Wicomico County
Water and Sewerage Plan

Wicomico County
Department of Public Works

2010

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1.1 GENERAL

The purpose of the Wicomico County Water and Sewerage Plan is to develop water and sewerage systems in accordance with the demands as anticipated by County plans and policies and in accordance with State requirements. This plan is intended to guide the development and improvement of water supply and sewerage systems for Wicomico County by outlining the requirements of the County for the next ten years.

These requirements were determined as a result of several efforts. First, the communities and entities where central water and/or sewerage systems exist or are proposed were contacted and asked to provide any updated or revised information. The local communities which provided information related to their water and sewer facilities include the incorporated towns of Delmar, Fruitland, Hebron, Mardela Springs, Pittsville, Salisbury, Sharptown, and Willards. Additionally, existing plans, such as the County Comprehensive Plan, the Existing County Water and Sewer Plan, City of Salisbury Sewer and Water Service Plan were reviewed and utilized in preparation of this latest County Water and Sewer plan.

1.2 GOALS AND OBJECTIVES

1.2.1 Goal:

To formulate a plan for providing adequate water supply systems and sewerage systems, whether publicly or privately owned, to all residents of Wicomico County.

1.2.2 Objectives:

1. To protect the health, safety and welfare of people in Wicomico County by maintaining and providing adequate water supply and sewerage systems.

2. To develop the water supply and sewerage systems in a way consistent with local Comprehensive Planning.

3. To develop the Plan in a way to facilitate its use as a tool to implement the county development policy so that:

   a. An ample supply of water may be collected, treated, and delivered to points of use;

   b. Wastewater may be collected and delivered to points best suited for waste treatment and disposal or for reuse;

   c. Wastewater will receive adequate treatment before any discharge to State waters in compliance with applicable water quality standards and discharge permit conditions (National Pollutant Discharge Elimination System), or be disposed of to minimize adverse effects on designated water uses.

4. These plans shall incorporate all or part of the subsidiary water supply and sewerage system plans of the municipalities, municipal corporations, privately owned facilities, and State and Federal Agencies having existing, planned, or programmed utility development within Wicomico County to the extent they are consistent with the County's comprehensive plan.

1.3 ORGANIZATION

Wicomico County does not have a Central Regulatory Authority over the operation of water and sewer facilities in the County. The water and sewerage facilities operated by various incorporated entities in the County are regulated by the Maryland Department of the Environment (MDE). Each municipality is responsible for the day-to-day operation and management of the water and sewer

facilities within its jurisdiction. Figure I illustrates the organization of the County as it relates to the management of the water and sewerage facilities in the County.

WICOMICO COUNTY MANAGEMENT
OF
WATER SUPPLY AND SEWERAGE FACILITIES

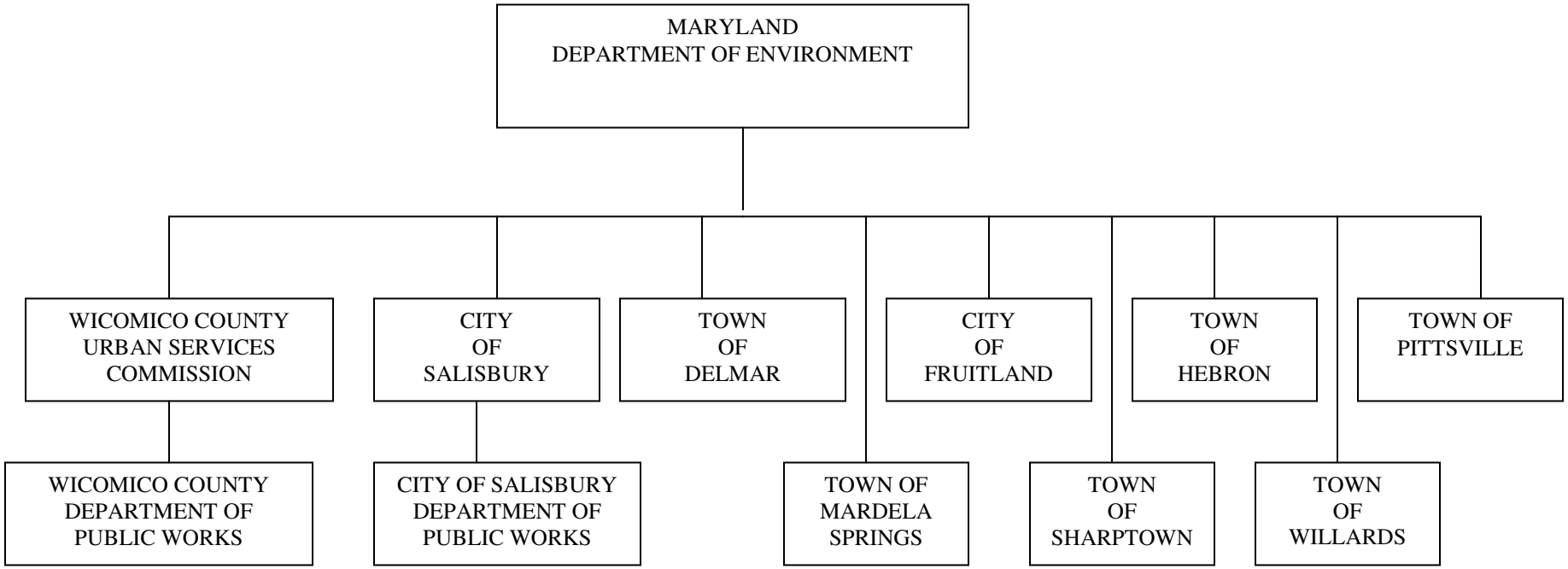

FIGURE 1

Salisbury: The City of Salisbury has two water treatment plants and an extensive water distribution network. The water treatment plants have a combined current production capacity of 12.00 million gallons per day (MGD). The city also operates a wastewater treatment plant with a capacity of 8.50 MGD. The facilities are managed by the City of Salisbury Department of Public Works.

Fruitland: The City of Fruitland has a 1.50 MGD water treatment plant with a distribution network. The city also owns a wastewater collection system and a 1.00 MGD wastewater treatment plant.

Delmar: The Town of Delmar operates a 0.60 MGD water treatment plant, a water storage facility and distribution system. It also has a wastewater collection system that discharges flow to a 0.85 MGD wastewater treatment plant.

Hebron: The Town of Hebron operates a 0.70 MGD water treatment plant and distribution system, as well as a 0.10 MGD aerated lagoon wastewater treatment plant.

Sharptown: The Town of Sharptown operates a 0.58 MGD water treatment and distribution system as well as a 0.15 MGD wastewater treatment plant and wastewater collection system.

Willards: The Town of Willards owns and operates a 0.24 MGD water treatment plant with storage and distribution system as well as a wastewater collection system with a 0.20 MGD wastewater treatment plant.

Pittsville: The Town of Pittsville has a 0.14 MGD water treatment plant and distribution system. It also owns a sewer collection network and a 0.12 MGD sewerage treatment plant.

Mardela Springs: The Town of Mardela Springs currently has no water and sewer facilities, and none are planned for the ten year planning period, however they have recently completed a feasibility study to identify and examine various options for providing such services.

1.3.1 Definitions:

A. "APPROVING AUTHORITY" means one or more officials, agents, or agencies of local government designated by the local governing body or specified by other provisions of Title 9, Subtitle 5, Environment Article, and Annotated Code of Maryland to take certain actions as a part of implementing this section.

B. "A SEWERAGE SERVICE AREA" is that area served by, or potentially served by, a single distribution system under the control of a single utility, or, in a very large system, sub-areas as delineated by the County.

C. "A WATER SERVICE AREA" means that area served by or potentially served by, a single distribution system under control of a single utility, or, in a very large system, sub-areas as delineated by the County.

D. "COMMUNITY SEWERAGE SYSTEM" means any system, whether publicly or privately owned, serving two or more individual lots, for the collection and disposal of sewerage or industrial wastes of a liquid nature, including various devices for the treatment of such sewage and industrial wastes.

E. "COMMUNITY WATER SUPPLY SYSTEM" means a source of water and a distribution system, including treatment and storage facilities, whether publicly or privately owned, serving two or more individual lots.

F. "CONTROLLING AUTHORITY" means a governmental body empowered by the county or municipality to provide for management, operation, and continuous preventive and corrective maintenance of a shared facility.

G. "DEPARTMENT" means the Maryland Department of the Environment.

H. "EXISTING SERVICE AREA" means that area which is currently served.

I. “FACILITIES” means the entire water system including well, treatment plant and distribution system or the entire sewer system including collection system, treatment plant and storage lagoon with the exception of the discharge system.

J. "FINAL PLANNING STAGES" means a work or works of community water supply and community sewerage system for which contract plans and specifications have been completed.

K. "FIVE YEAR PERIOD" means that period, depending upon the County's Capital Improvement Program, five years following the date of adoption of the plan, its amendment or revision by the County.

L. "IMMEDIATE PRIORITY" means a work or works of community water supply and community sewerage system for which the beginning of construction is scheduled to start within two years following the date of adoption of the plan, its amendment and revision thereof.

M. "INDIVIDUAL SEWERAGE SYSTEM" means a single system of sewers and piping treatment tanks or other facilities serving only a single lot and disposing of sewage or individual wastes of a liquid nature, in whole or in part, on or in the soil of the property, into any waters of this State, or by other methods.

N. "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.

O. “INTERIM SYSTEMS” means temporary in an existing or planned service area.

P. "MULTI-USE SEWERAGE SYSTEM" means a single system serving a single lot whether owned or operated by an individual or group of individuals under private or collective ownership and serving a group of individuals for the collection and disposal of sewage or industrial wastes of a liquid nature, including various devices for the treatment of such sewage and industrial wastes having a treatment capacity in excess of 5,000 GPD.

Q. "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 GPD.

R. "NON-POINT SOURCE" means pollution originating from land run-off where no specific outfall can be identified.

S. "PLAN" means a plan for the provision of adequate water supply systems and sewerage systems, whether publicly or privately owned, throughout the County and all amendments and revisions thereto.

T. “PRIVATE SYSTEM” means a reference only to ownership.

U. "SHARED FACILITY/ SYSTEM" 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 water or sewerage systems located on the individual lots or on parcels owned in common by users or the controlling authority.

V. "TEN-YEAR PERIOD" means that period of the six through ten years following the date of adoption of the plan, its amendment or revision by the County.

W. "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 such work has been set as of the adoption date of this plan, its amendment, or revision.

1.3.2 Plan Format:

The Wicomico County Water and Sewerage Plan is prepared in accordance with the Maryland Department of Environment Regulation 26.03.01. Chapter One consists of the County's goals and objectives, service category definitions, management framework, review process, and the philosophy behind the development of the Plan.

Chapter Two consists of basic background data including hydrological, geological, topographical, and soils information, as well as population projections. This text discussion is supplemented by tables which portray the basic data.

Chapters Three and Four discuss the water supply and sewerage systems planning, respectively. The text discussion is supplemented by a series of maps, tables, and figures which depict the essential information regarding these services.

1.4 WATER AND SEWER PROBLEMS

The 1990 Amendment to the Wicomico County Comprehensive Water and Sewerage Plan highlighted that of the seven existing municipal wastewater treatment facilities four discharge directly to tidal estuaries. These include the municipalities of Salisbury, Fruitland, Sharptown and Hebron. The private wastewater treatment facilities discharging to tidal waters include, Mardela Middle and High School, Northwestern Elementary School, Nanticoke Seafood and Poplar Hill Pre-Release Unit. The municipalities of Delmar, Pittsville and Willards discharge into non-tidal waterways. The only private

wastewater treatment facility discharging to non-tidal waters is Perdue Farms. The remainder of the County comprising about 60% of the population utilizes individual onsite systems with subsurface disposal.

Approximately 5% of Wicomico County is covered by water. However, most of the surface water covering the County is brackish water that would require treatment for human consumption. Currently, the primary source of drinking water in the County is ground water, which is abundantly available throughout the County.

Wicomico County's topography is generally a low lying terrain subject to tidal and non-tidal flooding. As a result, the discharge of treated wastewater to water bodies presents a problem since the waste is dispersed slowly as it is transported up and down along streams by tidal action. Occurrence of tides as such creates a pollution zone both above and below the waste discharge point, thereby eliminating or limiting the use of the receiving stream.

1.5 WATER AND SEWER PLANNING

1.5.1 Plan Development:

Water supply and sewerage systems are generally required for communities as population increases, as individual systems reach the failing phase, or as commercial/industrial loadings necessitate adequate water supply or improved wastewater treatment. In Wicomico County water supply and sewerage systems have been constructed to serve the major populated areas.

This plan considers the densely populated area in central Wicomico County as a single region, known as the Metro-Core, which is presently served by three separate systems owned and operated by the communities of Salisbury, Delmar and Fruitland. The outlying towns of Pittsville, Sharptown, Hebron and Willards are presently served by their own systems and are considered separately in the

Plan. In addition, several rural villages, (Nanticoke, Bivalve, Tyaskin, Quantico, Whitehaven, Parsonsburg, Powellville, and Allen) are considered in this report since their growth during this ten year planning period may or may not eventually warrant detailed planning for water supply and/or sewerage systems.

Most existing water supply systems in Wicomico County have few problems, and have potential for expansion. As the needs of a service area grow, an existing system can be expanded within the constraints of economic and technical feasibility.

Public sewerage is presently provided for the communities of Salisbury, Fruitland, Delmar, Pittsville, Hebron, Sharptown and Willards. All systems within the county are routinely evaluated by State and Local Governmental Agencies as part of the continuing effort to provide adequate service consistent with increasingly stringent environmental protection policies.

In general, water supply and sewerage facilities will be developed, owned and managed by the various jurisdictions within the Metropolitan Core Area according to geographic and municipal constraints. It is recommended, however, that the comprehensive development plans of adjacent jurisdictions be continuously coordinated to assure that they are compatible with each other.

1.5.2 Management:

Water supply and sewerage systems are regulated by Maryland's Department of the Environment and Department of Natural Resources. Each corporate jurisdiction, including Wicomico County, is under State regulatory jurisdiction.

The Wicomico County Council, functioning as the Urban Services Commission, with technical assistance and guidance from the County Department of Public Works, has certain responsibility for water and wastewater systems which are not controlled by either incorporated towns or private

corporations and which serve County residents outside existing corporate limits. This is presently limited to isolated water distribution and sewerage collection systems. The Commission does not operate water treatment or sewage treatment facilities. These are the responsibility of the incorporated towns or private corporations having such systems.

The City of Salisbury provides water and sewerage service to residents of the City. The City's Public Works Department is responsible for planning, designing, construction, operating, and maintaining these systems. All systems which serve the smaller incorporated towns are owned and operated by the respective towns with the assistance of consultants.

The installation of individual water supply and/or individual sewerage systems is subject to the Maryland Department of the Environment requirements (COMAR 26.03.01 Regulations) and the local Health Department requirements.

a. An individual water supply or individual sewerage system may not be permitted to be installed where an adequate community water or sewerage facility is available. If an existing community water or sewerage facility is inadequate or is not available, an interim individual water and sewerage system may be used as set forth in b(1), b(2), and b(3) below.

b. Interim individual water supply and sewerage systems may be permitted to be installed in any portion of the County, except where otherwise prohibited, where community systems will be programmed for construction within the S-1, S-2, S-3, S-4 and W-1, W-2, W-3, W-4 service categories provided that:

    (1) Such interim systems are adjudged by the local health department to be adequate, safe and in compliance with pertinent State and Local Regulations, including minimum lot ownership as set forth in Regulation No. 26.04.02 and 26.04.03 ss .02 and .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 five years 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.

c. Individual water supply or sewerage systems, not of an interim nature, shall be permitted to be installed in any portion of the County designated as S-5, S-6 and W-5, W-6 where community systems are not planned. Such installations shall be governed by the Regulations 26.04.02 and 26.04.03 as minimum requirements.

There has been some consideration of creating a county-wide authority such as a Sanitary Commission. This Commission's purpose would be to plan for and manage the water and sewer needs of the entire county in a more comprehensive manner. Efforts should be made to discuss this idea among the County, municipalities and owners of the private facilities.

1.5.3 Service Category Definitions:

Six water supply and sewerage service categories are defined in this Plan in accordance with COMAR 26.03.01. The service categories refer to the planning status of a given area. The service categories are defined as follows:

- **W-1 and S-1:** Areas served by community and multi-use water supply (W-1) and sewerage (S-1) systems which are either existing or under construction. (Existing and under construction).
- **W-2 and S-2**: Areas to be served by extensions of existing communities and multi-use water supply (W-2) and sewerage (S-2) systems which are in the final planning stages. (Final Planning)

- **W-3 and S-3:** Areas where improvements to, or construction of, new community and multi-use water supply (W-3) and sewerage (S-3) systems will be given immediate priority (Immediate Priority).
- **W-4 and S-4:** Areas where improvements to, or construction of, new community and multi-use water supply (W-4) and sewerage (S-4) systems will be programmed for the three to five year period (Five Year Period).
- **W-5 and S-5:** Areas where improvements to, or construction of, new community and multi-use water supply (W-5) and sewerage (S-5) systems are programmed for inclusion within the six through ten year period (Ten Year Period).
- **W-6 and S-6:** Areas which are not programmed for water supply and sewerage systems within the ten year period. (No Planned Service).

1.6 WATER AND SEWER PLAN AMENDMENT PROCEDURES

1.6.1 Triennial Review:

COMAR 26.03.01 requires that this Plan shall be reviewed by Wicomico County at least triennially. The County may review and update the Plan as often as required. Draft plans, revisions, and amendments shall be submitted to the Maryland Department of the Environment for distribution to each official planning agency that has jurisdiction in the County, which includes MDP, DNR, and MDA for consultation (typically 30 day review and comment) following official adoption by Wicomico County. The County is required to hold public hearings on all revisions and amendments to the Plan prior to submittal to the regulatory agencies. The Maryland Department of the Environment must receive prior written notice of all public hearings on plans, amendments, and revisions.

1.6.2 Amendments:

Since the Water and Sewerage Plan is a dynamic planning document, it must constantly be revised and upgraded to reflect current developments within Wicomico County. In order for changes to be made to the Plan, the following procedure must be followed:

I. Owner/Applicant's Responsibility

A. Confirm with service provider that allocation is available and applicant is eligible for allocation.

B. Complete a Wicomico County Application for Water and/or Sewer Requests for Amendment (See 1.6.3).

C. Submit completed application to service provider

II. Service Provider's Responsibilities (Approximately 30 Days)

A. Review adequacy of owner/applicant's submittal and completed application.

B. Verify that the requested water and/or sewer allocation will be provided for this project contingent upon plan amendment approval by local municipality approving authority.

C. Coordinate with County DPW and owner/applicant.

D. Sign Application for Amendment Request.

E. Return Application to Applicant for Submittal to County DPW.

III. County Department of Public Works Responsibilities (Approximately 90 Days)

A. Review adequacy of applicant's submittal.

B. Coordinate with Service Provider and MDE.

C. Schedule and advertise public hearing before County Council.

D. Present amendment request to County for approval.

E. Submit to MDE the project description, concurrence on plan amendment, and verification from the service provider that the water and/or sewer allocation will be provided contingent upon approval by MDE.

F. Submit verification that project is consistent with County and Municipal Comprehensive Plans to MDE.

G. Submit signed Notice of Public Hearing with Certification of Publication to MDE.

H. Submit copy of the minutes for County Council's public hearing on the amendment with signed Certification of Authenticity to MDE.

I. Obtain verification that project is consistent with County Comprehensive Plan from Planning & Zoning and submit to MDE.

IV. Maryland Department of the Environment's Responsibilities (Approximately 90 Days)

A. Review adequacy of County DPW's submittal.

B. Distribute submittal to other state reviewing agencies, i.e. MDP, DNR, and MDA.

C. Evaluate project per state regulations.

D. Coordinate with County DPW and other state reviewing agencies.

E. Forward written state approval, extension or denial to County DPW, Service Provider, and owner/applicant.

1.6.3 Application for Water and/or Sewer Requests for Amendment:

Wicomico County
Department of Public Works

Application for Water and/or Sewer Requests for Amendment to the Wicomico County Water and Sewer Plan

General Information:

Project Name:_____ Applicant Name:_____

Project Location:_____Tax Map/ Parcel(s):_____

☐ Residential ☐ Commercial ☐ Industrial ☐ Institutional

Project Description:_____

_____

Priority Funding Area:_____ Comprehensive Plan Service Category: W-____ S-____

Project Zoning:_____ Property Acreage:_____

Applicant Address:_____

Applicant Phone/Fax/Email:_____

Design Engineering Firm:_____ Contact Person:_____

Design Engineering Firm Address:_____

Design Engineer Firm Phone/Fax/Email:_____

Design Information:

Name of Municipality (Service Provider) or Private System where service is being provided:_____

Identify existing water main service size & location:_____

Identify existing sewer main service size & location:_____

Proposed Equivalent Dwelling Units (EDU's): _____Population Equivalent:_____

Identify proposed water service size(s), length & location(s) of each, connection to existing, & projected water consumption (gpd):_____

_____

Identify proposed sewer service size(s), length & location(s) of each, connection to existing, & projected sewer flow (gpd):_____

Design Information Continued:

_____

Identify proposed pump station(s) typical flow (gpd) per EDU, typical peak factor, average daily flow (gpd), peak daily flow (gpd), peak flow rate (gpm), length & size of forcemain(s), pump discharge head, head loss factor per foot in forcemain, velocity of flow in forcemain, pump type, approximate pump run time, pump efficiency, and wet well size and volume: _____

_____

_____

_____

_____

The applicant hereby certifies that the above described information is true/accurate to his/her best knowledge. The applicant also agrees to pay the Wicomico County Water and Sewer Plan Amendment Processing Fee and reimburse Wicomico County for expenses incurred for advertising costs associated with a public hearing.

Applicant's Signature:_____ Date:_____

Service Provider:

The above described project information is true/accurate and consistent with the municipal comprehensive plan and _____ is willing to provide the requested water and/or sewer allocation contingent upon local municipality authority approval and Maryland Department of the Environment approval.

Service Provider Comments:_____

_____

Authorized Government Official's Name:_____ Title:_____

Authorized Government Official Signature:_____ Date:_____

Service provider shall have 30 days to review application for consistency with water and sewer master plan

Applicant shall submit application package including two sets of plans on 11"x17" showing overall project, existing and proposed water and sewer lines and locations, specifications, and application form signed by above listed parties to:

Wicomico County Department of Public Works
Water and Sewer Amendment Request
Government Office Building
P.O. Box 968, Room 201
125 N. Division Street
Salisbury, MD 21803-0968

*Send check payable to "Wicomico County" for processing fee at time of submittal. Advertising reimbursement to follow at later date

1.7 POLICY ON DENIED ACCESS LINES

The Communities within Wicomico County require annexation as a condition for connection to public water and sewer services. This service is contingent upon inclusion into the County's Water and Sewer Plan. The property is allowed access or the right for connection to public water and sewer systems once annexed or it enters into agreement for such an annexation. However, exceptions are made when there is a public health concern, and connection is allowed.

Connections to this line (or portion of the line) are prohibited except per the following:

a. Connection of failing individual systems certified by the environmental health officer, only after all alternatitive solutions have been ruled out, and

b. Adequate capacity exists in the system to support the additional flows, and

c. Any sewer or water extensions(s) made to abate the health emergency outside of the designated growth area is not to be construed as a modification of the comprehensive Plan, zoning or character of the area being served, or as an argument for a zoning revision based on the change and mistake rule, and

d. Only the existing structure(s) certified by the health officers as failing will be permitted to connect and no further development on those lots may increase the waster demand or wastewater flow until the affected area is properly amended into the Comprehensive Plan in a manner that would support the further development of the area.

In circumstances where State and/or Federal funding has been used for any part of the water or sewer collection, distribution, or treatment systems, whereby new capacity potentials have been added for additional services, that, for any connection outside of the state certified Priority

Funding Area (PFA) to a "denied access" line, will require amendment to the Wicomico County Water and Sewer Plan in accordance with COMAR.

1.8 POLICY ON PRIVATE FACILITIES

Under the direction of the County Council of Wicomico County the feasibility of allowing the Shared Water and Sewer Facilities commonly known as Private Water and Sewer systems has been completed recently. The purpose was to ascertain, if, these kind of facilities can serve certain areas within the county where the public water and sewer system can not provide the services technically and economically and also evaluate, if, these facilities can be an asset to address the failing septic system areas.

We learned that some state of the art technologies are available which are not only economical but also environment friendly to achieve the aforementioned objectives.

Based on this research the county may consider allowing these kinds of shared facilities on an as needed basis in some areas provided the proposed facilities meet the criteria as set forth herein:

- Community and/or shared water and sewer facilities shall be designed for economical and efficient expansion.
- Community and/or shared water and sewer facilities shall be designed with redundancy built-in to allow for convenient repairs and replacement.
- These facilities should have proven reliability in the vicinity.
- Ownership and/or operation of these facilities shall be by an entity such as an individual, partnership, or a utility company or qualified operator. A developer or, private non-profit institution shall not be allowed ownership and/or operation due to their lack of experience, proper staffing and financial stability.

- A community and/or shared facilities agreement including but not limited to a financial management plan and escrow account shall be required of the developer/owner to guarantee proper operation, maintenance and replacement costs of the facilities.
- The facilities must be approved by necessary state and local agencies including but not limited to MDE, PSC, and the county, if applicable.
- The discharge from private sewer systems shall not be located within unsuitable soils, wetlands, floodplains or critical areas.
- Water usage shall be metered for billing purposes using remote reading technology.
- Sewer usage shall be billed based upon water usage metering even if served by individual wells.
- A fire hydrant system shall be provided when private water systems are used.
- Fluoride treatment may be required on private water systems.
- Nutrient reduction technology is required on private sewer systems.
- Ultra-violet light disinfection must be provided on private sewer systems.
- Use of these facilities shall be precluded from location within the A-1 Agricultural-Rural Zoning District, or from serving new or expanded developments within the A-1 District. Specifically exempt from this restriction are facilities intending to serve institutional uses, agricultural businesses, and/or developments existing as of the effective date of this plan.
- Use of these facilities to serve residential developments within designated growth areas shall be limited as to the number of new residential dwelling units to be

served. The number of units to be served shall be determined by the "base density," defined as one (1) dwelling unit per acre, exclusive of roads, rights-of-way, and other easements. To increase the number of units, a developer may use Transferable Development Rights as provided for in Section 225-58 of the Wicomico County Code.

The proposed facilities must also follow the approval process set forth herein:

a. Sketch Plat review by Planning & Zoning Commission
b. Comprehensive Land Use Plan and Zoning Authorization letter from Director of Planning, Zoning and Community Development
c. Conceptual approval from Maryland Department of the Environment for feasibility of a community and/or shared system
d. Water & Sewer Plan Amendment by the County (and update of Chapters 3 & 4 of this document).
e. Preliminary Plat approval by Planning & Zoning Commission
f. Construction Plan approval and permitting by Maryland Department of the Environment
g. Construction Plan approval by Public Works Department
h. Certified Plant Operator, System Design, and Rate Schedule approval by Public Service Commission
i. Community Facilities Service Agreement, Financial Management Plan and Urban Service District approval by the County and the Urban Services Commission

j. Final Plat approval by Planning & Zoning Commission

k. Construction Inspection by Public Works Department

l. Periodic monitoring of the facilities by state and local agencies

CHAPTER 2 – BACKGROUND INFORMATION

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2.1 GENERAL

Wicomico County, Maryland is 380 square miles of land consisting of tidewater, agricultural, and urban communities interspersed within a minimally developed region of marshland, woodland and farmland. The generally rectangular shaped county is centrally located on the Delmarva Peninsula. Its northern boundary is contiguous with the State of Delaware. The Nanticoke River and Pocomoke River, tributaries of the Chesapeake Bay, form the County's western and eastern boundaries respectively, placing it between Maryland's Dorchester County and Worcester County. The County's third major waterway, the Wicomico River, forms the western length of its southern boundary adjacent to Maryland's Somerset County. A survey line draws a tangent to form the eastern length of the southern boundary of Worcester County.

U.S. Routes 50 and 13 are major arteries serving the Delmarva Peninsula and traverse Wicomico County east/west and north/south intersecting at the City of Salisbury. These two routes link the County with the commercial and industrial centers of Philadelphia, Wilmington, Norfolk, Richmond, Baltimore, and Washington, D. C., all of which are within a 120 mile radius from the City of Salisbury.

Salisbury is the primary growth center of Wicomico County. The Salisbury-Wicomico County Planning and Zoning Commission have defined the area in and around Salisbury, Fruitland, and Delmar as the Metro Core, in order to plan for the orderly development of this urban area.

2.2 PHYSICAL CHARACTERISTICS

Wicomico County's basic physiography, including topographic, geologic, hydrologic and soils characteristics, has not significantly changed since their initial delineation. Throughout the County the differences in elevation are slight, offering a

generally level appearance, the underlying sediments are the sources of domestic and industrial water supplies. Soil conditions range between suitable to unsuitable for all rural and urban land uses. Reference the latest edition of the Wicomico County Soil Survey per USDA Natural Resources Conservation Service for details.

2.2.1 Topography and Drainage

Nearly level to gently-rolling topography is characteristic of Wicomico County. The continuing fluctuations of sea level since the Pleistocene Age followed by erosion of the marine terraces, and the deposition of wind blown sediments have sculptured the land surface creating a unique arrangement of terraces, stream channels, crowned valleys, basin-like depressions, remnant dunes, swamps, and marshes.

Wicomico County soils have developed from parent material which consisted of sediments transported by water, wind, and glacial meltwater. The parent material sediments ranged in size from clay particles to pebbles. Occasionally, large stones and cobblestones are discovered, and it is theorized that ice fragments drifting downstream from the ice age glaciers carried a mixture of clay, gravel, and stones which were deposited as the ice melted. The General Soil Map can be found in the recently revised Soil Survey of Wicomico County, Maryland that provides a broad picture of the distribution of Wicomico County's nine soil associations.

2.2.2 Groundwater Protection

The geologic structure underlying Wicomico County is characteristic of the Atlantic Coastal Plain sedimentary deposits which developed through geologic time. The sediments overlie the crystalline bedrock and range from 4000 to 6000 feet thick.

The Maryland Geological Survey, in cooperation with the U. S. Geological Survey, has compiled extensive data on the lithology and hydrogeology of Wicomico County which can be found in The Water Resources of Somerset, Wicomico and Worcester Counties. A study by the U. S. Geological Survey titled "Professional Paper 822, Water Resources of the Delmarva Peninsula" has extensive maps of groundwater quality and aquifer availability. Further details on the groundwater of the County is provided in the Groundwater Protection Report as prepared by the Wicomico County Health Department and to be approved separately by the County.

The Paleochannel is considered a significant sub-formation located within the Pleistocene Deposits. It is a prolific source of groundwater which can be easily developed to serve the future demands of Wicomico County. Wicomico County, the City of Salisbury, and the Town of Delmar have adopted ordinances to protect this asset.

Several of the municipalities have also adopted ordinances to safeguard the wellhead protection areas. The remaining municipalities, as well as the County, are encouraged to do the same.

2.3 POPULATION TRENDS

Population projections for Wicomico County and its jurisdictions are provided in order that the character of growth for this region can be assessed relative to the County's present and future water supply and sewerage systems requirements. Population estimates and projections for the County from 1980 through 2030 are shown in Table 2.1, and estimates and projections for municipalities and rural villages from 2000 through 2020 are shown in Table 2.2. The Maryland Department of Planning provided the County projections in Table 2.1, and the Salisbury-Wicomico Department of Planning, Zoning and Community Development developed the population projections for the Metro

Core, the rural villages and the City of Salisbury in Table 2.2. The projections for the other municipalities in the County were obtained either from the jurisdictions' adopted comprehensive plans, or from the Maryland Department of Planning.

The populations of the City of Salisbury, the City of Fruitland and the Town of Delmar are expected to steadily increase and will account for the majority of the County's population growth through the year 2020.

In 2000, the population of the Metro Core (including Salisbury, Fruitland and Delmar, and adjacent unincorporated areas of Wicomico County) represented approximately 66% of the County population. This percentage is expected to increase to 70% by the year 2020.

Table 2.1: County population projections.

	Historical			**Projected**			
Census Year	1980	1990	2000	2005	2010	2020	2030
County Total	64,540	74,339	84,644	90,000	96,100	107,450	117,550

Source: Maryland Department of Planning, Planning Data Services, December 2008

Table 2.2: Population Projections by Service Area

Service Area\Year	2000	2010	2020
Municipalities			
Salisbury	23,743	28,925	34,490
Fruitland	3,774	4,950	6,100
Delmar*	3,282	5,325	6,235
Hebron	807	975	1,225
Sharptown	649	725	800
Willards	940	1,110	1,260
Pittsville	1,182	1,330	1,490
Mardela Springs	364	360	360
Villages			
Nanticoke/Bivalve/Tyaskin	1,425	1,420	1,420
Quantico	115	121	127
Allen	148	155	165
Powellville	158	158	158
Parsonsburg	268	278	288
Whitehaven	78	78	78
Salisbury Metro Core**	56,007	65,644	74,800

* Includes MD and DE residents.

** Includes the incorporated areas of Salisbury, Fruitland and Delmar (Md.), and adjacent County lands as defined by the 1998 Wicomico County Comprehensive Plan.

Sources:
(1) 2000 population figures for the municipalities are from the 2000 U.S. Census.
(2) 2000 population figures and 2010 and 2020 projections for the villages and Salisbury Metro Core are from estimates developed by the Salisbury-Wicomico Department of Planning, Zoning and Community Development, May 2009.
(3) 2010 and 2020 projections for the City of Salisbury and Mardela Springs developed by the Salisbury-Wicomico Department of Planning, Zoning and Community Development, May 2009.
(4) 2010 and 2020 projections for Fruitland (2009), Delmar (2009, Draft), Sharptown (2008) and Willards (2008) are from their Comprehensive Plans.
(5) 2010 and 2020 projections for the Towns of Hebron and Pittsville are from the Maryland Department of Planning, Municipal Projections, 2008.

2.3.1 Population Characteristics

According to the 2000 Census, Wicomico County has a population of 84,644 people. The eight incorporated municipalities - Salisbury, Fruitland, Delmar, Hebron, Sharptown, Willards, Pittsville and Mardela Springs - accounted for about 40% of the County's population. The general demographic characteristics of the County population are compared with the State of Maryland and are presented in Table 2.3. In general, the figures for Wicomico County and the State of Maryland are comparable, with the exception of income and post-high school educational attainment levels. The County's per capita and median household income levels are only about 70% that of the State. The percentage of persons at least 25 years old who have at least a Bachelor's degree in Wicomico County is about 22%, which is 10% less than the State percentage.

Table 2.3: Population Characteristics
Wicomico County and the State of Maryland

	WICOMICO COUNTY		MARYLAND	
	NUMBER	**%**	**NUMBER**	**%**
POPULATION	84,644	---	5,296,486	
Male	40,335	47.7	2,557,794	48.3
Female	44,309	52.3	2,738,692	51.7
RACE				
White	62,145	73.4	3,493,504	66.0
Nonwhite	22,499	26.6	1,802,982	34.0
AGE				
0-4	5,317	6.3	353,393	6.7
5-19	18,839	22.3	1,139,572	21.5
20-44	30,550	36.1	1,978,806	37.4
45-64	19,115	22.6	1,225,408	23.1
65+	10,823	12.8	599,307	11.3
MEDIAN AGE	35.8	---	36.0	---
HOUSEHOLDS (HH)				
Total HH Population	81,500	---	5,162,430	---
Total # of HH	32,218	---	1,980,859	---
Ave. HH Size	2.53	---	2.61	---
LABOR FORCE				
Tot. Pop. 16+	66,207	---	4,085,942	---
In Labor Force	44,815	67.7	2,769,525	67.8
Male Pop. 16+	30,749	---	1,935,130	---
In Labor Force	22,633	73.6	1,418,491	73.3
Female Pop. 16+	35,458	---	2,150,812	---
In Labor Force	22,182	62.6	1,351,034	62.8
INCOME				
Per Capita	$24,128	---	$34,261	---
Median HH Income	$47,300	---	$68,300	---
EDUCATION				
Pop. 25 Years & Over	53,521	---	3,495,595	---
Less than 9th Grade	3,190	6.0	178,169	5.1
9th - 12th Grade, no Diploma	7,149	13.4	386,917	11.1
HS Graduate (inc. GED)	18,396	34.4	933,836	26.7
Some College, No Degree	10,376	19.4	711,127	20.3
Associate Degree	2,692	5.0	186,186	5.3
Bachelor's Degree	7,326	13.7	629,304	18.0
Graduate/Prof. Degree	4,392	8.2	470,056	13.4
HS Graduate or Higher	43,182	80.7	2,930,509	83.8
Bachelor's or Higher	11,718	21.9	1,099,360	31.4

Source: U.S. Census Bureau, Census 2000

2.3.2 Water and Sewer Planning Demographics

Wicomico County has seven incorporated areas with public water and sewerage service facilities. These include Delmar, Fruitland, Hebron, Pittsville, Salisbury, Sharptown and Willards. Comprehensive water and sewer plan maps for these incorporated areas are provided as an appendix to this document. The water and sewer maps highlight the status of various water and sewer services for each area. The maps also denote water and sewer services activities being planned in these areas.

2.3.3 Projected Water and Sewer Capacity Needs

In Wicomico County, increases in population are projected for all of the municipalities with public water and sewer service, with the greatest increases anticipated for Salisbury, Fruitland and Delmar. This will result in significant demand for water supply and sewer disposal capacities. Summarized below are anticipated water and sewer demands being planned for the County with respect to projected population increase by the year 2020.

Table No. 2.4: Anticipated Water Demand

Service Area	Water Supply Demand and Planned Capacity					
	Year	**2000**	**2005**	**2010**	**2015**	**2020**
Salisbury	Pop. Served	23,743	26,330	28,925	31,710	34,490
	Anticipated Demand (MGD)	5.51	6.19	6.90	7.28	7.66
Fruitland	Pop. Served	3,774	4,360	4,950	5,530	6,100
	Anticipated Demand (MGD)	0.51	0.59	0.67	0.75	0.82
Delmar	Pop. Served	3,282	4,300	5,325	5,840	6,235
	Anticipated Demand (MGD)	0.44	0.58	0.72	0.79	0.84
Hebron	Pop. Served	807	890	975	1,100	1,225
	Anticipated Demand (MGD)	0.09	0.10	0.11	0.12	0.13
Sharptown	Pop. Served	649	690	725	760	800
	Anticipated Demand (MGD)	0.07	0.08	0.08	0.08	0.09
Willards	Pop. Served	940	995	1,110	1,155	1,260
	Anticipated Demand (MGD)	0.09	0.10	0.12	0.13	0.14
Pittsville	Pop. Served	1,182	1,250	1,330	1,410	1,490
	Anticipated Demand (MGD)	0.13	0.14	0.15	0.16	0.16
Mardela Springs	Pop. Served	364	362	360	360	360
	Anticipated Demand (MGD)	0.04	0.04	0.04	0.04	0.04
Nanticoke/Bivalve/Tyaskin	Pop. Served	1,425	1,423	1,420	1,420	1,420
	Anticipated Demand (MGD)	0.16	0.16	0.16	0.16	0.16
Quantico	Pop. Served	115	118	121	124	127
	Anticipated Demand (MGD)	0.01	0.01	0.01	0.01	0.01
Allen	Pop. Served	148	151	155	160	165
	Anticipated Demand (MGD)	0.02	0.02	0.02	0.02	0.02
Parsonsburg	Pop. Served	268	273	278	283	288
	Anticipated Demand (MGD)	0.03	0.03	0.03	0.03	0.03
Powellville	Pop. Served	158	158	158	158	158
	Anticipated Demand (MGD)	0.02	0.02	0.02	0.02	0.02
Whitehaven	Pop. Served	78	78	78	78	78
	Anticipated Demand (MGD)	0.01	0.01	0.01	0.01	0.01
Salisbury Metro Core	Pop. Served	56,007	60,400	64,795	69,770	74,741
	Anticipated Demand (MGD)	10.56	11.15	11.75	12.42	13.09

NOTES:
(1) For an explanation of population figures, see footnotes for Table 2.2.
(2) Delmar's population includes Maryland and Delaware residents.
(3) Salisbury Metro Core Includes the incorporated areas of Salisbury, Fruitland and Delmar (Md.), and adjacent County lands served by public facilities.
(4) Anticipated demands for Mardela Springs, Nanticoke/Bivalve/Tyaskin, Quantico, Allen, Parsonsburg, Powellville, Whitehaven and the unincorporated portions of the Salisbury Metro Core are for private wells.

Table No. 2.5: Anticipated Sewer Demand

Service Area	Sewer Demand and Planned Capacity					
	Year	**2000**	**2005**	**2010**	**2015**	**2020**
Salisbury	Pop. Served	23,743	26,330	28,925	31,710	34,490
	Anticipated Demand (MGD)	5.35	5.65	4.80	5.40	6.10
Fruitland	Pop. Served	3,774	4,360	4,950	5,530	6,100
	Anticipated Demand (MGD)	0.47	0.57	0.67	0.75	0.82
Delmar	Pop. Served	3,282	4,300	5,325	5,840	6,235
	Anticipated Demand (MGD)	0.52	0.62	0.72	0.79	0.86
Hebron	Pop. Served	807	890	975	1,100	1,225
	Anticipated Demand (MGD)	0.04	0.07	0.10	0.11	0.12
Sharptown	Pop. Served	649	690	725	760	800
	Anticipated Demand (MGD)	0.12				
Willards	Pop. Served	940	995	1,110	1,155	1,260
	Anticipated Demand (MGD)	0.07	0.10	0.10	0.11	0.12
Pittsville	Pop. Served	1,182	1,250	1,330	1,410	1,490
	Anticipated Demand (MGD)	0.08	0.12	0.13	0.14	0.15
Mardela Springs	Pop. Served	364	362	360	360	360
	Anticipated Demand (MGD)	0.04	0.04	0.04	0.04	0.04
Nanticoke/Bivalve/Tyaskin	Pop. Served	1,425	1,423	1,420	1,420	1,420
	Anticipated Demand (MGD)	0.14	0.14	0.14	0.14	0.14
Quantico	Pop. Served	115	118	121	124	127
	Anticipated Demand (MGD)	0.01	0.01	0.01	0.01	0.01
Allen	Pop. Served	148	151	155	160	165
	Anticipated Demand (MGD)	0.01	0.01	0.02	0.02	0.02
Parsonsburg	Pop. Served	268	273	278	283	288
	Anticipated Demand (MGD)	0.03	0.03	0.03	0.03	0.03
Powellville	Pop. Served	158	158	158	158	158
	Anticipated Demand (MGD)	0.02	0.02	0.02	0.02	0.02
Whitehaven	Pop. Served	78	78	78	78	78
	Anticipated Demand (MGD)	0.01	0.01	0.01	0.01	0.01
Salisbury Metro Core**	Pop. Served	56,007	60,400	64,795	69,770	74,741
	Anticipated Demand (MGD)	6.46	6.92	7.37	7.80	8.21

NOTES: (1) For an explanation of population figures, see footnotes for Table 2.2.
(3) Delmar's population includes Maryland and Delaware residents.
(3) Salisbury Metro Core Includes the incorporated areas of Salisbury, Fruitland and Delmar (Md.), and adjacent County lands served by public facilities.
(4) Anticipated demands for Mardela Springs, Nanticoke/Bivalve/Tyaskin, Quantico, Allen, Parsonsburg, Powellville, Whitehaven and the unincorporated portions of the Salisbury Metro Core are for private wells.

2.4 ADOPTED COMPREHENSIVE PLANS

In accordance with State Law, each jurisdiction in Wicomico County has adopted a Comprehensive Plan to guide future growth and assist in addressing land use decisions. State legislation enacted in 2006 added new requirements to comprehensive plans. By October 1, 2009, all jurisdictions were required to include a Water Resources Element (WRE) and a Municipal Growth Element (MGE) in their Plans, which two six-month extensions may be requested. Additionally, Counties with a certified agricultural land preservation program, as Wicomico has, must also include a Priority Preservation Element in their Plans.

Wicomico County and the City of Salisbury are in the process of updating their Plans. The City of Salisbury recently adopted their Plan in July of 2010. which replaces the Metro Core Plan adopted by the Salisbury City Council on September 22, 1997. Wicomico County's current Plan was adopted on February 3, 1998 The Town of Delmar adopted their Plan update on September 28, 2009. The Town of Mardela Springs is in the process of updating their 1997 Plan with a tentative adoption in the fall of 2010. The 2009 Town of Hebron Comprehensive Plan was adopted in July of 2010 and Willard's' Plan was adopted on March 8, 2010. Sharptown adopted its Plan in August, 2008, and it includes both the WRE and MGE. Fruitland adopted its Plan in March, 2009, and it also includes both the WRE and MGE. Pittsville's Plan was adopted in 1997.

CHAPTER 3 – WATER

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3.1 GENERAL

This chapter includes a general discussion of the potable water characteristics available to Wicomico County. The following specific data is included:

a. An inventory and description of existing community system potable wells.

b. An inventory and description of existing water treatment facilities.

c. An inventory and description of general water problem areas within the various water service areas throughout the County.

d. An inventory and description of the immediate and future requirements for water development within each water service area in the County.

e. An inventory and description of existing and future water use predictions based on past and present use, population projections, industrial and agricultural trends, soil conditions, and political and financial contingencies.

The Maryland Department of the Environment published a Guidance Document entitled Water Supply Capacity Management Plans dated July 6, 2006. The purpose of the Guidance Document is to assist local governments and other owners of community water supply systems in Maryland in determining the capacity of the water supply systems and in allocating the remaining capacity in a responsible manner. The County encourages all water providers to follow the Guidance Documents.

3.2 COUNTY WATER USE

Approximately 5% of Wicomico County (about 12,160 acres) is covered with surface water, such as rivers, streams, and marshes. Most of this surface water is

brackish and can not be cost effectively used for potable purposes. The prime source of potable water for Wicomico County is groundwater. The supply of potable groundwater within Wicomico County is abundant and is adequate through the ten year planning period and for the foreseeable future. However, the majority of water used is in an unconfined aquifer which is susceptible to surface contamination. Careful land use planning needs to be in place and enforced to protect the water supply from surface contamination.

The Paleochannel is considered to be one of the best sources of groundwater in Wicomico County. It is a former stream valley filled with sand and gravel within the deposits of the Pleistocene and Pliocene formations. Wicomico County has a unique resource in this buried riverbed. The Paleochannel extends for approximately ten miles from eastern Dorchester County to US Route 13 to about two miles northeast of Salisbury. The hydrological significance of the channel lies in the fact that it constitutes a downward thickening of the blanket of the Pleistocene-Pliocene materials resulting in saturated deposits of sand and gravel in the channel's central portions that offer to help the drawdown available to wells outside the channel. Therefore, individual wells drilled in the channel will produce much more water from the Pleistocene-Pliocene deposits than wells drilled outside this channel. It is potentially one of the most prolific sources of groundwater in the Atlantic Coastal Plain and is estimated to store approximately seven billion gallons of water.

The Paleochannel and its associated deposits are extremely important sources of future potable groundwater, and will likely be tapped heavily for groundwater supplies within the next few years. The Paleochannel is part of the surficial unconfined aquifer

which is susceptible to surface contamination. Therefore, the County, the City of Salisbury, and the Town of Delmar have adopted the Paleochannel Overlay District to implement preservation measures for this vast resource. The purpose of the Overlay District is to establish protective measures, in the form of use limitations, performance standards, and detailed review procedures. These restrictions and standards ensure protection of the riverbed from contamination resulting from incompatible land uses, conserving and protecting this vital resource.

The Paleochannel Overlay District prohibits the following uses within its designated region: soil remediation facilities; hazardous waste storage or facilities; toxic waste storage or facilities; any principal use that will store underground or generate wastes that are ignitable, corrosive, reactive, toxic, hazardous, infectious, or chemical or petroleum laden; borrow pits; and sanitary landfills.

Since several recharge areas for the water bearing aquifers are common to Wicomico, Worcester, and Dorchester Counties in Maryland and to Sussex County, Delaware, and the major water bearing aquifers, including the Paleochannel supply, traverse the same County and State boundaries, the development and usage of these groundwater sources will ultimately require a coordinated effort among these jurisdictions. It is recommended that an inter-jurisdictional Water Commission representing Wicomico, Worcester, and Dorchester Counties in Maryland and Sussex County, Delaware be created to assure that these valuable water aquifers and recharge areas are adequately protected from potential sources of contamination and that water consumption from these sources is properly planned and projected in order to avoid overloading their capabilities.

The projections shown in Table 3 indicate that there will be a population of approximately 43,700 persons in the listed Wicomico County municipalities (Salisbury, Fruitland, Delmar, Hebron, Sharptown, Willards, Pittsville, and Mardela Springs) by the year 2010. The Wicomico County Comprehensive Plan estimates a total population of approximately 96,100 persons throughout the entire County by that date. The total water usage in Wicomico County is estimated to be about 16.6 MGD by the year 2010. Table 3 also shows the projected water demands for the County by service areas for the year 2010 and 2020.

3.3 PUBLIC WATER SERVICE AREAS

The following pages, tables, and figures provide a more detailed description of water demands, water supply facilities, and system characteristics for the water service areas within the County. Some of these service areas are largely rural in nature, characterized by scattered collections of dwellings together with some commercial establishments. In the more densely populated areas served by community systems, the water demands are categorized into residential, industrial, and institutional where such information is available. Where communities have no metering facilities, use and demand figures are estimated based on generally accepted values. Attached at the end are specific maps for each municipality that depict the various water service areas with their appropriate priority categories for the entire County through the year 2020.

The municipalities of Salisbury, Fruitland, and Delmar have discussed the possibility of interconnecting the Town's water systems to provide service backup in case of emergency, such as fire, drought or major repairs. Currently the system between

Salisbury and Fruitland is installed but not active and the project is still in the planning stages for a Salisbury and Delmar connection as approximately over a mile of pipe would be needed.

3.3.1 Salisbury

The water system for the City of Salisbury is operated by the Salisbury Department of Public Works, an agency within the City's municipal framework. The present system includes two (2) water treatment and pumping facilities whose wells take water from the Quaternary and Pleistocene–Pliocene aquifers. One of the facilities was constructed in 1920 and is located on East Main Street along the stream which transverses the municipal park. The other facility was built in 1976 north of the City along the "Paleochannel" on Naylor Mill Road.

The East Main Street Water Plant has nine (9) active wells. All of the sixteen (16) original wells have been abandoned and sealed. These wells have been replaced with wells of similar size in a nearby location. In general, well failure has been due to encrustation, not a dwindling water supply. Existing wells are between 34' and 92' deep. Replacement of declining wells is programmed on an as needed basis to maintain a minimum of 3,500 gallons per minute (gpm) with one (1) production well out of service.

The nine (9) remaining wells have a combined pumping capacity (actual groundwater draw-down) of approximately 4.0 MGD. Two (2) separate water mains convey raw potable water to a 24-inch header main which discharges into the East Main Street Treatment Facility. There, the raw water cascades downward through the multiple-tray aerator for CO_2 removal and iron oxidation. From there it is collected, and lime,

fluoride, chlorine and zinc poly-phosphate (a food-grade corrosion inhibitor) are added prior to discharge into the distribution system.

Five (5) high service pumps draw from the low-level reservoir and discharge treated water into the distribution system. High service pump capacities are as follows: # 1 - 2500 gpm; # 2 - 1500 gpm; # 3 - 2500 gpm; # 4 - 2500 gpm; and # 5 -1500 gpm. With pumps Nos. 1, 2 and 3 considered as standby units, the remaining two high service pumps can furnish approximately 4,000 gpm (5.76 MGD) to the system. However, pumping at this rate will deplete the ground level reservoir (500,000 gallons) in about two hours. An emergency generator is provided to give very short term water supply in the case of power failure. Two portable generators are available to operate two Park wells during an extended power outage, permitting a sustained output of 1,000 gpm.

The East Main Street well field water quality is consistent and good with iron less than 0.03 parts per million (ppm). However, this treatment plant has a limit of production which can not be increased without physical expansion. Additional water supply is targeted towards the "Paleochannel" and will be part of the Naylor Mill Road Treatment Plant Supply System. The Naylor Mill # 2 Well and emergency generator were constructed and put into service in March 1990.

The current Naylor Mill Road Water Treatment Facility consists of two (2) wells drilled approximately 180 to 200 feet into the Pleistocene-Pliocene aquifer (Paleochannel). These wells each have a capacity of 4500 gpm (6.48 MGD) and are served by two (2) deep-well submersible pumps, each with a capacity of 2250 gpm. (3.24 MGD).

The raw water is treated through eight (8) pressure ferro-sand filters with pre- and post- chlorination, fluoridation, pre- and post- sodium hydroxide, and zinc polyphosphate addition. As a result, the slight iron content (0.2 ppm) is reduced and a good quality potable drinking (iron > 0.02 ppm) water is produced. The treated water is delivered by four (4) high service pumps into the distribution system feeding into the Edgemore Avenue Elevated Storage Tank and the College Avenue Elevated Storage Tank.

With both plants in operation, the City of Salisbury is able to serve to the users approximately 12.0 MGD with the maximum capacity of each facility of about 5.7 MGD (East Main Street Plant) and 6.3 MGD (Naylor Mill Road Plant). In 2008, the average water consumption including residential, commercial and industrial demands was 5.6 MGD, with a peak daily consumption of approximately 7.4 MGD, which occurred in April 2008.

The City of Salisbury has three (3) elevated tanks, one 375,000 gallon tank at College Avenue, another 500,000 gallon tank at Edgemore Avenue (available only for fire flow), a 500,000 gallon elevated storage tank at Wor-Wic Community College, and a low-level reservoir at both the College and Edgemore Avenue water treatment facilities. The East Main Street Plant has a 500,000 gallon reservoir, half of which is needed to keep the plant at a suitable operating level. The other half of the reservoir, 250,000 gallons, is for storage. The Naylor Mill Road Plant has a one million gallon on-site reservoir. Approximately 200,000 gallons of water is needed to maintain a safe operating level of the water treatment facility. The additional 800,000 gallons is for storage. Thus, the combined storage capacity of the elevated storage tanks and the reservoirs is approximately 2.4 million gallons.

The distribution system consists of a network of mains, varying in size from 4" to 30" in diameter, serving the entire approximate City Limits. Any unserved areas are comprised of relatively undeveloped property that was recently annexed. In addition, certain fringe areas adjacent to the corporate limits, are served by extensions of the municipal transmission system, such as Quiet Acres.

Future system developments include additional elevated storage, transmission mains, and possible expansion of treatment facilities (Table 8).

The City of Salisbury installed water meters on all residential, commercial and industrial services in January 1961. Water meters assure that revenues generated by water usage accurately reflect the amount of water used. In 2006, the City initiated a change to an automated meter reading system replacing almost all of its existing meters. Water meters are tested for accuracy on an as-needed basis. The City routinely performs all sampling and laboratory analysis on the raw and treated potable waters as required by both the Environmental Protection Agency (EPA) and the Maryland Department of the Environment (MDE).

The older existing system plus the newly developed "Paleochannel" system is considered adequate for the ten (10) year planning period and beyond. Furthermore, the “Paleochannel” system can be expanded in varying stages of 4500 gpm capacity intervals (6.48 MGD) with accompanying treatment facility additions, as demand indicates.

Two (2) additional elevated tanks with approximately 2.0 million gallon capacity have been proposed in order to increase pressure, capacity, and to balance the water distribution system. Also, the replacement, cleaning and maintenance of certain existing municipal park production wells and well screens and routine extensions and other

improvements to the water system, as required, will continue to be programmed within the W-5 category. The timetable for many water main extensions within the corporate limits will depend on residential, commercial and industrial developmental demands (Table 8).

Areas shown as W-1 and S-1 include properties currently served, under construction and undeveloped infill lots throughout the City. Areas W-2 and S-2 through W-5 and S-5 represent full build out of planned but unapproved growth projects. The Total Adjusted Demand represented by water and sewer service areas W-1 and S-1 through W-5 and S-5 is 9.36 MGD. The Total Adjusted Demand figure was based on the Water and Sewer Maps of planned service areas in the Salisbury area, a unit residential demand of 3.5 EDU's or 875 GPD, per acre, as recommended in the Planning for Wastewater Flows from Future Development section of the WASTEWATER CAPACITY MANAGEMENT PLANS GUIDANCE DOCUMENT and a unit commercial, industrial, and institutional demand of 704 GPD per acre for undeveloped properties. The latter figure was calculated using 2007 metered flows and measured developed areas as shown on the Water and Sewer Maps.

The City's 2009 groundwater appropriation permit authorizes the City to withdraw up to 7.6 MGD. The City anticipates an increase in its groundwater appropriation permit from 7.6 to 10.5 MGD and plans to increase its water production capacity at the Park Water Treatment Plant by 1.0 MGD by January 2012.

Although the 9.36 MGD Total Adjusted Demand exceeds the current groundwater appropriation permit, the planned increase will enable the City's treatment capacity to outpace its growth demands going forward. See the chart below. During the peak

building years of 2001-2006, the City issued an average of 500 building permits per year. This figure represents the maxim rate of growth that the local economy is expected to support going forward. Looking ahead over the 10-year planning period, the 500 EDU's per year figure will be used to generate a conservative estimate of growth among infill lots and areas W-2 and S-2 through W-5 and S-5.

EDU's available at initiation of WSAMP	1,760
EDU's built out in 2010	500
EDU's available as of January 2011	1,260
EDU's built out in 2011	500
EDU's available as of December 2011	760
EDU's added through Park Plant upgrade	4,000
EDU's available as of January 2012	4,760
EDU's built out in 2012	500
EDU's available as of January 2013	4,260
EDU's built out in 2013	500
EDU's available as of January 2014	3,760
EDU's built out in 2014	500
EDU's available as of January 2015	3,260
EDU's built out in 2015	500
EDU's available as of January 2016	2,760
EDU's built out in 2016	500
EDU's available as of January 2017	2,260
EDU's built out in 2017	500
EDU's available as of January 2018	1,760
EDU's built out in 2018	500
EDU's available as of January 2019	1,260
EDU's added through Paleo Plant upgrade	24,000
EDU's available as of January 2020	25,260

The City has developed a draft Water and Sewer Allocation Management Plan (WSAMP) that is scheduled for implementation in the future (date is to be determined). The WSAMP will be the City's mechanism for controlling the rate at which water and wastewater treatment capacity is allocated to growth projects. Any property that is to be developed will not be served until after the City has granted a water and sewer allocation for that property. Based on information contained in the City's WATER SUPPLY

CAPACITY MANAGEMENT PLAN, it is anticipated that 1760 EDU's will be available for growth projects upon adoption of the WSAMP. Although it is possible that all of these EDU's will be reserved shortly after the WSAMP is adopted, it is unlikely that the number of EDU"s that will be brought online will exceed 500 per year. Under the WSAMP, the number of EDU's allocated will never exceed the number of EDU's available for allocation.

Using the assumed development rate of 500 EDU's per year, the initial 1760 EDU's will be adequate to accommodate growth until 2012, at which time the City plans to provide an additional 4,000 EDU's of capacity through restoration of the Park Water Treatment Plant and well field. Again conservatively assuming the 500 EDU's per year growth rate, these interim improvements should accommodate growth until the Paleo Treatment Plant Expansion in 2017, as currently programmed in the City's Capital Improvements Plan. Assuming completion in 2019, an additional 6 MGD, or 24,000 EDU's will become available for allocation at that time. Based on information contained in the City's WASTEWATER CAPACITY MANAGEMENT PLAN, there are 11,300 EDU's of capacity available in 2009 for growth, a figure that should be adequate to accommodate the City's continued growth until 2030. If the number of requested EDU's at any time exceeds the available capacity at the Water Treatment Plants of the Wastewater Treatment Plant, further allocations will not be granted until additional capacity becomes available.

3.3.2 Fruitland

The City of Fruitland owns and operates its water system. The original system was constructed in 1979 and included one (1) water treatment plant and two (2) wells. The water plant is located on Division Street near Morris Mill Pond. There are two wells at the water plant that take water from the unconfined Pleistocene-Pliocene/Columbia aquifer. The wells are drilled approximately 70 feet deep with 25 feet of 16-inch diameter stainless steel well screen. The two wells have a combined pumping capacity of approximately 750 gpm.

Well #1 has a raw water iron concentration of 1.2 ppm and Well #2 has a raw water iron concentration of 1.4 ppm. The raw water is conveyed to the treatment plant and is treated for iron removal, pH control, corrosion control, fluoridation and chlorine disinfection. Iron is removed to a level of less than 0.1 ppm at the treatment plant and a good quality potable drinking water is produced. Low service well supply pumps move water through the plant treatment process and discharges into the plant clear well. High service variable speed drive pumps convey water from the plant clear well and discharge into a distribution system feeding into an elevated storage tank located at the Wastewater Treatment Plan site on West Main Street. The tank water level elevation provides the City distribution system with a static water pressure of 55-60 psi. An emergency generator (350 kw) is provided at the water treatment plant site in case of power failure.

Two new production wells were installed in 2005. Well #3 and Well #4 are located in an easement off of Division Street across from the water plant. Both wells take water from the Pleistocene–Pliocene/Columbia aquifer, the same aquifer as Wells #1 and #2. The wells are drilled approximately 97 feet deep with 20 feet of 10-inch diameter

stainless steel well screen. The pumping capacity of Well #3 and Well #4 is 400 gpm and 300 gpm, respectively.

The current average daily demand is about 0.51 MGD, with a peak daily consumption of approximately 0.55 MGD. The treatment plant has a capacity of 1.5 MGD, and the elevated tank has a 500,000 gallon storage capacity. The distribution system consists of a network of mains, varying in sizes from 6-inch to 16-inch in diameter serving the entire developed portion of the corporate city.

The City of Fruitland has installed water meters on all services to assure that daily water consumption approximates the actual water usage and that minimum amounts of water are wasted. The City routinely performs all sampling and laboratory analysis on the raw and treated potable water as required by both the Environmental Protection Agency (EPA) and the Maryland Department of the Environment (MDE). A potable and safe quality of water is being and will be maintained at all times throughout the transmission system.

The timetable for many extensions within the corporate limits will depend on residential, commercial and industrial developmental demands. Therefore, some planned extensions to the system will not coincide with the designated ten year planning period covered by this Plan, and the City should continue to be aware of these pressures and should plan for service extensions beyond the ten year planning period.

3.3.3 Delmar

The Town of Delmar is an incorporated community that is located partially in Maryland and partially in Delaware. The Town is served by a single public water

system. The Town has two wells to supply water, but only one well (identified as Well #3A) is currently utilized to supply water to the public distribution system. The other well is identified as Well #2A and is not currently being used as a water source because it is not needed to meet demands. Both wells are located off York Street on the Delaware side. Five (5) wells are either not in service or abandoned, as follows: Well #1 off York Street (abandoned), Well #2 off York Street (out of service), Well #3 off York Street (abandoned) and two (2) Maryland wells off Foskey Lane. The Town is currently attempting to obtain funding for construction of a back-up well in case Well #3A becomes unavailable due to maintenance or failure.

Wells #2A and #3A are permitted for a maximum instantaneous pumping capacity of 1,100 gpm and 750 gpm, respectively, by the Delaware Department of Natural Resources and Environmental Control (DNREC) under Permit #89-006A and 89-006B. Well #2A was installed in 1980. The well has a 16-inch by 10-inch diameter casing installed to a depth of 205 feet. A 10-inch diameter stainless steel screen approximately 30 feet long was provided to screen the lower portion of the Pleistocene Formation (Manokin Aquifer). The well was gravel packed for the full screen depth and cement grouted during the initial construction. The well pump was modified to a new pumping rate of 895 gpm in 1998 during construction of the adjacent water treatment plant.

Well #3A was installed in 1986. The well is finished to a depth of 146 feet. The 10-inch diameter stainless steel screen is approximately 30 feet long, and screens the upper portion of the Pleistocene Formation (Columbia Aquifer). The well was also gravel packed for the full screen depth and cement grouted to 100 feet during the initial

construction. The well pump was modified to a new pumping rate of 620 gpm in 1998 during construction of the adjacent water treatment plant.

The Town has two (2) elevated water storage facilities within the Town Limits. There is a 250,000 gallon elevated water storage tank off York Street and a 300,000 gallon elevated water storage tank off Foskey Lane. The tanks are utilized to provide pressure for the daily operation of the water system, as well as to provide additional volume of water necessary for peak water usage and fire demands.

The elevated storage tank located off York Street was installed in 2000. It is a spherical tank on a single pedestal. The elevated storage tank located off Foskey Lane was installed in 1980. It is a 4 legged spherical tank with a head range approximately 30 feet and an approximate maximum static pressure of 55 psi when the tank is full. The Foskey Lane tank is on an annual maintenance program with an outside agency. .

A new water treatment facility was constructed in 1998 on the south side of York Street adjacent to Wells #2A and #3A. The water treatment facilities include an air stripping tower, three (3) pressure iron and manganese removal filters, liquid feed systems for feeding potassium permanganate and orth-polyphosphate, a lime feed system consisting of a dry feeder and a dissolving tank and a chlorination system all housed in a 3,100 square foot masonry building. The water treatment facility is designed to treat 460,000 gallons per day (GPD) at a maximum filtration rate of 1,000 gpm for an 8 hour operating day. Adjusting filter operations to a 16 hour operating day will increase rated plant capacity to 595,000 GPD based on the pumping rate of Well #3A. Raw water from Well #2A has a higher flow rate and higher iron concentration which the depleted filters cannot effectively reduce to the Maximum Contaminant Level of 0.3 ppm. Replacing the

existing media filters at the Water Treatment Plant will allow the Town to meet permit limitations for average annual withdrawal anticipated for future development through the year 2020.

Extensive water distribution system improvements were completed in 2001, with the installation of over 6 miles of 10-inch diameter and 8-inch diameter water mains along Old Stage Road east of Route 13, along Foskey Lane from Second Street to Old State Road and along portions of State Street (Route 54), Maryland Avenue, Jewell Street, Lincoln Avenue, East Street, Second Street, and Eighth Street. The overall distribution system was successfully looped by these improvements and service was extended to areas recently annexed into the Town.

Average water consumption in 2000 was 440,000 GPD. Continued development of both approved and planned residential projects within current Town limits will result in a fairly rapid growth in water consumption through the year 2012, followed by a much more modest increase (less than 1% per year) thereafter, unless additional land annexation takes place. The town currently operates a 0.60 MGD water treatment plant with a planned upgrade 0.72 MGD.

The total storage in the two existing elevated tanks is 550,000 GPD. This is adequate to meet the current average daily water demand of 331,000 GPD plus a 2 hour fire demand of 1,500 gpm if "equivalent storage" (the amount of water output from the water treatment facility over a daily production period of 8 hours) is considered. Equivalent storage calculations are allowed by national standards when backup electric generators are in place. Total "storage" becomes 982,000 gallons which is adequate through the entire planning period. The Town may still want to consider a third elevated

storage tank in the Stage Road area at some time in the future to better maintain water pressures in an area of future high demand.

The Town is planning to undertake the following water projects:

1. Extensions to the existing water distribution system to serve other areas of proposed development.

2. Develop a new 300 gpm well to supplement Well #3A or a new 900 gpm well to replace Well #3A.

3.3.4 Hebron

The Town of Hebron is a corporate community served by a public water system constructed in the 1980's that is owned and operated by the town. In 1996, the town upgraded their existing water system. The improvements included the construction of two (2) new production wells, construction of a new 300,000 gallon single pedestal elevated water storage tank, installation of water distribution system improvements, and the abandonment of existing production Wells #2 and #4. The existing 75,000 gallon elevated water storage tank was disconnected from the Town's distribution system and dismantled. Two additional wells (Well #1 and #3) were abandoned prior to 1955.

The two production wells, Well #5 and #6, are 8-inches in diameter and 280 feet deep to the sump and 370 feet deep to the bottom of the screen. These wells are screened in the Salisbury formation. The submersible well pumps installed within Wells #5 and #6 supply and transport water to the new elevated water storage tank at a rate of 220 gpm. Treatment of the water pumped from the new wells includes both pre- and post-chlorination, which is controlled by an automatic chlorine gas feed system that has been

installed inside the base of the elevated water storage tank. The 300,000 gallon elevated water storage tank provides enough water storage to satisfy the Town's daily average water consumption volume of 114,000 gallons per day, as well as meet the fire protection water storage requirements for the community. Currently the Town has a groundwater appropriations permit that authorizes a daily average of 123,000 GPD, and a maximum monthly average of 205,000 GPD.

Residential water usage is not metered, although the Town applied for federal and state funding in 2008 to install meters on a Town-wide basis. A flat rate is charged based on a fixture count per dwelling. No existing industrial water demands are placed on the system, and the commercial establishments generate only minimal water demand. The water facilities currently serve approximately 496 connections, which are predominately for residential uses.

According to the Town's Comprehensive Plan adopted in July of 2010, there are 617 acres of undeveloped or under developed land within the existing Town limits, of which 552 acres are designated for residential land use and the remaining 65 acres for industrial / commercial uses. The undeveloped / under developed acreage designated for residential use creates the potential for an additional 2,185 dwelling units upon build-out of the existing corporate limits. Based on Maryland Department of the Environment standards (250 GPD per EDU), development of the potential dwelling units would create the demand for an additional 546,250 gallons per day, on average. Currently, the Town is discussing with developers plans to develop about 80 percent of the undeveloped land. In addition to the residential component, there is a significant commercial use proposed that would total approximately 450,000 sq. ft. of floor area that would generate additional

water demands, which roughly translates to 90,000 gallons per day of water (200 gallons per day per 1,000 square feet of gross floor area). As Hebron reaches build-out of the existing corporate boundary an additional 636,250 gallons of water capacity is needed. When the future water demand of the existing corporate boundary of the Town is combined with the average water consumption of 114,000 GPD, the total water demand of 750,250 exceeds the Town's Water Treatment Plant design capacity of 700,000 gallons per day.

Based on future demand within the current corporate limits, the Town has the potential to far exceed the MDE groundwater appropriation permit of 123,000 GPD, on average. Without seeking an increased groundwater appropriation permit, the Town is currently limited in their ability to issue permits for new development as a result of this issue.

In addition to analyzing the infill and redevelopment potential of land located within the existing Town boundary, the Town's 2010 Comprehensive Plan also projects the need to expand water service beyond the corporate boundary into the surrounding county through annexation of areas defined as future growth areas. According to the Town's Municipal Growth Element, contained in the adopted 2009 Town of Hebron Comprehensive Plan, the future growth area consists of 132 acres: 96 acres have been designated as Mixed Use; 11 acres as Employment; 7 acres for Park; and 18 acres Public/Semi-Public uses. This future growth area could result in a minimum of an additional 336 residential units at build-out, as well as approximately 480,000 square feet of additional commercial uses. The estimated water demand generated by this expansion

would add the need for another 180,000 gallons per day of potable water (84,000 GPD – residential and 96,000 GPD – commercial).

The total projected water demand based on the infill and redevelopment potential within the existing Town limits, as well as a result of future annexations within the defined growth areas has the potential to generate the demand of 930,250 gallons of water per day: existing flow of 114,000 GPD; planned development within the existing corporate boundary of 636,250 GPD; and water extensions to defined growth areas beyond the Town boundary of 180,000 GPD. The total projected demand based on build-out of the existing corporate limits, as well as the future growth areas exceeds both the design capacity of the system and the Town's groundwater appropriation permit issued by MDE.

The Town of Hebron is currently studying its capital needs for the proposed growth along with funding and phasing alternatives. Most of the projected growth within the corporate limits is expected to take place within the next 10 years. Facilities expansions to serve lands beyond the Town boundary are expected to occur within the next 20 years.

Overall, based on the Town's desired growth, which is inconsistent with the Wicomico County Comprehensive Plan, the Town could potentially have a demand for water capacity that far exceeds the groundwater appropriation permit, as well as the design capacity of the current water treatment system.

3.3.5 Sharptown

The Town of Sharptown is a corporate community served by one public water system. The Town currently obtains its potable water supply from four (4) wells, two of which are screened in the Pleistocene-Pliocene Aquifer, and two of which are screened in the Nanticoke Aquifer. Two other wells (Wells #2 and #3) have been sealed, capped and abandoned, due to an inadequate water supply and quality.

Well #1 is screened at a depth of 300 feet in the Nanticoke Aquifer. The well has a 12-inch casing and a 125 gpm submersible pump. The original turbine pump was removed during a Water System Upgrade in 1991, during which the well was cleaned, pumped off, and converted to a submersible pump. Well #1 is an emergency stand-by well, which is normally runs only during water system flushing to exercise the pump. The pump is set to automatically start only if the elevated water storage tank falls below a preset limit.

Well #4 is screened at a depth of 89 feet and has an 85 gpm submersible pump. The original well had a casing of 12-inches with a turbine pump. The screens began to allow sand to be pumped and the well was re-screened and a submersible pump was installed.

Well #5 is screened at a depth of 69 feet and has a 20 HP turbine pump. During the Water System Upgrade in 1991, the pump was overhauled and three additional pump bowls were added. The well has a 12-inch casing and currently pumps 208 gpm.

Well #6 was drilled and put in service during the Water System Upgrade in 1991. The well has a 12-inch casing and a 25 HP turbine pump. The screens are set at a depth of 300 feet in the Nanticoke Aquifer. The well pumping capacity is 450 gpm, and the

well is currently throttled back to a flow rate of 160 gpm. This is an operational strategy to blend the two shallow wells with this deep well to achieve the best quality water without filtering.

All four production wells are piped to a manifold piping arrangement and then piped through the Water Treatment Plant. At the water plant, the raw water is chlorinated with sodium hypochlorite for disinfection. Soda ash and lime can be added if needed to adjust the pH and alkalinity to desired levels of corrosion control. There are trace amounts of fluoride occurring naturally in the finished water, and therefore the Town Commissioners decided not to add fluoride in the treatment process.

Finished water leaves the water treatment plant and is pumped directly to the top of the 200,000 gallon elevated storage tank, where a splash-plate evenly disperses the water. Water is gravity fed to the distribution system through a 10-inch pipe at the bottom of the elevated storage tank. At the current daily flow rate of 75,000 GPD, it takes about 2.5 days for treated water to enter the water system. Water system pressure ranges from 48 psi to 52 psi, depending on the level of water in the tank.

The distribution system consists of a network of mains, varying in size from 2-inches to 10-inches in diameter. There is a 10-inch pipe leading from the elevated water storage tank that connects into an 8-inch water main running east and west. There are three 2-inch pipes on dead end streets that will be removed in the future and replaced with 6-inch pipes with hydrants at the ends for flushing and fire protection.

Water meters with backflow prevention are installed at each property being served with water. Water consumption has dropped significantly since the meters were installed during the Water System Upgrade in 1991. Prior to the water meters, customers

were charged according to the number of spigots at the property, not on the amount of water used. As much as 450,000 GPD was used during periods of dry weather, whereas now there is no significant change due to weather related conditions.

Any extension of the distribution system into undeveloped areas would be scheduled as these areas developed to accommodate future growth. These projects would fall within the W-3 category.

3.3.6 Willards

The Town of Willards owns and operates its water system constructed in 1974. Originally, individual residences received potable water from shallow wells, mostly dug-well type with a few drilled wells. The domestic water supply from these wells was high in iron content, extremely hard, and generally of unacceptable quality. As a result, the Town installed a central water system to serve all areas within the town limits.

The town's wells draw groundwater from the Manokin Aquifer. There are two wells, each drilled to the depth of 320 feet. Each well is 8-inches in diameter and has a deep well submersible pump that has a pumping rate of 145 gpm, which supplies a maximum of 208,800 GPD. The Town's Water Appropriation Permit allows the Town to withdrawal of up to 173,000 GPD from Manokin Aquifer.

The water treatment plant has the capacity to handle water from only one well at a time. The second well is used for stand-by and is alternated into service monthly. The current demand on the system is approximately 85,000 GPD with a peak flow of approximately 240,000 GPD.

The raw water is corrosive and high in iron. The iron concentration is 12 mg/l. The treatment process consists of ion exchange filters that are used for the iron removal, and sodium hydroxide for corrosion control. Chlorine gas is used in the disinfection process. The finished drinking water meets Primary Drinking Water Regulations.

The distribution system consists of a network of mains, varying in size from 6-inches to 8-inches in diameter. A 125,000 gallon elevated storage tank is located on Main Street, and provides reserve storage and static pressure for the distribution system. The town has also recently completed an additional 125,000 gallon elevated storage tank for a total storage capacity of 250,000 gallons.

Based on the findings of a 1996 Study prepared by McCrone, Inc., the Town plans to upgrade their existing water system per the recommendations of the study. The improvements include upgrading Well #1 by the addition of a new pump and motor, constructing new water filters with a building, repairing the existing elevated tank, adding a ground storage tank, looping various water mains, and computerizing the water reading and billing systems. Extensions of the distribution system within the undeveloped areas of the town will occur as required. The projects fall within the W-2 and W-3 categories.

In 2008, the neighboring Town of Pittsville applied for a grant from MDE to study improvements to the Town's water treatment plant. In addition, the project will include a feasibility study to evaluate the future drinking water needs of the overall Pittsville-Willards area. Once completed, the results of this study will be analyzed for possible future inclusion in this Plan.

3.3.7 Pittsville

The Town of Pittsville owns and operates its water system constructed in the early 1980's. The Town's central water system consists of two wells, a treatment plant, an elevated storage tank, and a network of mains varying from 8" to 12" in diameter. The current average daily demand is nearly 0.13 MGD, with a peak daily consumption of approximately 0.22 MGD. The treatment plant has a capacity of 0.14 MGD with a planned upgrade 0.25 MGD. The storage tank has a capacity of 200,000 gallons and provides a reserve and static pressure of approximately 72 psi in the service area.

As noted above under the Willards section, in 2008 Pittsville applied for a grant from MDE to study improvements to the Town's water treatment plant. The project will also include a feasibility study to evaluate the future drinking water needs of the overall Pittsville-Willards area. Once completed, the results of this study will be analyzed for possible future inclusion in this Plan.

3.3.8 Mardela Springs

The incorporated community of Mardela Springs consists of about 180 residences, churches, and commercial business establishments. An elementary, and combined middle and high school are located on the outskirts of the Town but are not within the incorporated limits. Mardela Springs' population has changed little since 1970, when 356 residents lived in the Town. The 2000 Census indicated the Town's population was 364, and U.S. Census estimates for each year since 2000 indicate little variation, with the 2007 population estimated at 358 persons. Given the Town's lack of public water and

sewer facilities, this Plan projects that Mardela Springs' population will remain stable, at 360 persons, through the year 2020. (See Table 2.2).

Domestic potable water supply is obtained from individual wells, which range in depth up to approximately 300 feet. The quality of the water pumped from the deeper wells has a high pH and a high dissolved solids content.

At the time of this publication, the Town of Mardela Springs recently completed a feasibility study to analyze options for establishing community water and sewer systems. Included within the feasibility study is a description of the various options and cost estimates for wastewater collection, disposal and treatment of effluent, and water supply, storage, treatment and distribution.

According to the recommendations contained within the feasibility study, the preferred alternative for the water system is to provide potable water to the existing 180 improved parcels in Town in phases. In doing so, this alternative provides the public with fire protection at a reasonable capital cost.

3.3.9 Rural Villages

The villages of Nanticoke, Bivalve, Tyaskin, Quantico, Allen, Parsonsburg, Powellville, and Whitehaven have no foreseeable need for a central water system within this period. Therefore, residential and commercial developments in this area should continue to be served by individual wells. These wells must be installed in accordance with COMAR 26.04.02 (Regulations Governing Individual Water and Sewerage Systems Where Public Systems are Not Available) so as to reduce any potential health hazards. These areas will fall within the no-planned service category (W-6).

3.3.10 Urban Service Districts/Out of City Customers

The service areas of Salisbury, Fruitland, and Delmar all have provisions for urban services to provide public water to areas outside of their municipal service districts. In order to insure delivery of public water services to these areas, the County Charter has designated an extra-municipal Urban Services Commission to manage service development and expansion, under Chapter 97 of the County Code.

Urban Services is essential to attract future development to planned growth areas. Even though some planned growth areas may be located outside of the various municipal jurisdictional boundaries, it is possible for these areas to receive limited urban services. This promotes growth that is consistent with the Wicomico County Comprehensive Plan, presents immediate economic benefits to the municipality, and provides developers a greater economic return for developments in designated service areas.

The costs of system expansion and improvement to these areas should be shared by the developers, systems users, and their respective governments. In addition, County and municipal codes should be amended to permit cooperative agreements for the development, operation, and improvement of existing and new facilities shared by both municipal and non-municipal property owners. Efforts should be made to discuss this important matter further between the County and all the municipalities. At the time of this publication, an agreement with between the City of Salisbury and Urban Service Districts has expired.

In addition to Urban Service Districts, there are some areas which are served by public water beyond the corporate limits and are considered Out of City Customers.

There are a few individual dwellings served as Out of City Customers which have not been included. Refer to the list of water service areas below.

WATER SERVICE AREAS

AREA	PROVIDER	TYPE
Allenwood Shopping Center	Salisbury	Urban Service
Deers Head	Salisbury	Out of City Customer
East Urban Corridor	Salisbury	Out of City Customer
Elks Lodge	Salisbury	Out of City Customer
Fountain Road	Salisbury	Urban Service
Glen Avenue Elementary School	Salisbury	Out of City Customer
Glen Garden Apartments	Salisbury	Out of City Customer
Orchard Circle (East)	Salisbury	Urban Service
Orchard Circle (West)	Salisbury	Urban Service
North Park Garden Apartments	Salisbury	Out of City Customer
Park Manor	Salisbury	Out of City Customer
Riverside #1	Salisbury	Urban Service
Riverside #2	Salisbury	Urban Service
Riverside Pines	Salisbury	Urban Service
Salisbury Nursing Home	Salisbury	Out of City Customer
Salisbury Bible Fellowship	Salisbury	Out of City Customer
Salisbury University	Salisbury	Out of City Customer
Wicomico High School	Salisbury	Out of City Customer
Wicomico Youth & Civic Center	Salisbury	Out of City Customer
Westover Hills #1	Salisbury	Urban Service
Westover Hill #2	Salisbury	Urban Service
Quiet Acres	Salisbury	Out of City Customer

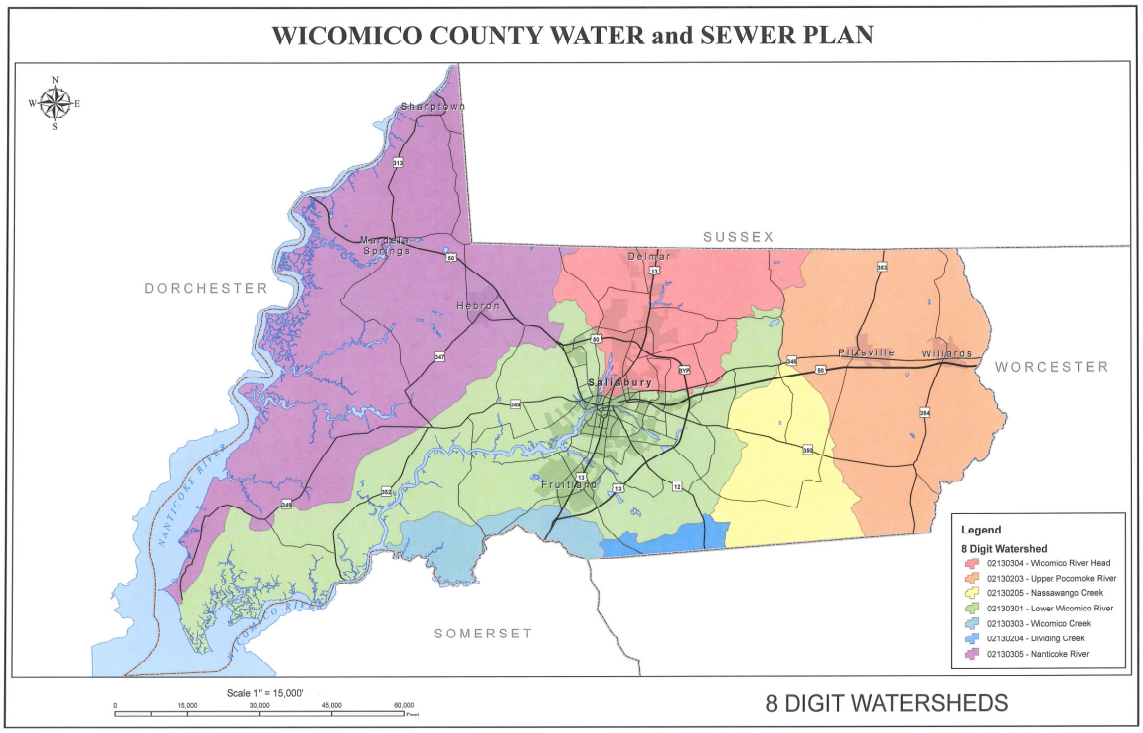
3.4 PRIVATE WATER SERVICE AREAS

Where no central water systems are planned, development within the County can be served by "package" treatment units. Use of these facilities shall be precluded from location within the A-1 Agriculture-Rural Zoning District, or from serving new or expanded developments within the A-1 District. Specifically exempt from this restriction are facilities intending to serve institutional uses, agricultural businesses, and/or developments existing as of the effective date of this Plan. The Maryland Department of the Environment and the Wicomico County Health Department exercise regulatory supervision relative to individual well systems and "package" type treatment facilities. Their efforts, and those of Wicomico County Department of Public Works and the Planning and Zoning Commission, provide the necessary regulatory authority to assure satisfactory construction, installation, and operation of individual well systems.

The 2005 Wicomico County Land Preservation, Parks, and Recreation Plan, which was adopted by the Wicomico County Council on March 7, 2006, states that "package systems should be prohibited in areas targeted by the County for preservation." The document also states that "private package water and sewer plants in the agricultural district… can work against the County's expressed goal of preserving rural areas for agriculture and related uses."

Privately owned and operated water systems located in the County and not in an area served by public water will be discussed herein. The private systems will be classified by the watershed in which it is located.

Wicomico County is divided into seven (7) watersheds. The Lower Wicomico River, Wicomico River Head, Wicomico Creek, Nassawango Creek, Dividing Creek, Upper Pocomoke River, and Nanticoke River. The watershed map is shown below.



3.4.1 Lower Wicomico River Watershed

Steeplechase Subdivision: Steeplechase Subdivision is served by an existing private system which will ultimately consist of 300 lots on 200 acres. The central water supply system has an estimated water consumption of 75,000 gallons per day. Fluoride treatment and a fire hydrant system may be required in the future. This subdivision is located on Crooked Oak Lane just west of Salisbury.

Nutters Crossing Subdivision: Nutters Crossing Sections 4 (Pond at Nutters), 5 (Woods at Nutters), and part of 3 are proposed to be served with a private water system. This subdivision will be located on Dixon Road just south of Salisbury. The system which will serve approximately 325 residential units will include two (2) production

wells drilled into the Columbia aquifer. The wells will be 8-inch diameter and will be approximately 95 feet deep. Each well is designed to produce 200 gpm. The system will have an average daily demand of 100,000 GPD. The water quality is generally good with low iron. The water treatment facilities will consist of pH adjustment and disinfection using sodium hypochlorite and caustic (liquid sodium hydroxide). Fluoride treatment and a fire hydrant system may be required. The facility will be equipped with two (2) hydropneumatic tanks. The system has been designed and permitted but not constructed.

The Environmental Risk Assessment is rated "High" per the Priority of Receiving Waters – Maryland State Watersheds. The overall watershed contains approximately 72,514 acres (non-water). See Supplemental map in Chapter 3 for location.

3.4.2 Wicomico River Headwaters Watershed

Perdue Farms: The corporate headquarters of Perdue Farms located on Old Ocean City Road is served by two (2) existing wells. These wells produce up to 20,000 GPD mostly for irrigation purposes.

The feed mill complex of Perdue Farms located on Zion Church Road is served by seven (7) existing wells. These wells produce up to 1,000,000 GPD of which 80% is used for cooling water that discharges to Peggy Branch, a tributary of the Wicomico River. Perdue is currently looking into a recirculation options.

There are no private water systems in this watershed aside from mobile home parks. The Environmental Risk Assessment is rated "High" per the Priority of Receiving Waters – Maryland State Watersheds. The overall watershed contains approximately 24,765 acres (non-water). See Supplemental map in Chapter 3 for location.

3.4.3 Wicomico Creek Watershed

There are no private water systems in this watershed. The Environmental Risk Assessment is rated "High" per the Priority of Receiving Waters – Maryland State Watersheds. The overall watershed contains approximately 19,516 acres (non-water). See Supplemental map in Chapter 3 for location.

3.4.4 Nassawango Creek Watershed

There are no private water systems in this watershed. The Environmental Risk Assessment is rated "High" per the Priority of Receiving Waters – Maryland State Watersheds. The overall watershed contains approximately 43,747 acres (non-water). See Supplemental map in Chapter 3 for location.

3.4.5 Dividing Creek Watershed

There are no private water systems in this watershed. The Environmental Risk Assessment is rated "Medium" per the Priority of Receiving Waters – Maryland State Watersheds. The overall watershed contains approximately 39,700 acres (non-water). See Supplemental map in Chapter 3 for location.

3.4.6 Upper Pocomoke River Watershed

There are no private water systems in this watershed aside from mobile home parks. The Environmental Risk Assessment is rated "High" per the Priority of Receiving Waters – Maryland State Watersheds. The overall watershed contains approximately 95,512 acres (non-water). See Supplemental map in Chapter 3 for location.

3.4.7 Nanticoke River Watershed

Nanticoke Seafood:

Nanticoke Seafood (formerly H. B. Kennerly & Son) is the only industry located within the village of Nanticoke. The company processes oysters and clams and is served by three supply wells. The wells are each 100 feet deep in the Manokin Aquifer, and they have a high iron content.

The Environmental Risk Assessment is rated "Very High" per the Priority of Receiving Waters – Maryland State Watersheds. The overall watershed contains approximately 110,464 acres (non-water). See Supplemental map in Chapter 3 for location.

3.4.8 Mobile Home Parks

Eighteen mobile home parks in Wicomico County have privately owned and operated water systems. Attached is a table listing each mobile home park and the size of the system.

	Name and Location	Population	No. of Wells	Well Condition	Type of System	Watershed	Water Demand (GPD)	Well Appropriation Limit (GPD)	Permit Expiration	Aquifer
1.	"Bennett Mobile Home Park" Naylor Mill Rd, Salisbury	111	2	G	P	LWR.	4,500	7,500	2011	SA, MA
2.	"Bohnak Trailer Park & Sales" Brown St Extended, Fruitland	243	1	G	C	LWR.	7,000	14,000	2014	SA, MA
3.	"Charles Boyer Trailer Park" Morris Rd, Pittsville	21	1	G	P	UPR.				SA
4.	"Cedarhurst Village" U.S. Route 50, Salisbury	273	4	G	P	LWR.	12,000	20,000	2014	SA, MA

	Name and Location	Population	No. of Wells	Well Condition	Type of System	Watershed	Water Demand (GPD)	Well Appropriation Limit (GPD)	Permit Expiration	Aquifer
5.	"Country Village Mobile Home Park" Rounds Rd., Parsonsburg	114	1	G	P	UPR.	7,600	13,500	2013	SA
6.	"Eastwood Village II" Mt. Hermon Church Rd., Salisbury	36	1	G	P	LWR.	2,400	3,600	2008	SA, MA
7.	"Eastwood Village I" Johnson Rd., Salisbury	165	3	G	P	LWR.	9,000	13,500	1998	SA, MA
8.	"Gateway Village" Shell Rd., Delmar	84	1	G	P	WRH				SA
9.	"Green Meadows Compact Homes" Bi-State Blvd., Delmar	99	1	G	M	WRH	9,400	15,600	2012	SA
10.	"John Walston Mobile Home Park" Walston Switch Rd., Salisbury	270	4	G	P	LWR.				SA
11.	"Naylor Mill Village" Naylor Mill Rd., Salisbury	156	1	G	P	LWR.				SA, MA
12.	"Hebron Woods" U.S. Route 50, Hebron	375	1	G	C	NR.	25,700	43,000	2009	SA
13.	"Oak Ridge Trailer Park" South Upper Ferry Rd., Eden	189	3	G	P	LWR.				SA, MA
14.	"Oak Terrace Trailer Court" Riverton Rd., Mardela Springs	48	1	G	P	NR.	3,400	5,200	2019	SA, NA
15.	"Parkway Mobile Estates" Bi-State Blvd., Delmar	27	2	G	P	WRH				SA
16.	"Pine Tree Mobile Estates" Jones-Hastings Rd., Parsonsburg	129	2	G	P	UPR.	8,600	13,000	2020	SA
17.	"Salisbury Mobile Home Park" U.S. Route 13, Salisbury	582	3	G	M	WRH				SA, MA
18.	"West Side Mobile Park" Nanticoke Rd., Salisbury	282	2	G	P	LWR.	2,100	8,400	2005	SA, MA

G - Good C - Community P - Private M - Municipal
Amount of water used is approximately 100 GPD per person.
This data provided by Wicomico County Health Department.

3.5 TABLES

Table 3: Projected Water Supply Demand and Planned Capacity

Table 4: Inventory of Existing Community System Wells

Table 5: Inventory of Existing Impounded Supplies

Table 6: Inventory of Existing Water Treatment Facilities

Table 7: Inventory of Water Problem Areas

Table 8: Immediate 5 and 10 Year Priorities for Water Development

Table 9: Inventory of Existing Shared/Community Facilities

TABLE 3
PROJECTED WATER SUPPLY, DEMAND, AND PLANNED CAPACITY

Service Area			Salisbury	Fruitland	Delmar*	Hebron	Sharptown	Willards	Pittsville	Mardela Springs	Nanticoke/ Bivalve/ Tyaskin	Quantico	Allen	Parsonsburg	Powellville	Whitehaven	Salisbury Metro Core
2000	Pop.	T	23,743	3,774	3,282	807	649	940	1,182	364	1,425	115	148	268	158	78	56,007
		S	23,743	3,774	3,282	807	649	940	1,182	0	0	0	0	0	0	0	31,929
		US	0	0	0	0	0	0	0	364	1,425	115	148	268	158	78	24,078
	GPCD	Gals.	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
	Cap.	D	5.51	0.51	0.44	0.09 [1]	0.07 [1]	0.09	0.13	0.04 [5]	0.16 [5]	0.01 [5]	0.02 [5]	0.03 [5]	0.02 [5]	0.01 [5]	10.56 [4, 8]
		P	10.20	1.50	0.60	0.70	0.58 [3]	0.22	0.14	0	0	0	0	0	0	0	12.30
2010	Pop.	T	28,925	4,950	5,325	975	725	1,110	1,330	360	1,420	121	155	278	158	78	64,795
		S	28,925	4,950	5,325	975	725	1,110	1,330	0	0	0	0	0	0	0	40,330
		US	0	0	0	0	0	0	0	360	1,420	121	155	278	158	78	24,465
	GPCD	Gals.	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
	Cap.	D	6.90 [4, 8]	0.67 [6]	0.72 [6]	0.11 [5]	0.08 [1, 5]	0.12 [5]	0.15 [5]	0.04 [5]	0.16 [5]	0.01 [5]	0.02 [5]	0.03 [5]	0.02 [5]	0.01 [5]	11.75 [4, 8]
		P	12.00	1.50	0.72 [2]	0.70	0.58 [3]	0.24	0.25	0	0	0	0	0	0	0	14.15
2020 [9]	Pop.	T	34,490	6,100	6,235	1,225	800	1,260	1,490	360	1,420	127	165	288	158	78	74,741
		S	34,490	6,100	6,235	1,225	800	1,260	1,490	0	0	0	0	0	0	0	48,080
		US	0	0	0	0	0	0	0	360	1,420	127	165	288	158	78	26,661
	GPCD	Gals.	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
	Cap.	D	7.66 [4, 8]	0.82 [6]	0.84 [6]	0.13 [5]	0.09 [1, 5]	0.14 [5]	0.16 [5]	0.04 [5]	0.16 [5]	0.01 [5]	0.02 [5]	0.03 [5]	0.02 [5]	0.01 [5]	13.09 [4, 8]
		P	18.00	1.50	0.88 [3]	0.70	0.58 [3]	0.24	0.25	0	0	0	0	0	0	0	14.26

NOTE: Capacities rated in million gallons per day (MGD)
T: Total US: Unserved P: Planned S: Served D: Demand

[1] 16 hour per day filter operation with existing wells
[2] 13 hour per day filter operation with one new well
[3] 15 hour per day filter operation
[4] Industrial demand estimated at 3 MGD
[5] Commercial demand estimated at 10% of residential demand
[6] Commercial/Industrial demand estimated at 35% of residential demand
[7] Urban Service Water customers estimated at 1130
[8] Commercial, Industrial, and Institutional estimated at 170% of residential demand
[9] 2020 subject to plan amendment and MDE approval

*Delmar includes Delaware and Maryland Residents

Year	Maryland	Delaware
2000	1,875	1,407
2010	3,580	1,745
2020	4,155	2,080

TABLE 4
INVENTORY OF EXISTING COMMUNITY SYSTEM WELLS

Owner	Well	Aquifer	Coordinate Location	Screen depth (feet)	Diam. (inches)	Max. Safe Yield (gpm)	Pumping Capacity	Water Quality*
Salisbury (E. Main Street Plant)	#2	Quaternary	195,000N 1,208,000E	38 to 54	12	133	133	good
	#7	"	"	46 to 66	12	724	724	good
	#8	"	"	44 to 66	12	500	500	good
	#10	"	"	34 to 58	12	300	300	good
	#14	"	"	52 to 72	12	517	517	good
	#15	"	"	50 to 65	16	500	500	good
	#16	"	"	42 to 62	12	150	0	good
	#17	"	"	44 to 90	14	1,171	1,171	good
	#18	"	"	44 to 92	14	796	796	good
Salisbury (Naylor Mill Road Plant)	Naylor Mill #1	Pleistocene-Pliocene (Paleochannel)	214,000N 1,202,000E	82 to 165	I.D. 26	4,500	4,500	good
	Naylor Mill #2	"	213,100N 1,203,600E	105 to 195	I.D. 26	4,500	4,500	good
Fruitland	#1	Pleistocene-Pliocene/Columbia	182,000N 1,200,000E	70	16	375	375	good >0.1ppm iron (raw water high iron)
	#2			70	16	375	375	
	#3	"	"	97	10	400	400	
	#4	"	"	97	10	300	300	
Delmar	#2A	Manokin	233,000N 1,207,000E	205	10	1,100	895	good
	#3A	Columbia	233,000N 1,207,000E	146	10	750	620	good

TABLE 4
INVENTORY OF EXISTING COMMUNITY SYSTEM WELLS

Owner	Well	Aquifer	Coordinate Location	Screen depth (feet)	Diam. (inches)	Max. Safe Yield (gpm)	Pumping Capacity	Water Quality*
Hebron	#5	Quarternary	217,000N 1,177,000E	370	8	220	220	good
	#6	"	216,500N 1,177,000E	370	8	220	220	good
Sharptown	#1	Nanticoke	259,500N 1,167,000E	300	12		125	high mineral good except for corrosiveness
	#4	Pleistocene/ Pliocene	"	89	12	85	85	"
	#5	Pleistocene/ Pliocene	"	69	12	208	208	"
	#6	Nanticoke	"	300	12	450	450	"
Willards	#1	Manokin	208,000N	320	8	145	145	good
	#2	"	1,273,000E	320	8	145	145	good
Pittsville	#1	Manokin	209,000N	111	6	200	135	good
	#2	"	1,254,500E	116	6	200	135	good

* Finished Water
Note: Willards Comprehensive Plan referenced 75 gpm pumping capacity per well

TABLE 5
INVENTORY OF EXISTING IMPOUNDED SUPPLIES

Owner	Crest elevation above sea level	Spillway length	Total length of dam	Height of crest above stream bed	Flooded area of crest elevation	Length of shoreline at crest elevation	Area of land owned	Water overflowed crest for first time	Capacity of reservoir	Safe Yield (MGD)	Average daily withdrawal (MGD)

*Currently none exist

TABLE 6
INVENTORY OF EXISTING WATER TREATMENT FACILITIES

Owner	Operating Agency	Water Source	Type Treatment	Plant Coordinate Location	Rated Plant Cap. (MGD)	Avg. Prod. (MGD)	Max. Peak Flow (MGD)	Storage Cap. (MGD)	Planned Expansion MGD/Dates	Sludge Disposal Method
Salisbury (E. Main St. Plant)	City of Salisbury	9 wells	aeration, lime add't., chlorination, fluoridation and zinc polyphosphate	197,000N / 1,204,000E	4,000 gpm 5.7	1181 gpm 1.7	3700gpm 5.3	0.63 [1]	N/A	residues to County Landfill
Salisbury (Naylor Mill Road Plant)	City of Salisbury	2 wells	Ferro-sand filters; pre & post chlorination, fluoridation, pre and post sodium hydroxide, zinc polyphosphate	213,000N / 1,203,000E	4,400 gpm 6.3	3125 gpm 4.5	4,500 gpm 6.2	1.30 [2]	N/A	residues to WWTP
Fruitland	City of Fruitland	4 wells	chlorination, fluoridation, Iron removal & pH control	183,000N / 1,200,000E	1.50	0.52	0.55	0.50	N/A	residues to County Landfill
Delmar	Town of Delmar	2 wells	chlorination, pH control plus pressure filters for iron and manganese removal	233,000N / 1,207,000E	0.60	0.50	0.86	0.55	N/A	N/A
Hebron	Town of Hebron	2 wells	pre & post chlorination	215,000N / 1,175,000E	0.79	0.10	0.10	0.30	N/A	N/A
Sharptown	Town of Sharptown	4 wells	chlorinated with sodium hypochlorite, soda ash and lime additions for pH correction	259,000 N / 1,167,000 E	500 gpm 0.58	0.08	0.12	0.20	N/A	N/A

TABLE 6
INVENTORY OF EXISTING WATER TREATMENT FACILITIES

Owner	Operating Agency	Water Source	Type Treatment	Plant Coordinate Location	Rated Plant Cap. (MGD)	Avg. Prod. (MGD)	Max. Peak Flow (MGD)	Storage Cap. (MGD)	Planned Expansion MGD/Dates	Sludge Disposal Method
Willards	Town of Willards	2 wells	filtration softening, sodium hydroxide, & chlorination	207,000N / 1,272,000E	0.22	0.09	0.29	0.25	N/A	residues to County Landfill
Pittsville	Town of Pittsville	2 wells	Chlorinated with Sodium Hypochlorite Soda ash and Lime additions	209,000N / 1,254,500E	0.14	0.10	0.22	0.20	N/A	residues to County Landfill

[1] The East Main Street Plant has a 500,000 gal on site reservoir, half of the reservoir is needed to keep the plant at a operating level. The other half is for storage. Thus 250,000 + 375,000 College Avenue Water Tower = 625,000 storage.

[2] The Naylor MIll Road Plant has a 1 MG on site reservoir. Approx 200,000 gals of water is needed to maintain a safe operating level. The additional 800,000 is for storage. 800,000 reservoir + 500,000 Edgemore Ave Water Tower = 1.3 MG of storage capacity. (Note that 500,000 GAL Edgemore Water Tower is too short to provide equalization storage, only available for fire flow.)

TABLE 7
INVENTORY OF WATER PROBLEM AREAS

Service Area	Coordinate Location	Population	Areas	Nature of Problem	Planned Correction Date
Salisbury	N/A	1 EDU	Levin Dashiell Rd.	MTBE in Groundwater	2011
	N/A	1 EDU	Hobbs Road	MTBE in Groundwater	
Fruitland	N/A		Sharp Point Rd	Nitrates & Iron	2013
	N/A		West of Rt. 13	Nitrates & Iron	2013
	N/A		East of Rt. 13	Nitrates & Iron	2013
Nanticoke/ Bivalve/ Tyaskin	N/A	1425		Poor water quality from individual well	unknown
Mardela Springs	N/A	364	Corporate town limits	Individual wells - possible contamination from failing septic systems	unknown
	N/A	1 EDU	Church Street	MTBE in Groundwater	

TABLE 8
IMMEDIATE, 5, AND 10 YEAR PRIORITIES FOR WATER DEVELOPMENT

Fiscal Year and Project Number	County Priority Assigned	Coordinate Location	Description	Estimated Costs*			Project Status Construction Start	
				Total	Federal and/or State	Local	Immediate Priority Projects	5 and 10 Year Period Projects
Salisbury Water Supply								
2015- 2017 WP0008	W-5		Expand Paleo Production	$ 40,576,000			2015	2017
2010- 2013 WP0011	W-3		Increase Paleo Well Field Production	$ 3,894,000			2010	2011
2010 - 2012 WP0028	W-3		Milford Street Water Tower	$ 4,702,000			2010	2012
2010-2014 WP0030	W-3		WWTP Water Tower	$ 3,192,000			2010	2016
2011 WP0033	W-3		New Park Wells & Raw Water Lines	$ 1,128,000			2011	2012
2010-2012 WP0036	W-3		Caustic Feed System	$ 1,200,000			2010	2014
Water Distribution								
2010-2011 WM0003	W-3		24" Water Main in Gordy Rd.	$ 1,700,000			2010	2013
2013 WM0005	W-4		24" Water Main in Naylor Mill Road	$ 1,156,000			2013	2015
2010 WM0006	W-3		12" Water Main in Naylor Mill Rd.	$ 200,000			2010	2015

TABLE 8
IMMEDIATE, 5, AND 10 YEAR PRIORITIES FOR WATER DEVELOPMENT

Fiscal Year and Project Number	County Priority Assigned	Coordinate Location	Description	Estimated Costs*			Project Status Construction Start	
				Total	Federal and/or State	Local	Immediate Priority Projects	5 and 10 Year Period Projects
Maintenance								
2011 - 2019 WP0009	W-3		Replace Park/East Main St Aeration Trays	$ 300,000			2011	2021
2010-2019 WP0012	W-3		Restore Park Well Field	$ 1,800,000			2010	2021
2010-2013 WP0018	W-3		Retrofit Wells with Auxillary Power	$ 320,000			2010	2015
2010-2013 WP0025	W-3		Restore Paleo Well Field	$ 440,000			2010	2015
2010 WP0026	W-3		Office trailer at Paleo Water Plant	$ 80,000			2010	2011
2017 WP0034	W-5		Park Water Treatment Plant Upgrade	$ 3,100,000			2017	2019
2018 WP0035	W-5		Edgemore Water Tower	$ 100,000			2018	2019
2013-2014 WM0008	W-3		Replace Isabella St. Water Main/Phase II	$ 169,000			2013	2016
2010-2019 WM0010	W-3		Replace Undersized Distribution Piping	$ 300,000			2010	2021
2013-2014 WM0012	W-4		Replace Isabella Street Water main Phase III	$ 125,000			2013	2016
2012 WM0013	W-4		Replace West Isabella St. Water Main	$ 210,000			2012	2015

TABLE 8
IMMEDIATE, 5, AND 10 YEAR PRIORITIES FOR WATER DEVELOPMENT

Fiscal Year and Project Number	County Priority Assigned	Coordinate Location	Description	Estimated Costs*			Project Status Construction Start	
				Total	Federal and/or State	Local	Immediate Priority Projects	5 and 10 Year Period Projects
2012-2019 WM0014	W-4		Replace Cast Iron Piping - Systemwide	$ 10,390,000			2012	2021
2015 WM0017	W-5		Replace Scenic Drive PCCP Pipe	$ 200,000			2015	2015
2010-2011 WM0020	W-3		Replace East Main Street Water Main	$ 261,000			2010	2013
2010	W-3		West Water Tower	$ 1,700,000			2010	2012
Fruitland								
2013-2014	Final Planning (W-4)	179,900 N 1,199,200 E 176,700 N 1,195,000 E 176,700 N 1,193,500 E	8" & 10" water main extensions in southeast and southwest section within corporate limits along & adjacent to Cedar Lane, Brown St. & U.S. Route 13	$ 110,000	-	110,000		2014
2013-2014	Final Planning W-4	182,000 N 1,190,000 E	8",10", & 12" water main extensions throughout corporate limits	$ 200,000	N/A	200,000		2014
2013-2014	W-3	N/A	Additional water storage on east side of Rt. 13				2013	

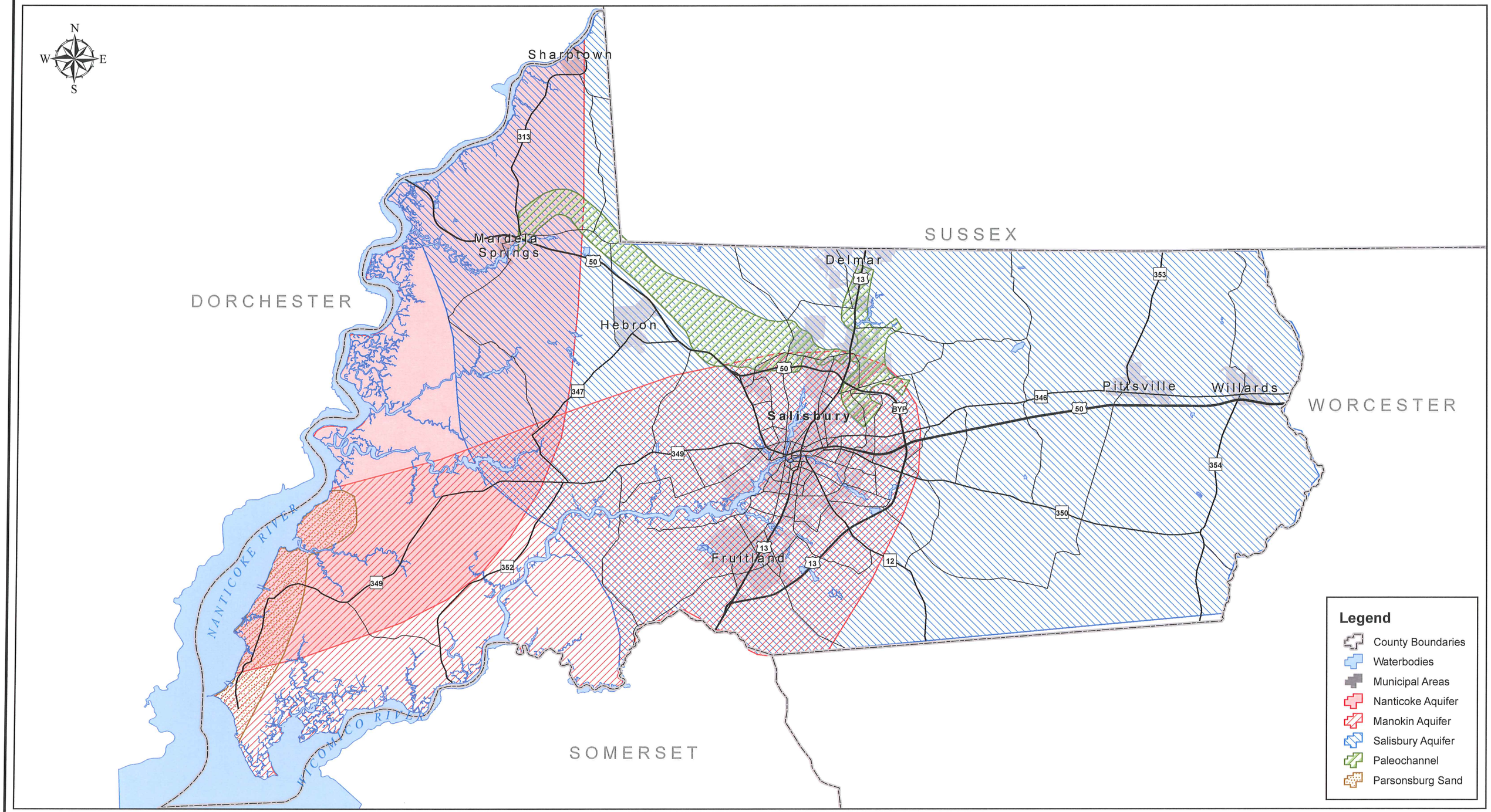
TABLE 8
IMMEDIATE, 5, AND 10 YEAR PRIORITIES FOR WATER DEVELOPMENT

Fiscal Year and Project Number	County Priority Assigned	Coordinate Location	Description	Estimated Costs*			Project Status Construction Start	
				Total	Federal and/or State	Local	Immediate Priority Projects	5 and 10 Year Period Projects
Delmar								
2008-2012	W-3	N/A	Extension into other areas of proposed development					
2007-2013	W-4	N/A	Replacement of small mains throughout town					
Hebron								
2006-2016	W-5	N/A	Extension of distribution system to serve newly developed areas within town					
Sharptown								
2012	W-3	N/A	Water Main Extensions to Accommodate Future Growth					
2008-2018	W-5	N/A	Remove three 2" Pipes at Dead Ends and Replace with 6" Pipes with Hydrants					
Willards								
None								
Pittsville								
2008-2012	W-3	N/A	Water Main Extensions to Accommodate Future Growth					
2008 - 2011	W-3	209,000 N 1,254,500 E	WTP Upgrades					

TABLE 9
INVENTORY OF EXISTING SHARED /COMMUNITY FACILITIES

Shared or Community System	Type of System	Size of System (GPD)	Age of System	MDE Permit Number	Households Served	Current Nutrient Loading	Watershed
Steeplechase Subdivision	Private	75,000	1994	#04-DP-1221	300	0	LWR.
Nutters Crossing Subdivision (Clubhouse)	Private	6,800	1991	#04-DP-3380	N/A	0	LWR.
Nutters Crossing Subdivision (Section 4, 5 and part of 3)	Private	280,000	Proposed	#04-DP-3380	325	0	LWR.
Perdue Farms	Wells	285,000	1972	#05-DP-0359	N/A	0	WRH.
Nanticoke Seafood	Wells	6,300	Unknown	#07-DP-1297	*Not currently operational	N/A	NR.

WICOMICO COUNTY WATER and SEWER PLAN

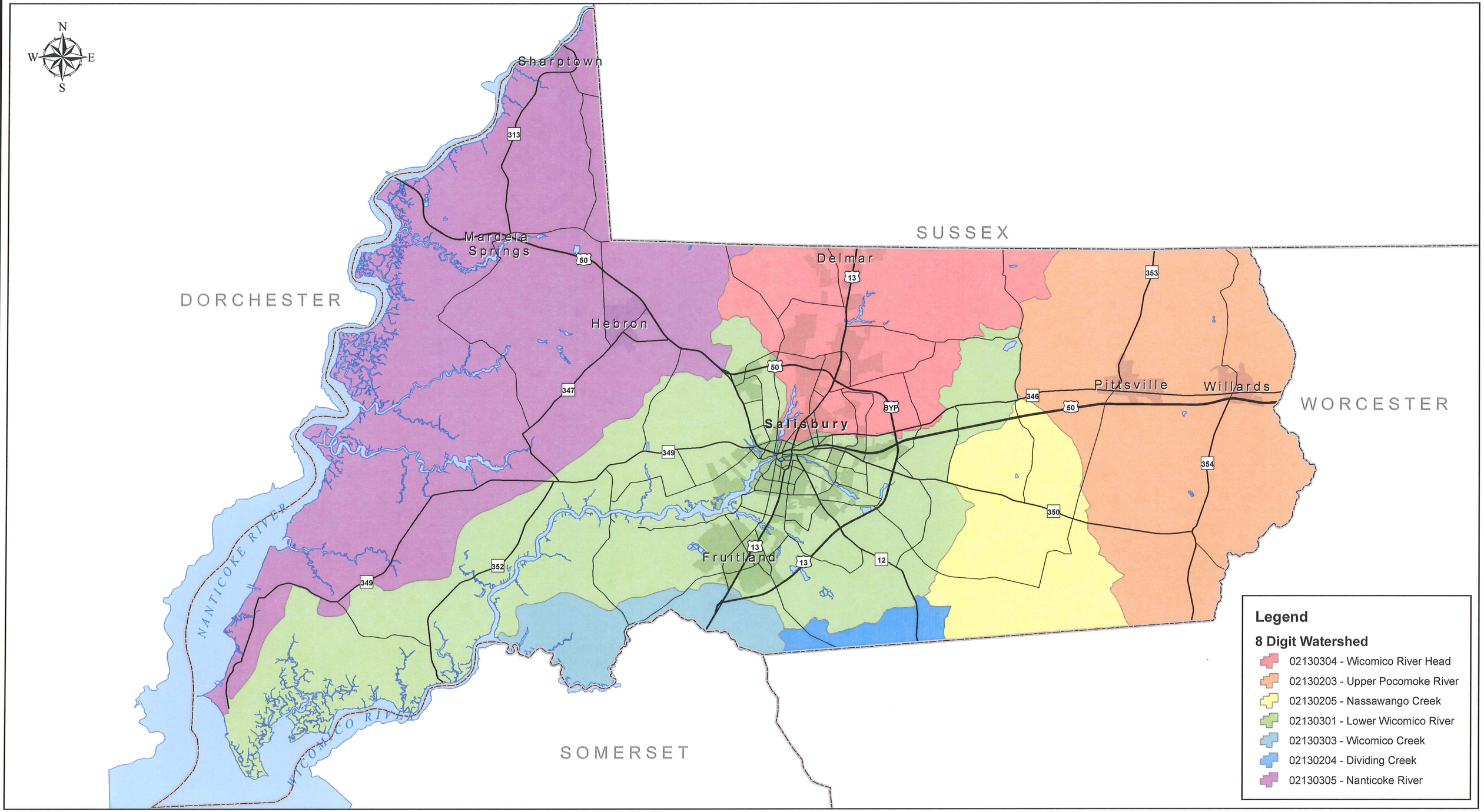


Scale 1" = 15,000'

0 15,000 30,000 45,000 60,000 Feet

PRINCIPAL AQUIFERS

WICOMICO COUNTY WATER and SEWER PLAN

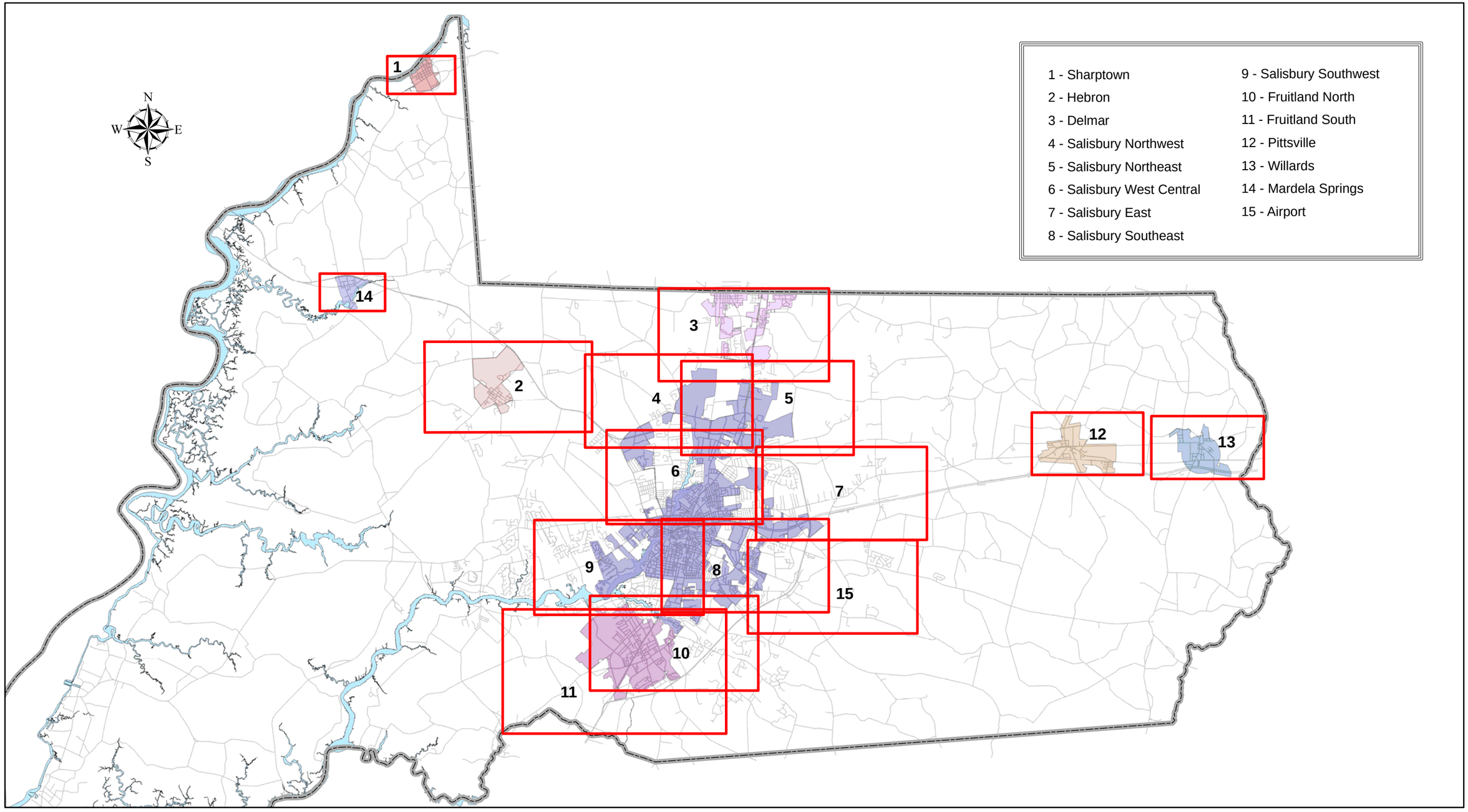


Scale 1" = 15,000'

0 15,000 30,000 45,000 60,000 Feet

8 DIGIT WATERSHEDS

WICOMICO COUNTY WATER PLAN



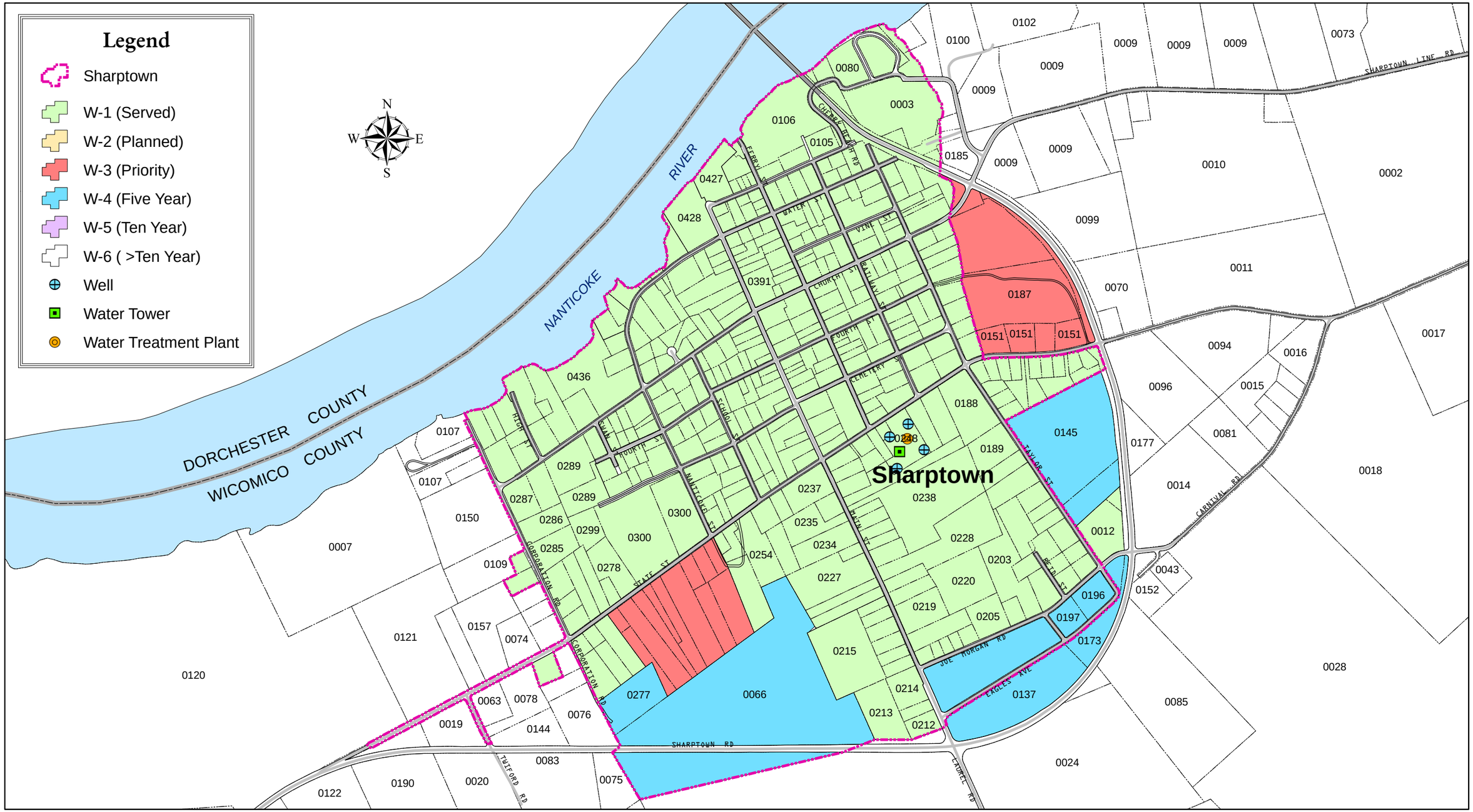
Scale 1" =13000'

0 6,500 13,000 26,000 39,000 Feet

KEY TO VICINITY MAPS FOR WATER SERVICE AREAS

wico_sewerservice.mxd - DM 4/20/2010

WICOMICO COUNTY WATER and SEWER PLAN



Scale 1" = 600'

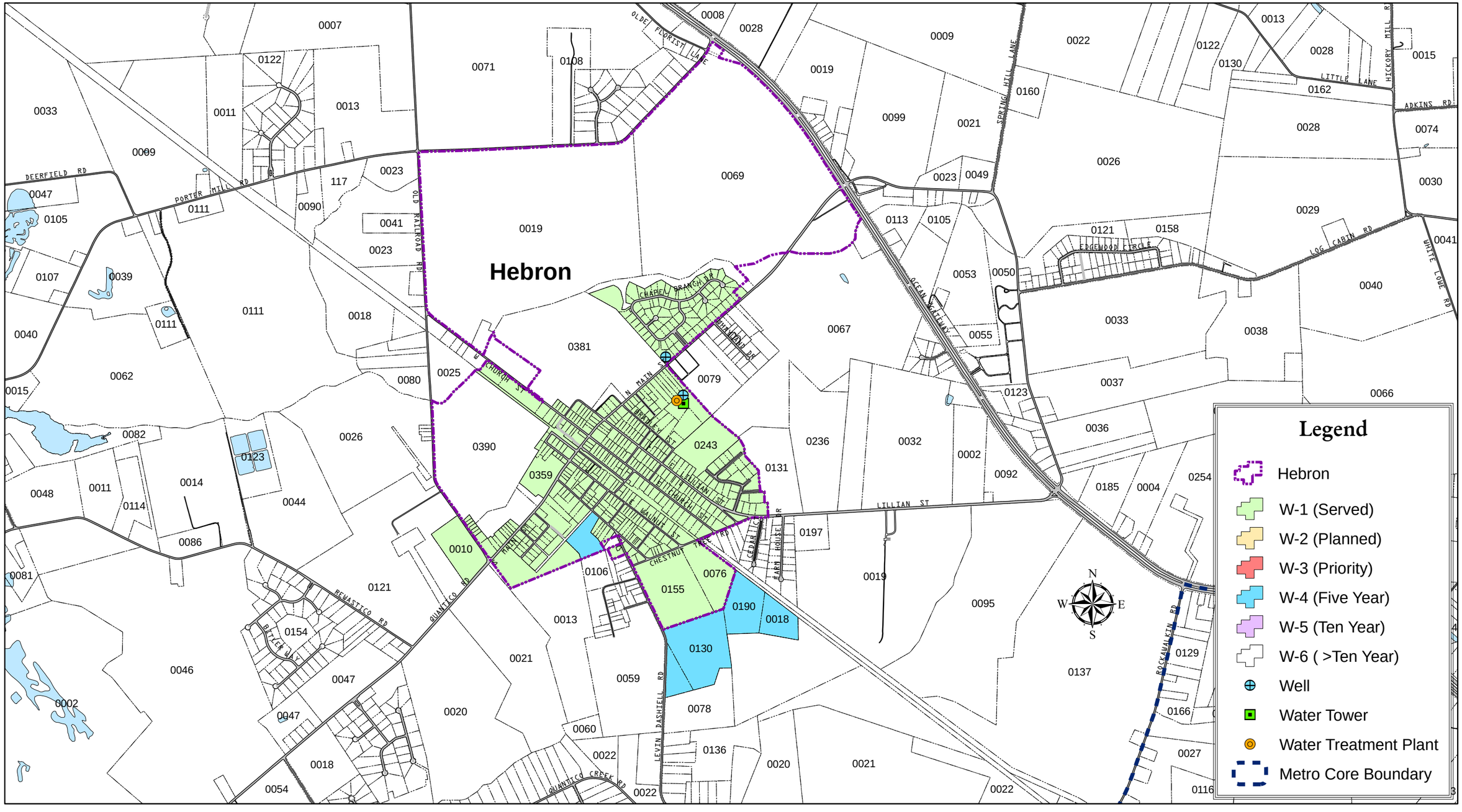
0 300 600 1,200 1,800 Feet

WATER SERVICE AREAS - SHARPTOWN VICINITY

2010
Map 1

wico_waterservice.mxd - DM 4/20/2010

WICOMICO COUNTY WATER and SEWER PLAN



Scale 1" = 1500'

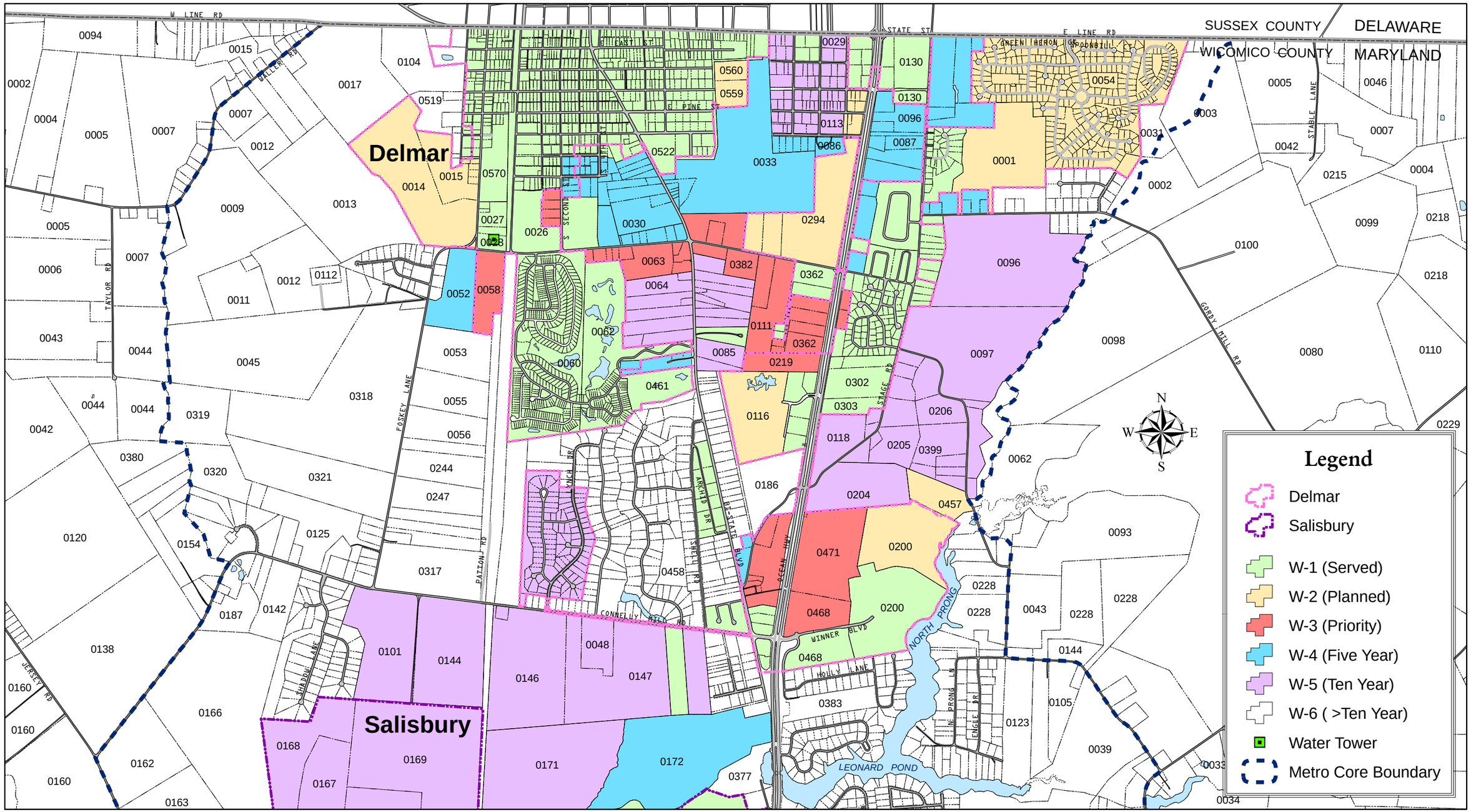
0 750 1,500 3,000 4,500 Feet

WATER SERVICE AREAS - HEBRON VICINITY

2010
Map 2

wico_waterservice.mxd - DM 4/20/2010

WICOMICO COUNTY WATER and SEWER PLAN



Scale 1" = 1500'

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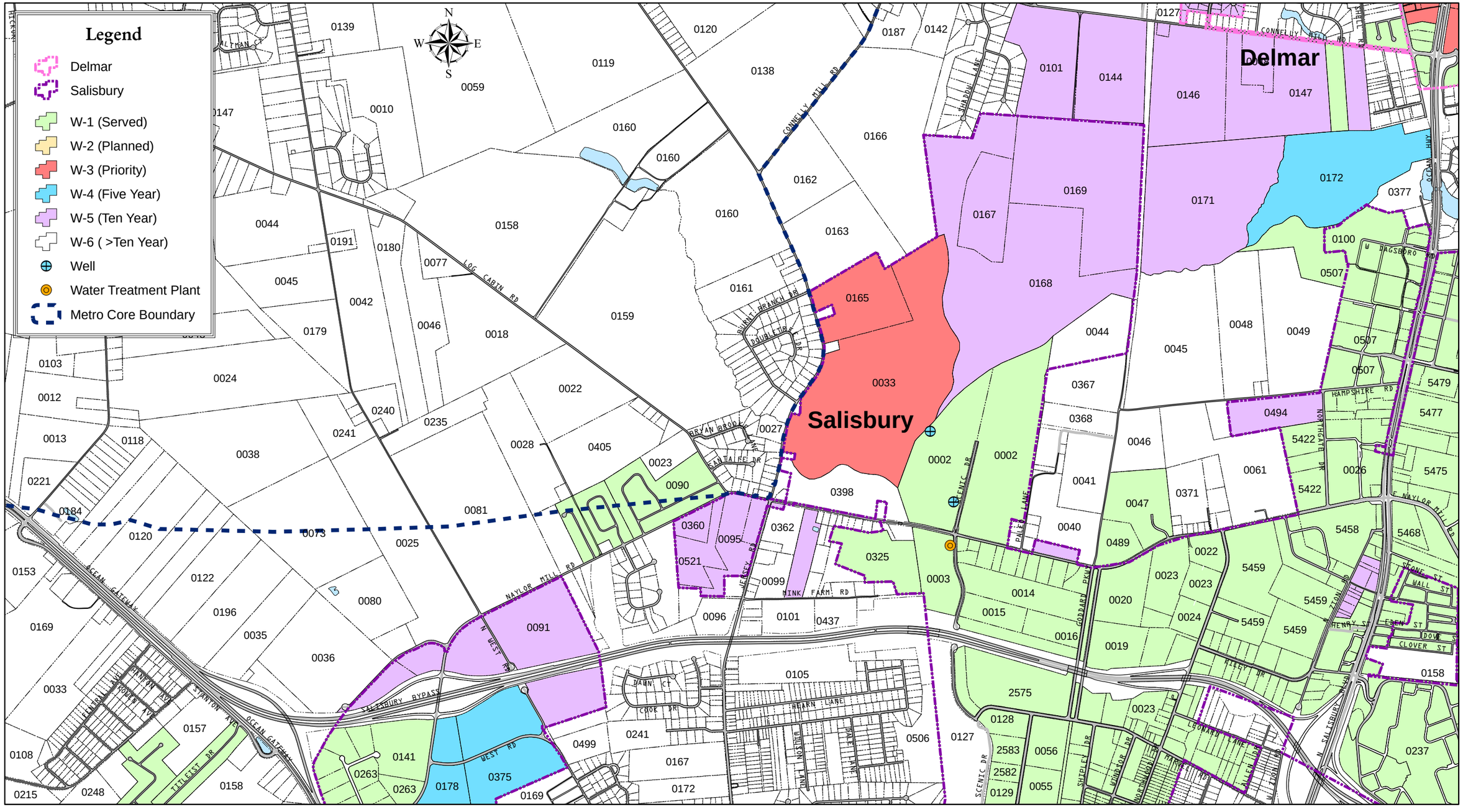
WATER SERVICE AREAS - DELMAR VICINITY

2010
Map 3

wico_waterservice.mxd - DM 4/20/2010

WICOMICO COUNTY WATER and SEWER PLAN



Scale 1" = 1500'

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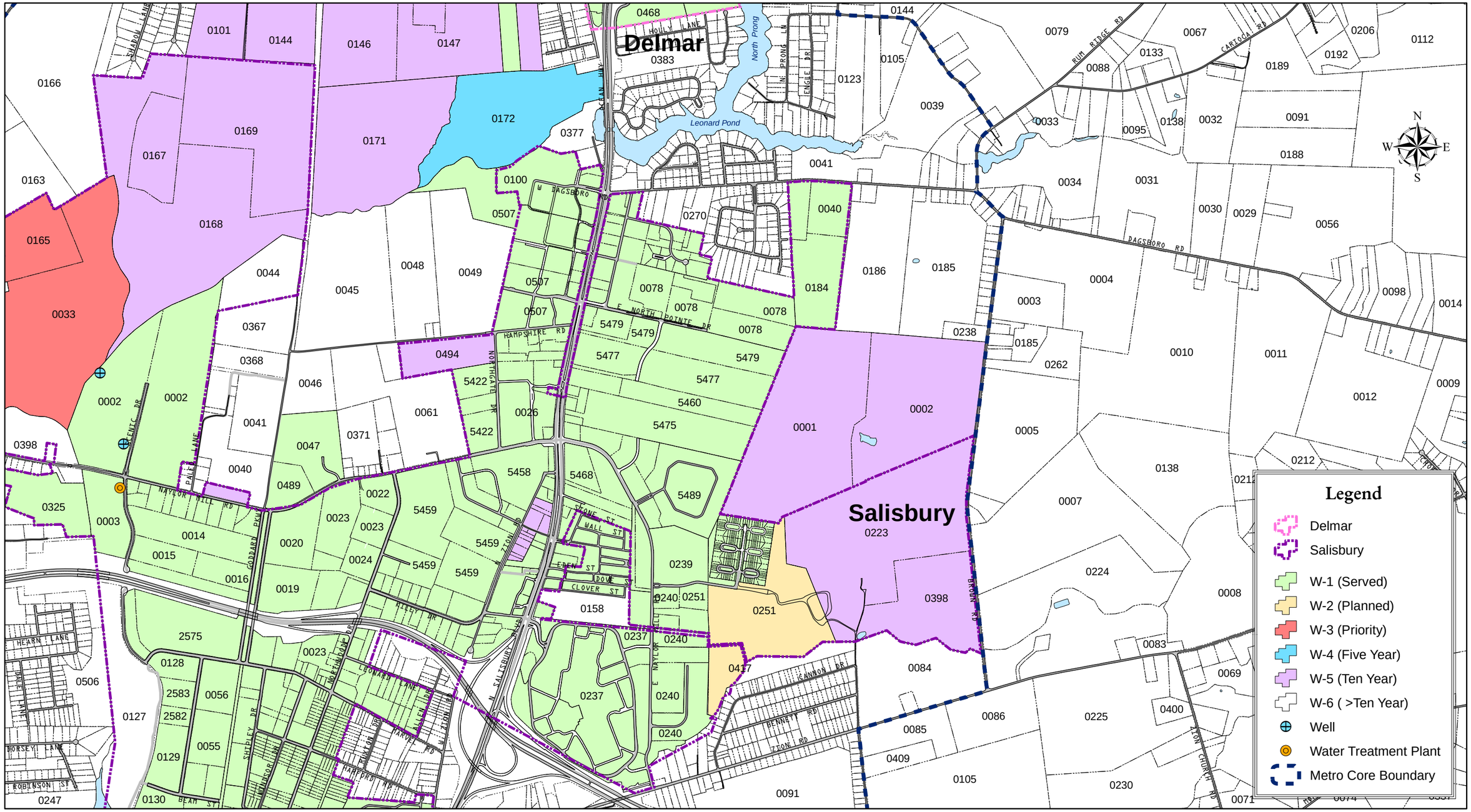
WATER SERVICE AREAS - SALISBURY NORTHWEST VICINITY

2010
Map 4

wico_waterservice.mxd - DM 4/20/2010

WICOMICO COUNTY WATER and SEWER PLAN



Scale 1" = 1500'

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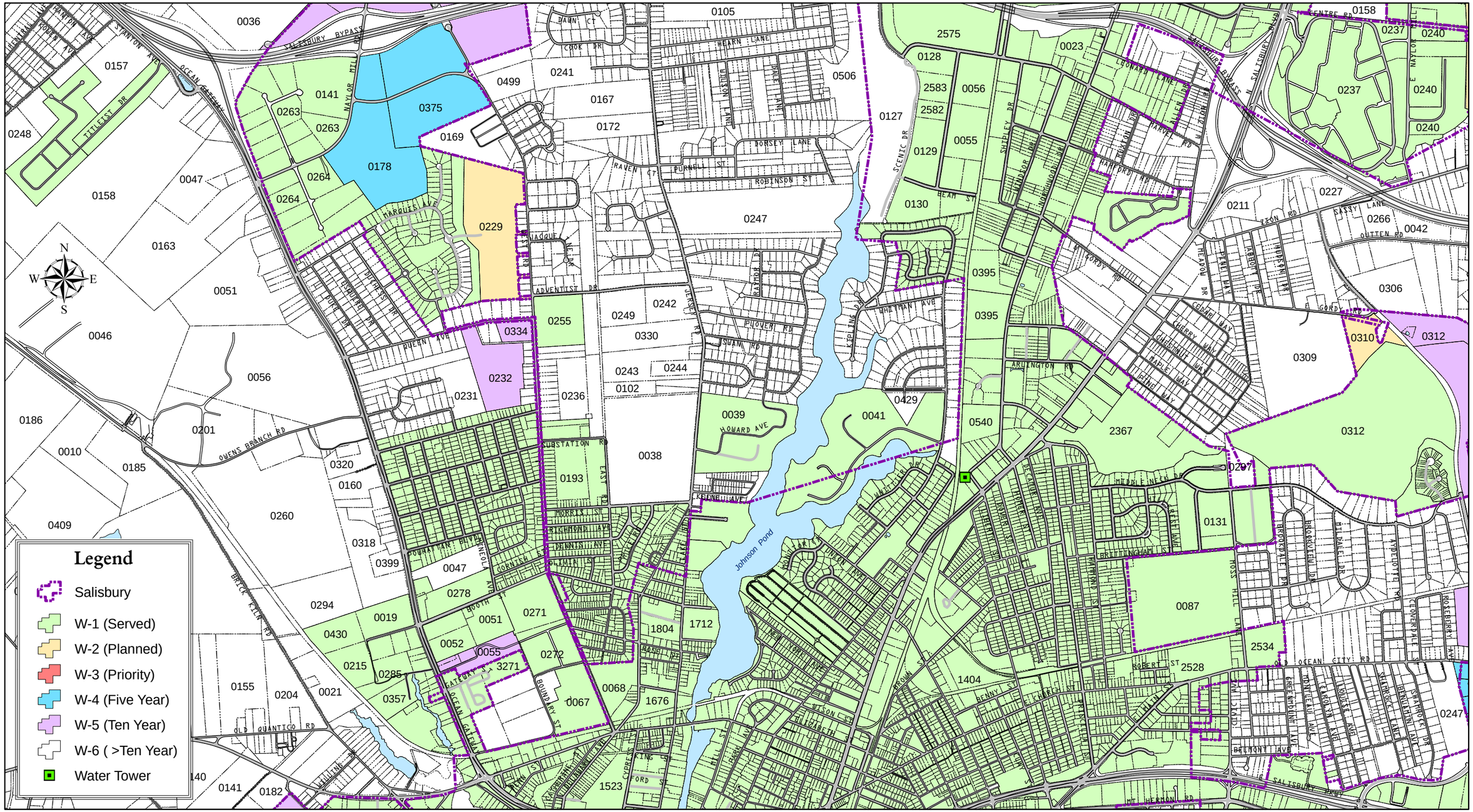
WATER SERVICE AREAS - SALISBURY NORTHEAST VICINITY

2010
Map 5

wico_waterservice.mxd - DM 4/20/2010

WICOMICO COUNTY WATER and SEWER PLAN



Scale 1" = 1500'

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WATER SERVICE AREAS - SALISBURY WEST CENTRAL VICINITY

2010
Map 6

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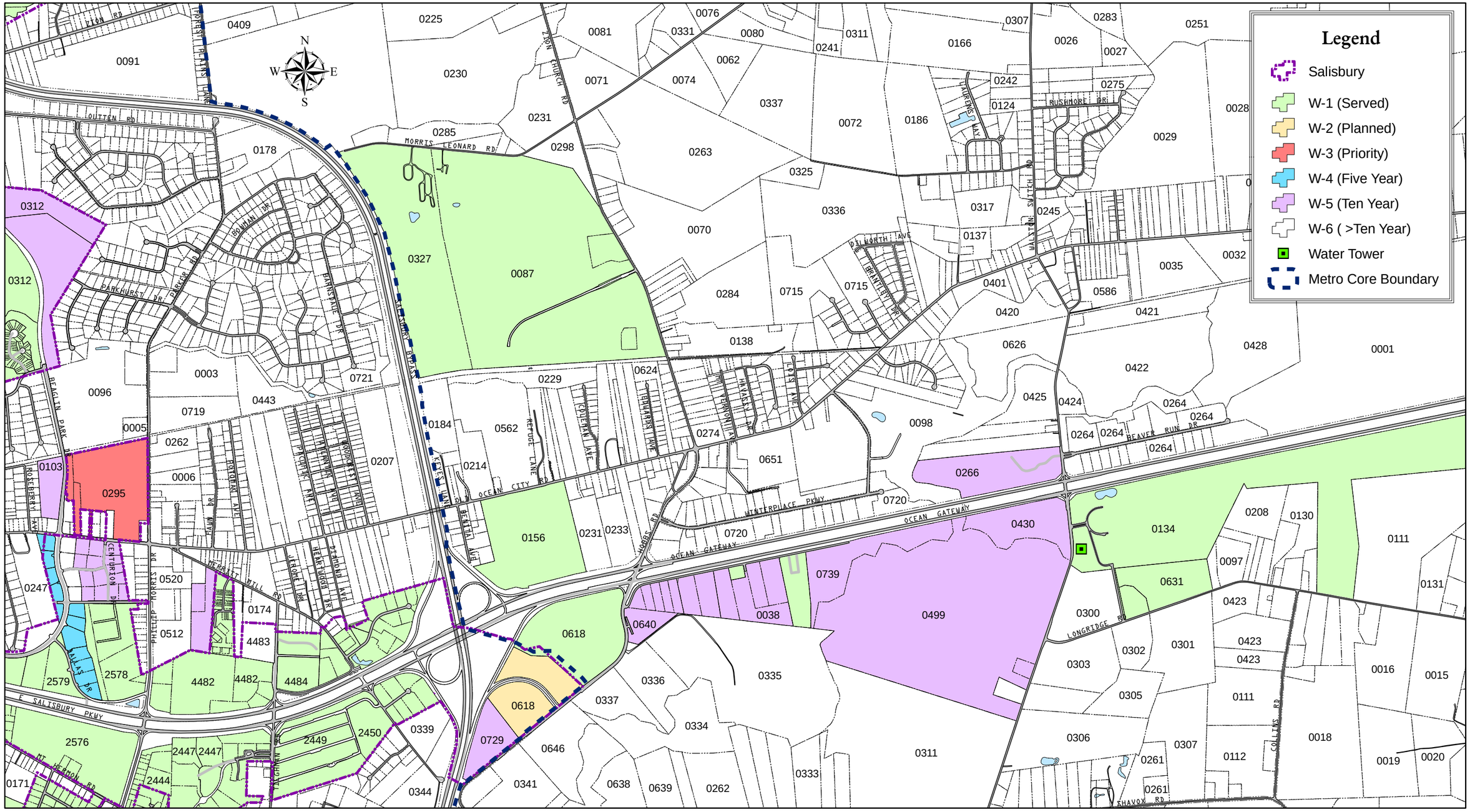
WICOMICO COUNTY WATER and SEWER PLAN



Scale 1" = 1500'

0 750 1,500 3,000 4,500 Feet

WATER SERVICE AREAS - SALISBURY EAST VICINITY

2010
Map 7

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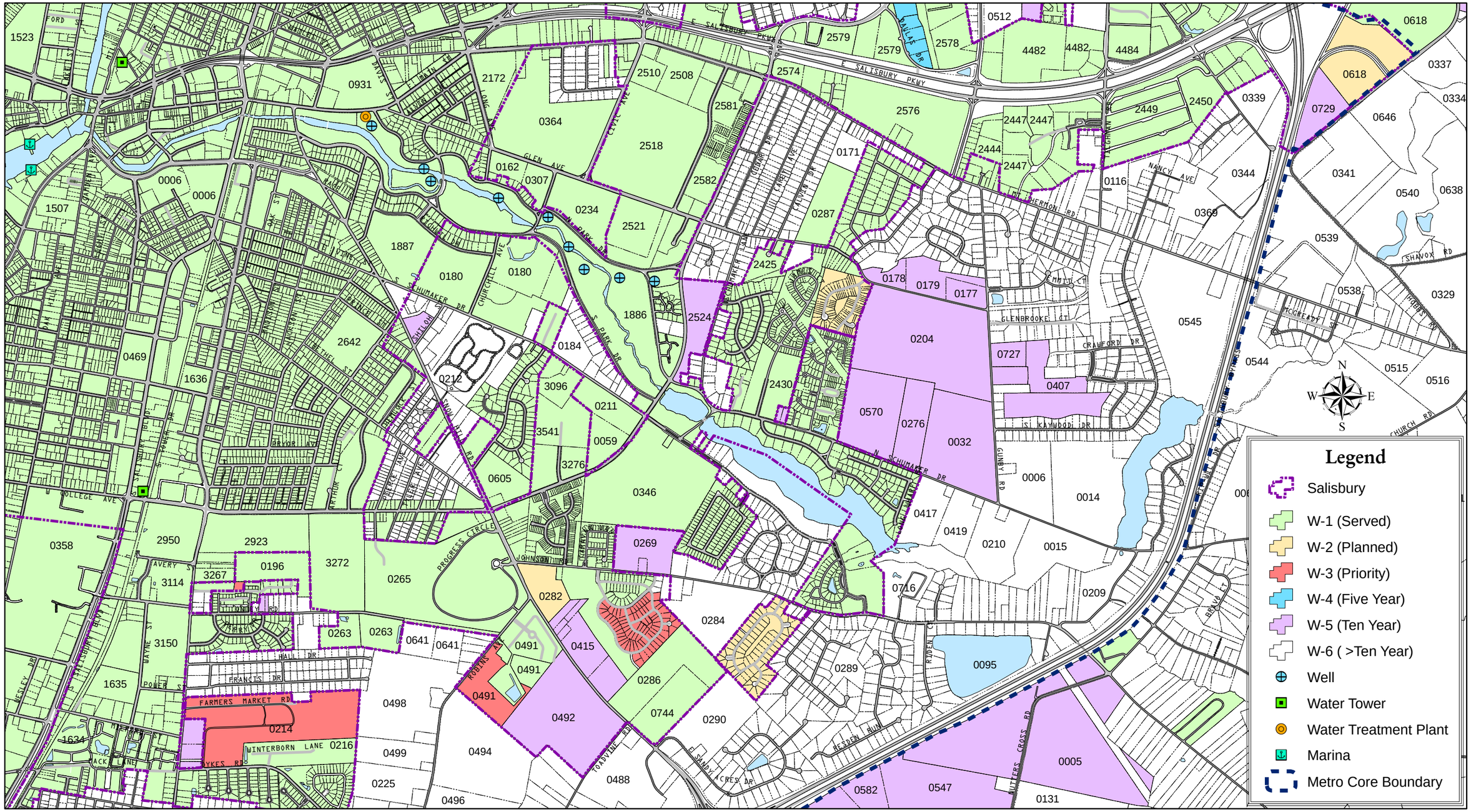
WICOMICO COUNTY WATER and SEWER PLAN



Scale 1" = 1500'

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WATER SERVICE AREAS - SALISBURY SOUTHEAST VICINITY

2010
Map 8

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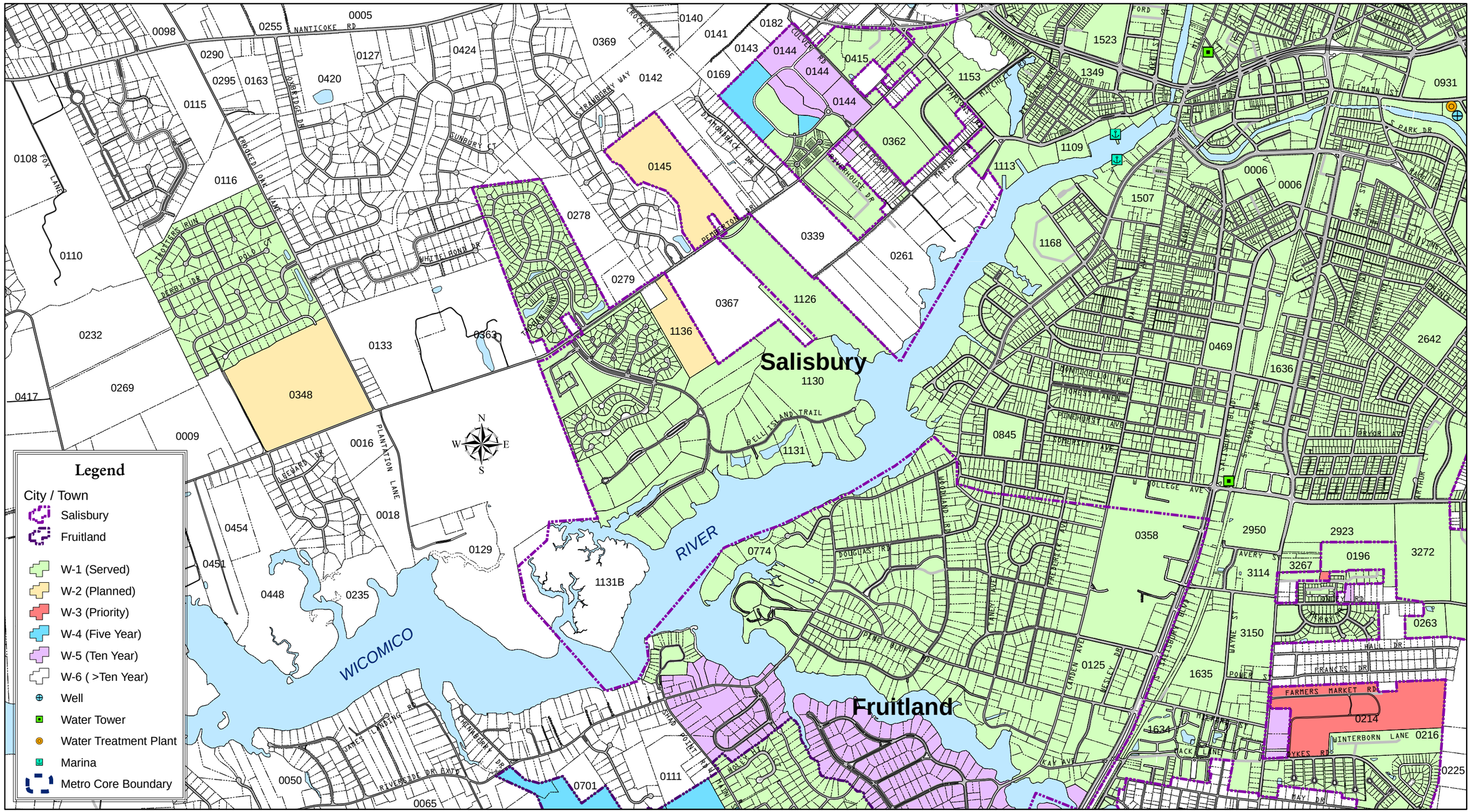
WICOMICO COUNTY WATER and SEWER PLAN



Scale 1" = 1500'

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WATER SERVICE AREAS - SALISBURY SOUTHWEST VICINITY

2010
Map 9

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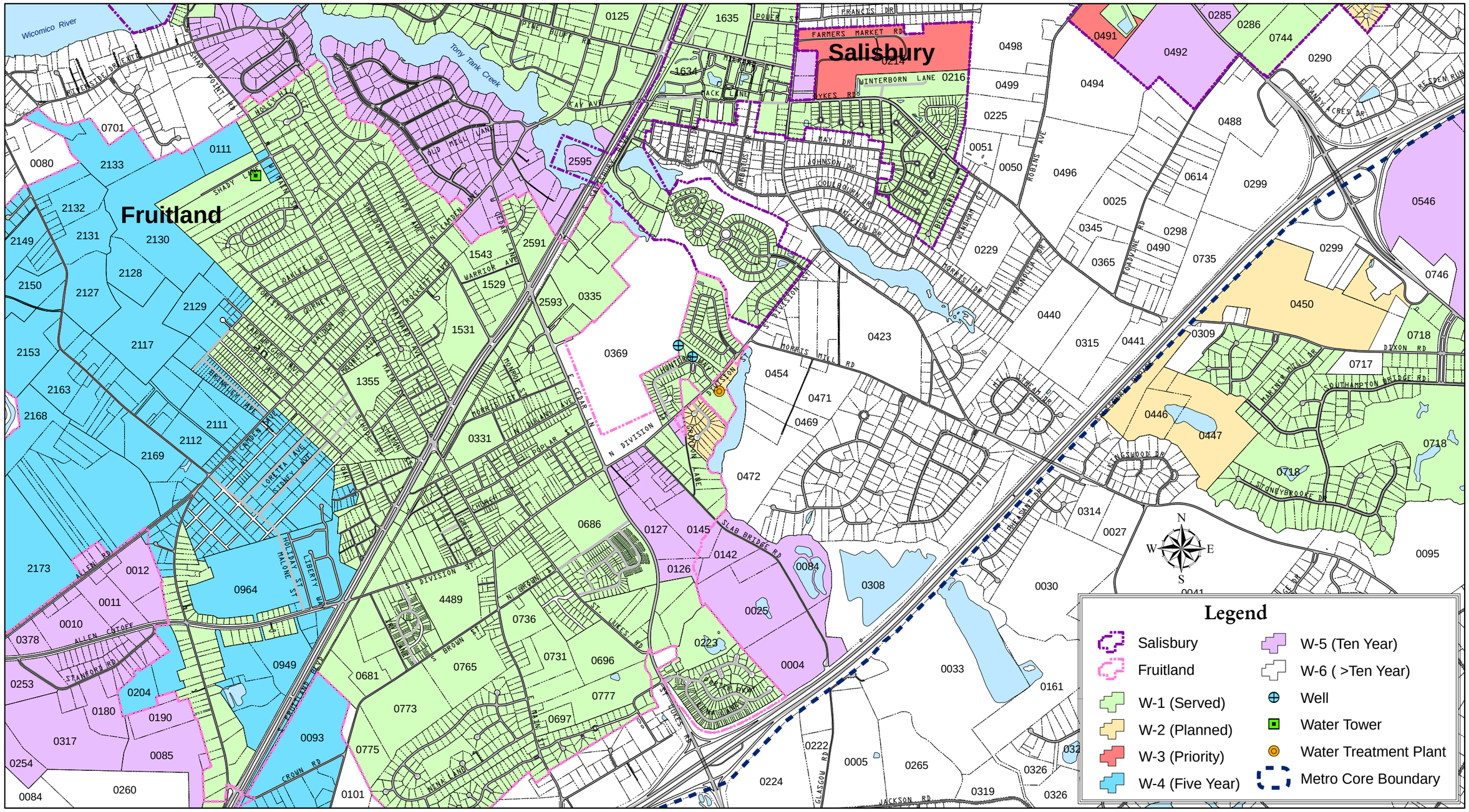
WICOMICO COUNTY WATER and SEWER PLAN



Scale 1" = 1500'

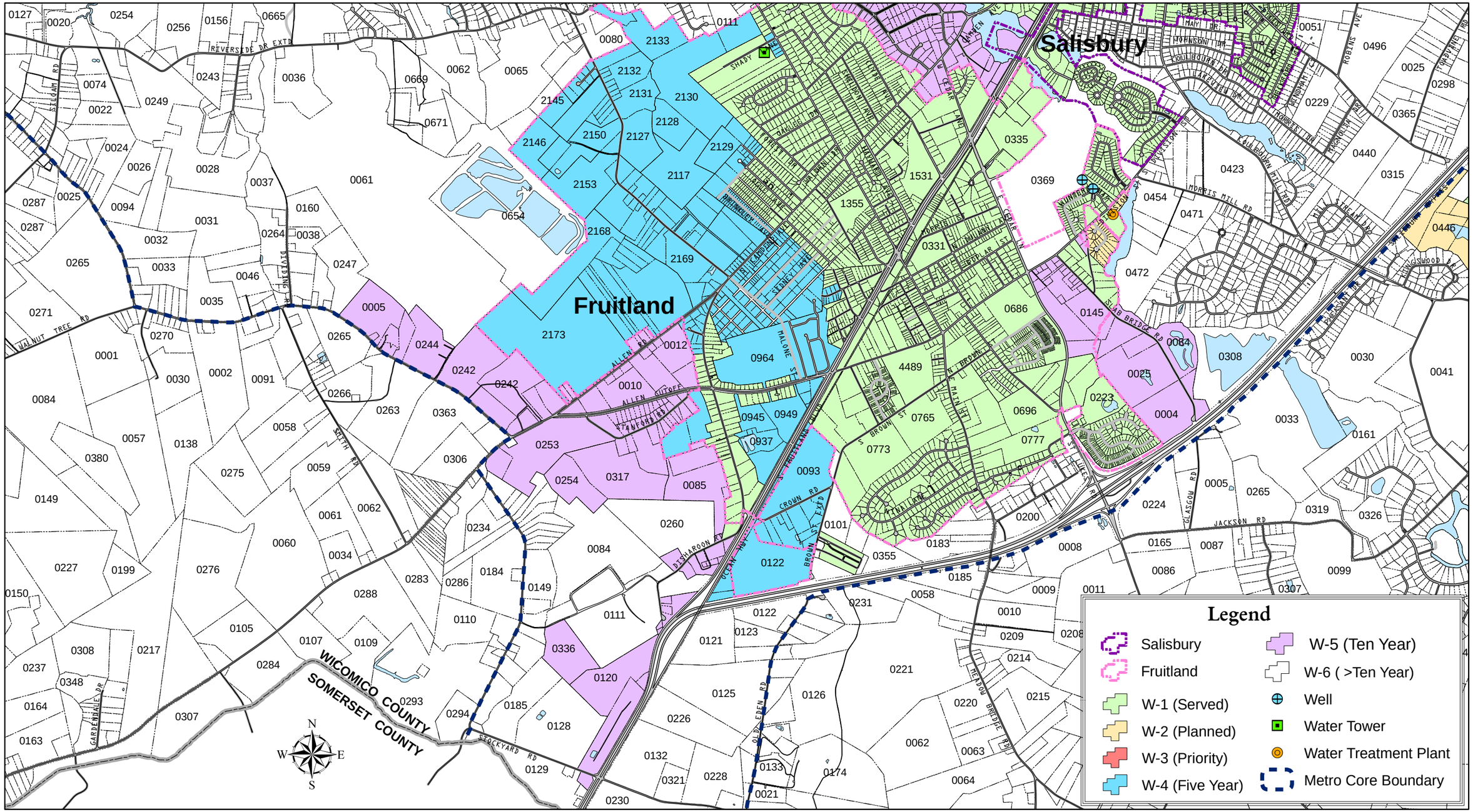
0 750 1,500 3,000 4,500 Feet

WATER SERVICE AREAS - FRUITLAND NORTH VICINITY

2010
Map 10

wico_waterservice.mxd - DM 4/20/2010

WICOMICO COUNTY WATER and SEWER PLAN



Scale 1" = 2000'

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WATER SERVICE AREAS - FRUITLAND SOUTH VICINITY

2010
Map 11

wico_waterservice.mxd - DM 4/20/2010

WICOMICO COUNTY WATER and SEWER PLAN

Pittsville

Legend

- Pittsville
- W-1 (Served)
- W-2 (Planned)
- W-3 (Priority)
- W-4 (Five Year)
- W-5 (Ten Year)
- W-6 (>Ten Year)
- Well
- Water Tower
- Water Treatment Plant

Scale 1" = 1000'

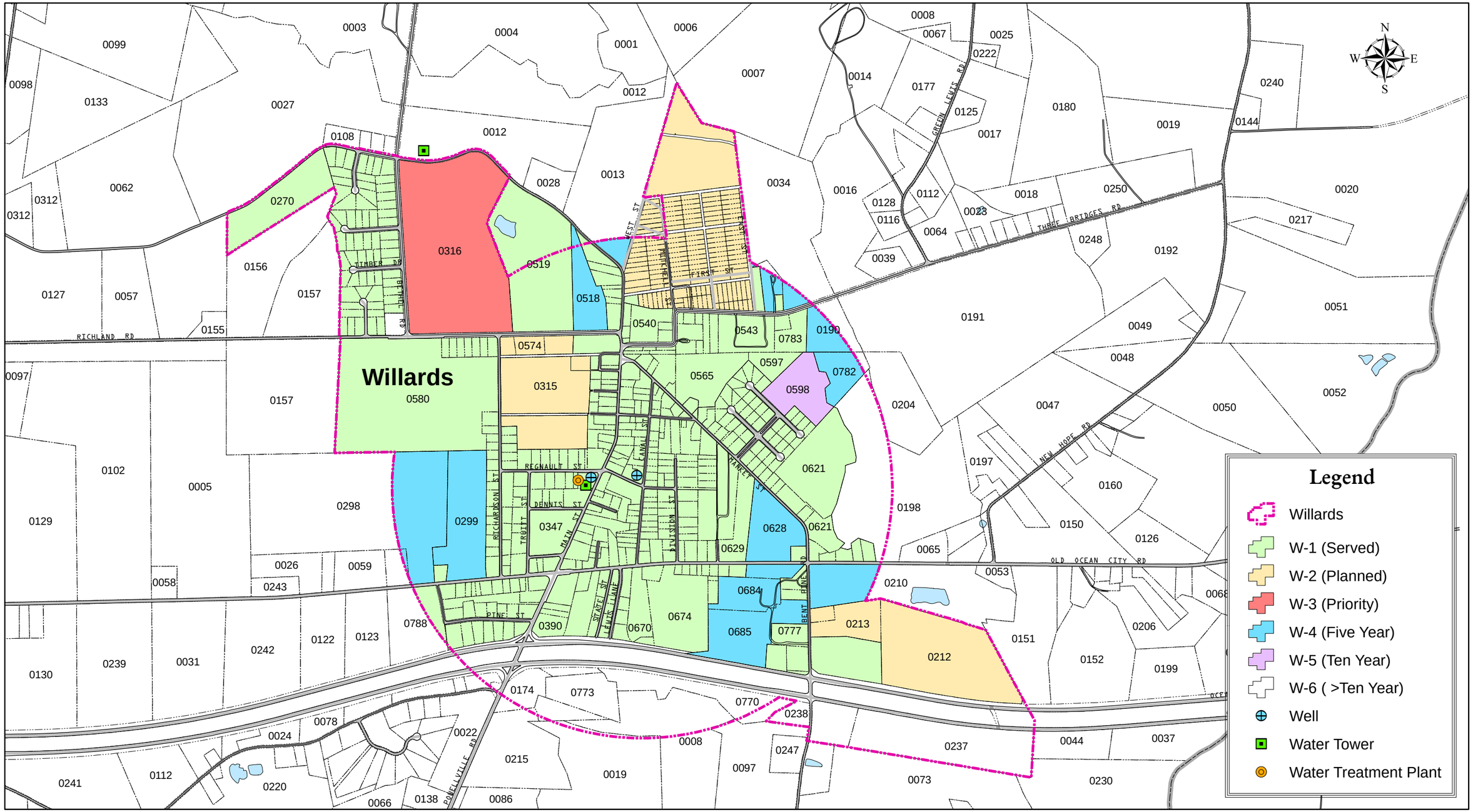
0 500 1,000 2,000 3,000 Feet

WATER SERVICE AREAS - PITTSVILLE VICINITY

2010
Map 12

wico_waterservice.mxd - DM 4/20/2010

WICOMICO COUNTY WATER and SEWER PLAN



Scale 1" = 1000'

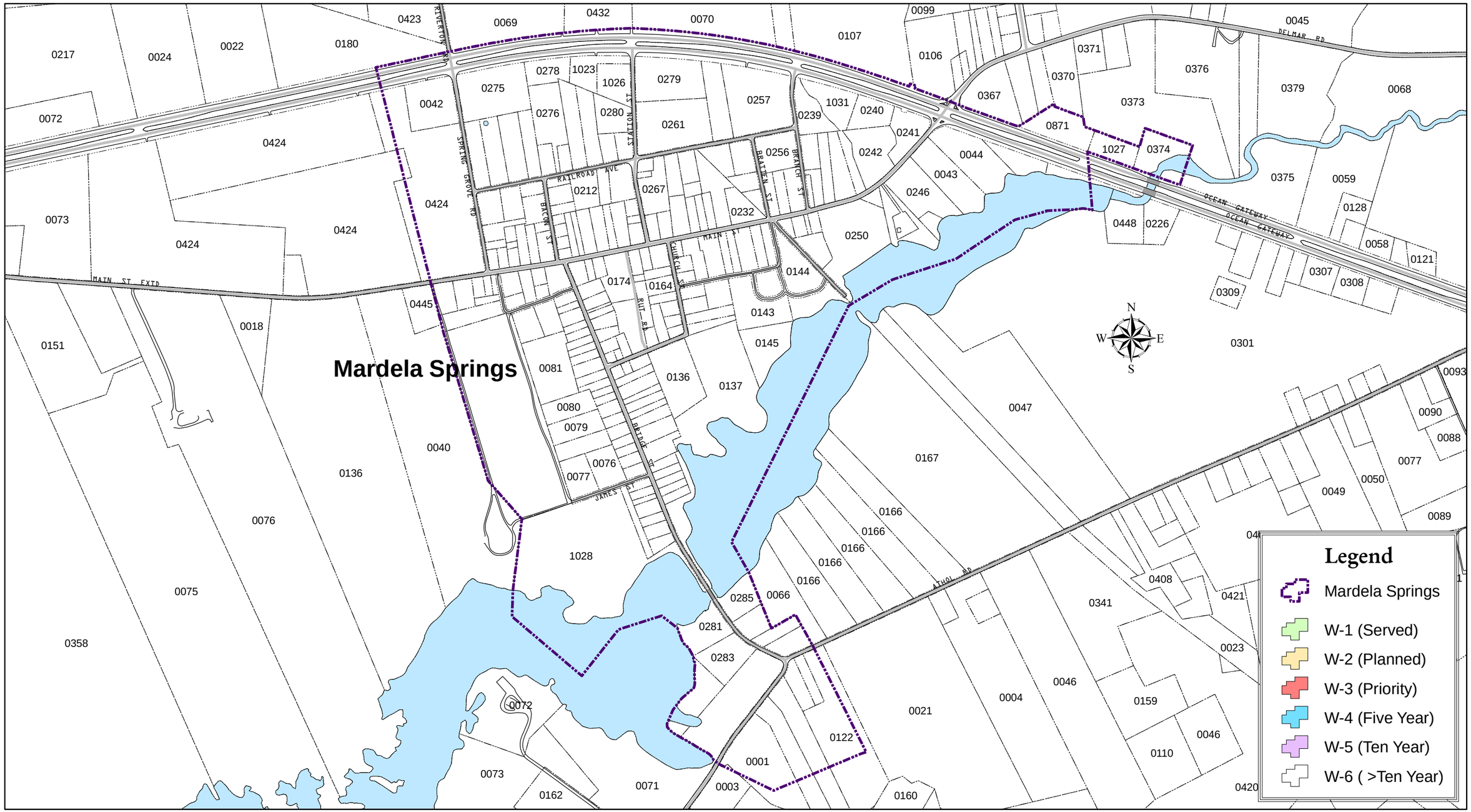
0 500 1,000 2,000 3,000 Feet

WATER SERVICE AREAS - WILLARDS VICINITY

2010
Map 13

wico_waterservice.mxd - DM 4/20/2010

WICOMICO COUNTY WATER and SEWER PLAN



Scale 1" = 600'

0 300 600 1,200 1,800 Feet

WATER SERVICE AREAS - MARDELA SPRINGS VICINITY

2010
Map 14

wico_waterservice.mxd - DM 4/20/2010

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4.1 GENERAL

Wicomico County's future growth is dependent on the development of improved methods for wastewater treatment and disposal. Also, the County and the incorporated communities are faced with the problem of adequately handling and disposing of sewage sludge generated at the treatment facilities and of septic sludge pumped from individual septic disposal systems. Private on-site sewage disposal systems are subject to the Groundwater Protection Report prepared by the State of Maryland in 2006 which attempts to maintain a minimum separation between these systems and groundwater. The underlying concept is that the density of the lot will help dilute the nitrogen contamination to a point that the nitrate levels are not elevated above the EPA maximum contaminant level of 10 ppm. The State has issued an initiative under the Bay Restoration Fund to install pre-treatment units in on-site disposal systems to further reduce the nitrogen levels.

The location of the existing and planned sewer services are shown on attached maps found at the end of this Chapter. The sewer service categories are depicted on this map, but will continue to expand within the planned growth areas proposed in the County and Metro Core Comprehensive Plans.

The Maryland Department of the Environment published a Guidance Document entitled Wastewater Capacity Management Plans dated July 6, 2006. The purpose of the Guidance Document is to assist local governments and other community wastewater treatment plant (WWTP) owners in the State of Maryland to determine plant capacity and to track the remaining available capacity for allocation. The Guidance Document emphasizes the need to plan ahead to ensure that growth takes place without overloading

sewage facilities. The County encourages all sewer providers to follow the Guidance Documents.

4.2 PUBLIC SEWER SERVICE AREAS

4.2.1 Salisbury

The City of Salisbury has the largest concentration of population within Wicomico County and is served by an extensive sewerage collection system and an 8.5 MGD BNR/ENR wastewater treatment facility.

The present sewerage collection system is composed mainly of separate sanitary sewers throughout the Salisbury Service Area. Presently, the sewerage collection system is capable of serving the entire city and some adjacent "Urban Service Districts". Due to the generally flat topography of the area, all the wastewater must be pumped one or more times to the treatment facility located off Marine Road on the southwest side of the city.

The collection system includes forty-five (45) lift stations and two (2) major pumping stations. The lift stations pump the wastewater flows to gravity systems that eventually flow to the major pumping stations. The two (2) major pumping stations, North Side Station on Fitzwater Street and South Side Station on Ridge Road, pump the collected wastewater through force mains to the treatment facility. The design capacity of the North Side Station is 21.6 MGD (15,200 gpm) and of the South Side Station is 8.9 MGD (6,150 gpm). Currently, both of these stations have been operating satisfactorily with minimal raw sewage overflows recorded. Also, the City has developed an excellent schedule of routine maintenance to assure continued satisfactory service from these stations.

The wastewater collection system consists of a network of sewers, varying in size from 6-inches to 42-inches in diameter, covering the corporate limits and certain "Urban Service Areas" adjacent to the city. The existing system has sufficient capacity to adequately handle the normal wastewater flows.

The Salisbury Wastewater Treatment Plant came on line around 1955 and has been upgraded numerous times since. All flows to the Plant are pumped by off site pumping facilities. The flow is screened by mechanical bar screens; the screenings are dewatered by compression and conveyed to a dumpster for transfer to the landfill. The wastewater flow then enters conical grit chambers which allow the grit to settle to the bottom and the process flow to continue to the next unit; grit is pumped to a grit washer and the grit conveyed to a dumpster for disposal at the landfill. The next process is primary clarification; in these clarifiers the wastewater particles are again allowed to settle and this time the biological mass that settles to the bottom is generally referred to as sludge; the sludge is pumped to holding tanks. From the primary clarifiers the wastewater flows to the internal Recycle Pumping Station which pumps the flow to the Anoxic Filters. The Anoxic Filters are large tanks filled with submerged plastic media which provides attachment surface for the working biomass which converts the nitrates to nitrogen, in these tanks the flow progresses from the bottom to the top of the tank; these tanks require anaerobic conditions or no free oxygen in the wastewater. As flow reaches the top of the Anoxic Filters, it flows by pipe to a distribution tower where the flow is then directed to the Oxic Filters; these filters contain plastic media to provide surface for the biomass and flow is distributed over the top of the media by rotating distributors. In these tanks ammonia is converted to nitrates and this process requires good oxygen

transfer. Flow from the Oxic Filters goes two directions: most is returned to the Internal Recycle Pumping Station since the nitrates must be converted to nitrogen to remove the nitrogen from the wastewater. The remaining flow goes to the secondary clarifier where settleable biomass is removed as sludge; the wastewater flow then goes to the effluent pumping station where it is pumped to the effluent sand filters. These sand filters remove the remaining nitrates and fine particles to ensure a clear effluent. This effluent is aerated and then treated by ultraviolet disinfection and then flows to the underwater diffuser in the Wicomico River. Phosphorus removal is achieved by chemical precipitation in the clarifiers.

The biomass removed as sludge from the clarifiers is pumped to holding tanks. This sludge is then pressed by a belt filter press to produce a cake which can be hauled to the landfill. Also the cake can be dried by sludge dryer to a very dry product that can meet Class A sludge standards, which permits disposal at locations other than the landfill.

Strict enforcement of the City's industrial pre-treatment regulations for each industrial discharge has significantly reduced the solid loadings that must be handled at the plant. This has consequently reduced odor complaints and improved treatment.

Average wastewater flow was 4.7 MGD in 2008 at the wastewater treatment facility. One industry, Perdue Foods, Inc. constitutes the major significant industrial contribution to the wastewater system, averaging approximately 1.2 MGD. This industry alone contributes about a quarter of the total wastewater flow conveyed to the wastewater treatment plant.

As discussed previously, Salisbury is the largest municipality in Wicomico County and has the greatest growth potential, with a projected population through the

year 2020 of approximately 35,000 people. The Salisbury sewerage system serves the entire population within the city limits as well as several "Urban Service Districts" and out of city customers.

Previous upgrades of the existing wastewater treatment facility were performed in order to comply with the requirements outlined in the NPDES Permit. These upgrades involved not only improving the quality of the discharge effluent to meet the new federal requirements, but also outlined a method of sludge handling and disposal practices via land application of sludge to farmland.

Current plans for Salisbury's WWTP include a capacity expansion and increased quality treatment. The first phase included expansion from 6.8 to 8.5 MGD and was completed in 2008. The upgraded plant utilizes biological and chemical processes to treat wastewater to meet Enhanced Nutrient Removal standards. The design capacity of the facility is 8.5 MGD with sufficient hydraulic capacity to handle approximately 30 MGD during rainfall events. The upgraded plant is in the start up and evaluation phase. The second phase of the capacity expansion upgrade will enable the daily average flow to increase to 10.2 MGD with a peak flow of approximately 30 MGD. The second phase of the expansion will require County approval as described in Item 8 of the City of Salisbury Resolution 784 and Wicomico County Resolution 530. With this upgrade, areas designated by the Health Department as "failing septic areas" will be served by the City.

All available acreage for the existing wastewater treatment plant may be utilized in the future upgrade. The Little League Park, on Pemberton Drive, currently occupies a portion of the original plant property; however the park may be relocated if necessary.

Options for future treatment plant expansions are necessary to sustain further capacity and quality treatment upgrades.

In order to relieve existing individual septic system problems and to adequately handle anticipated and existing development in the eastern portions of the City's service areas, a 30 inch Interceptor running from North Park Drive and Beaglin Park Drive via College Avenue to South Side Pumping Station has been constructed along with a 24" extension terminating at Phillip Morris Drive and Route 50.

Sewage in this portion of the collection system flows by gravity directly to the South Side Pumping Station and interconnects with the already existing interceptor along Beaglin Park Drive. With the completion of these projects sewerage service is now available to commercial or residential development, either existing or planned, within the eastern Salisbury Service Area without overloading the collection system.

4.2.2 Fruitland

The City of Fruitland owns and operates an advanced secondary BNR (biological nutrient removal) wastewater treatment plant on West Main Street along with the related sewerage collection system. This wastewater treatment plant was placed in service in December of 2002 and is designed to ultimately serve a population of 10,000 people.

Fruitland's collection system is comprised of 8-inch, 10-inch, and 15-inch gravity sewers that flow to a pumping station at Clyde Avenue. The Clyde Avenue Station is equipped with three centrifugal pumps, each having a capacity of 900 gpm (1.3 MGD), which pumps the sewage through a 10-inch force main directly to the fine screens at the treatment plant.

The northeast quadrant of the collection system is currently served by three pump stations with a fourth station under construction. NE Pump Station #1 is located at 107 East Cedar Lane and is a duplex submersible lift station rated at 500 gpm (0.72 MGD). NE Pump Station #3, currently under construction, is located at 607 St. Luke's Road and is a duplex submersible lift station rated at 276 gpm (0.476 MGD). The "Meadowbrook" Pump Station is located at 532 North Division Street and serves the Meadowbrook and Hunt Club South subdivisions. This station is rated at 70 gpm (0.1 MGD) and is a duplex submersible lift station. The "East Fields" Pump Station is located at 108A Nina Lane within the East Fields and Saddlebrook subdivisions located off East Main Street. This lift station is of duplex submersible construction with a rated capacity of 143 gpm (0.2 MGD).

There are two submersible lift stations located in the southwest quadrant of the collection system. Station #1 is a duplex unit located at Sharps Branch and Camden Avenue having a pumping capacity of 0.135 MGD. Station #2 is a duplex unit located at Camden Avenue and Allen Cut-off Road having a pumping capacity of 0.124 MGD.

The wastewater treatment plant is an advanced secondary BNR plant consisting of fine screening headworks followed by grit removal. Wastewater flow from the collection system continues to one of two sequencing batch reactor (SBR) activated sludge tanks where treatment to remove BOD5, TSS, Total P, and Total N through biological processing transpires. The effluent flow is decanted from the two SBR tanks to a post equalization tank from which flows are then metered in series to a traveling bridge filter, UV disinfection, and cascade aeration. Final treated effluent discharges through a 21-inch outfall pipe to the Wicomico River.

Biological solids are digested within an aerobic digester. Digested solids are prepared for final disposal through covered drying beds, mechanical dewatering, or lime-heat processing.

The treatment plant currently has a MDE rated capacity of 0.8 MGD with the potential to be re-rated to 1.0 MGD in the future. The facility is averaging about 99% reduction in the raw BOD loadings and 99% removal in the suspended solids content (TSS). Total nitrogen concentrations in the effluent average below 3 mg/l which is the goal of upcoming enhanced nutrient removal (ENR) technology. Total phosphorous concentrations have averaged l mg/l with a permit limit of 2 mg/l. Future ENR standards shall require a limit of 0.3 mg/l which will necessitate additional treatment to obtain this goal.

Current domestic flows within the Fruitland Service Area are estimated to be approximately 670,000 GPD with peak flows up to about 800,000 GPD. Based on current population projections and wastewater production, the estimated flows for the year 2020 are estimated to be 820,000 GPD. The flow is generated by approximately 4,000 residents, retail shopping centers, several smaller commercial establishments, one industrial park, two schools, and other smaller public facilities. The present MDE rated capacity of 800,000 GPD at the wastewater treatment facility will be sufficient through 2010, but the aforementioned 1.0 MGD upgrade will be necessary to accommodate anticipated growth in 2020.

4.2.3 Delmar

The Town of Delmar, both of the portions in Maryland and in Delaware, is served by a single sewage collection system that transports the wastewater flows to the treatment facility located on Connelly Mill Road in Maryland.

The collection system consists of a network of sewers, varying in size from 8-inch to 18-inch, covering most of the incorporated area. The existing collection system is considered adequate for sewage flows in the areas presently served, however the rehabilitation program should be continued to repair and replace portions of the over 50 year old sewer lines for prevention of infiltration and inflow into the system.

One main pumping station, located at Fifth St. & Pine St., receives the sewage from the gravity collection system serving the town center. This pumping station, upgraded in 1995, is equipped with two centrifugal pumps, each with a capacity of approximately 1500 gpm (2.16 MGD). The Town Center's total wastewater flow is conveyed through a 12-inch force main to the wastewater treatment plant.

The collection system includes four other pump stations located at Holly Oak Trailer Park, Wood Creek residential community, State Line Plaza, and Connelly Mill Road.

Construction was completed on the East Annexation sewer collection system serving U. S. Route 13 and Stage Road, south to the weigh station. Service was also extended to the Wicomico County Visitors Center. This system includes 8-inch & 10-inch gravity sewer with pumping station at Route 54 and Stage Road and a regional station at Stage Road and U. S. Route 13. The visitor center also has a pumping station

for conveyance to Connelly Road. This collection system has the potential to expand in all directions as areas develop and are incorporated.

The wastewater treatment facility, completed in 1988, consists of a screen tank, grit tank, control building with fully equipped lab, surge basin, aeration tank, pump building, secondary and tertiary clarifiers, sludge building, aerobic digesters, belt filter press, covered drying beds, chlorine contact tank, sulfur dioxide dechlorination system and outfall to Wood Creek (a tributary of the headwaters of the Wicomico River through Johnson's Pond). The activated sludge facility is designated as Class 5SA and originally had a design capacity of 0.65 MGD with capability of handling peak flow up to 1.5 MGD. The wastewater treatment plant is currently being re-rated to a design capacity of 0.85 MGD.

Infiltration and inflow into the collection system continues to increase the flow above the plant capacity even following the recent extensive rehabilitation. Although this results in excess treatment costs, it has not significantly affected the effluent quality. The facility discharges effluent which remains in compliance with the National Pollutant Discharge Elimination System (NPDES) permit.

Engineering studies are currently underway to determine the feasibility of extending the existing collection system into areas of proposed development. Due to the topography of the area, lift stations or a major pumping station may be required to either raise the wastewater into gravity interceptor sewers or transport it directly to the treatment facility.

In view of the increasing demand for public sewer service and the potential development in the area surrounding the Town, consideration should be given to additional facilities planning prior to reaching the full capacity of the treatment plant.

In the Delmar Service Area, urban development is confined to the expanding corporate town limits, including service to failing sewer areas and new development in a southerly direction along U. S. Route 13 and Bi-state Boulevard. An increase in residential development is currently underway within this service area. Additionally, commercial development has increased and will probably continue to increase along U.S. Route 13 and Stage Road north.

Sewage service requirements for this service area have been satisfied through extensions of the existing collection system to the south and east of town. Demands of sewerage service further south have also been recently served by new trunk sewers flowing directly to the wastewater treatment plant.

It is estimated that current domestic flows approximate 550,000 GPD. However, due to infiltration/inflow volumes, it is estimated that the average wastewater flows handled at the wastewater treatment plant reach about 700,000 GPD with peak flows as high as 1.5 MGD.

Identification of infiltration and inflow sources and continuing rehabilitation of the collection system are currently a priority consideration. This will enable the Town to service additional proposed development and to extend the system into areas being considered for annexation.

The Delmar Wastewater Treatment Plant ENR upgrade began construction in June 2009. The upgrade was designed to reflect revised NPDES permit and TMDL

limitations. Based on the ENR Draft Strategy documents and TMDL limitations, the plant upgrade will be designed with the goal of meeting a total nitrogen concentration limit of 3 mg/l and a total phosphorus concentration limit of 0.3 mg/l in the plant discharge at a flow of 0.85 MGD. Current planning calls for the addition of denitrifying, continuous flow sand filters with automatic, chemistry based methanol addition after the existing tertiary clarifiers. Under the same construction contract, headworks improvements including an influent screen and a new grit removal system will also be installed.

Consideration should be given to extending the wastewater collection system to provide service to the several streets within the Town that are not presently served in addition to other areas of proposed development. The Town should also consider continuing their efforts to rehabilitate deteriorated sections of the existing collection system. This project would be of an ongoing nature. Currently the Town of Delmar is in discussions with Tidewater Utilities regarding the WWTP.

4.2.4 Hebron

Hebron received Federal and State assistance for construction of a wastewater collection and treatment system to serve the area within the corporate town limits in the 1980's.

The system consists of a treatment facility, pumping stations and the related wastewater collection system. This collection system serves the existing commercial and residential users within the corporate limits through 8-inch and 10-inch sewer service lines. Treatment consists of stabilization lagoons with treated effluent discharged to

Rewastico Creek, downstream of Rewastico Pond. Lagoon effluent is chlorinated and dechlorinated prior to its discharge.

The existing wastewater treatment system is designed to treat 101,000 gallons per day. The average effluent flow per day for the years 2003 through 2006 was 56,284 gallons per day, which represents 55.7 percent of capacity. Currently, the waste water facilities serve 496 connections, which almost all connections are residential. Based on the current capacity of their existing wastewater treatment plant, the Town is just capable of meeting the 2010 demand (100,000 gallons per day); however, expansions will be necessary to meet the projected 2020 demand of 120,000 gallons per day of treatment capacity.

According to the Town's Comprehensive Plan adopted in July of 2010, there are 617 acres of undeveloped or under developed land within the existing Town limits, of which 552 acres are designated for residential land use and the remaining 65 acres for industrial / commercial uses. The undeveloped / under developed acreage designated for residential use creates the potential for an additional 2,185 dwelling units upon build-out of the existing corporate limits. Based on Maryland Department of the Environment standards, development of the potential dwelling units would create the demand for an additional 546,250 gallons per day of treatment capacity. Currently, the Town is reviewing proposals to develop about 80 percent of the undeveloped land within its boundaries. In addition to the residential component, there is a significant commercial use proposed that would total approximately 450,000 sq. ft. of floor area that would generate additional sewerage needs, which roughly translates to 90,000 gallons per day of treatment capacity (200 gallons per day per 1,000 square feet of gross floor area). As

Hebron reaches build-out of the existing corporate boundary an additional 636,250 gallons per day of treatment capacity is needed, which far exceeds the Town's WWTP design capacity of 101,000 gallons per day in excess of six times the current per day treatment capacity.

The Town's Comprehensive Plan also projects the need to expand sewer service beyond the corporate boundary into the surrounding county through annexation. According to the Town's Municipal Growth Element contained in the adopted 2009 Town of Hebron Comprehensive Plan, the future growth area consists of 132 acres: 96 acres have been designated as Mixed Use; 11 acres as Employment; 7 acres for Park; and 18 acres Public/Semi-Public uses. This future growth area could result in a minimum of an additional 336 residential units at build-out, as well as approximately 480,000 square feet of additional commercial uses. The estimated sewer flow generated by this expansion would add another 180,000 gallons per day of wastewater treatment demand (84,000 GPD – residential and 96,000 GPD – commercial).

The total projected sewerage flow that the current growth plans would generate is the sum of existing flow (56,284 GPD), planned development within the existing corporate boundary (636,250 GPD), and sewer extensions to properties beyond the Town boundary (180,000 GPD). The total projected demand based on build-out of the existing corporate limits, as well as the future growth areas is 872,534 GPD, which is seven times greater than the existing treatment capacity of their existing facility.

The Town of Hebron is currently studying its capital needs for the proposed growth along with funding and phasing possibilities. However, most of the projected growth within the Town corporate limits is expected to take place within the next 10

years. Facility expansion to serve lands beyond the Town boundary is also expected to occur within the next 20 years. Facility planning is currently underway.

Overall, based on the Town's desired growth, which is inconsistent with the Wicomico County Comprehensive Plan, the Town could potentially have a demand for sewer capacity that far exceeds the planned sewer system capacity.

4.2.5 Sharptown

The Town of Sharptown is served by a sanitary sewerage collection system and a secondary wastewater treatment facility. The original collection system was constructed about 1936 with additional interceptor sewers and the secondary treatment plant being constructed about 1972.

The collection system consists of an interceptor sewer along Water Street which receives the flow from the original collection system's two outfall sewers and transports it by gravity to a pumping station at the wastewater treatment facility on Little Water Street. The collection system consists of pipes varying between 6-inch and 12-inch in diameter throughout the developed sections of the service area. The pumping station is equipped with two centrifugal pumps, each with a 350 gpm capacity.

Due to the age of sections within the collection system, considerable infiltration occurs throughout the system because of inadequate pipe joints in conjunction with a relatively high water table. Except for the pipe joints, the collection system is in relatively good condition and the existing system is considered adequate for collection of flows within the currently served areas. However, any extended demands for service outside the corporate limits will require an evaluation of the capacity of the collection

system. A test and seal repair project was performed in the early 1980's. This project was funded by EPA and the State of Maryland. Significant infiltration sources were repaired. In the 1989, significant inflow/infiltration was again reported. Correction or treatment plant expansion is warranted.

The wastewater treatment facility consists of a "package type" extended aeration unit located on Little Water Street with an outfall to the Nanticoke River. The average wastewater flows approximate 115,000 GPD with peak flows of about 150,000 GPD including residential, commercial and industrial flows. The majority of this additional flow is caused by defective sewer lines allowing infiltration and inflow to enter the sewerage system. The only significant industry, Block and Gugenheimer (B & G Food) is located within the corporate limits and discharges to the municipal sewerage system. The greatest flow from this industry occurs during washing of the "pickling vats", plus inflow from rainfall landing on the site however B & G may be relocating and thus its onsite lagoon may be converted into a stormwater management facility.

In order to avoid high surge flows, it is recommended that a surge tank be installed at the plant to spread these flows over a longer time and avoid possible overloading the treatment facility.

The Sharptown wastewater treatment facility is considered adequate for present demands, but its capacity and the capacity of the collection system is lower than it should be because of excess infiltration and potential growth. Taylor Street sewer requires replacement due to deterioration and improper size and slope.

The most current improvements to the plant include a new 28,000 gallon sludge holding tank in 1990 and a de-chlorination tank with post-aeration in 1988.

These improvements should enable the town to be in compliance with the requirements of their NPDES Permit. Any extension of the sewerage distribution system into undeveloped areas would be scheduled as these areas develop. Currently this project would fall within the S-2 category.

4.2.6 Willards

The Town of Willards is served by a separate wastewater collection and treatment system constructed in 1974. This system has recently been upgraded, and the properties within the service area are connected. The collection system serves the entire town along with a few properties outside the corporate limits.

The collection system is composed of 8-inch and 10-inch diameter pipes traversing the service area. Due to the flat topography, four lift stations are required to service the collection system; three stations lift the wastewater from portions of the system through 4-inch force mains up to the gravity system for additional transportation, and one station, located at the treatment facility, forces the total sewage flow through a 4-inch force main to the primary lagoon.

The wastewater treatment facility, located along Poplar Neck Road, is an activated sludge plant and lagoon system with a point of discharge into Cypress Creek which drains into the Pocomoke River. The WWTP has a maximum capacity of 0.20 MGD. The current average flow is 80,000 GPD.

Future growth for Willards, over the next five to ten years, will be within the town corporate limits only. The WWTP improvements are sized to allow the town to grow from approximately 400 to 800 connections. There is adequate growth potential within

the town to use all available connections provided by the WWTP upgrade; however, no growth will be possible until the redesigned treatment plant is completed.

As development is scheduled within the corporate town limits, the system should be extended to meet new demands as they occur. Extensions should be included in the S-3 category and projected sewer/water demand through 2030 is approximately 0.12 MGD.

In 2008, the neighboring Town of Pittsville applied for a grant from MDE to fund a feasibility study to evaluate the wastewater treatment needs of the Pittsville/Willards area. The study will include an engineering evaluation of various alternatives and technologies to determine the most appropriate and cost-effective alternative required to meet the wastewater treatment needs of both Pittsville and Willards. Once completed, the results of this study will be analyzed for possible future inclusion in this Plan.

4.2.7 Pittsville

The Pittsville Service Area is serviced by wastewater facilities consisting of a collection system and treatment plant which was constructed in 1983. The collection system consists of a gravity sewerage system with lift stations. The treatment plant is an oxidation ditch activated sludge system with a tertiary filter system. The plant was built in 1983 and is permitted for 115,000 GPD. The plant outfall is 10-inch diameter and discharges to the Aydelotte Branch. A 2005 ENR Study for the Town of Pittsville recommends a 12-inch diameter outfall in the future.

Northern portions of Casher Wells Road and Maple Street, and eastern portions of Railroad Avenue and Main Street within Town Limits remain unserved.

Plans are currently being made for expansion of the existing wastewater treatment plant. These plans are directly related to State and Federal funding.

As noted above, in 2008 Pittsville applied for a grant from MDE to fund a feasibility study to evaluate the wastewater treatment needs of the Pittsville/Willards area. The study will include an engineering evaluation of various alternatives and technologies to determine the most appropriate and cost-effective alternative required to meet the wastewater treatment needs of both Pittsville and Willards. Once completed, the results of this study will be analyzed for possible future inclusion in this Plan.

4.2.8 Mardela Springs

According to the Maryland State Health Department, a potential public health hazard exists within the Mardela Springs Service Area due to failing septic tanks throughout the town.

At the time of this publication, the Town of Mardela Springs recently completed a feasibility study to analyze options for establishing community water and sewer systems. Included within the feasibility study is a description of the various options and cost estimates for wastewater collection, disposal and treatment of effluent, and water supply, storage, treatment and distribution.

According to the recommendations contained within the feasibility study, the preferred alternative for the wastewater treatment plant is to use the combination Gravity and Low Pressure design with a stream discharge and sequencing batch reactor, which provides the most versatility in expanding the system to accommodate future development.

4.2.9 Rural Villages

The villages of Nanticoke, Bivalve, Tyaskin, Quantico, Allen, Parsonsburg, Powellville, and Whitehaven have no foreseeable need for a central sewerage system within this planning period. Therefore, residential and commercial developments in this area should continue to be served by individual subsurface wastewater disposal systems. These systems must be constructed in accordance with COMAR 26.04.02 (Regulations Governing Individual Water and Sewerage Systems Where Public Systems are Not Available) so as to reduce any potential health hazards. These areas will fall within the no-planned service category (S-6).

4.2.10 Urban Service Districts/Out of City Customers

The service areas of Salisbury, Fruitland, and Delmar all have provisions for urban services to provide public sewer to areas outside of their municipal service districts. In order to insure delivery of public sewer services to these areas, the County Charter has designated an extra-municipal Urban Services Commission to manage service development and expansion, under Chapter 97 of the County Code.

Urban Services is essential to attract future development to planned growth areas. Even though some planned growth areas may be located outside of the various municipal jurisdictional boundaries, it is possible for these areas to receive limited urban services. This promotes growth that is consistent with the Wicomico County Comprehensive Plan, presents immediate economic benefits to the municipality, and provides developers a greater economic return for developments in designated service areas. Efforts should be

made to discuss this important matter further between the County and all the municipalities.

In addition to Urban Service Districts, there are some areas which are served by public sewer beyond the corporate limits and are considered Out of City Customers. There are a few individual dwellings served as Out of City Customers which have not been included. Refer to the list of sewer service areas below.

SEWER SERVICE AREAS

AREA	PROVIDER	TYPE
Airport	Salisbury	Out of City Customer
Cherokee Lanes	Salisbury	Urban Service
Coty Cox	Salisbury	Urban Service
Deers Head	Salisbury	Out of City Customer
East Urban Corridor	Salisbury	Out of City Customer
Elks Lodge	Salisbury	Out of City Customer
Glen Avenue Elementary School	Salisbury	Out of City Customer
Glendale Garden	Salisbury	Out of City Customer
Glen Garden Apartments	Salisbury	Out of City Customer
Green Meadows	Delmar	Out of City Customer
Lincoln Heights	Salisbury	Urban Service
Manokin #1	Salisbury	Urban Service
Manokin #2	Salisbury	Urban Service
North Park Garden Apartments	Salisbury	Out of City Customer
Riverside #1	Salisbury	Urban Service

Riverside #2	Salisbury	Urban Service
Riverside Pines	Salisbury	Urban Service
Salisbury Nursing Home	Salisbury	Out of City Customer
Westover Hills #1	Salisbury	Urban Service
Westover Hills #2	Salisbury	Urban Service
Wicomico County Tourism	Delmar	Out of City Customer
Wicomico High School	Salisbury	Out of City Customer
Wicomico Youth & Civic Center	Salisbury	Out of City Customer
Woodlawn	Delmar	Urban Service

The costs of system expansion and improvement to these areas should be shared by the developers, systems users, and their respective governments. In addition, County and municipal codes should be amended to permit cooperative agreements for the development, operation, and improvement of existing and new facilities shared by both municipal and non-municipal property owners.

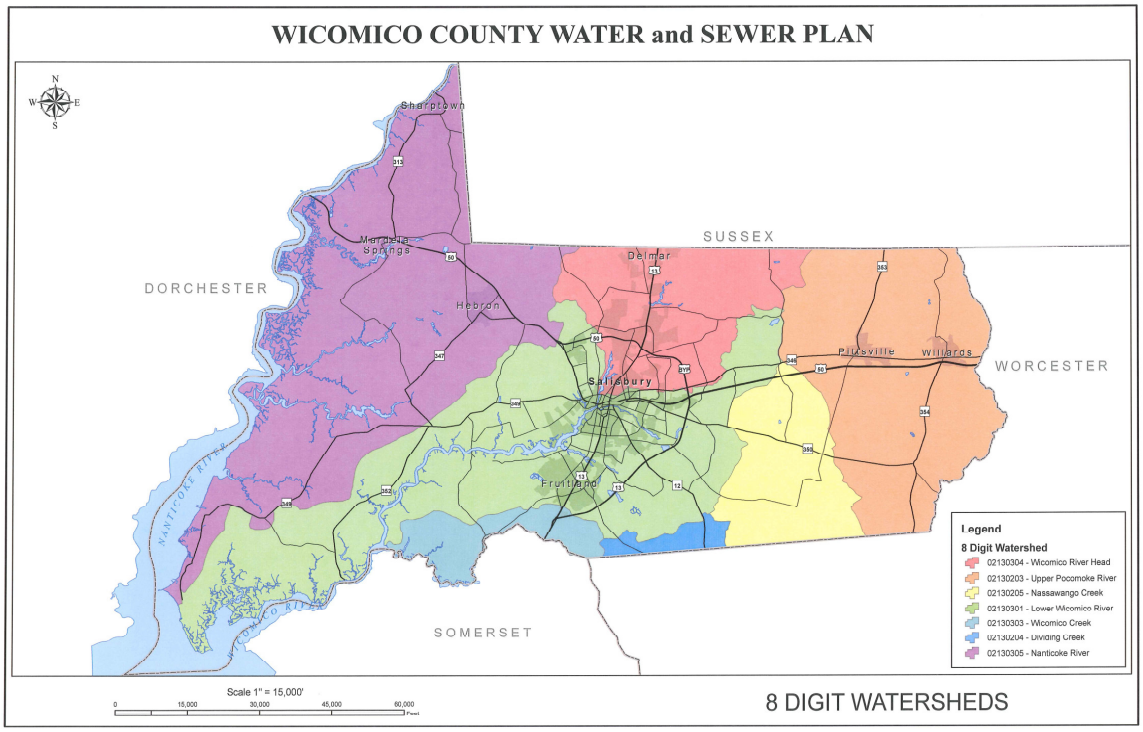
4.3 PRIVATE SEWER SERVICE AREAS

Where no central sewerage systems are planned, development within the County can be served by "package" treatment units which discharge their effluents to a subsurface disposal system. Use of these facilities shall be precluded from location within the A-1 Agriculture-Rural Zoning District, or from serving new or expanded developments within the A-1 District. Specifically exempt from this restriction are facilities intending to serve institutional uses, agricultural businesses, and/or developments existing as of the effective date of this Plan. The Maryland Department of

the Environment and the Wicomico County Health Department exercise regulatory supervision relative to individual disposal systems and "package" type treatment facilities. Their efforts, and those of Wicomico County Department of Public Works and the Planning and Zoning Commission, provide the necessary regulatory authority to assure satisfactory construction, installation, and operation of individual disposal systems.

The 2005 Wicomico County Land Preservation, Parks, and Recreation Plan, which was adopted by the Wicomico County Council on March 7, 2006, states that "package systems should be prohibited in areas targeted by the County for preservation." The document also states that "private package water and sewer plants in the agricultural district… can work against the County's expressed goal of preserving rural areas for agriculture and related uses."

Private sewer systems located in the County and not in an area served by public sewer will be discussed herein. The private systems will be classified by the watershed in which it is located. The watershed map is shown below.



4.3.1 Lower Wicomico River Watershed

Nutters Crossing Subdivision: The Nutters Golf Course Clubhouse, located just south of Salisbury on Snow Hill Road, has a system designed for a flow of 6,800 gallons per day. Wastewater from the kitchen passes through a grease trap and all wastewater receives septic tank treatment. After treatment, the effluent is pressure-distributed by twin pumping chambers to two deep trench tile field systems, one located adjacent to the clubhouse, the second between holes four and eight of the golf course. This system was constructed around 1991.

Nutters Crossing Subdivision's proposed private sewer system includes approximately 325 units in Sections 4 (Pond at Nutters), 5 (Woods at Nutters), and part of 3, producing an average flow of 80,000 gallons per day and a maximum flow of 280,000 gallons per day. The wastewater treatment system consists of screening with flow equalization and a treatment process membrane bio-reactor followed by ultraviolet

light disinfection. There is a sludge holding tank and sludge dewatering unit on site. Once the effluent has been treated, it is pumped to a storage lagoon where the reclaimed wastewater will remain until dispensed by a spray irrigation system. This system has been designed and permitted, but has not yet been constructed.

Village Down River: Village Down River is a condominium development consisting of 49 residential units. This development utilizes a low pressure sewer collection system with individual grinder pumps on each lot. The system boasts an average wastewater flow of 17,100 gallons per day with a maximum flow of 34,200 gallons per day. After the wastewater is collected, it flows to a flow equalization tank and then the wastewater treatment system. Treatment consists of sequencing batch reactors followed by post equalization and ultraviolet light disinfection. On site, there is a sludge holding tank, and the effluent is disposed via drip irrigation. This system which is located on Riverside Drive Extended northwest of Fruitland has been designed and permitted, but not yet operational.

Cherry Hill Condominiums: This condominium development consists of ten detached units and twelve duplex units located just north of Fruitland along the Wicomico River. The units are served by a private sewer system with a design flow of 6,000 GPD. Each unit has an individual septic tank which connects to a shared drain field. This system was constructed around 1995.

Crown Sports Complex: This sports complex hosts both indoor and outdoor sports events and is located just south of Fruitland at the former Crown Cork and Seal plant. The facility is served by a private sewage system having a design flow of 5,000

GPD. The system consists of an aerobic package plant and drip irrigation system which was constructed around 1966.

The Environmental Risk Assessment is rated "High" per the Priority of Receiving Waters – Maryland State Watersheds. The overall watershed contains approximately 75,514 acres (non-water). See Supplemental map in Chapter 3 for location.

4.3.2 Wicomico River Headwaters Watershed

Perdue Farms: The corporate headquarters located on Old Ocean City Road and the feed mill complex located on Zion Church Road are served by a private sewage plant originally constructed at the mill site in 1972. The plant has been upgraded to SBR treatment with a permitted flow of 285,000 GPD to Peggy Branch, a tributary of the Wicomico River, or to an on-site spray irrigation area.

Beaver Run Elementary School: Beaver Run Elementary School, located off Maryland Route 346 near Salisbury, has an individual system constructed in 1958. Total enrollment and staff is currently at 641 with an estimated usage of 12,800 GPD. Wastewater is treated by a standard septic tank and distributed to the drain field. The enrollment is expected to be adequately served by this system for at least the succeeding ten year period.

The Environmental Risk Assessment is rated "High" per the Priority of Receiving Waters – Maryland State Watersheds. The overall watershed contains approximately 24,765 acres (non-water). See Supplemental map in Chapter 3 for location.

4.3.3 Wicomico Creek Watershed

There are no private sewer systems in this watershed. The Environmental Risk Assessment is rated "High" per the Priority of Receiving Waters – Maryland State

Watersheds. The overall watershed contains approximately 19,516 acres (non-water). See Supplemental map in Chapter 3 for location.

4.3.4 Nassawango Creek Watershed

There are no private sewer systems in this watershed. The Environmental Risk Assessment is rated "High" per the Priority of Receiving Waters – Maryland State Watersheds. The overall watershed contains approximately 43,747 acres (non-water). See Supplemental map in Chapter 3 for location.

4.3.5 Dividing Creek Watershed

There are no private sewer systems in this watershed. The Environmental Risk Assessment is rated "Medium" per the Priority of Receiving Waters – Maryland State Watersheds. The overall watershed contains approximately 39,700 acres (non-water). See Supplemental map in Chapter 3 for location.

4.3.6 Upper Pocomoke River Watershed

There are no private sewer systems in this watershed. The Environmental Risk Assessment is rated "High" per the Priority of Receiving Waters – Maryland State Watersheds. The overall watershed contains approximately 95,512 acres (non-water). See Supplemental map in Chapter 3 for location.

4.3.7 Nanticoke River Watershed

Mardela Springs Middle & High School and Northwest Elementary School: The Mardela Springs Middle and High School and Northwestern Elementary School, are located off Maryland Route 313 northeast of Mardela Springs. Both schools are served by a single wastewater treatment facility constructed in 1966 and was updated in 2006. The treatment plant, located off Maryland Route 54 behind the High School, consists of a

main pump station on site that pumps to a flow-equalization tank followed by two sequencing batch reactors and post flow equalization. An extended aeration treatment unit is included in the treatment system followed by ultraviolet light disinfection. There is also a solids holding tank on site. The plant is designed for an average flow of 14,000 GPD and discharges into Barren Creek to the Nanticoke River. The schools have obtained a stream discharge permit from Maryland Department of the Environment (MDE).

In 1996, Environmental Consultants International Corporation was contracted to upgrade the wastewater collection system for both schools. The work involved elimination of some manholes and gravity sewer lines, replacement of two lift pumps and blower timer controls, and the addition of a lift pump and blower for the treatment facility.

Nanticoke Seafood: Nanticoke Seafood, formerly H. B. Kennerly & Son, located off Maryland Route 349 in Nanticoke has a treatment plant for wastewater generated from washing and clean-up at their seafood processing plant. Wastewater is collected in a sump, screened, chlorinated and directed through two settling tanks prior to discharge into the Nanticoke Harbor. The system has an average flow of 6,300 gallons per day however it is currently not operational.

Westside Primary School: Westside Primary, located off Maryland Route 347 just south of Quantico, is served by its own individual system. The school was constructed in 1956 and currently has an enrollment of 290 students and 22 staff. Usage is estimated at 6,000 gallons per day. Wastewater is treated in a septic tank and

distributed to a drain field. The system is expected to adequately handle the projected increase in enrollment for at least the next ten years.

Poplar Hill Pre-Release Unit: Wastewater from the Poplar Hill Pre-Release Unit, adjacent Maryland Route 349, about 10 miles west of Salisbury, flows by gravity to the treatment facility located northeast of the main building complex. This plant is owned by the State of Maryland and operated by the Maryland Environmental Service (MES).

A Capital Program for improvements to the wastewater treatment facility at Poplar Hill Pre-Release Unit was submitted for approval in the FY-94 budget package. The existing plant is designed to treat a daily average flow of 25,000 GPD. Treated effluent is discharged through a spray irrigation system on a dedicated disposal field. In 1991 the raw sewage flow exceeded the design capacity of the 1.52 million gallon facultative lagoon 160 days. The 1.5 million gallon storage pond must be operated at a level lower than that designed, and at this elevation there is not enough storage capacity. Trash has accumulated in the influent line, as no screening mechanism exists. Disposal to the spray field during the winter months has caused the area to be over-saturated.

A Capital Improvement project was completed in 1989 utilizing grant money from the EPA. This project enlarged and lined the treatment lagoon and added the spray irrigation system and the storage pond.

The following components were added to enhance the treatment of the existing facultative lagoon: Rotary fine screen; Pumping station with flow metering; and, floating aerators and baffles. In addition, a second spray irrigation system was installed to increase the disposal area. MES awarded the design contract in 1993, and construction was completed in 1996.

The Environmental Risk Assessment is rated "Very High" per the Priority of Receiving Waters – Maryland State Watersheds. The overall watershed contains approximately 110,464 acres (non-water). See Supplemental map in Chapter 3 for location.

4.3.8 Mobile Home Parks

Eighteen mobile home parks in Wicomico County have private sewer systems. Attached is a table listing each mobile home park and the size of the system. There are mobile home parks in each watershed listed above.

	Name and Location of Mobile Home (MH)	Population	# of Approved MH's	Type of System	Sewage Cond.	Watershed	Waste Water Treatment	Wastewater Capacity	Nutrient loading to Watershed
1.	"Bennett Mobile Home Park" Naylor Mill Rd, Salisbury	111	37	C	G	LWR.	On-Site		
2.	"Bohnak Trailer Park & Sales" Brown St Extended, Fruitland	243	81	C	G	LWR	On-Site		
3.	"Charles Boyer Trailer Park" Morris Rd, Pittsville	21	7	P	G	UPR.	On-Site		
4.	"Cedarhurst Village" U.S. Route 50, Salisbury	273	91	C	G	LWR	On-Site		
5.	"Country Village Mobile Home Park" Rounds Rd., Parsonsburg	114	24	C	G	UPR.	On-Site		
6.	"Eastwood Village II" Mt. Hermon Church Rd., Salisbury	36	12	P	G	LWR	On-Site		
7.	"Eastwood Village I" Johnson Rd., Salisbury	165	55	C	G	LWR	On-Site		
8.	"Gateway Village" Shell Rd., Delmar	84	28	M	G	WRH.	Municipal		
9.	"Green Meadows Compact Homes" Bi-State Blvd., Delmar	99	33	C	G	WRH.	On-Site		
10.	"John Walston Mobile Home Park" Walston Switch Rd., Salisbury	270	90	C	G	LWR	On-Site		
11.	"Naylor Mill Village" Naylor Mill Rd., Salisbury	156	52	C	G	LWR	On-Site		

	Name and Location of Mobile Home (MH)	Population	# of Approved MH's	Type of System	Sewage Cond.	Watershed	Waste Water Treatment	Wastewater Capacity	Nutrient loading to Watershed
12.	"Hebron Woods" U.S. Route 50, Hebron	375	125	C	G	NR.	On-Site		
13.	"Oak Ridge Trailer Park" South Upper Ferry Rd., Eden	189	63	C	G	LWR	On-Site		
14.	"Oak Terrace Trailer Court" Riverton Rd., Mardela Springs	48	18	C	G	NR.	On-Site		
15.	"Parkway Mobile Estates" Bi-State Blvd., Delmar	27	9	P	G	WRH.	On-Site		
16.	"Pine Tree Mobile Estates" Jones-Hastings Rd., Parsonsburg	129	43	C	G	UPR.	On-Site		
17.	"Salisbury Mobile Home Park" U.S. Route 13, Salisbury	582	194	M	G	WRH.	Municipal		
18.	"West Side Mobile Park" Nanticoke Rd., Salisbury	282	94	C	G	LWR	On-Site		

G - Good C - Community P - Private M - Municipal

Amount of water used is approximately 100 GPD per person.

This data provided by Wicomico County Health Department on 8/23/06.

4.3.9 Inventory of Existing Marinas

Wicomico County has a total of nine (9) existing marinas listed as follows:

	Name and Location	Pump-out Facilities	Maryland Clean Marina*
Public Facilities			
1.	Port of Salisbury	Yes	Yes
2.	Cedar Hill Marina	Yes	Yes
3.	Nanticoke Harbor	Yes	Yes
4.	Riverside Marina	No	Pending
Private Facilities			
1.	Whitehaven Marina	Yes	No
2.	Wikander Yacht Yard	Yes	No
3.	Green Hill Yacht & Country Club	No	No
4.	Wicomico Yacht Club	Yes	No
5.	Village Down River	Yes	No

* The Maryland Department of Natural Resources' Maryland Clean Marina Initiative recognizes and promotes marinas, boatyards and yacht clubs of any size that meet legal requirements and voluntarily adopt pollution prevention practices. A Certified Clean Marina has ensured compliance with regulatory requirements, and has voluntarily exceeded them by adopting a significant proportion of recommendations in the Maryland Clean Marina Guidebook.

4.4 Watershed Total Maximum Daily Loads

In order to ensure water quality as required by the Clean Water Act, Total Maximum Daily Loads (TMDL) must be established to monitor effects of point and non-point sources on receiving water/stream quality. The Environmental Protection Agency (EPA) and the Maryland Department of the Environment (MDE) regulatory agencies have established a process for developing TMDL's in improved waterways. This will

ultimately involve setting limitations for future NPDES permits for each Water Reclamation Facility (WRF). In response to growing concerns regarding the Chesapeake Bay's water quality, the Chesapeake Bay Program established goals to reduce nutrient loadings to the watershed: Maryland, Pennsylvania, Virginia, District of Columbia, and the Environmental Protection Agency. Maryland quickly established a voluntary program to encourage and assist municipalities to upgrade their wastewater treatment plants. Currently within Wicomico County, six bodies of water have been identified as impaired and have calculated TMDL's.

WATER BODY NAME	IMPAIRMENT	LOCATION
Adkins Pond/Pocomoke River	Phosphorous and Sediment	Upper Pocomoke Watershed in Wicomico County
Lower Wicomico River	Bacteria and Nutrients	Lower Wicomico River Watershed in Wicomico and Somerset County, MD, and Sussex County, DE
Wicomico Creek	Nutrients	Wicomico Creek Watershed in Wicomico and Somerset County.
Johnson Pond	Phosphorus and Sediment	Wicomico River Headwaters Watershed
Tony Tank Lake	Phosphorous and Sediment	Lower Wicomico River Watershed
Wicomico River Headwaters	Fecal Bacteria	Wicomico River Headwaters Watershed

This data is provided by Maryland Department of the Environment, 2008

The State of Maryland has adopted a point source strategy to address nutrient loadings from publicly owned and operated wastewater treatment plants. The strategy has two components for public "significant" waste water treatment plants (WWTPs), which have a design capacity of 500,000 GPD or greater, the State has adopted a schedule of programmed improvements designed to upgrade those facilities to achieve Enhanced Nutrient Reduction (ENR) technologies and to operate the (ENR) facility in a manner that optimizes nutrient removal capacity.

Delmar, Fruitland, and Salisbury are either in the process or have completed upgrades of their WWTPs to ENR technology. The Salisbury WWTP recently completed upgrades to achieve ENR levels. Upgrades in Delmar and Fruitland are scheduled in 2010

and 2012, respectively.

For more information about future loads based on changing technology and population increases, as well as strategies directed at reducing the nutrient loads associated with Point Sources, review the adopted Wicomico County Water Resources Element.

The vast majority of homes located in Wicomico County that are not served by municipal or private sewer systems are served by traditional individual septic systems. Based on flow figures in the municipal systems and the number of housing units on smaller systems in the County we can estimate that roughly half of the housing units in Wicomico County are on private individual septic systems. The table below provides an estimate of the distribution of those systems by watershed in 2010.

WATER BODY NAME	SEPTIC SYSTEMS	ESTIMATED FLOW (MGD)
Wicomico River Head	3,500	0.83
Wicomico Creek	300	0.07
Upper Pocomoke	1,300	0.31
Nassawango Creek	800	0.19
Nanticoke River	3,200	0.75
Lower Wicomico	8,500	2.00
Dividing Creek	100	0.02

This data is provided by KCI Technologies, 2009

4.5 TABLES

Table 9: Projected Sewer Demands and Planned Capacity

Table 10: Inventory of Existing Sewer Treatment Facilities

Table 11: Inventory of Existing Shared/Community Facilities

Table 12: Inventory of Sewer Problem Areas – Individual and Community

Table 13: Water Quality Problems Due to Storm Drainage Outfalls and Due to Non-Point Sources

Table 14: Immediate, 5, and 10 Year Priorities for Sewerage Development

Table 15: Flow Data: Wastewater Treatment Plants

Table 15A: Flow Data: Collector Sewers, Interceptors, Pumping Stations, and Force Mains

TABLE 9
PROJECTED SEWER DEMANDS AND PLANNED CAPACITY

Service Area			Salisbury	Fruitland	Delmar*	Hebron	Sharptown	Willards	Pittsville	Mardela Springs	Nanticoke/ Bivalve/ Tyaskin	Quantico	Allen	Parsonsburg	Powellville	Whitehaven	Salisbury Metro Core
2000	Pop.	T	23,743	3,774	3,282	807	649	940	1,182	364	1,425	115	148	268	158	78	56,007
		S	23,743	3,774	3,282	807	649	940	1,182	0	0	0	0	0	0	0	31,929
		US	0	0	0	0	0	0	0	364	1,425	115	148	268	158	78	24,078
	GPCD	Gals.	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90
	Cap.	D	5.51	0.51	0.44	0.08	0.06	0.07	0.08	0.04 [1]	0.14 [1]	0.01 [1]	0.01 [1]	0.03 [1]	0.02 [1]	0.01 [1]	6.42 [4]
		P	6.80	0.80	0.65	0.10	0.15	0.08	0.12	0	0	0	0	0	0	0	8.45
2010	Pop.	T	28,925	4,950	5,325	975	725	1,110	1,330	360	1,420	121	155	278	158	78	64,795
		S	28,925	4,950	5,325	975	725	1,110	1,330	0	0	0	0	0	0	0	40,330
		US	0	0	0	0	0	0	0	360	1,420	121	210	278	158	78	24,465
	GPCD	Gals.	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90
	Cap.	D	5.86 [1,5]	0.67 [2]	0.72 [2]	0.10 [1]	0.07 [1]	0.11 [1]	0.13 [1]	0.04 [1]	0.14 [1]	0.01 [1]	0.02 [1]	0.03 [1]	0.02 [1]	0.01 [1]	7.37 [4]
		P	8.50	1.00	0.85	0.10	0.15	0.20	0.12	0	0	0	0	0	0	0	10.35
2020 [6]	Pop.	T	34,490	6,100	6,235	1,225	800	1,260	1,490	360	1,420	127	165	288	158	78	74,741
		S	34,490	6,100	6,235	1,225	800	1,260	1,490	0	0	0	0	0	0	0	48,080
		US	0	0	0	0	0	0	0	360	1,420	127	225	288	158	78	26,661
	GPCD	Gals.	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90
	Cap.	D	6.41 [1, 5]	0.82 [2]	0.84 [2]	0.12 [1]	0.08 [1]	0.12 [1]	0.15 [1]	0.04 [1]	0.14 [1]	0.01 [1]	0.02 [1]	0.03 [1]	0.02 [1]	0.01 [1]	8.19 [4]
		P	8.50	2.00	1.10	0.10	0.15	0.20	0.12	0	0	0	0	0	0	0	13.30

NOTE: Capacities rated in million gallons per day (MGD)
T: Total US: Unserved P: Planned S: Served D: Demand

*Delmar includes Delaware and Maryland Residents

Year	Maryland	Delaware
2000	1,875	1,407
2010	3,580	1,745
2020	4,155	2,080

[1] Commercial demand estimated at 10% of residential

[2] Commercial/Industrial demand estimated at 50% of residential

[3] Industrial demand estimated at 3 MGD

[4] Urban Service Sewer customers estimated at 1315

[5] Commercial, Industrial, and Institutional demand estimated at 170% of residential

[6] 2020 subject to plan amendment and MDE approval

TABLE 10
INVENTORY OF EXISTING SEWER TREATMENT FACILITIES

Owner	Type Treatment	Plant Coordinate Location	Occupied Acres	Vacant Acres	Point of Discharge	Max Site Capacity (MGD) Secondary	Max. Site Capacity (MGD) Advanced	Existing/ Permitted (MGD) Capacity	Flows (MGD) Average/ Peak	Planned or Expected Abandonment Date of Interim MGD Date	Operating Agency	WWTP Design Capacity (MGD)	Nutrient TMDL ****	Current Nutrient Loading (lbs/yr) ***
Salisbury	BNR/ENR	193,000N 1,195,000E	43	43	Wicomico River	10.20	10.20	8.50	4.70 15.00	N/A	City	8.50		Nitrogen 142,776 Phosphorus 35,694
Fruitland	BNR Plant	185,000N 1,195,000E	10	28	Wicomico River	5.00	5.00	0.80	0.65 0.80	N/A	City	0.80		Nitrogen 16,324 Phosphorus 4,081
Delmar	Activated Sludge	221,000N 1,204,000E	4	5	Wood Creek - Wicomico River	0.85*	0.85	0.85	0.55 1.50	N/A	Town	0.85		Nitrogen 17,542 Phosphorus 4,386
Hebron	Facultative Lagoon	215,500N 1,170,000E	12	7	Rewastico Creek - Nanticoke River	0.10	0.10	0.101	0.05 0.18**	N/A	Town	0.101		Nitrogen 5,482 Phosphorus 1,827
Sharptown	Activated Sludge	261,000N 1,165,000E	1	3	Nanticoke River	0.45	0.15	0.15	0.12 0.15	N/A	Town	0.15		Nitrogen 4,386 Phosphorus 1,462
Willards	Activated Sludge	211,000N 1,272,000E	5.75	0.25	Burnt Mill Branch - Pocomoke River	0.20	0.20	0.08	0.08 0.20	N/A	Town	0.20		Nitrogen 6,030 Phosphorus 2,010
Pittsville	Oxidation Ditches	210,000N 1,258,000E	5	15	Aydylotte's Branch - Pocomoke River	0.38	0.38	0.115	0.09 0.11	N/A	Town	0.115		Nitrogen 7,127 Phosphorus 2,376

* Pilot testing in process to verify rated capacity of 0.85 MGD
**BOD under limit
***Source: Wicomico County Water Resources Element Plan
**** Currently no data available
BNR - Biological Nutrient Removal
ENR - Enhanced Nutrient Reduction

TABLE 11
INVENTORY OF EXISTING SHARED/ COMMUNITY FACILITIES

Shared or Community System	Type of System	Size of System (GPD)	Age of System	MDE Permit Number	Households Served	Current Nutrient Loading (Nitrogen)	Watershed
Nutters Crossing Subdivision (Clubhouse)	Spray Irrigation	6,800	1991	#04-DP-3380	N/A	0	LWR.
Nutters Crossing Subdivision (Section 4, 5 and part of 3)	Spray Irrigation	280,000	1991	#04-DP-3380	325	0	LWR.
Perdue Farms	Spray Irrigation	285,000	1972	#05-DP-0359	N/A	0	WRH.
Nanticoke Seafood	N/A	6,300	N/A	#07-DP-1297	*Not currently operational	N/A	NR.
Village Down River	Drip Irrigation	34,200	2008	#05-DP-3519	49	8 mg/L or 0.0 lbs per year Nitrogen	LWR.
Salisbury Christian School	ENR	5,000	2009	#06-DP-3326	650 (staff and enrollment)	304.4 lbs per year of Nitrogen	LWR.
Beaver Run Elementary	N/A	12,800	1958	N/A	641 (staff and enrollment)	N/A	WRH.
Crown Sports Complex	Activated Sludge	5,000	1966	#05-DP-2503	N/A	77 lbs per year	LWR.
Cherry Hill Condominiums	BNR	6,000	1995	#06-DP-3161	22	20 mg/L or 219 lbs per year	LWR.
Westside Primary School	N/A	6,000	1956	N/A	312 (staff and enrollment)	N/A	NR.
Mardela Springs Northwest Elem., Middle, & High Schools	Activated Sludge	14,000	1966	#10-DP-1105	724 (staff and enrollment)	129 lbs per year	NR.
Popular Hill Pre-Release Unit	Spray Irrigation	25,000	1989	#07-DP-2250	173 (staff and enrollment)	10 mg/L or 913 lbs per year	NR.

Equation for Nutrient Loading = mg/L x Flow (mgpd) x 365 Days x 8.34 Conversion Factor
BNR - Biological Nutrient Removal
ENR - Enhanced Nutrient Removal

TABLE 12
INVENTORY OF SEWER PROBLEM AREAS - INDIVIDUAL AND COMMUNITY

Service Area	Coordinate Location	Population (No. of Lots)	Acres	Nature of Problem	Treatment Capacity (mgd)	Treatment Demand (mgd)	Planned Correction Date
Salisbury	Mill Street PS			Combined Sewers			
	Waverly Street PS			Combined Sewers			
	Lincoln Heights			Failing Septic Systems			
	Carey Heights	134		Failing Septic Systems			
	McCready Street			Failing Septic Systems			
	Fairfield	125		Failing Septic Systems			
	Maple Plains	180		Failing Septic Systems			
	Green Acres	30		Failing Septic Systems			
	Westlake	102	72.5	Failing Septic Systems			
	Overbrook	57		Failing Septic Systems			
	Hearn and Bailey	330		Failing Septic Systems			
	Highland Park	74		Failing Septic Systems			
	Valleywood	87		Failing Septic Systems			
	Midvale Manor			Failing Septic Systems			
	Chesapeake Heights	112		Failing Septic Systems			
	Autumn Grove	12		Failing Septic Systems			

TABLE 12
INVENTORY OF SEWER PROBLEM AREAS - INDIVIDUAL AND COMMUNITY

Service Area	Coordinate Location	Population (No. of Lots)	Acres	Nature of Problem	Treatment Capacity (mgd)	Treatment Demand (mgd)	Planned Correction Date
Salisbury	Cannon Farms	226		Failing Septic Systems			
	West Zion Road			Failing Septic Systems			
	Schumaker Lane			Failing Septic Systems			
	Regency Drive			Failing Septic Systems			
	Holland Heights	5	1.9	Failing Septic Systems			
	Jersey Heights	105		Failing Septic Systems			
	Northwood	777		Failing Septic Systems			
	Moss Hill Acres	73		Failing Septic Systems			
	Belmont	41		Failing Septic Systems			
	R. B. White			Failing Septic Systems			
	Granville Phillips	7		Failing Septic Systems			
	Givens Addition	14		Failing Septic Systems			
	Justice Heights	23		Failing Septic Systems			
	Cloverdale Farm	70		Failing Septic Systems			
	Greenlawn	11	9.6	Failing Septic Systems			

TABLE 12
INVENTORY OF SEWER PROBLEM AREAS - INDIVIDUAL AND COMMUNITY

Service Area	Coordinate Location	Population (No. of Lots)	Acres	Nature of Problem	Treatment Capacity (mgd)	Treatment Demand (mgd)	Planned Correction Date
Salisbury	Deerfield	22	19.4	Failing Septic Systems			
	Pleasant Acres			Failing Septic Systems			
	Parker Heights	47		Failing Septic Systems			
	White Plains	26		Failing Septic Systems			
	Walkers Delight			Failing Septic Systems			
	Beaver Run	18		Failing Septic Systems			
	Pine Grove	30	8.85	Failing Septic Systems			
	Colonial Acres	76		Failing Septic Systems			
	Havassy Manor	30	9.02	Failing Septic Systems			
	Smithwood	34	19.6	Failing Septic Systems			
	Plainfield	47		Failing Septic Systems			
	Grenada Manor	21	17.52	Failing Septic Systems			
	Beaverdam Creek	5	9.34	Failing Septic Systems			
	Ocean Heights	16		Failing Septic Systems			
	William Wilkins & Tom Lavery			Failing Septic Systems			
	Perdue Heights	43		Failing Septic Systems			

TABLE 12
INVENTORY OF SEWER PROBLEM AREAS - INDIVIDUAL AND COMMUNITY

Service Area	Coordinate Location	Population (No. of Lots)	Acres	Nature of Problem	Treatment Capacity (mgd)	Treatment Demand (mgd)	Planned Correction Date
Salisbury	Park Manor	82		Failing Septic Systems			
	Old Dam	4	1.28	Failing Septic Systems			
	Sunayr	74		Failing Septic Systems			
	Livingston Heights	87	23.5	Failing Septic Systems			
	Lowman			Failing Septic Systems			
	Crestwood	83	41.6	Failing Septic Systems			
	Morris Acres	19	12	Failing Septic Systems			
Fruitland	Meadow Bridge Manor	39 (13 lots)	13.6	Failing Septic Systems			
Delmar	Woodland Area			Failing Septic Systems			
	Connelly Mill Road						
Mardela Springs	Town			Failing Septic Systems - Small Lots			
Whitehaven				Difficulty replacing failing systems due to narrow lots			

TABLE 13
WATER QUALITY PROBLEMS DUE TO STORM DRAINAGE OUTFALLS AND DUE TO NON-POINT SOURCES

Service Area	Coordinate Location	Nature of Problem	Reach Affected
Nanticoke	Nanticoke Harbor	discharges from watercraft and surface runoff	Nanticoke River - approximately 0.5 miles northeast of Roaring Point
Bivalve	Bivalve Harbor (Jackson Harbor)	discharges from watercraft and surface runoff	Nanticoke River - approximately 1.0 miles northwest of Ragged Point

TABLE 14
IMMEDIATE, 5, AND 10 YEAR PRIORITIES FOR SEWERAGE DEVELOPMENT

Fiscal Year and Project Number	County Priority Assigned	Coordinate Location *	Description	PL 660 Eligibility	Estimated Costs**			Projected Schedule***			
					Total	Federal and/or State	Local	Preliminary Plans	Final Plans	Start Construction	Complete Construction
Salisbury											
Waste Water Expansion											
2012 SL0008	S-4		Parkside Lift Station		$ 1,196,000					2012	2012
2010 - 2012 SM0015	S-3		18" SS in Northwood Drive		$ 1,291,000					2010	2010
2011 SM0004	S-4		30" Sewer in North Division St.		$ 1,536,000					2011	2011
2013 SM0008	S-4		42" Isabella St. Part II		$ 860,000					2013	2013
2010 - 2013 SM0013	S-3		42" SS Delaware Ave		$ 2,518,000					2010	2011
2014 SM0012	S-4		42" Isabella St. Part III		$ 630,000					2014	2014
2013 SM0005	S-4		36" SS Isabella & Church St.		$ 1,124,000					2013	2013
2010 - 2013 SM0018	S-3		DP & L Collection System Upgrade		$ 1,598,000					2010	2011
Maintenance											
2010 - 2014 SM0012	S-3		Mill Street PS Improvements		$ 825,000					2010	2011
2010 - 2019 SM0019	S-3		Infrastructure Replacement/ Refurbishment		$ 11,800,000					2010	2019
2010 - 2012 SL0014	S-3		Liftstation Pump Replacement		$ 975,000					2010	2011

TABLE 14
IMMEDIATE, 5, AND 10 YEAR PRIORITIES FOR SEWERAGE DEVELOPMENT

Fiscal Year and Project Number	County Priority Assigned	Coordinate Location *	Description	PL 660 Eligibility	Estimated Costs**			Projected Schedule***			
					Total	Federal and/or State	Local	Preliminary Plans	Final Plans	Start Construction	Complete Construction
2010 - 2019 SL0007	S-3		Bypass Pumps for Lift Stations		$ 600,000					2010	2012
2010 - 2019 SL0003	S-3		SCADA Lift Station Alarm Transmitters		$ 600,000					2010	2012
2010 - 2019 SM0020	S-3		Replace Sewer in East Main St.		$ 276,000					2010	2011
Fruitland											
2013-2014	S-3		Southwest Interceptor					2012	2014	2015	2017
2013-2014	S-3		Clyde Ave. - Sewer Main Upgrade					2011	2012	2013	2014
Delmar											
2011	S-3		Identification of I & I Sources								
2008 - 2012	S-3		Collection System Rehabilitation								
2011	S-3		Facilities Planning								
2007-2018	S-3		Extend sewer to proposed developments								
2008-2010	S-3		WWTP Upgrade for Nutrient Removal		$3,500,000	$2,700,000	$800,000				
2011	S-3		0.5 MGD WWTP and Spray Irrigation for DE which will acoomadate both DE and MD flows								

TABLE 14
IMMEDIATE, 5, AND 10 YEAR PRIORITIES FOR SEWERAGE DEVELOPMENT

Fiscal Year and Project Number	County Priority Assigned	Coordinate Location *	Description	PL 660 Eligibility	Estimated Costs**			Projected Schedule***			
					Total	Federal and/or State	Local	Preliminary Plans	Final Plans	Start Construction	Complete Construction
2010	S-3		WWTP Expansion								
Hebron											
2008-2018	S-5		Extend sewer to service existing and proposed residential units within and outside corporate								
Sharptown											
2008-2018	S-2	261,000N 1,165,000E	On-going collection system extenstions through undeveloped residential areas								
2008-2018	S-5		Infiltration and inflow re-hab projects								
Willards											
2016	S-5		Install Sand Filter at WWTP								
Pittsville											
2012	S-3		Expansion of WWTP and extension of sewer service								

* Where applicable for both treatment facility and point of discharge location.
** Based on real dollar values.
*** Month and year--for the last 5 years the "Construction Schedule Column" and need not be filled in.

TABLE 15
FLOW DATA: WASTEWATER TREATMENT PLANTS

Name or Service Area	Design Parameters			Flow			Development Occupancy Units [1]		
	Hydraulic (MGD)	Organic (ppm)		Avg. Day*	Max Day**	Date of Max Day	Existing*	Anticipated BPI***	PWA
		BOD5	TSS						
Salisbury	30.00	375	250	4.70	8.00				
Fruitland	0.80	99% reduction	99% removal	0.65	0.80				
Delmar	0.65	20	30	0.55	1.50			25	
Hebron	0.10	30	90	0.05	0.18				
Sharptown	0.15	45	45	0.12	0.15				
Willards	0.08	300	250	0.08	0.20			310 (R) 2 (C)	
Pittsville	0.12			0.09	0.011				

* Per Effective Date of Plan
** During Previous Fiscal Year
*** List Residential (R) Separately from Commercial (C) and Industrial (I)
BPI--Building Permits Issued Per Effective Date of Plan
UC --Building Permits Issued Per Effective Date of Plan for Units under Construction
NUC--Building Permits Issued Per Effective Date of Plan for Units not under Construction
PWA--Building Permits for Unexpired Public Works Agreements Per Effective Date of Plan
[1] Includes Industrial, Commercial and Residential Units

TABLE 15A
FLOW DATA: COLLECTOR SEWERS, INTERCEPTORS, PUMPING STATIONS AND FORCE MAINS

Name or Service Area	Sewer			Pumping Station						Force Main	
	Diam. (in)	Flow, Avg. Day (MGD)*	Flow, Design (MGD)	Number of Pumps	Capacity of Each Pump (MGD)	Normal Pumping Capacity (MGD)	Avg. Day Pumpage (MGD)*	Max. Day Pumpage (MGD)**	Max Day Pumpage Date	Diam. (in)	Flow, Design (MGD)
Salisbury	6 - 42										
Airport				2	355						
					321						
Airport Annex				2							
Bandstand					34						
Baseball Complex				2	181						
					107						
Brookshire				2	18						
					32						
Canal Woods				2	380						
					341						
Cherokee Lanes											
College Ave.				2	308						
College Lane				2	175						
					193						
DP&L				2	460						
Eireann Mhor				2	361						
					429						
Fitzwater St.				2	1,480						
Forrest Lake				2	177						
					80						
Glen Ave.				2	654						
					666						
Handy St.				2							
Harbor Pointe l				2	60						
					52						
Harbor Pointe ll				2	428						
					457						
Mall Drive				2	221						
					194						
Middle Neck				2	24						
					14						
Mill St.				2	351						
					303						

TABLE 15A
FLOW DATA: COLLECTOR SEWERS, INTERCEPTORS, PUMPING STATIONS AND FORCE MAINS

Name or Service Area	Sewer			Pumping Station						Force Main	
	Diam. (in)	Flow, Avg. Day (MGD)*	Flow, Design (MGD)	Number of Pumps	Capacity of Each Pump (MGD)	Normal Pumping Capacity (MGD)	Avg. Day Pumpage (MGD)*	Max. Day Pumpage (MGD)**	Max Day Pumpage Date	Diam. (in)	Flow, Design (MGD)
Northside PS				3	900	8.64					
					2,800						
					4,000						
Northgate (Wal-Mart)				2	114						
					91						
Old water plant					79						
Parkside				2	738						
					779						
Phillip Morris Dr.				2	1,774						
					1,588						
Perdue Stadium											
Red Lobster				2	133						
					130						
Riverside Pines				2	36						
					35						
Rogers Ave.											
Rolling Rd.				2	227						
					220						
Scenic Dr.				2	238						
					246						
South Park				2	31						
					37						
South Side PS				4	700	5.76					
					700						
					3,000						
					3,400						
Sumpter Pointe				2	35						
					41						
University Village											
Waverly Dr.				2	272						
Worwic											
Zoo				2	176						
					174						

TABLE 15A
FLOW DATA: COLLECTOR SEWERS, INTERCEPTORS, PUMPING STATIONS AND FORCE MAINS

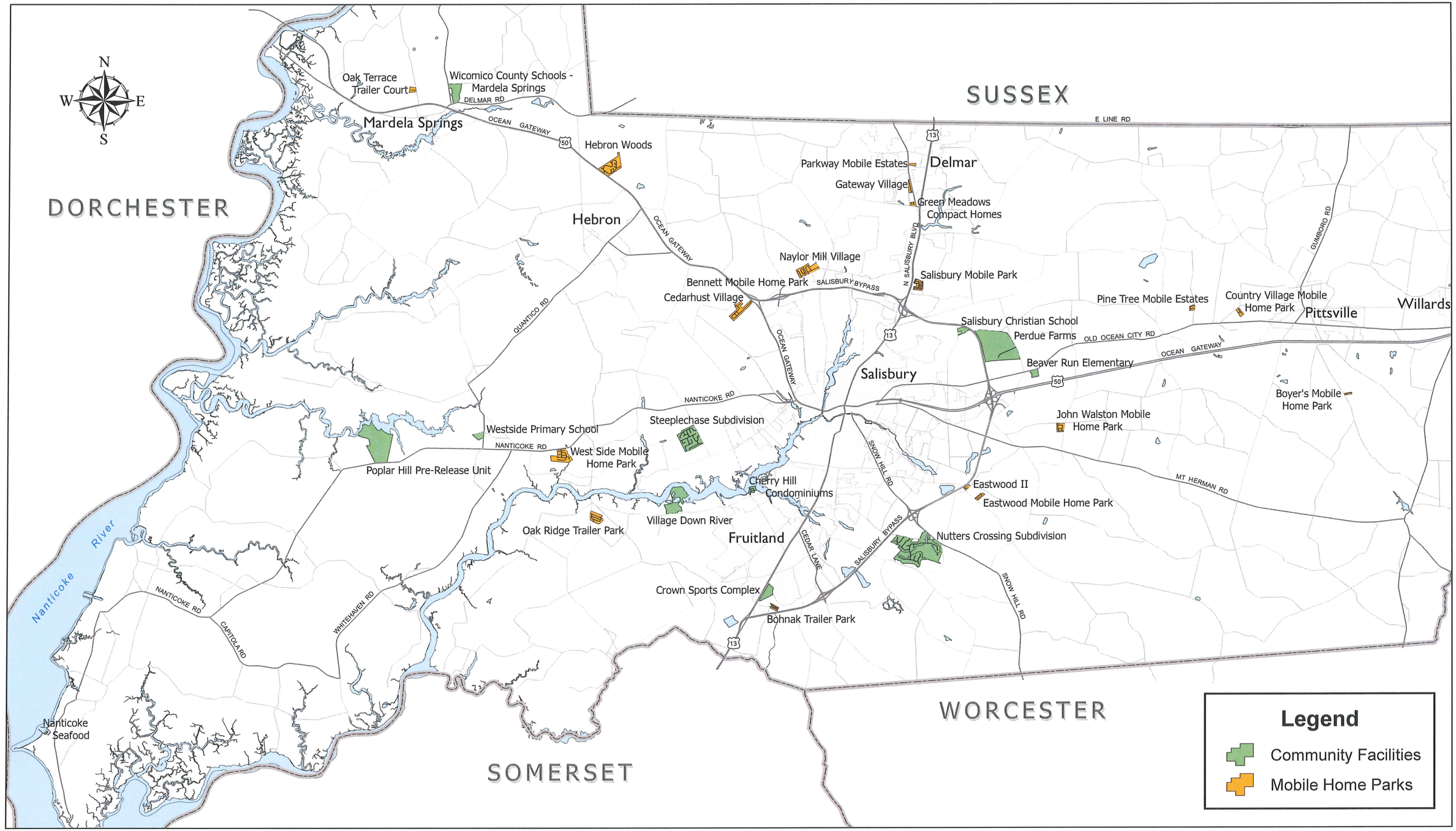
Name or Service Area	Sewer			Pumping Station						Force Main	
	Diam. (in)	Flow, Avg. Day (MGD)*	Flow, Design (MGD)	Number of Pumps	Capacity of Each Pump (MGD)	Normal Pumping Capacity (MGD)	Avg. Day Pumpage (MGD)*	Max. Day Pumpage (MGD)**	Max Day Pumpage Date	Diam. (in)	Flow, Design (MGD)
Fruitland											
Clyde Ave.	8			3	1.3		0.65	0.8		10	
	10										
	15										
Northeast Quadrant											
NE PS #1	10			2		0.72					
NE PS #3	10			2		0.476					
Meadowbrook	8			2		0.1					
East Fields	8			2		0.2					
Colonial Village	8			2							
Holly Hill	8			2							
Southeast Quadrant											
Station #1	8			2		0.135					
Station #2	8			2		0.124					
Delmar	8-18										
2nd, 4th	10										
Jewell St.	12		0.74								
5th	15		0.84								
	18										
State St.	10		0.53								
Maryland Ave.	10		0.53								
Pine, Penns., Eliz.	12		0.64								
Elizabeth	15		0.82								
Lynch Drive	10										
Stage Rd., 12th	10										

TABLE 15A
FLOW DATA: COLLECTOR SEWERS, INTERCEPTORS, PUMPING STATIONS AND FORCE MAINS

Name or Service Area	Sewer			Pumping Station						Force Main	
	Diam. (in)	Flow, Avg. Day (MGD)*	Flow, Design (MGD)	Number of Pumps	Capacity of Each Pump (MGD)	Normal Pumping Capacity (MGD)	Avg. Day Pumpage (MGD)*	Max. Day Pumpage (MGD)**	Max Day Pumpage Date	Diam. (in)	Flow, Design (MGD)
Pine St. P.S.				2	2.16		0.55	1.5		12	
Stage Rd. P.S. 1				2	0.576					8	0.516
Stage Rd. P.S. 2				2	0.252					4	0.252
Wood Creek P.S.				2	0.504					6	
Holly Oak P.S.				2	0.288					6	
Visitors Center P.S.				2	0.0965					4	
Connelly Mill Rd. P.S.				2	0.828					8	
State Line Plaza P.S.				2	0.238					4	
Hebron											
Chaple Branch PS				2	0.252	0.127	0.049	0.0156	1/30/2005	4	
Wilson Street PS				2	0.432	0.238	0.21	0.288	1/30/2005	4	
Chestnut Street PS				2	1.152	0.705	0.078	0.106	10/26/2005	8	0.47
WWTP Discharge PS				2	1.08	0.619	0.054	0.18	10/4/2005	8	0.619
Sharptown	6 - 12										
Main St.	10										
State, Nanticoke	10										
Little Water	10										
Little Water St. PS				2	350					6	
Willards	8-10										
PS #1 Sewer Shed	10	0.78	0.08								
Station #1 - WWTP				2		0.72	0.078	0.08		4	
Station #2 - WTP				2		0.72				4	
Station #3				2						4	
Station #4				2						4	
Pittsville											
Station #1											
Station #2											
Station #3											
Station #4											
Station #5											

* Per Effective Date of Plan
** During Previous Fiscal Year

WICOMICO COUNTY WATER and SEWER PLAN



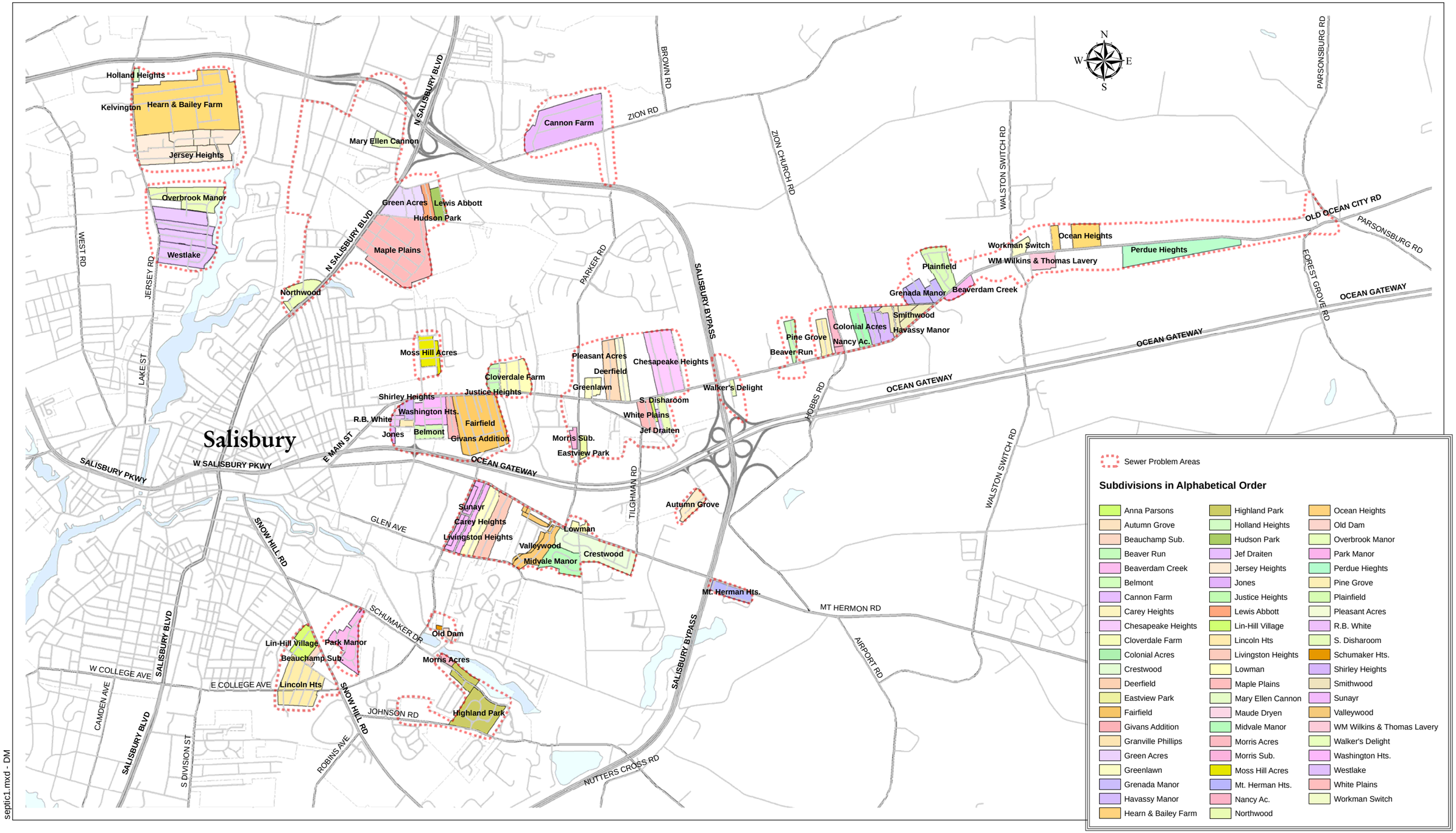
Scale 1" = 2 miles

0 1 2 4 6 Miles

EXISTING SHARED / COMMUNITY FACILITIES

SharedFacility1.mxd - DM

WICOMICO COUNTY WATER and SEWER PLAN



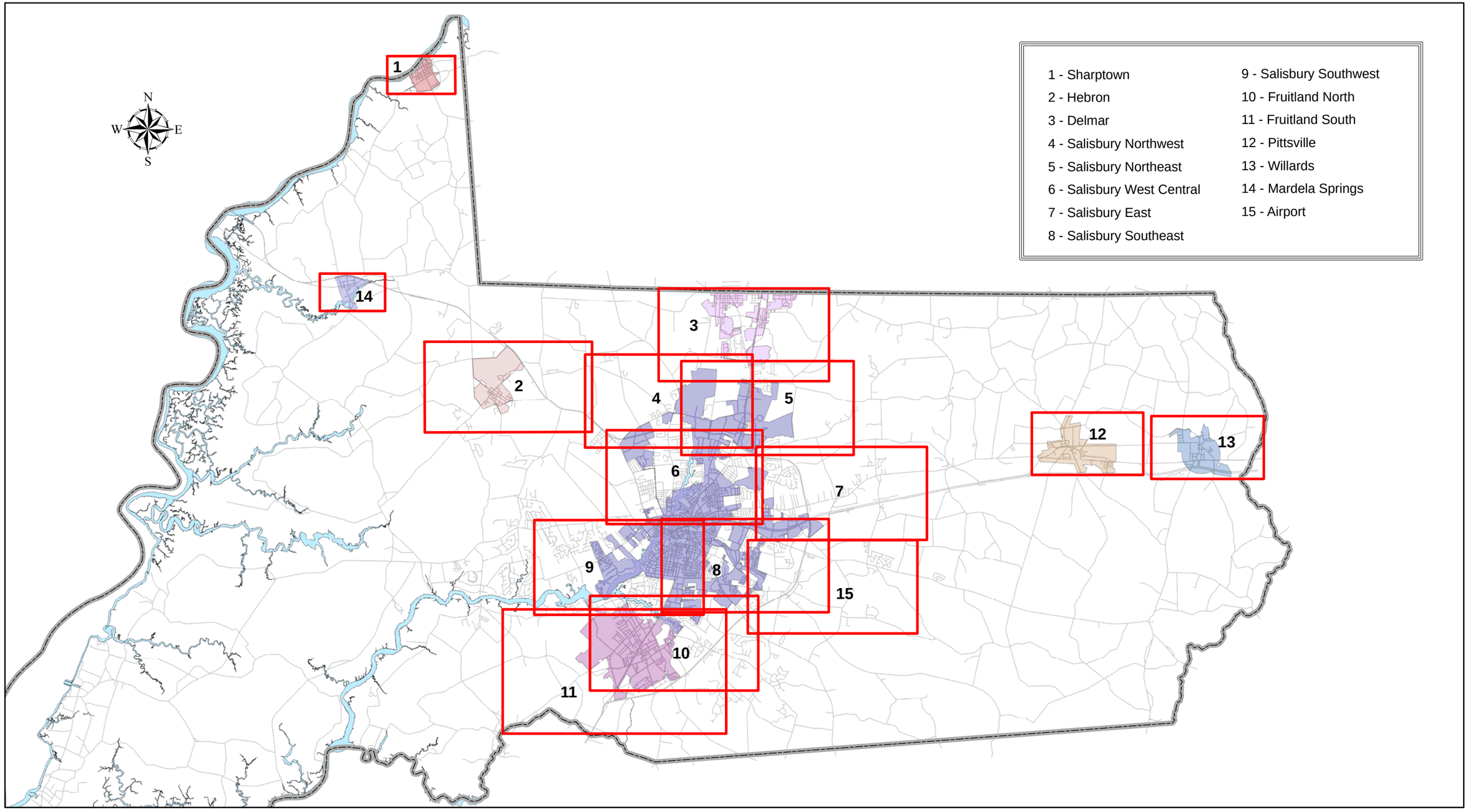
septic1.mxd - DM

0 3,000 6,000 12,000 Feet

Scale 1" = 3000'

SEWER PROBLEM AREAS - INDIVIDUAL AND COMMUNITY

WICOMICO COUNTY SEWER PLAN



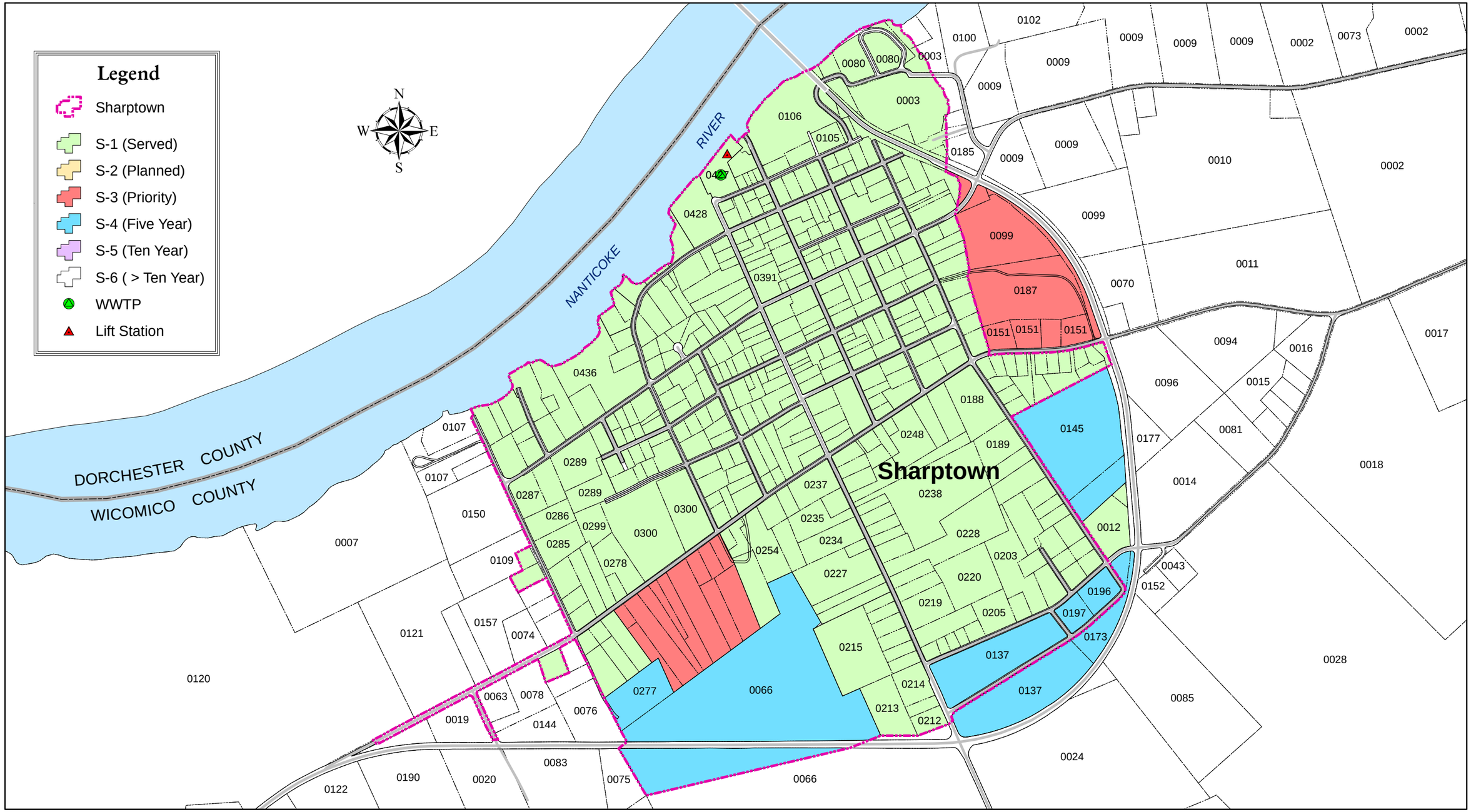
Scale 1" =13000'

0 6,500 13,000 26,000 39,000 Feet

KEY TO VICINITY MAPS FOR SEWER SERVICE AREAS

wico_sewerservice.mxd - DM 4/20/2010

WICOMICO COUNTY WATER and SEWER PLAN



Scale 1" = 600'

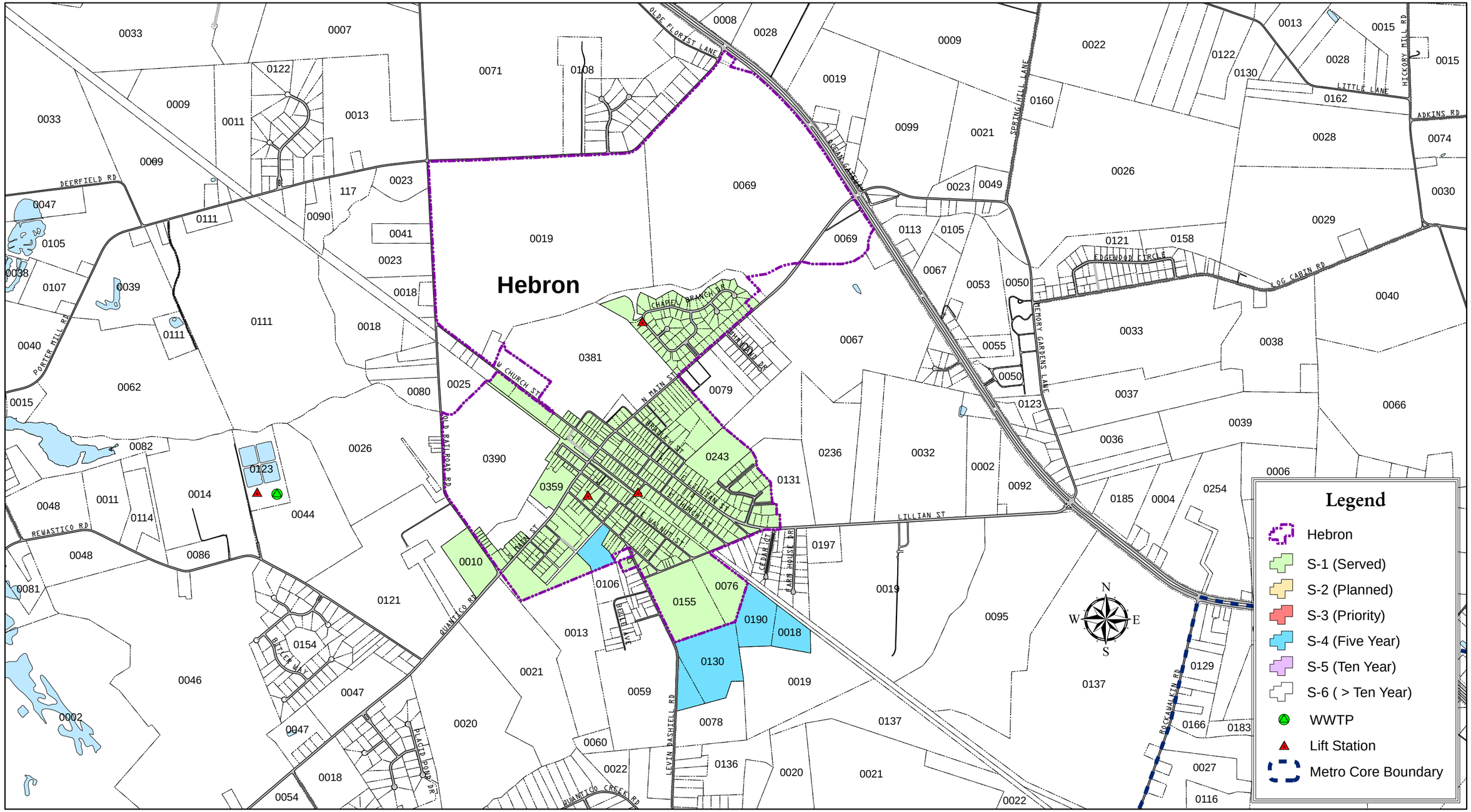
0 300 600 1,200 1,800 Feet

SEWER SERVICE AREAS - SHARPTOWN VICINITY

2010
Map 1

wico_sewerservice.mxd - DM 4/20/2010

WICOMICO COUNTY WATER and SEWER PLAN



Scale 1" =1500'

0 750 1,500 3,000 4,500 Feet

SEWER SERVICE AREAS - WILLARDS VICINITY

2010
Map 2

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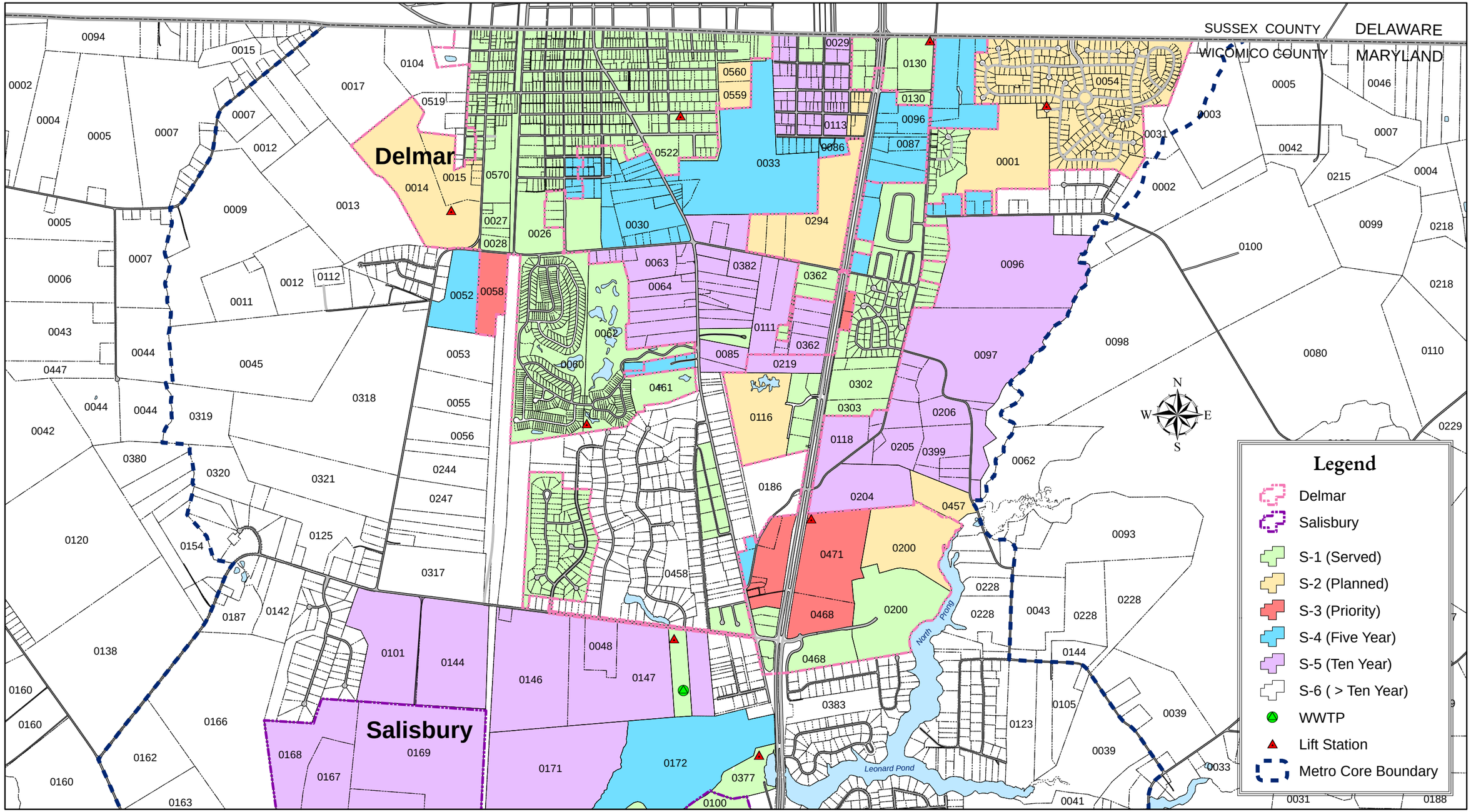
WICOMICO COUNTY WATER and SEWER PLAN



Scale 1" =1500'

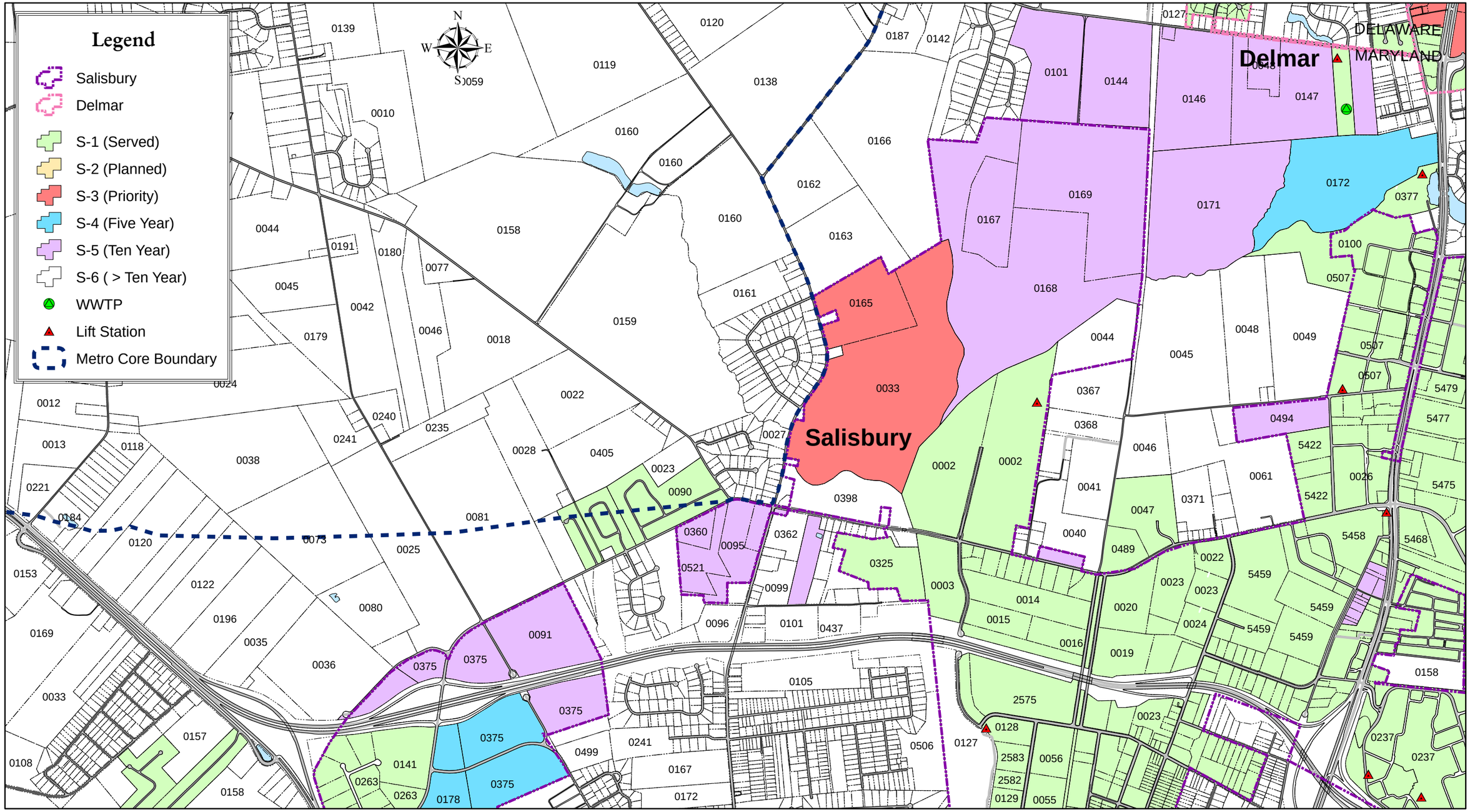
0 750 1,500 3,000 4,500 Feet

SEWER SERVICE AREAS - DELMAR VICINITY

2010
Map 3

wico_sewerservice.mxd - DM 4/20/2010

WICOMICO COUNTY WATER and SEWER PLAN



Scale 1" =1500'

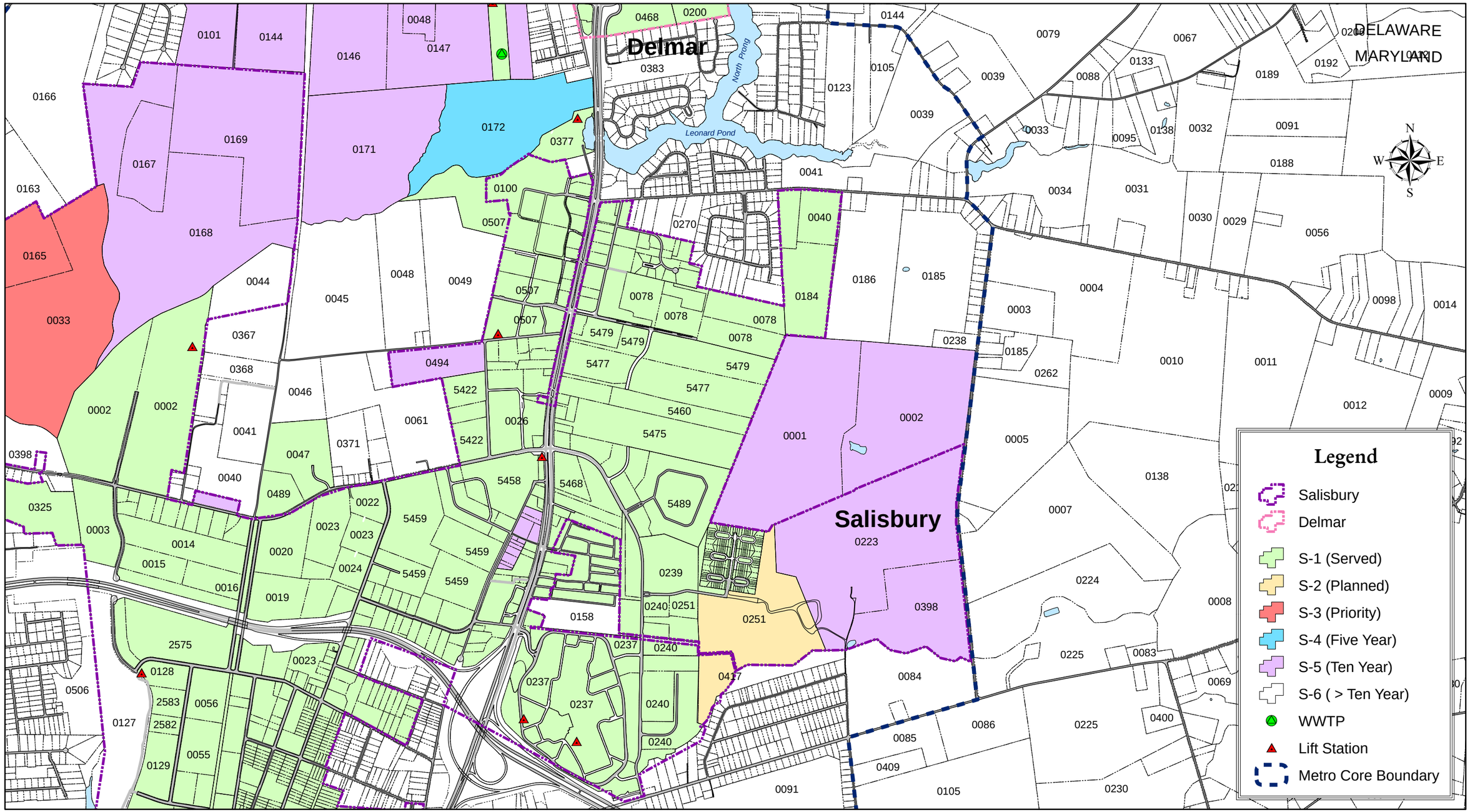
0 750 1,500 3,000 4,500 Feet

SEWER SERVICE AREAS - SALISBURY NORTHWEST VICINITY

2010
Map 4

wico_sewerservice.mxd - DM 4/20/2010

WICOMICO COUNTY WATER and SEWER PLAN



Scale 1" =1500'

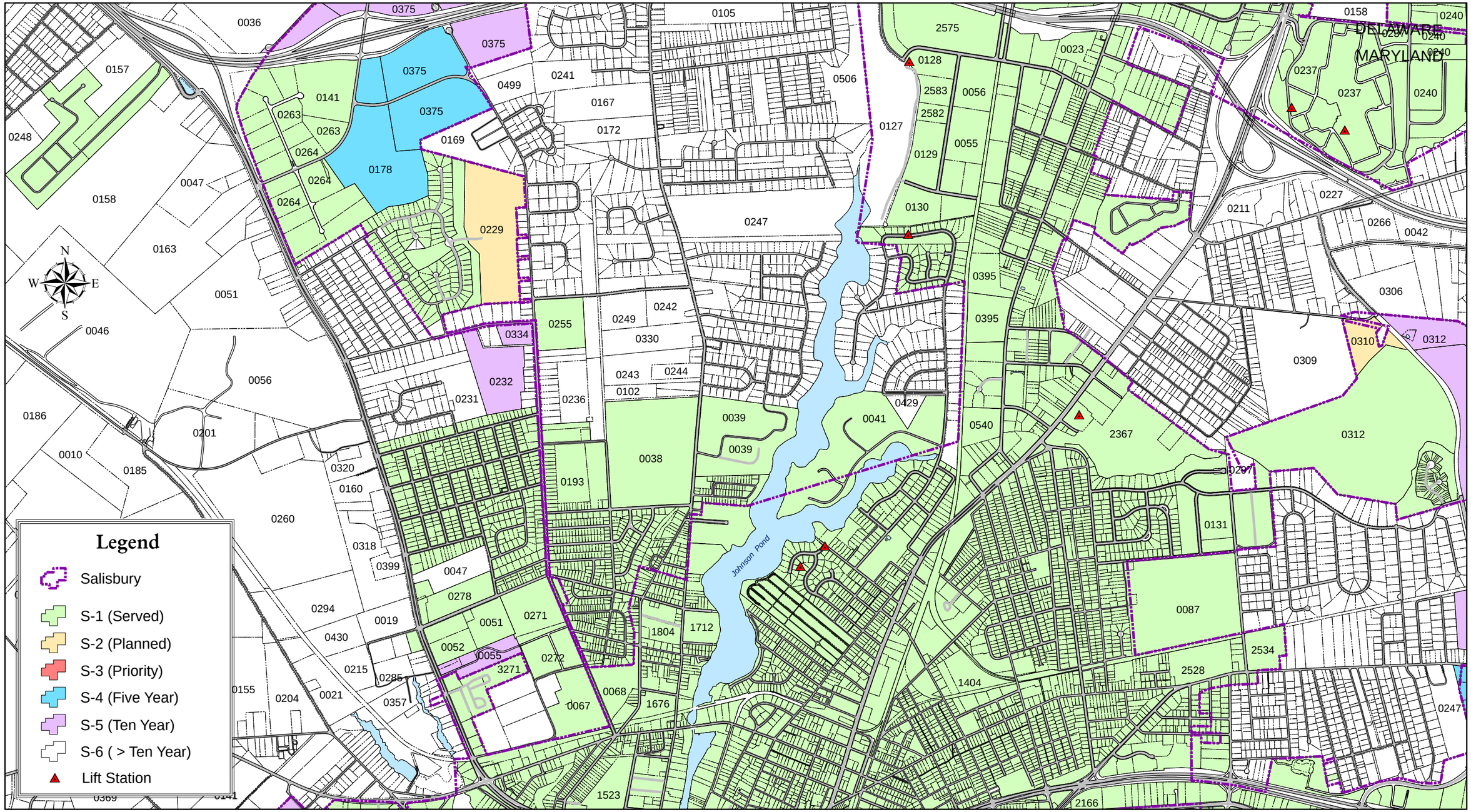
0 750 1,500 3,000 4,500 Feet

SEWER SERVICE AREAS - SALISBURY NORTHEAST VICINITY

2010
Map 5

wico_severservice.mxd - DM 4/20/2010

WICOMICO COUNTY WATER and SEWER PLAN



Scale 1" =1500'

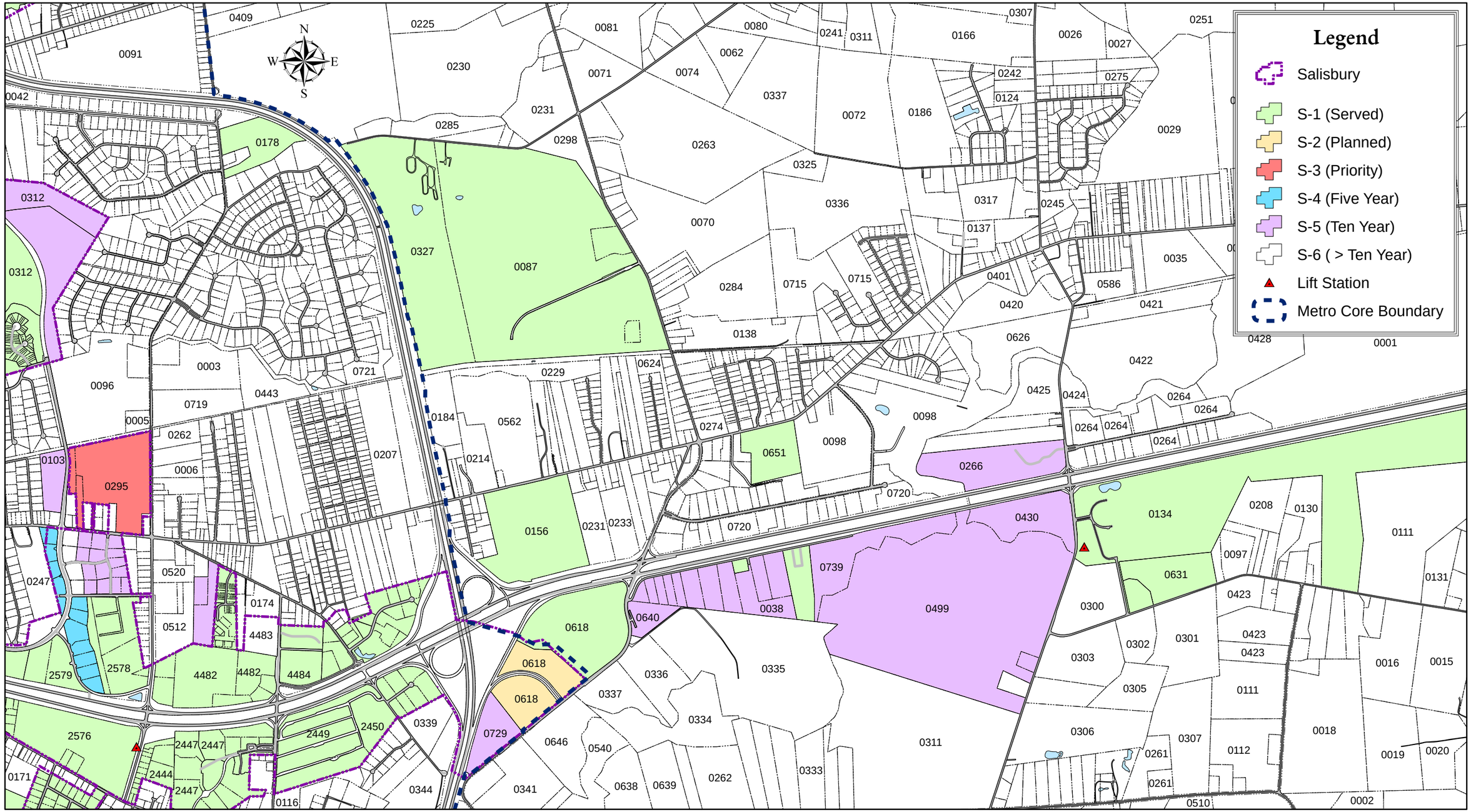
0 750 1,500 3,000 4,500 Feet

SEWER SERVICE AREAS - SALISBURY WEST CENTRAL VICINITY

2010
Map 6

wico_sewerservice.mxd - DM 4/20/2010

WICOMICO COUNTY WATER and SEWER PLAN



Scale 1" =1500'

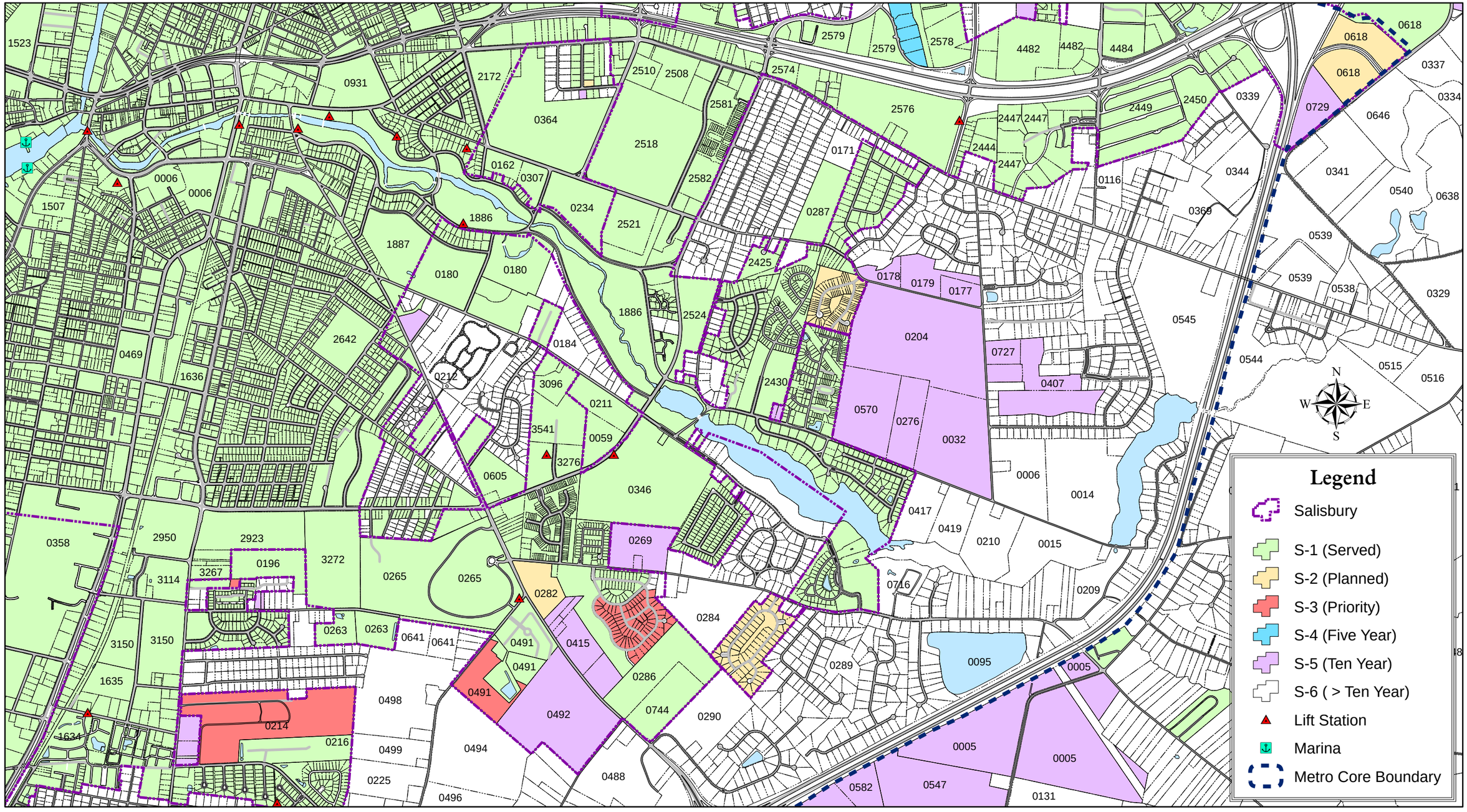
0 750 1,500 3,000 4,500 Feet

SEWER SERVICE AREAS - SALISBURY EAST VICINITY

2010
Map 7

wico_sewerservice.mxd - DM 4/20/2010

WICOMICO COUNTY WATER and SEWER PLAN



Scale 1" =1500'

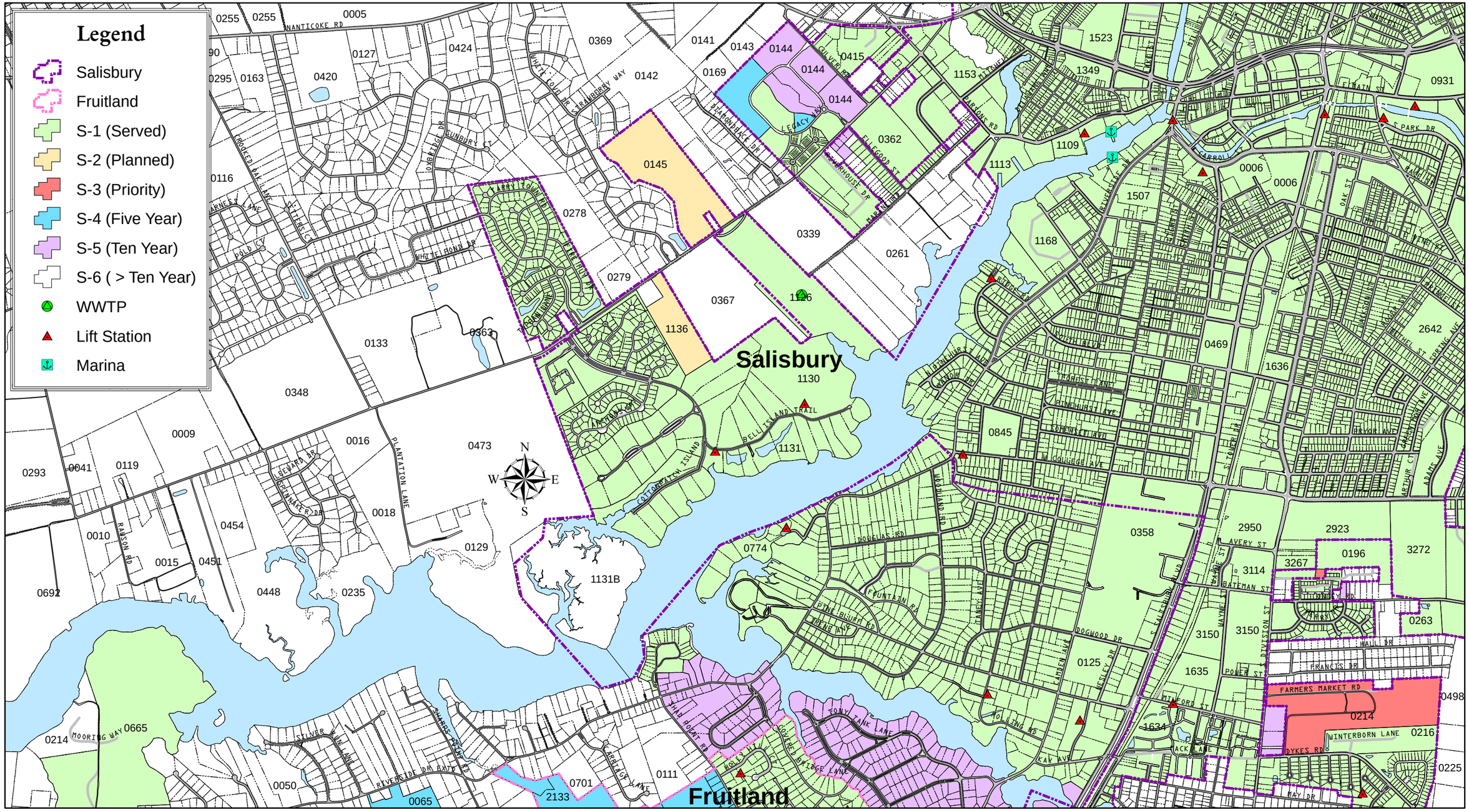
0 750 1,500 3,000 4,500 Feet

SEWER SERVICE AREAS - SALISBURY SOUTHEAST VICINITY

2010
Map 8

wico_sewerservice.mxd - DM 4/20/2010

WICOMICO COUNTY WATER and SEWER PLAN



Scale 1" =1500'

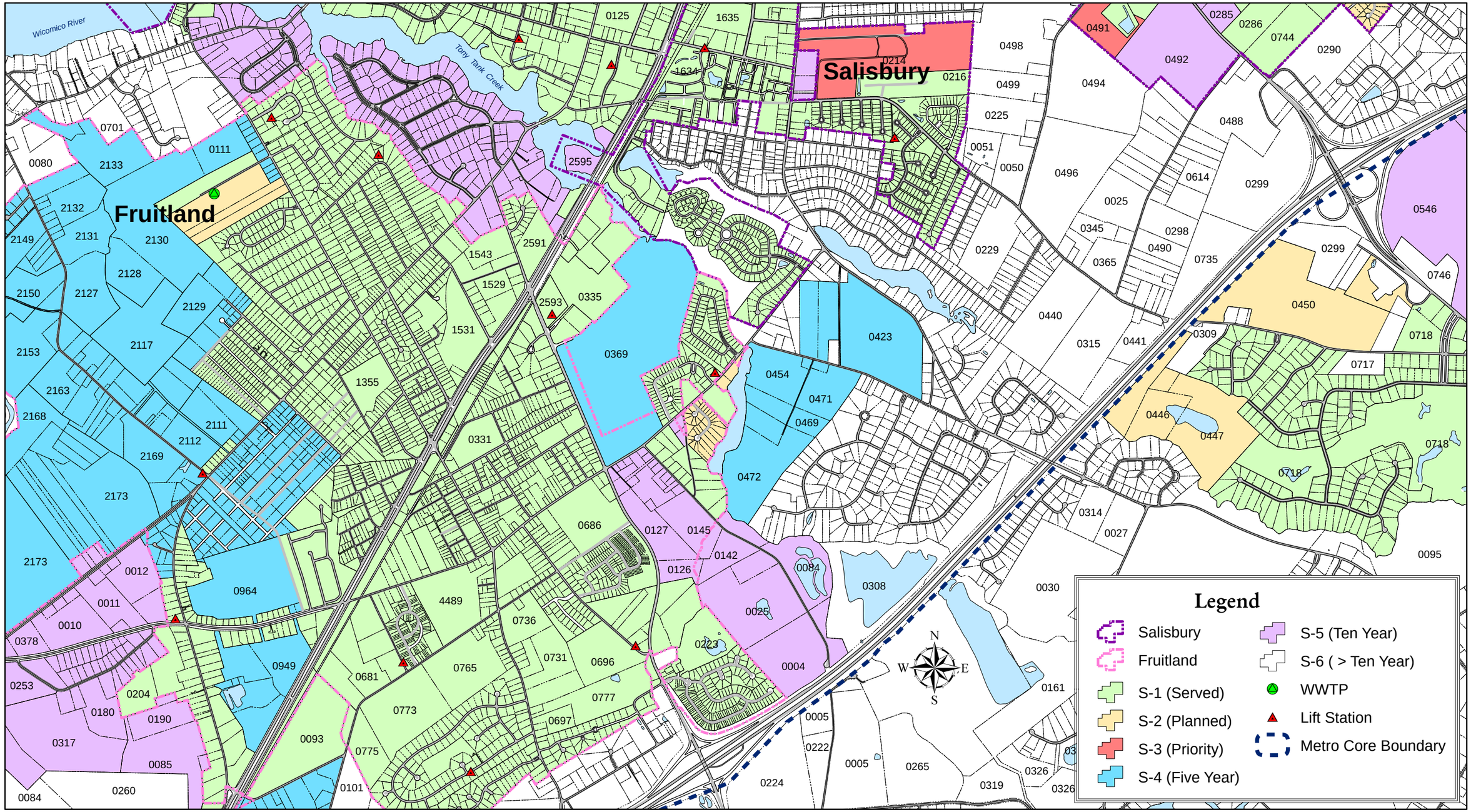
0 750 1,500 3,000 4,500 Feet

SEWER SERVICE AREAS - SALISBURY SOUTHWEST VICINITY

2010
Map 9

wico_sewerservice.mxd - DM 4/20/2010

WICOMICO COUNTY WATER and SEWER PLAN



Scale 1" =1500'

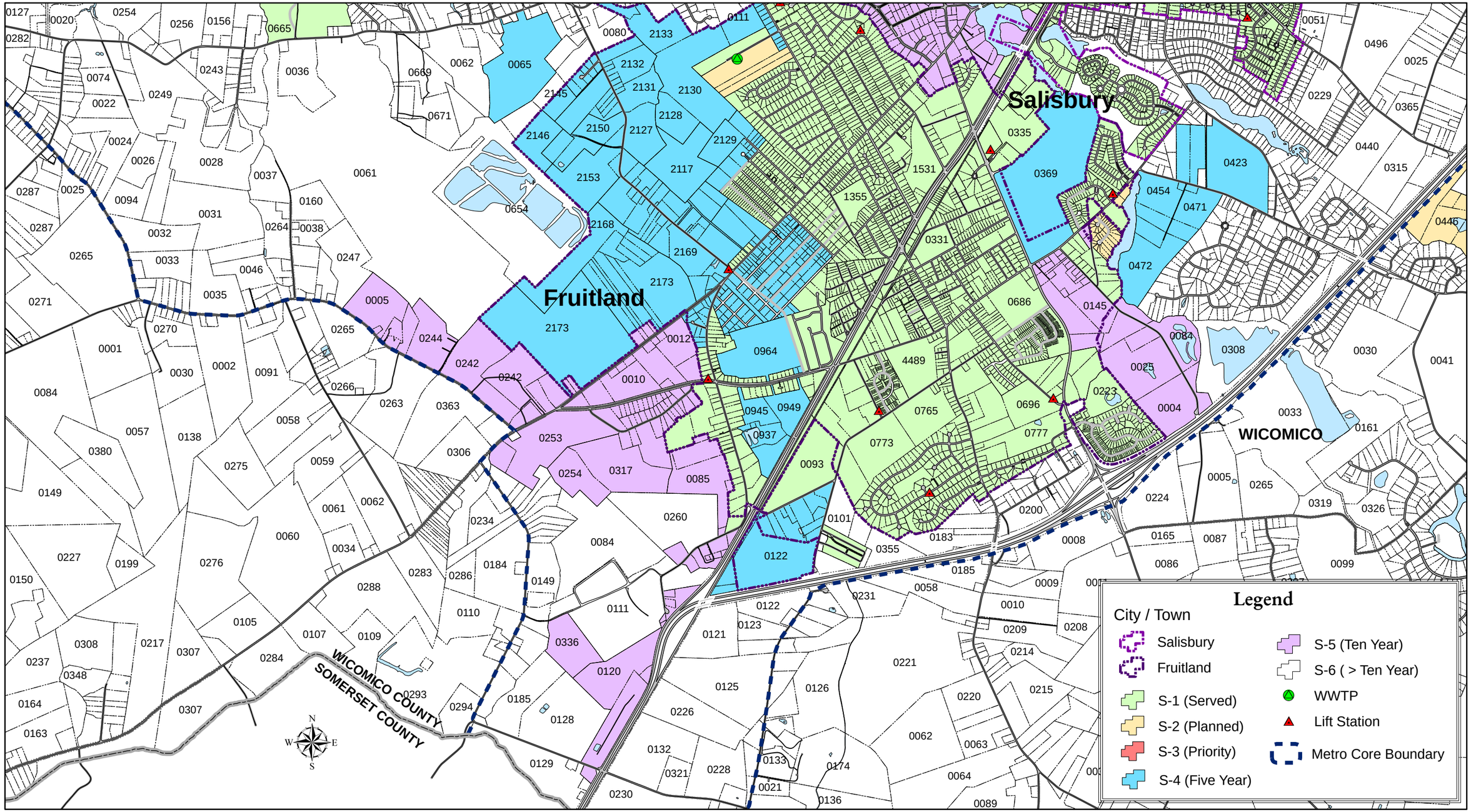
0 750 1,500 3,000 4,500 Feet

SEWER SERVICE AREAS - FRUITLAND NORTH VICINITY

2010
Map 10

wico_sewerservice.mxd - DM 4/20/2010

WICOMICO COUNTY WATER and SEWER PLAN



Scale 1" = 2000'

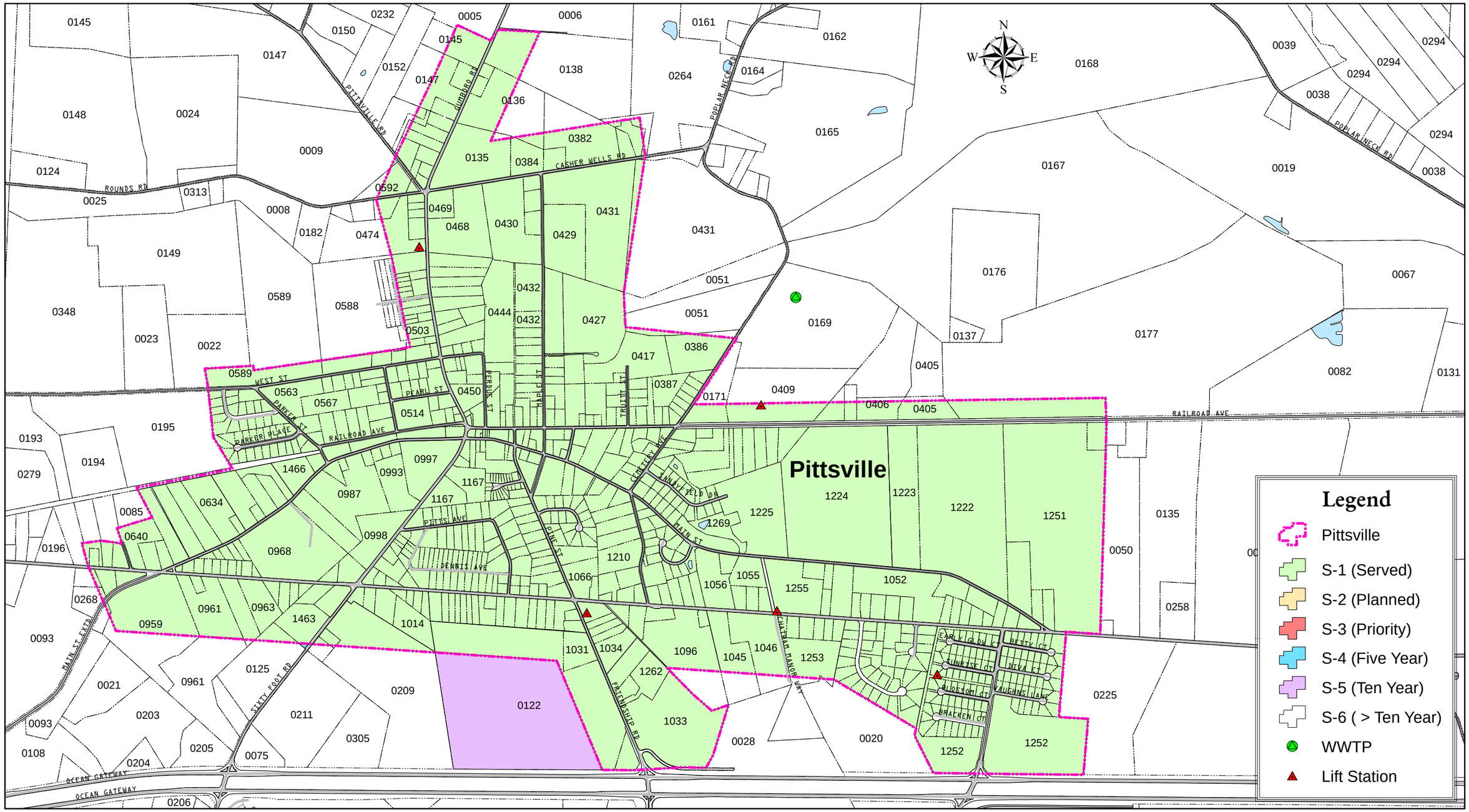
0 1,000 2,000 4,000 6,000 Feet

SEWER SERVICE AREAS - FRUITLAND SOUTH VICINITY

2010
Map 11

wico_sewerservice.mxd - DM 4/20/2010

WICOMICO COUNTY WATER and SEWER PLAN



Scale 1" =1000'

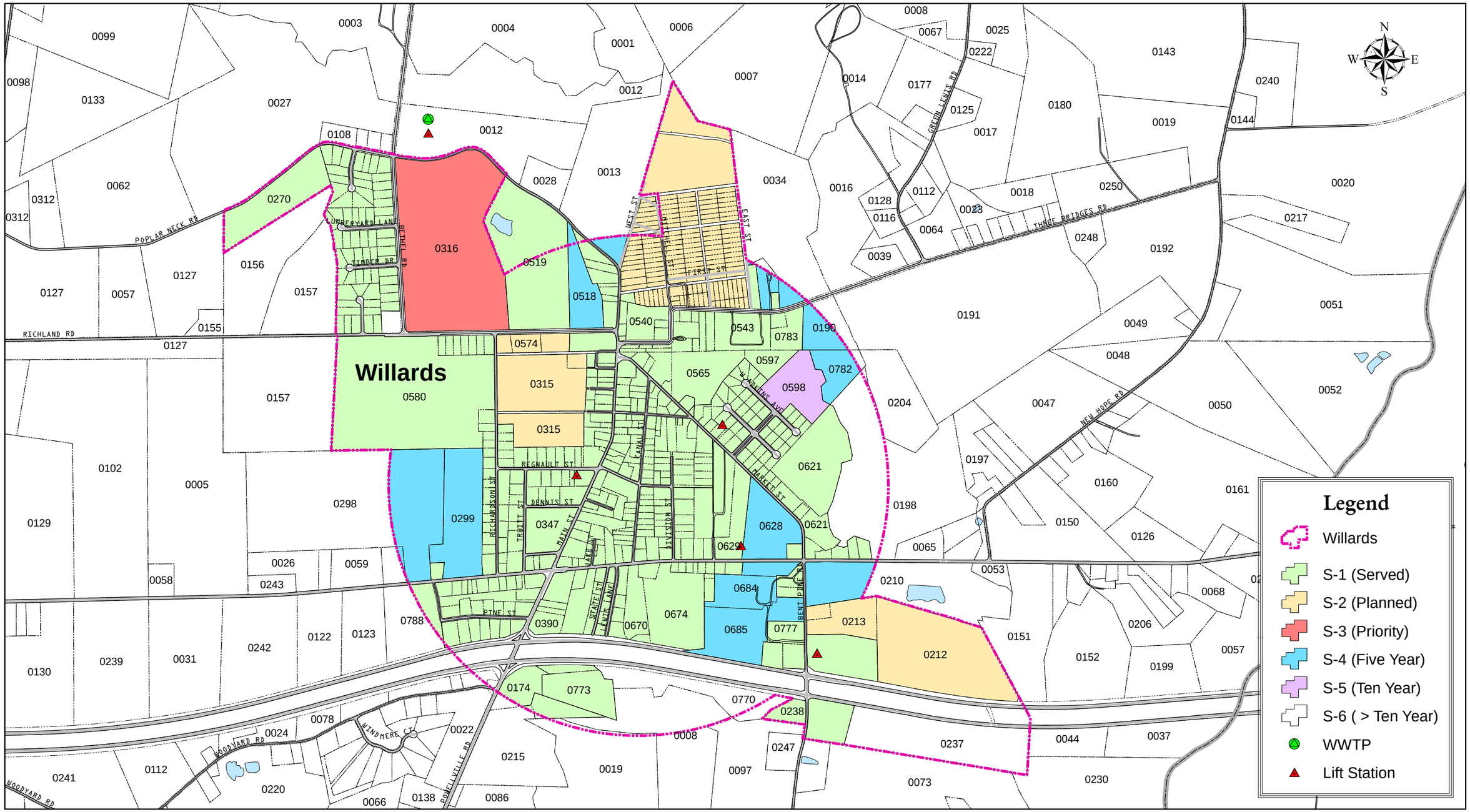
0 500 1,000 2,000 3,000 Feet

SEWER SERVICE AREAS - PITTSVILLE VICINITY

2010
Map 12

wico_sewerservice.mxd - DM 4/20/2010

WICOMICO COUNTY WATER and SEWER PLAN



Scale 1" =1000'

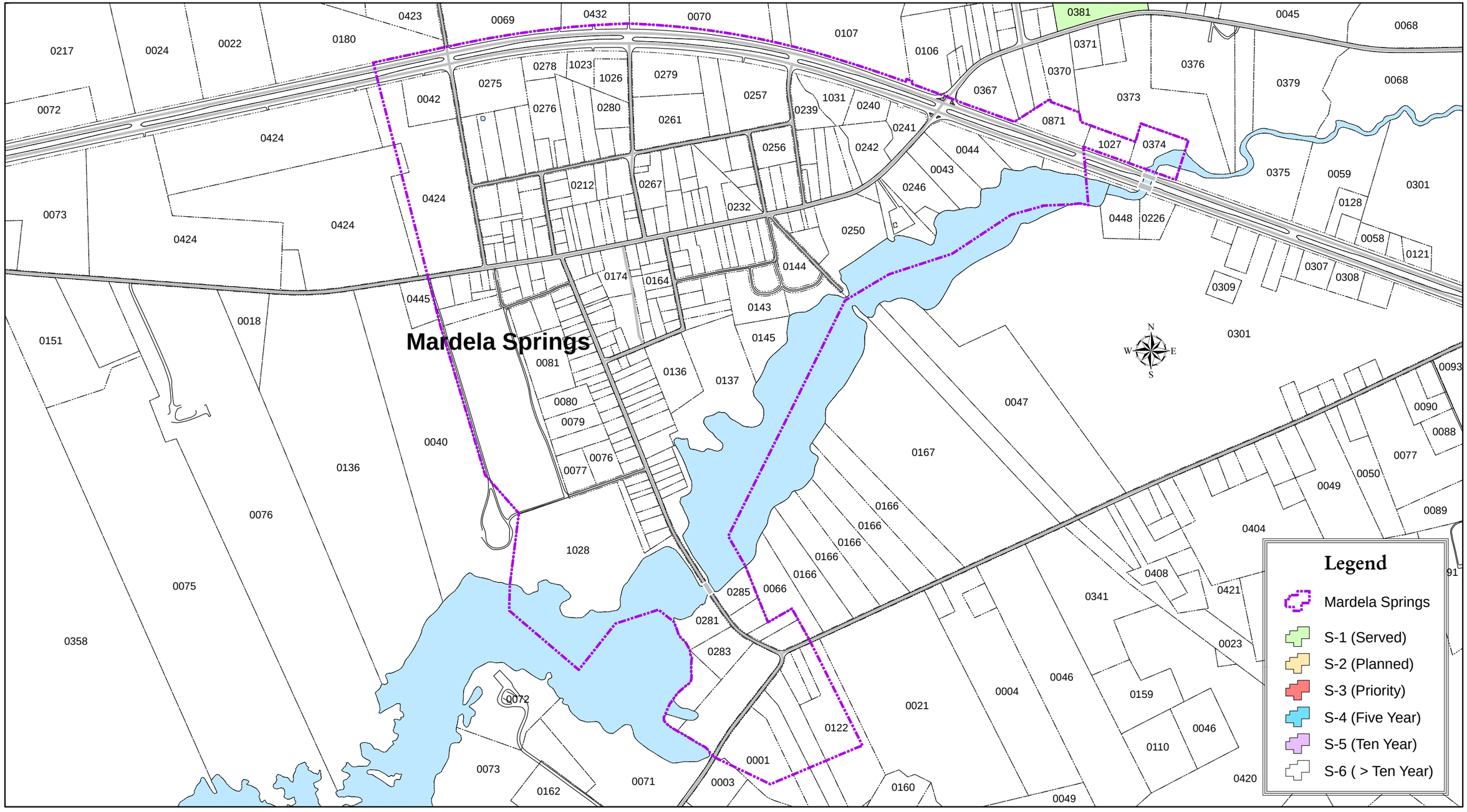
0 500 1,000 2,000 3,000 Feet

SEWER SERVICE AREAS - WILLARDS VICINITY

2010
Map 13

wico_sewerservice.mxd - DM 4/20/2010

WICOMICO COUNTY WATER and SEWER PLAN



Scale 1" = 600'

0 300 600 1,200 1,800 Feet

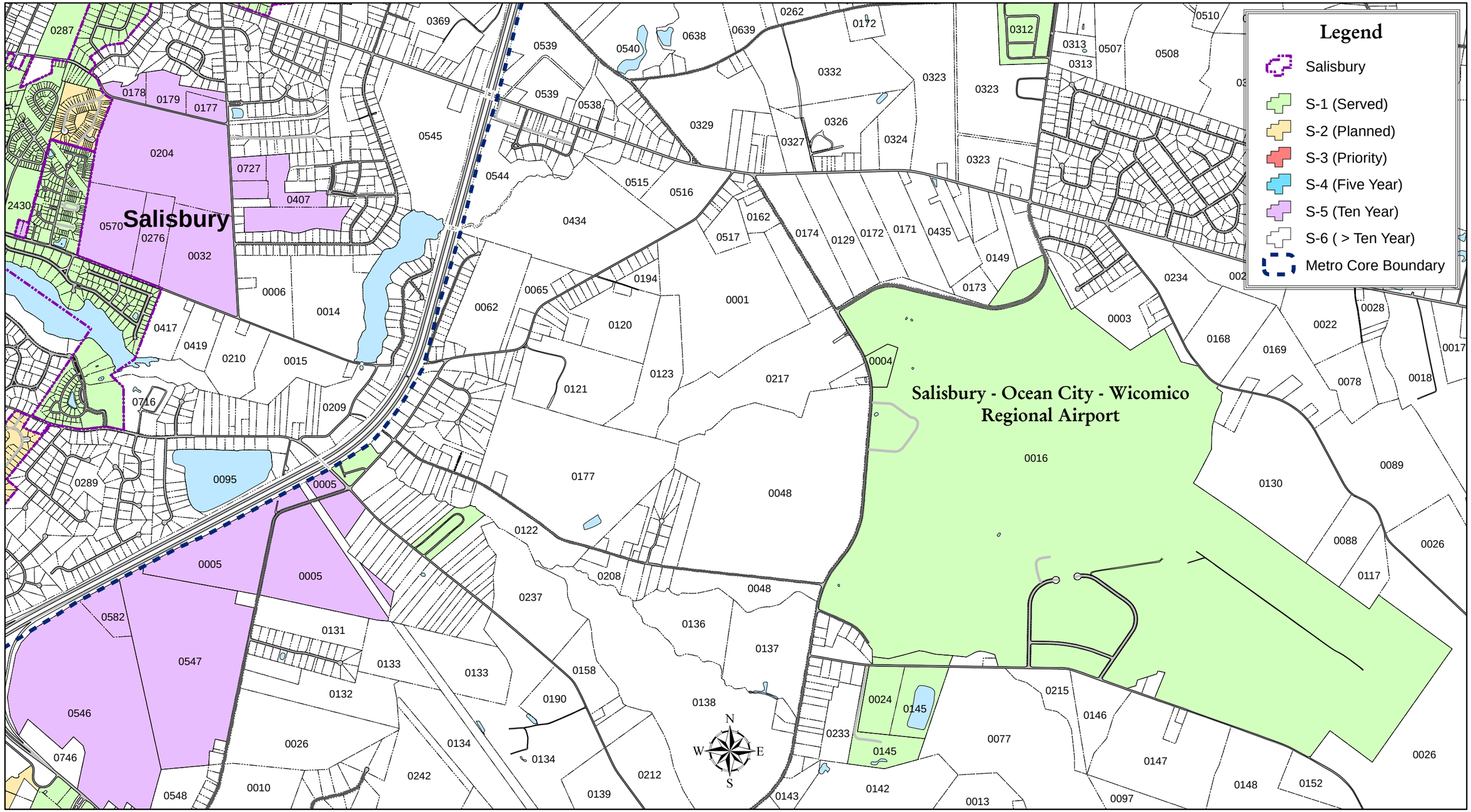
SEWER SERVICE AREAS - MARDELA SPRINGS VICINITY

2010

Map 14

wico_sewerservice.mxd - DM 4/20/2010

WICOMICO COUNTY WATER and SEWER PLAN



Scale 1" =1500'

0 750 1,500 3,000 4,500 Feet

SEWER SERVICE AREAS - SALISBURY AND AIRPORT VICINITY

2010
Map 15

wico_sewerservice.mxd - DM 4/20/2010