department will address, in so far as possible, existing problems on a case-by-case basis.
- #3. To improve water quality, nitrogen removing septic systems may be required by the Health Department for all new and replacement septic systems.

Major sources of pollutants in the Patuxent River include discharged disposal of treated sewage wastes, sediment from agricultural uses and construction, toxins in the form of herbicides and insecticides, and airborne pollutants from vehicles and power plants.

**Table No. 12
Water Quality Problems Due to
Storm Drainage Outfalls and Non-point Sources¹**

Service Area	Problem Description	Location	Planned Correction
N/A	Restricted Shellfish Harvesting	Chalk Point North (On Patuxent, West Central County North)	Upgrade septic systems using grant funds and require new lots to have nitrogen removing systems
N/A	Restricted Shellfish Harvesting	Battle Creek (On Patuxent)	Upgrade septic systems using grant funds and require new lots to have nitrogen removing systems
N/A	Restricted Shellfish Harvesting	Island Creek (On Patuxent)	Upgrade septic systems using grant funds and require new lots to have nitrogen removing systems
N/A	Restricted Shellfish Harvesting	Mill Creek (Solomons)	Upgrade septic systems using grant funds and require new lots to have nitrogen removing systems

¹ Source: MDE. A more complete analysis of water quality problems will be available during the 2009 update

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CHAPTER FIVE

WATER AND SEWERAGE SERVICE IMPLEMENTATION PLAN

A. PURPOSE AND SCOPE

Reduction in Federal funding levels and limited State and Federal revenue sources have placed more of a burden of funding infrastructure improvements on local government. Calvert County collects capital connection charges to pay for system improvements but this can not be relied on to correct all of the identified problem areas. Therefore, it is very important for Calvert County to establish priorities to implement desired water and sewer capital improvements while maximizing the limited available funding.

B. LOCAL, STATE AND FEDERAL FUNDING

The State Maryland Department of the Environment (MDE) has switched to a loan, cost-share and supplemental assistance type of programs for water and sewer projects. One of the over-riding premises effecting State assistance is conformance with the Maryland Smart Growth Policy which steers funding of infrastructure towards Priority Funding Areas (PFAs). Therefore, any use of government funding sources will have to be consistent with the State's growth policies and must be directed towards projects that are within a designated PFA. The funding sources available through the Maryland Department of the Environment (MDE) are described below.

- Maryland Water Quality Revolving Loan Fund Program
A source of low-interest loans for water quality improvement projects. Example of water and sewer projects include Wastewater Treatment Plant (WWTP) upgrade, sewage pumping stations, combined sewer overflow abatement and connection of failing septic systems to public sewers.
- Sewerage Facilities Supplemental Assistance Program
Provides grant assistance to local governments for planning, design and construction of needed wastewater facilities. Funds are targeted to WWTP upgrades, connection of failing septic systems in older established communities and rehab of existing conveyance systems.
- Water Supply Financial Assistance Program
Provides financial assistance to local governments for the acquisition, construction, rehabilitation and improvement of publicly owned water supply facilities. Examples of projects include upgrading water treatment facilities, well development, distribution system, water tanks and small system consolidation.
- Maryland Drinking Water Revolving Loan Fund Program
A source of low-interest loans for water supply system capital projects. Example of water projects include drinking water plant improvements, storage facilities and extension of water service.
- Maryland Linked Deposit Water Quality Loan Program
Provides a low-interest source of financing for water quality capital improvements. This program makes loans more accessible to private entities by utilizing the existing commercial lending community and is, therefore, a logical choice for funding private

failing septic areas. Types of projects funded includes community and non-community water system capital improvements to meet federal and State requirements, correction of failing septic systems through replacement or connection to public sewer.

- **Biological Nutrient Removal Cost-Share Program**
Assists local governments with providing advanced wastewater treatment for nutrient removal. The minimum WWTP size is 500,000 gallons per day to qualify.

The financial application process for the State funding is as follows:

1. MDE solicits projects.
2. Pre-applications are rated and a priority list established.
3. Projects are selected from priority list (#2) for inclusion in:
 - a. Bond Bill request for State grant funds.
 - b. Intended Use Plan (IUP) for State Revolving Loan Fund.
4. Pre-applications are accepted throughout the year.

In addition, funding sources for non-point sewage problems are available through the Maryland Department of Natural Resources (DNR).

Section 319 Program provides formula grants to the states to implement non-point source projects and programs in accordance with Section 319 of the Clean Water Act (CWA). State and local governments and non-profit organization are eligible to apply for this funding. For the State of Maryland, projects may be located in any part of the state, with either a statewide or local scope. The control of non-point source pollution through prevention, education, planning or restoration must be the focus of the project.

Chesapeake Bay Implementation Grants assist states, public or nonprofit entities, and individuals to conduct research, experiments, investigations, training, demonstrations, surveys, or studies related to pollution reduction and the improvement of living resources in the Chesapeake Bay pursuant to Section 117(a). It also implements the Chesapeake Bay interstate management programs pursuant to 117(b) of the CWA. The Chesapeake Bay Program awards grants to reduce and prevent pollution and to improve the living resources in the Chesapeake Bay.

Grants are awarded for implementation projects as well as research, monitoring, and other related activities. Funds are available to state water pollution control agencies, interstate agencies, other public nonprofit agencies, institutions, and individuals in the Chesapeake Bay basin (Maryland, Pennsylvania, Virginia, and the District of Columbia). In Maryland, the program is administered by the Maryland Department of Natural Resources.

Coastal Zone Management Implementation Award is granted to Maryland which receives funds from National Oceanographic and Atmospheric Administration (NOAA) to implement its Coastal Zone Management Program. Funds are available to support projects such as coastal wetlands management and protection; natural hazards management; public access improvements; reduction of marine debris; assessment of the impacts of coastal growth and development; special areas management planning; regional management issues; and demonstration projects with the potential to improve coastal zone management. Assistance is provided to the states through the Coastal Zone Management Act Section 306/306A formula grant for which a non-federal match is required, Section 309 program enhancement

grant for which no match is required, and Section 6217 that provides funds for the development of the Coastal NPS Pollution Program. The Coastal Zone Management Division of the Maryland DNR administers these grant programs.

Section 106 Water Pollution Control Program Grants of the CWA authorizes EPA to provide federal assistance to states and interstate agencies to establish and implement ongoing water pollution control programs. Prevention and control measures supported by state water quality management programs include permitting; pollution control activities; surveillance, monitoring, and enforcement; advice and assistance to local agencies; and training and public information.

Increasingly, EPA and the states are working together to develop basin-wide approaches to water quality management. The Section 106 program is fostering a watershed protection approach at the state level by examining the states' water quality problems holistically and focusing the limited finances on effective program management.

C. CAPITAL IMPROVEMENT PROGRAM PLANNING

The Capital Improvement Program (CIP) is made up of high dollar, multi-year projects involving acquisition, construction, renovation, or expansion. All projects are consistent with the goals established in the County's Comprehensive Plan and related subordinate plans. Financing for these projects comes from the County's general fund, the sale of general obligation bonds, and state funding. Utility improvements are funded from capital connection fees, and water and sewerage bonds.

Calvert County develops a five-year CIP. This allows adequate time for planning and financing of major improvements, including work on water and sewer facilities. The purpose of this chapter is to provide guidance for future CIP plans and programs building on the priorities established in Chapters Three and Four. The County Commissioners adopt a water and sewer CIP on an annual basis. Once adopted, the Department of Public Works (DPW) includes priority projects in their CIP request. The CIP is part of the annual budget process.

D. PRIORITY SYSTEM

The Water and Sewer Plan attempts to guide the County in implementing water and sewerage needs presented in previous chapters. The County should utilize the following water and sewer priority ranking system to evaluate water and sewer projects as a mechanism to develop a water and sewer CIP. A priority system is based on the following criteria (criteria listed under each priority number is in no particular order):

Priority 1

- a) Projects that will implement a major objective of the Comprehensive Plan. These objectives range from land use and natural resources to economic development.
- b) Projects located in or serving a Priority Funding Area (PFA)
- c) Projects located in or serving designated 'growth area' on the Comprehensive Development Plan (figure 6) and consistent with the provisions in Chapter 3, section K and Chapter 4, Section J.

- d) Projects that will remedy a condition that is dangerous to public health and safety or the environment.
- e) Projects that will correct a system or infrastructure that is failing condition or malfunctioning.
- f) Projects that fulfill a legally binding agreement.

Priority 2

- a) Projects needed to promote the orderly development of desirable commercial or residential area(s) outside of a Town Center or Employment Center and are consistent with the provisions in Chapter 3, section K and Chapter 4, Section J.
- b) Projects that will correct an anticipated system or infrastructure deficiency that is still functioning.
- c) Projects needed to address a potential public safety issues.
- d) Projects that will remedy available capacity levels in the County's major systems.

Priority 3

- a) Projects that will improve the orderly development of desirable commercial or residential area(s) outside a Town Center or Employment Center but are not absolutely necessary, provided they are consistent with the provisions in Chapter 3, section K and Chapter 4, Section J.
- b) Projects that will improve the efficiency of the County's water and sewer systems.
- c) Projects that are part of the normal maintenance of a system.

Priority 4

- a) Projects that can be postponed without harming existing programs or the County's water and sewer system.

E. WATER AND SEWER NEEDS ANALYSIS

Based on the priority ranking system described in Section D and building on the problem areas identified in Chapters Three and Four, the Calvert County Department of Public Works Utilities Division develops a 'Needs' list for water and sewer projects. This list will then become the basis for establishing priorities and developing a Water and Sewer CIP program for implementation.

F. PRIORITIES FOR WATER SERVICE

Recommended priorities for provisions of water service are summarized in Table 8 (repeated below from Chapter 3). The following is a description of each recommended water capital project:

1. The East Prince Frederick Water Tower and Well consists of the construction of an additional elevated water storage tower and additional production well to meet the anticipated growth in the Town Center as well as balance the water being supplied on the west and east sides of Maryland Route 2/4 in the Prince Frederick Town Center [Priorities 1a, 1b, 1c, 2c & 2d].
2. The Chesapeake Heights / Dares Beach Water Treatment Projects shall provide new water treatment facilities at the existing wells to ensure the water supplied meets the MDE water quality standards for arsenic [Priorities 1b & 1d].
3. The St. Leonard Well Project consists of installing a new 6" well to supplement the existing 4" wells to keep up with the increasing demand in the Town Center [Priority 1a, 1b, 1c, 2c & 2d].
4. The Shores of Calvert Water Tank Project includes the replacement of the existing aged 15,000 gallon water storage tank as well as the treatment plant controls and pump station [Priority 2b & 2c].
5. The Hunting Hills Water System Upgrade is a project to completely rehabilitate the distribution system and replacement of the water storage tank. Rehabilitation shall include the replacement of the distribution lines, installation of new water meters, well housing repairs and minor upgrades to the controls and electrical system. The new system capacity will be upgraded to 250,000 GPD [Priorities 2b & 2c].
6. The Lakewood Water System Upgrade consists of replacing the existing aged water storage tank [Priorities 2b & 2c].
7. The Dares Beach Waterline / Tank Repainting project includes the replacement of an aging 40 year old waterline that has a history of leaks and other related problems, as well as the maintenance and painting of the water storage stand pipe at the Dares Beach water facility [Priorities 2b & 2c].
8. Water Meter Replacement Project to retrofit all of the existing water meters within the Bureau of Utilities, beginning with the existing water meters that are not functioning, ultimately replacing all of the existing Bader Meter water meters with new Master Meter water meters to ensure accuracy and readability. Currently un-metered water systems will ultimately have water meters installed as well. For reference, Badger Meter, Inc. previously terminated their production of the "TRACE" electronic transponder meter reading system equipment and effective June 2007 has terminated their support of this equipment. [Priorities: some areas 1b, 1c, 1e, 2b & 3c; other areas 2a; 3b, 3c].
9. The second phase of the Lakewood Water System Upgrade consists of replacing the aging water distribution system [Priorities 2b & 2c].

**Table No. 8 (Repeated from Chapter 3)
Immediate, 5 and 10 Year Priorities for Water Development**

			Estimated Costs ¹			Project Status / Construction Start	
Fiscal Year and Project Number	County Priority Assigned	Description	Total	Federal and/or State	Local	Immediate Priority Projects	5 and 10 Year Period Projects
FY08 Proj. #4807	1a, 1b, 1c, 2c & 2d	East Prince Frederick Water Tower and Well	1.540	1.0 (MDE Loan)	0.540 (Cap Conn.)	In Progress (Preliminary Design + Permit) / Summer 2008	-
FY08 Proj. # -	1b & 1d	Chesapeake Heights / Dares Beach Water Treatment	0.1625	-	0.1625 (Loan)	In Progress (Pilot Testing + Design) / Fall 2007	-
FY08 (Prior) Proj. #4804	1a, 1b, 1c, 2c & 2d	St. Leonard Well	0.103	-	0.103 (Loan)	In Progress (Preliminary Design) / Spring 2008	-
FY08 (+ Prior) Proj. #4808	2b & 2c	Shores of Calvert Water Tank	0.125	-	0.125 (Loan)	In Progress (Design) / Fall 2007	-
FY08 (Prior) Proj. #4800	2b & 2c	Hunting Hills Water System Upgrade	0.319	-	0.319 (Loan)	In Progress (Preliminary Design) / Spring 2008	-
FY08 (+ Prior) Proj. #4801	2b & 2c	Lakewood Water System Upgrade (Tank Replacement) ²	0.040	-	0.040 (Loan)	In Progress (Preliminary Design) / Summer 2008	-
FY08 (+ Prior) Proj. #4805	2b & 2c	Dares Beach Water Line Replacement / Tank Painting	0.140	-	0.140 (Loan)	In Progress (Design) / Fall 2007	-
FY08 to FY11 Proj. # -	1b, 1c, 1e; 2a, 2b, 3b & 3c	Water Meter Replacement Project (All Water Systems)	1.650	-	0.290 (Cap Conn.)	In Progress (Planning) / Summer 2007	-
FY09 Proj. #4801	2b & 2c	Lakewood Water System Upgrade (Water Distribution System) ²	0.250	-	0.250 (Loan)	In Progress (Preliminary Design) / Summer 2009	-

G. PRIORITIES FOR SEWERAGE DEVELOPMENT

Recommended priorities for provisions of sewerage facilities are summarized in Table 13.

1. The Solomons Forcemain Study includes the engineering evaluation of the aging Solomons Forcemain Pump Station (and the impacts of other connected pump stations) and the performance of the existing 10" force main (4.7 miles long) which sends Solomons effluent to the Solomons WWTP. For reference, the existing capacity of the Solomons Forcemain has dropped from 700 GPM to 450 GPM.

¹ Preliminary cost estimates based on dollar values as of effective date of plan where applicable, in millions of dollars

² Lakewood Project was split into two subprojects due to different tasks and funding spanning two fiscal years with one year gap in between funding

- Subsequent construction will include the cleaning and required modifications of the 10" force main (air release stations and check valves), replacement of the degritting unit, as well as the upgrading of the Solomons Sewage Pump Station pumps to meet the growing future demands [Priorities 1a, 1b, 1c & 2b].
2. The Solomons WWTP Improvements Project consists of improvements to increase plant safety, efficiency and to protect electrical equipment on site. This project includes the acquisition of a new rotary fan press, pretreatment for septage receiving, plant safety study and rehabilitation program, lightning protection study and modifications, and the replacement of the existing PLC control system previously destroyed by lightning [Priorities 1a, 1b, 1c, 1d & 1e].
 3. The Solomons Headworks Equipment Retrofit Project consists of the retrofitting of the equipment at the Solomons Headworks to accomplish the following: add a mezzanine level, install at Pistagrit system to deal with sand, modify lead/lag time for pump operation, and install Godwin dri-prime stand by pump for emergency operation [Priorities 1a, 1b, 1c, 1e & 2c].
 4. The Solomons WWTP Plant Upgrade project will expand the capacity of the Solomons WWTP to handle the projected future flow demands from the Solomons Sanitary District [Priorities 1a, 1b & 1c].
 5. Prince Frederick Sewer Line (CMH to old Calvert Middle School) Project consists of the replacement of the aging 6 inch force main sewer line from Calvert Memorial Hospital to Dares Beach Road intersection with MD 2/4 (in vicinity of Calvert Middle School) [Priorities 1a, 1b, 1c, 2b & 2d].
 6. Prince Frederick Sewer Pump Station #2 Rehabilitation Project consists of the upgrade of aging infrastructure necessary to meet the increased demands on the system [Priorities 1a, 1b, 1c, 2b & 2d].
 7. Prince Frederick Sewer Line (Dares Beach Road to Pump Station #3) Project consists of the replacement of the aging gravity sewer line (south of Dares Beach Road intersection with MD 2/4) through to PF Pump Station #3 (along North Prince Frederick Boulevard) [Priorities 1a, 1b, 1c, 2b & 2d].
 8. The Prince Frederick Sewer Pump Station (Chapline) Project is an upgrade of the existing Prince Frederick Chapline WWPS. This upgrade is necessary to meet the increased demands on the system, as well as replacing aged equipment [Priorities 1a, 1b, 1c, 2b & 2d].
 9. The Prince Frederick WWTP #1 Plant Upgrade project will provide an upgrade to add capacity to the existing facility. The intent is to add rapid infiltration basins (or alternate measures) to the existing facility and SBR (Sequencing Batch Reactor) technology to the processing [Priorities 1a, 1b, 1c & 2d].
 10. The Prince Frederick Sewer Line (PF Wastewater Pump Station #2 to Prince Frederick Wastewater Treatment Plant #2) Project will replace the aging gravity sewer line between Prince Frederick sewer pump station #2 (off Main Street through to Prince Frederick Wastewater Treatment Plant #2 (Tobacco Ridge) [Priorities 1a, 1b, 1c, 2b & 2d].

11. The Prince Frederick Church Street Sewer Line Project consists of the replacement of the existing gravity sewer line in the vicinity of the Church Street (MD 231) and Main Street (MD 765) intersection in conjunction with the intersection improvements that are to be completed as part of the Prince Frederick Streetscape Project [Priorities 1a, 1b, 1c, 2b & 2d].
12. Industrial Park WWTP Plant Upgrade Project will include the replacement of aging (+30 year old) and worn out WWTP equipment with SBR technology (or alternatively, modify or construct new a wastewater pump station to redirect flow from the IPA to the PF WWTP#1) [Priorities 1a, 1b, 1c & 2b].
13. The Chesapeake Beach Wastewater Treatment Plant Outfall Project will replace the outfall for the Chesapeake Beach WWTP. The total cost of the project is estimated at \$1,900,000. The cost share is divided based on ownership of the plant, as shared by the partners which are the Towns of North and Chesapeake Beach, and Anne Arundel County [Priorities 1a, 1b, 1c, 1d & 1e].
14. Chesapeake Beach Wastewater Treatment Plan Screw Pump / Emergency Holding Tank Project will include the replacement of the influent screw pumps at the Chesapeake Beach WWTP, and create an emergency holding tank for the facility. A total of 35% of the project, which Calvert County will not participate in, will expand the plant capacity. The cost share is divided based on ownership percentage of the plant, as shared by the partners which are the Towns of North and Chesapeake Beach, and Anne Arundel County [Priorities 1a, 1b, 1c, 2c & 2d].
15. The Chesapeake Beach Wastewater Treatment Plant Reconstruction and ENR Upgrade Project will replace equipment at the Chesapeake Beach WWTP which has reached the end of its useful life. Concurrently with this replacement the plant will be modified for Enhanced Nutrient Removal. A portion of the project, which Calvert County will not participate in, will also expand the plant capacity. A grant from the state Bay Restoration Funds is expected to cover 40% of eligible project costs. The balance will come from a Maryland Department of the Environment loan [Priorities 1a, 1b, 1c, 2c & 2d].

Table No. 13
Immediate, 5 and 10 Year Priorities for Sewerage Development

				Costs ¹		Projected Schedule		
Fiscal Year and Project Number	County Priority Assigned	Description Total	PL 660 ² Eligibility	Other Federal Local	Preliminary Plans	Financial Plans	Start Construction	Complete Construction
FY08 (+ Prior) Proj.	1a, 1b, 1c & 2b	Solomons Forcemain Study (See G1 Above)	N/A	0.250	Yes	Capital Connections	Spring 2008 (Currently under Evaluation)	FY09

¹ Based on real dollar values, in millions of dollars.

² Public Law 660, Section 8, Federal Water Pollution Control Act, provides grants for state water-pollution control programs and authorized the granting of funds for construction of necessary treatment works to prevent the discharge of untreated sewage.

**Table No. 13
Immediate, 5 and 10 Year Priorities for Sewerage Development**

				Costs ¹		Projected Schedule		
Fiscal Year and Project Number	County Priority Assigned	Description Total	PL 660 ² Eligibility	Other Federal Local	Preliminary Plans	Financial Plans	Start Construction	Complete Construction
#4859								
FY08 to FY09 Proj. # -	1a, 1b, 1c, 1d & 1e	Solomons WWTP Improvements (See G2 Above)	Anticipated	1.125	Yes	State Loan (or Co. Loan)	FY09 (Engineering in FY08)	FY09~FY10
FY08 to FY09 Proj. # -	1a, 1b, 1c, 1e & 2c	Solomons Headworks Equipment Retrofit (See G3 Above)	N/A	1.525	In Progress	Capital Connections	FY09 (Engineering in FY08)	FY09
FY09 to FY10 Proj. # -	1a, 1b & 1c	Solomons WWTP Plant Upgrade (See G4 Above)	Anticipated	1.280	No	State Loan (or Co. Loan)	FY09 (Engineering in FY08)	FY09~FY10
FY08 (+ Prior) Proj. #4852	1a, 1b, 1c, 2b & 2d	Prince Frederick Sewer Line [CMH to old Calvert Middle School] (See G5 Above)	-	0.360	No	State Loan (or Co. Loan)	FY09 (Engineering in FY08)	FY09
FY08 (+ Prior) Proj. #4858	1a, 1b, 1c, 2b & 2d	Prince Frederick Sewer Pump Station #2 Rehabilitation (See G6 Above)	N/A	0.4325	Yes	Capital Connections	FY09 (Engineering in FY08)	FY09~FY10
FY08 to FY09 Proj. # -	1a, 1b, 1c, 2b & 2d	Prince Frederick Sewer Line [Dares Beach Road to Pump Station #3] (See G7 Above)	-	0.550	No	State Loan (or Co. Loan)	FY09 (Engineering in FY08)	FY09
FY10 Proj. # -	1a, 1b, 1c, 2b & 2d	Prince Frederick Sewer Pump Station (Chapline) [See G8 Above]	N/A	0.2075	No	Capital Connections	FY10 (Engineering in FY10)	FY10~FY11
FY11 to FY12 Proj. # -	1a, 1b, 1c & 2d	Prince Frederick WWTP #1 Plant Upgrade (See G9 Above)	Anticipated	2.40	No	State Loan (or Co. Loan)	FY12 (Engineering in FY11)	FY13

**Table No. 13
Immediate, 5 and 10 Year Priorities for Sewerage Development**

				Costs ¹		Projected Schedule		
Fiscal Year and Project Number	County Priority Assigned	Description Total	PL 660 ² Eligibility	Other Federal Local	Preliminary Plans	Financial Plans	Start Construction	Complete Construction
FY13 Proj. # -	1a, 1b, 1c, 2b & 2d	Prince Frederick Sewer Line [PF Pump Station #2 to Wastewater Treatment Plant #2] (See G10 Above)	Anticipated	0.70	No	State Loan (or Co. Loan)	FY13 (Engineering in FY13)	FY13~FY14
FY10 Proj. # -	1a, 1b, 1c, 2b & 2d	Prince Frederick Church Street Sewer Line (See G11 Above)	N/A	0.180	Yes	Capital Connections	FY10 (Engineering in FY10)	FY10
FY08 to FY10 Proj. # -	1a, 1b, 1c & 2b	Industrial Park WWTP Plant Upgrade (See G12 Above)		0.630	No	State Loan (or Co. Loan)	FY09 (Engineering in FY08)	FY09~FY10
FY08 Proj. #4850	1a, 1b, 1c, 1d & 1e	Chesapeake Beach WWTP Outfall Project (See G13 Above)	N/A	1.90	Complete	(County: Capital Connections)	Construction Started 6/07 - Underway	FY08
FY08 Proj. #4851	1a, 1b, 1c, 1d & 1e	Chesapeake Beach WWTP Screw Pump / Emergency Holding Tank (See G14 Above)	Anticipated	6.90	Yes	State Loan	Construction Started 7/07	FY09~FY10
FY08 to FY10 Proj. # -	1a, 1b, 1c, 1d & 1e	CB WWTP Reconstruction and ENR Upgrade (See G15 Above)	Anticipated	20.0	Yes	BRF Grant (40%) & State Loan for balance	FY08 (Engineering in FY08)	FY10~FY11

H. CAPITAL IMPROVEMENTS FOR WATER AND SEWER

Based on the 'needs' list and priorities list described in previous sections, a Capital Improvement Program (CIP) can be developed. Recommended CIP projects are illustrated in Table 14.

Table No. 14
Capital Improvements Required for
Implementation of Water and Sewerage Projects

Public Works/ Utilities Bureau Division of Water & Sewerage	Prior Approvals (thru FY07)	Five Year CIP					Total thru
		FY08	FY09	FY10	FY11	FY12	FY12
Water Projects							
St. Leonard Well	\$103,000	\$0	\$0	\$0	\$0	\$0	\$103,000
Hunting Hills Water System Upgrade	\$319,000	\$0	\$0	\$0	\$0	\$0	\$319,000
Shores of Calvert Water Tank	\$100,000	\$25,000	\$0	\$0	\$0	\$0	\$125,000
Dares Beach Waterline/Tank Painting	\$115,000	\$25,000	\$0	\$0	\$0	\$0	\$140,000
East Prince Frederick Water Tower & Well	\$200,000	\$1,340,000	\$0	\$0	\$0	\$0	\$1,540,000
Lakewood Water System Upgrade	\$40,000	\$0	\$250,000	\$0	\$0	\$0	\$290,000
Chesapeake Heights / Dares Beach Water Treatment	\$0	\$162,500	\$0	\$0	\$0	\$0	\$162,500
Water Meter Replacement Project	\$0	\$450,000	\$450,000	\$450,000	\$300,000	\$0	\$1,650,000
Total Water Projects	\$877,000	\$2,002,500	\$700,000	\$450,000	\$300,000	\$0	\$4,329,500
Sanitary/Wastewater Projects							
Solomons Forcemain Study	\$79,000	\$171,000	\$0	\$0	\$0	\$0	\$250,000
Solomons WWTP Improvements	\$0	\$250,000	\$875,000	\$0	\$0	\$0	\$1,125,000
Solomons Headworks Equipment Retrofit	\$0	\$275,000	\$1,250,000	\$0	\$0	\$0	\$1,525,000
Solomons WWTP Plant Upgrade	\$0	\$0	\$180,000	\$1,100,000	\$0	\$0	\$1,280,000
Prince Frederick Sewer Line (CMH to old Calvert Middle School)	\$180,000	\$180,000	\$0	\$0	\$0	\$0	\$360,000
Prince Frederick Sewer Pump Station #2 Rehabilitation	\$357,500	\$75,000	\$0	\$0	\$0	\$0	\$432,500
Prince Frederick Sewer Pump Station #1	\$0	\$90,000	\$0	\$0	\$0	\$0	\$90,000
Prince Frederick Sewer Line Dares Beach Road to Pump Station #3	\$0	\$300,000	\$250,000	\$0	\$0	\$0	\$550,000
Prince Frederick Sewer Pump Station Chapline	\$0	\$0	\$0	\$207,500	\$0	\$0	\$207,500
Prince Frederick WWTP #1 Plant Upgrade	\$0	\$0	\$0	\$0	\$200,000	\$2,200,000	\$2,400,000
Industrial Park WWTP Plant Upgrade	\$0	\$30,000	\$200,000	\$400,000	\$0	\$0	\$630,000
Chesapeake Beach WWTP Outfall Project	\$302,080	\$0	\$0	\$0	\$0	\$0	\$302,080
Chesapeake Beach WWTP Screw Pump / Emergency Holding Tank	\$448,000	\$448,000	\$0	\$0	\$0	\$0	\$896,000
Chesapeake Beach WWTP Reconstruction and ENR Upgrade	\$50,000	\$826,800	\$876,800	\$1,753,600	\$0	\$0	\$3,507,200
Total Sanitary/Wastewater Projects	\$1,687,332	\$2,645,800	\$3,631,800	\$3,461,100	\$200,000	\$2,200,000	\$13,826,032
Total Utilities Projects	\$2,564,332	\$4,648,300	\$4,331,800	\$3,911,100	\$500,000	\$2,200,000	\$18,155,532

This process can be replicated for future CIP programs.

I. FINANCIAL MANAGEMENT

Groundwater is Calvert County’s primary water source and is readily obtainable in sufficient quantities to supply current residential and commercial needs. Recent aquifer studies indicate sufficient supply to meet projected needs beyond the year 2025. Groundwater usage is confined primarily to residential, commercial units, and the industrial demands of the Calvert Cliffs Nuclear Power Plant and the Cove Point LNG.

Eighteen municipal water systems are owned and operated by Calvert County. One municipal water system is owned and operated by the Town of North Beach. One is owned and operated by the Town of Chesapeake Beach. Six municipal wastewater treatment plants (WWTP) are owned by Calvert County, and one municipal wastewater treatment plant is jointly owned by Calvert County, the Towns of Chesapeake Beach and North Beach, and Anne Arundel County.

The Department of Public Works, Bureau of Utilities, Division of Water and Sewer, is responsible for the planning, design, construction and maintenance of County-owned water and sewerage systems. The County is authorized and directed at any time to set rates and fees as deemed necessary to insure that the water and sewer systems operate within the respective revenues. The County has completed the adoption of a new rate structure, which will be phased in over a seven year period beginning in Calendar Year 2006. When completely phased in, the operating rates will cover the operating costs. We are currently in the third year of the seven year phase-in of the new rates.

While it has no direct authority over the two municipal corporations, the County contractually operates the wastewater treatment facility serving both incorporated towns. The County also contractually operates one water system and wastewater treatment facility for a private community, as well as two high school wastewater treatment plants for the Board of Education. The Sanitary Districts are under the jurisdiction and control of the Board of County Commissioners.

The location of new community and sewerage systems and the extension of existing systems are done in accordance with the County Comprehensive Water and Sewer Plan which is consistent with the County Comprehensive Plan. Those properties that are not served by the Sanitary District water and sewerage systems are served by individual or private systems.

1. CHARGES AND ASSESSMENTS

a) Connection Charges

The County, by ordinance or resolution, may make a charge for each water and sewer connection. The funds derived from these charges may be used for payment of principal and interest on growth-related bond issuance, accumulating funds for growth-related capital improvements, and for the purchase of large capital equipment for the systems. The County is currently re-evaluating the fee structure for these connections.

b) Front Foot Benefit Assessments

As of December, 2007, the County has no front foot benefit assessments in place. The Board of County Commissioners may elect to assess front foot charges if there is placement of water or sewer service lines along County or State roads which would enable the property owner to elect connection to County water or sewer service at a future date. This charge is used to recover the cost of constructing the water and sewer lateral lines and is paid annually from the inception of service for a period of 20 years.

c) Usage Charge

For the purpose of providing funds to maintain and operate its water supply and sewerage systems, and for the payment of bonded indebtedness, the County may assess charges which shall consist of either a base charge for service and a variable charge based on water consumption, a minimum, or ready-to-service charge. These charges are due quarterly when presented and after 60 days from that date bear interest at a rate of 8% per annum. For the purpose of providing funds to finance the design, engineering, construction and extension of a water supply or sewerage system, the County is authorized to borrow money through the issuance and sale upon the full faith and credit of the County of its general obligation bonds.

d) Phase in of Rates

On December 13, 2005, the Board of County Commissioners voted to adopt a new, county-wide Base plus Variable Rate for all water and sewer systems, with a seven year phase-in planned. Systems will remain at their current rate until the new county-wide base plus variable rate, as calculated with a presumed usage of 10,000 gallons, exceeds that current rate. These rate adjustments will be implemented every calendar year, rather than a fiscal year basis. See schedule of fees, Table 15.

Table 15

Calvert County Schedule of Fees

Water & Sewer Fund

Rates shown do not include the Maryland Bay Restoration Fee.

Type	FY 2005	Jan-Dec 06 FY 2006/07	Jan-Dec 07 FY 2007/08	Jan-Dec 08 FY 2008/09
Unmetered Water & Sewer (Flat Rate)*				
Cavalier - Water	\$ 42.00	\$ 42.00	\$ 42.00	\$ 42.00
Hunting Hills - Water	\$ 42.00	\$ 42.00	\$ 42.00	\$ 42.00
Lakewood - Water	\$ 42.00	\$ 42.00	\$ 42.00	\$ 42.00
White Sands - Water	\$ 48.00	\$ 48.00	\$ 48.00	\$ 48.00
St. Leonard - Water	\$ 42.00	\$ 42.00	\$ 42.00	\$ 42.00
Twin Beach - Sewer	\$ 59.90	\$ 59.90	\$ 59.90	base/variable
Marley Run - Sewer	\$ 156.00	\$ 156.00	\$ 156.00	\$ 156.00
Dares Beach - Sewer	\$ 120.00	\$ 106.00	\$ 106.00	\$ 106.00
Chesapeake Lighthouse (part of Twin Beach)	\$ 59.90	\$ 59.90	base/variable	base/variable
Metered Water (no minimum)				
Paris Oaks	\$ 25.00	base/variable	base/variable	base/variable
Shores of Calvert	\$ 25.00	base/variable	base/variable	base/variable
Summit/Highlands	\$ 25.00	base/variable	base/variable	base/variable
Chesapeake Heights	\$ 25.00	base/variable	base/variable	base/variable
Metered Water (First 15,000 gals.)				
Chesapeake Lighthouse (part of Paris Oaks)	\$ 25.00	\$ 25.00	base/variable	base/variable
Dares Beach	\$ 18.75	\$ 18.75	\$ 18.75	\$ 18.75
Metered Water (First 10,000 gals.)				
Tara	\$ 45.00	\$ 45.00	\$ 45.00	\$ 45.00
Walnut Creek	\$ 45.00	\$ 45.00	\$ 45.00	\$ 45.00
Kenwood Beach	\$ 35.00	\$ 35.00	\$ 35.00	\$ 35.00
Cross Point	\$ 45.00	\$ 45.00	\$ 45.00	\$ 45.00
Marley Run	\$ 45.00	\$ 45.00	\$ 45.00	\$ 45.00
Water & Sewer (First 15,000 gals.)				
Prince Frederick				
Water	\$ 15.00	\$ 15.00	\$ 15.00	base/variable
Sewer	\$ 32.00	\$ 32.00	\$ 32.00	base/variable
Industrial Park				
Water	\$ 57.00	\$ 57.00	\$ 57.00	\$ 57.00
Sewer	\$ 69.00	\$ 69.00	\$ 69.00	\$ 69.00
Water & Sewer (no minimum)				
Solomons				
Water	\$ 12.00	base/variable	base/variable	base/variable
Sewer	\$ 18.00	base/variable	base/variable	base/variable
User Benefits				
St. Leonard - Water	\$ 13.83	\$ 13.83	\$ 13.83	\$ 13.83
Dares Beach - Sewer	\$ 106.00	\$ 120.00	\$ 120.00	\$ 120.00
Dares Beach - Water	\$ 46.74	\$ 46.74	\$ 46.74	\$ 46.74
Kenwood Beach - Water	\$ 49.25	\$ 49.25	\$ 49.25	\$ 49.25
Prince Frederick - Sewer	\$ 70.00	\$ 70.00	\$ 70.00	eliminated
Solomons - Residential	\$ 20.75	eliminated	eliminated	eliminated
Solomons - Commercial	\$ 30.75	eliminated	eliminated	eliminated
Base plus Variable Rates-Water (no minimum)**				
Base rate charged per EDU		\$ 20.91	\$ 24.35	\$ 27.82
Variable Rate charged per 1,000 gallons		\$ 1.34	\$ 1.45	\$ 1.55
Base plus Variable Rates-Unmetered Sewer (includes 10,000 gal charge)**				
Base rate charged per EDU				\$ 73.82
Base plus Variable Rates-Water & Sewer (no minimum)**				
Base rate charged per EDU		\$ 49.82	\$ 66.20	\$ 82.64
Variable Rate charged per 1,000 gallons		\$ 2.53	\$ 3.00	\$ 3.45
Systems transitioning 1/1/2006:	Systems transitioning 1/1/2007:	Systems transitioning 1/1/2008:		
Solomons	Chesapeake Lighthouse	Prince Frederick		
Paris Oaks		Twin Beach Sewer		
Chesapeake Heights				
Shores of Calvert				
Summit/Highlands				
Other Fees--Charges per 1,000 gallons				
	FY 2005	FY 2006	FY 2007	FY 2008
Bulk Water	\$ 3.00	\$ 3.00	\$ 3.00	\$ 3.75
Septage Treatment Plant	\$ 10.00	\$ 10.00	\$ 10.00	\$ 20.00
Holding Tank	\$ 5.00	\$ 5.00	\$ 5.00	\$ 10.00
Septage	\$ 23.00	\$ 23.00	\$ 23.00	\$ 45.00

*Flat-rated water systems with meters installed in a given fiscal year will go to a metered rate in the following fiscal year. See ** for more on rate adjustments in years following the change to metered rates.

**SCHEDULE FS
FINANCIAL MANAGEMENT STATISTICS
COUNTY WATER & SEWER PLANS
TABLE 16**

County Name: Calvert
 System Name: Calvert County Collection System
 Combined Data on Several Service Areas

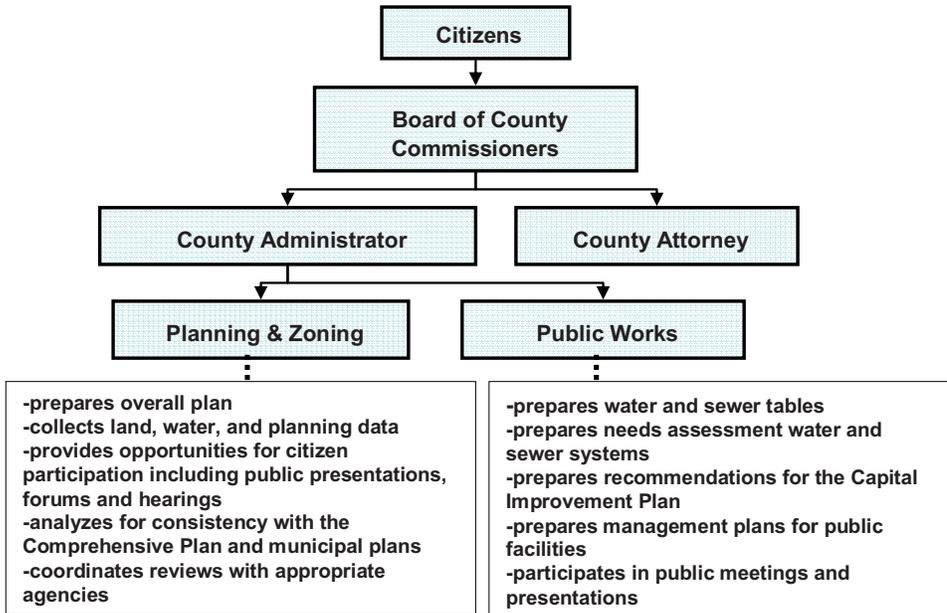
	<u>FY 2005</u>	<u>FY 2006</u>
Sewer Charge Revenue	\$ 1,965,903.00	\$ 1,989,343.00
Connection Charge Revenue	\$ 566,101.00	\$ 486,676.00
Front Foot Assessment Revenue	\$ -	\$ -
Other Revenue (Interest income & other reimbursements)	\$ 55,915.00	\$ 117,377.00
Total Revenue	<u>\$ 2,587,919.00</u>	<u>\$ 2,593,396.00</u>
Operation Expense	\$ 1,175,397.00	\$ 1,500,250.00
Maintenance Expense	\$ 141,078.00	\$ 283,259.00
Total Combined M&R	<u>\$ 1,316,475.00</u>	<u>\$ 1,783,509.00</u>
Administrative Allocation	\$ 189,198.00	\$ 203,813.00
Interest Expense	\$ 374,155.00	\$ 335,807.00
Depreciation Expense	\$ 923,204.00	\$ 1,001,907.00
Total Expense	<u>\$ 2,803,032.00</u>	<u>\$ 3,325,036.00</u>
Operating Income or (Loss)	\$ (215,113.00)	\$ (731,640.00)
Debt Principal	\$ 926,937.00	\$ 1,127,183.00
Total Flow Volume	\$ 1,498,643.77	\$ 1,516,717.74

APPENDIX A

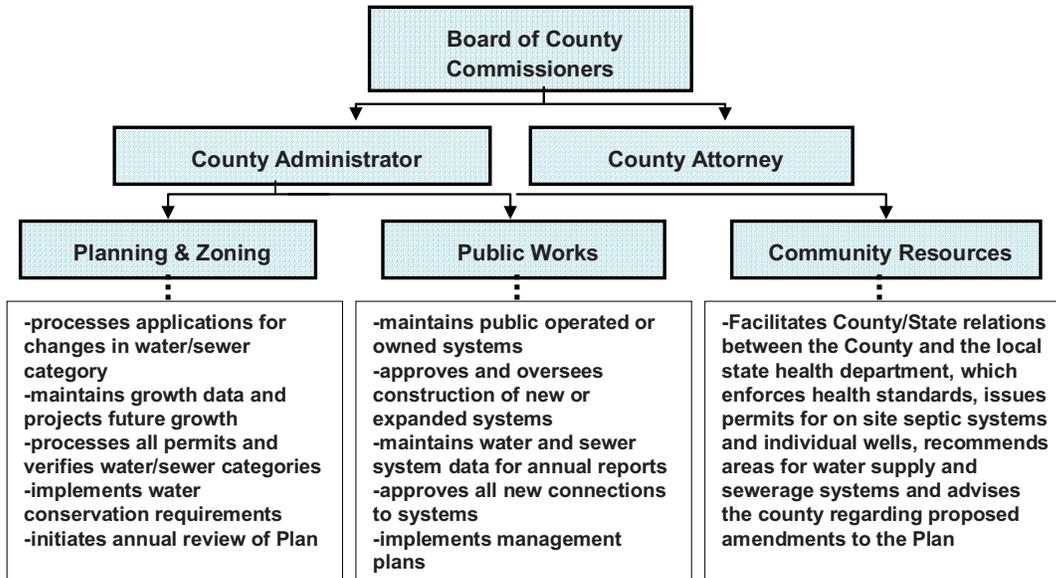
Water & Sewer Resolutions

Resolution Number	Amendment Number	Date Approved	Description
11-94	WSMA 93-11 – 93-13	06/07/94	Lusby Town Square
10-94	WSMA 93-10	06/07/94	Parcel 4, Tax Map 43, Lusby
38-94	WSMA 94-1	12/20/94	Parcel 522, Tax Map 7, Owings
39-95	WSMA 95-1 – 9-4	09/19/95	Southern Pines, Southern Elem. School
27-96	WSTA 96-1, WSMA 96-1	06/18/96	Marley Run
41-97	WSMA 97-1 – 97-3, 97-5	08/12/97	Hallowing Pt. Pk., Ranch Cntr., Royer Prop., Windy Hill School
17-98	WSTA 96-2	06/30/98	Chesapeake Beach Upgrade to 1.5 Million
29-98	WSMA 98-5 – 98-13	09/29/98	Comprehensive Plan Update
9-99	WSMA 99-1 – 99-3	04/06/99	Sealey Prop., Garner Prop., Mill Creek Middle School
39-99	WSTA 99-1	11/02/99	PFWTP II
43-99		11/09/99	Chesapeake Ranch Water Co.
29-01	WSMA 01-1, 01-2	07/10/01	Jesus Divine Word Church, Woodbridge
32-01	WSMA 00-1, 00-3	07/31/01	Board of Ed., Harrison' Corner
36-01	WSMA 98-1 – 98-4	08/28/01	Chesa. Plaza, McCready Ofc. Bldg., King Creek, Cross Pt. at Dowell
11-03	WSMA 02-1 & WSTA 02-1	04/01/03	Lusby & surrounding area
23-04	WSMA 04-1 & WSMA 04-2	8/4/04	Cove Pt. Park Aquatic Center & Ches. Hills Golf Club (portions containing clubhouse, pool and related amenities)

**Appendix B: Organizational Chart
Relating to Water and Sewerage
Plan Preparation and Approval**



**Relating to Water and Sewerage Plan Implementation
and Management of Water Supply and Sewerage Facilities**



Appendix C Chesapeake Water Association Capital Plan

Short term

- 2 each 18,000 gallon hydro-pneumatic vessels for storage, enhanced disinfection, and pressure stabilization. The additional usable storage should exceed 10,000 gallons. The project is scheduled for completion in early FY08.
- Upgrades and looping of existing distribution system to accommodate growth as needed.
- Conduct feasibility studies for fluoridation and the anticipated regulatory changes with respect to chlorine disinfection.

Long Term

- Increase pumping capacity of existing Aquia wells from 1.8 MGD to 2.5 MGD (by 2012)
- Construct well(s) in the Patapsco Aquifer to accommodate growth and provide reserve capacity in the possible event of arsenic migration or conversion of a neighboring subdivision by force of regulatory effect, or destruction of the Aquia as a reliable long term source. (2015)
- Construction of storage and distribution systems commensurate with realizable growth in the time frames dictated by growth rates and regulatory effect.