

Baltimore County Water Supply and Sewerage Plan

2020 Triennial Review

Report of the Review as submitted to the Baltimore County Council

May 18, 2021

Errata & Addenda
September 1, 2021

1. Insert County Council Resolution
2. Insert Transmittal Letter from Director, DPW&T

Errata & Addenda
December 27, 2021

1. Insert Final Action Letter from Director, MDE

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INTRODUCTION

The Environmental Article of the Annotated Code of Maryland (Section 9-503) requires Baltimore County to adopt a Plan for the provision of adequate water supply and sewerage throughout the County that is consistent with the County comprehensive land use plan. This Plan is to be reviewed by the County governing body at least once every three years.

The 10-year Baltimore County Water Supply and Sewerage Plan 2020 Triennial Review was adopted on August 2, 2021 by County Council Resolution No. 99-21.

Baltimore County *Master Plan 2020* was adopted by County Council Resolution 94-10 on November 15, 2010.

The 2020 Triennial Review was approved by Maryland Department of the Environment (MDE) in the letter from MDE's Director of the Water Management Administration dated November 30, 2021.

The next Triennial Review is due for submission to MDE in 2023.

STATEMENTS AND CERTIFICATIONS

Upon approval of the *Water Supply and Sewerage Plan 2020 Triennial Review*, COMAR 26.03.01.04 requires the following statements to be provided in this Introduction:

1. Statement certifying that the county governing board has officially adopted the plan. This will be the County Council Resolution, endorsed by the County Executive, adopting the *Triennial Review*.
2. Statement certifying that the plan incorporates subsidiary plans. This is not applicable to Baltimore County in that there are no subsidiary jurisdictions within the County.
3. Statement certifying that the sections covering the engineering aspects of water and sewerage projects have been prepared and reviewed for adequacy by a registered engineer licensed in the State. This statement is usually made in the letter from the Director of Public Works and Transportation submitting the *Triennial Review* to the Maryland Department of the Environment.
4. The letter of approval from the Maryland Department of the Environment.

Statements and certifications will be attached when the Plan is adopted and approved.

COUNTY COUNCIL OF BALTIMORE COUNTY, MARYLAND
Legislative Session 2021, Legislative Day No. 12

Resolution No. 99-21

Mr. Julian E. Jones, Jr., Chairman
By Request of County Executive

By the County Council, July 6, 2021

A RESOLUTION adopting the report of the 2020 Triennial Review of Baltimore County Water Supply and Sewerage Plan.

WHEREAS, pursuant to Title 9, Subtitle 5 of the Environment Article of the Annotated Code of Maryland, Baltimore County has adopted a comprehensive 10-year Water Supply and Sewerage Plan; and

WHEREAS, the Plan was adopted on March 05, 2018 by Resolution 5-18; and

WHEREAS, the County is required by State law to review the Plan every three years and to submit a report of its review, together with amendments thereto or revisions thereof, to the State Department of the Environment; and

WHEREAS, the Planning Board did on October 1, 2020 hold an advertised public hearing on the 2020 Triennial Review; and

WHEREAS, the Planning Board did on October 15, 2020 vote to recommend that the 2020 Triennial Review be adopted; now therefore

BE IT RESOLVED BY THE COUNTY COUNCIL OF BALTIMORE COUNTY, that the 2020 Triennial Review of the Baltimore County Water Supply and Sewerage Plan, as amended, is hereby adopted; and

BE IT FURTHER RESOLVED, that this Resolution be submitted to the County Executive for his approval; and

BE IT FURTHER RESOLVED, that a copy of this Resolution together with the 2020 Triennial Review be submitted to the Maryland Department of Environment; and

BE IT FURTHER RESOLVED, that this Resolution shall take effect from the date of its passage by the County Council.

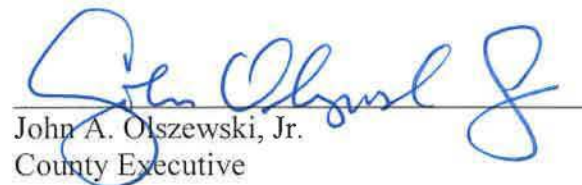
READ AND PASSED this 2nd day of AUGUST, 2021

BY ORDER

A handwritten signature in blue ink, appearing to read "Th H Bostwick", written over a horizontal line.

Thomas H. Bostwick
Secretary

DATE: August 6, 2021

A handwritten signature in blue ink, appearing to read "John A Olszewski Jr", written over a horizontal line.

John A. Olszewski, Jr.
County Executive

ITEM: RESOLUTION 99-21



JOHN A. OLSZEWSKI, JR.
County Executive

D'ANDREA L. WALKER, *Acting Director*
Department of Public Works and Transportation

August 10, 2021

D. Lee Currey, Director
Water and Science Administration
1800 Washington Boulevard, Suite 405
Baltimore, Maryland 21230-4718

Subject: Baltimore County Water Supply & Sewerage Master Plan
Triennial Review 2020

Dear Mr. Currey:

Baltimore County has completed its 2020 Triennial Review of the Water Supply and Sewerage Plan.

A preliminary draft of the Review was made available via e-mail to the Maryland Department of the Environment on September 22, 2020 with copies to the Maryland Department of Planning. The Baltimore County Planning Board held a hearing on October 21, 2020 and passed a resolution endorsing the Review on October 15, 2020. The report of the Review was adopted by the local governing body by County Council Resolution 99-21 signed by the County Executive on August 2, 2021.

I am forwarding one printed copy of the 2020 Triennial Review document, maps and appendices for review and approval. In lieu of additional paper copies the entire report, maps and appendices are available for viewing and download at:

<https://www.baltimorecountymd.gov/departments/publicworks/masterplan.html>

This Plan was prepared and processed following the requirements of COMAR 26.03.01, Regulation .02B. Sections covering engineering aspects of the plan have been prepared and reviewed for adequacy by Erin McKenna-Streyle, a P.E. licensed in the State of Maryland. If there are any questions, please feel free to contact Erin at (410) 887-8545.

Regards,



D'Andrea L. Walker, Acting Director
Bureau of Engineering & Construction
Department of Public Works and Transportation

DLW/JSP/EAM/s

Attachment: 1 copy: Council Resolution 99-21; "2020 Triennial Review..."

CC: Thomas H. Bostwick; James R. Benjamin Jr.; Charles Connor; Lauren Buckler; Jeffrey Peluso; Mike Mazurek; Lisa Eicholtz; Kevin Koepenick; Kui Zhao; Bryan Bokey; Robin Pellicano, MDE; Nicholai Francis-Lau, MDE; Dinorah Dalmasy, MDE; Chuck Boyd, MDP; Steve Alfaro, MDE; Hannah Benzion, MDE



Maryland

Department of the Environment

Larry Hogan, Governor
Boyd K. Rutherford, Lt. Governor

Ben Grumbles, Secretary
Horacio Tablada, Deputy Secretary

November 30, 2021

The Honorable Julian E. Jones, Jr.
Council Chair
Baltimore County Council
Old Courthouse
400 Washington Ave.
Towson, MD 21204

Dear Council Chair Jones:

The Maryland Department of the Environment (MDE) has completed its review of the **Triennial 2020 W&S Plan Update (Plan)** of the Baltimore County Water Supply and Sewerage Plan. The Baltimore County Council adopted the Plan on August 2, 2021 by Resolution 99-21. The Update included text regarding septic connections for public and safety reasons outside of the Urban Rural Demarcation Line (URDL), table updates with new information, such as population forecasts and proposed water and sewer infrastructure projects and updated water and sewer category maps.

Maryland Department of Planning Findings

The Maryland Department of Planning (MDP) found the update to be consistent with the County's adopted 2020 Master Plan. MDP noted that although the plan incorporates the amendments from Fall/Spring cycle since 2017, the WSP does not seem to include the amendments in Cycle 38 and EM-01. Planning recommends that the county confirm that these amendments will be added to the new WSP and adjust it accordingly. In addition, MDP's comments included several recommended Growth Tier Map changes. The County is encouraged to work with MDP on any recommended updates.

MDE Findings and Action

In accordance with §9-507(a) of the Environment Article, Annotated Code of Maryland, the Department hereby **approves the Triennial 2020 W&S Plan Update**.

Recommendation: Based on MDE's Digital Flood Insurance Rate Maps, portions of the County are within Flood Zones and Inundation areas. Please see the following mapped areas on the Climate Ready Action Boundary Map: <https://mdfloodmaps.net/CRAB/>. The



County could consider climate resiliency in future updates to the W&S Plan, which could include but not limited to the following steps (<https://toolkit.climate.gov/>):

- Explore Hazards: Identify climate and non-climate stressors, threats, and hazards and how they could affect assets (people and infrastructure).
- Assess vulnerability and risks: Evaluate assets vulnerability and estimate the risk to each asset.
- Investigate options: Consider possible solutions for your highest risks, check how others have responded to similar issues, and reduce your list to feasible actions.
- Prioritize and plan: Evaluate costs, benefits, and capacity to accomplish each action integrating the highest value actions into a stepwise plan.
- Take action: Move forward with your plan and check to see if your actions are increasing your resilience with monitoring.

The County is encouraged to contact Dave Guignet, State NFIP Coordinator, of MDE's Stormwater, Dam Safety, and Flood Management Program, at (410) 537-3775 for additional information regarding the regulatory requirements for Floodplains and Storm Surges.

The County is also encouraged to contact Matthew C. Rowe, CC-P, Assistant Director of MDE's Water and Science Administration, at (410) 537-3578 for additional information regarding Climate Change and Resiliency.

This completes MDE's review, as required by §9-507 of the Environment Article, Annotated Code of Maryland. If you need further assistance on these matters, please contact Heather Barthel, Deputy Director, at (410) 537-3512, toll-free at (800) 633-6101, or by e-mail at heather.barthel@maryland.gov.

Sincerely,

Matthew C. Rowe

D. Lee Currey, Director
Water and Science Administration

Enclosures

cc: Bryan Bokey, Department of Public Works, Baltimore Co.
Erin McKenna-Streyle, Project Manager, Department of Public Works, Baltimore Co.
Dave Guignet, State NFIP Coordinator, Water and Science Administration, MDE
Matthew C. Rowe, CC-P, Assistant Director, Water and Science Administration, MDE
Charles Boyd, Director, Planning Coordination, MDP
Heather Barthel, Deputy Director, Water and Science Administration, MDE

CHAPTER I: GOALS AND ORGANIZATION

GOALS OF THE COUNTY CONSISTENT WITH COMPREHENSIVE PLANNING

MASTER PLAN 2020

To promote policies and actions resulting in a safe, sustainable environment for future generations, the County Council in partnership with the Citizens of Baltimore County, Maryland, adopted *Master Plan 2020* on November 15, 2010 (Resolution 94-10). The goals of the plan are as follows:

Goal One: Continue the Success of Growth Management

- Direct the future growth within the Urban-Rural Demarcation Line (URDL)
- Protect and enhance Community Conservation Areas
- Promote redevelopment with an emphasis on ailing commercial or industrial properties
- Develop compact, mixed-use, transit-oriented and walkable neighborhoods
- Advance economic wellbeing by promoting a high quality labor force
- Provide a mixture of housing types for an emerging diversity of residents
- Support quality public schools to enhance communities
- Prioritize infrastructure improvements via the Capital Improvement Program to endorse sustainable development
- Protect the character and economic vitality of the rural communities

Goal Two: Improve the Built Environment

- Provide adequate open space and recreational opportunities and increase connections to nature by linking open spaces and parks
- Invest in public grounds by tree planting, buffer conservation and habitat restoration
- Expand and deliver multi-modal transportation services
- Reduce pollutant loadings of runoff with enhanced stormwater management
- Meet desire for green communities by providing regulatory incentives
- Ensure integration between regulations and sustainability programs such as LEED

Goal Three: Strengthen Resource Conservation and Protection

- Protect health of the natural environment and maintain a valuable biodiversity
- Restore ecosystems and encourage fair, efficient use of natural resources
- Preserve cultural assets to establish a tangible sense of community
- Nurture farming activities and importance of the agricultural industry
- Conserve rural characteristics and scenic vistas

WATER AND SEWER PLAN

Sustainable development has been defined as that which “meets the needs of the present in a responsible manner without compromising the ability of current and future generations to meet their own needs” (United Nations General Assembly (1987)). To help ensure a sustainable community, Baltimore County will continue the following actions to protect the public water supplies and sewer systems:

- Work with Baltimore City and adjacent jurisdictions to protect and enhance the water supply reservoirs;
- Maintain and upgrade all capital facilities as required;
- Implement the water resource conservation practices established in the Baltimore county plumbing code;
- Where technically feasible, require property owners with developed properties that utilize septic systems that are located within areas designated as S-1, to connect to public sewer and abandon their septic systems.
- Where technically feasible and as determined by the Department of Environmental Protection and Sustainability (EPS), individual properties, communities, and subdivisions with failing, inadequate, and substandard private onsite water or septic systems or other public health concerns exist inside of the Metropolitan District and outside of the URDL in W-7 and/or S-7 (no planned service) designated areas, public water and/or sewer may be extended to existing lots of record if evaluated and required by DPW as the most economically feasible solution. Such extensions are permitted through the County’s existing Water Supply and Sewerage Master Plan Amendment process.
- Actively participate in the Metropolitan District;
- Also actively participate in the Susquehanna River Basin Commission.

Master Plan 2020 was prepared in accordance with Article 66B of the Annotated Code of Maryland, Section 523 of the Baltimore County Charter, and pertinent sections in the Baltimore County Code. Development of the master plan involved all “stakeholders”, such as citizens and community associations, county and state agencies, government officials, and businesspersons. Similarly, in preparing this Water and Sewer Plan, the appropriate comprehensive planning agencies were consulted: the Maryland Department of Planning, the Baltimore County Department of Planning, and the regional planning group, the Baltimore Metropolitan Council (BMC). This unified effort helped to ensure the Water and Sewer Plan is indeed consistent with, and in fact supportive of the County’s goals of comprehensive planning.

The Water and Sewer Plan shall remain in effect concurrently with the Master Plan. Any revision to one plan that has substantive impact on the other will require commensurate modification of the other plan.

ADDITIONAL PLANS

Additional plans and studies are amendments to the *Master Plan 2020*, which further define land use and growth management strategies countywide, and for specific areas of the County. The County's Master Planning web page lists all adopted community and other plans:

<https://www.baltimorecountymd.gov/departments/planning/masterplanning/adoptedcommunityplans/index.html>

Furthermore, "The Baltimore County, Maryland Land Preservation, Parks and Recreation Plan," was adopted by the Baltimore County Council as a *Master Plan 2020* Amendment on June 5, 2017. The full document is posted at:

<https://www.baltimorecountymd.gov/departments/planning/masterplanning/parkrecplan>

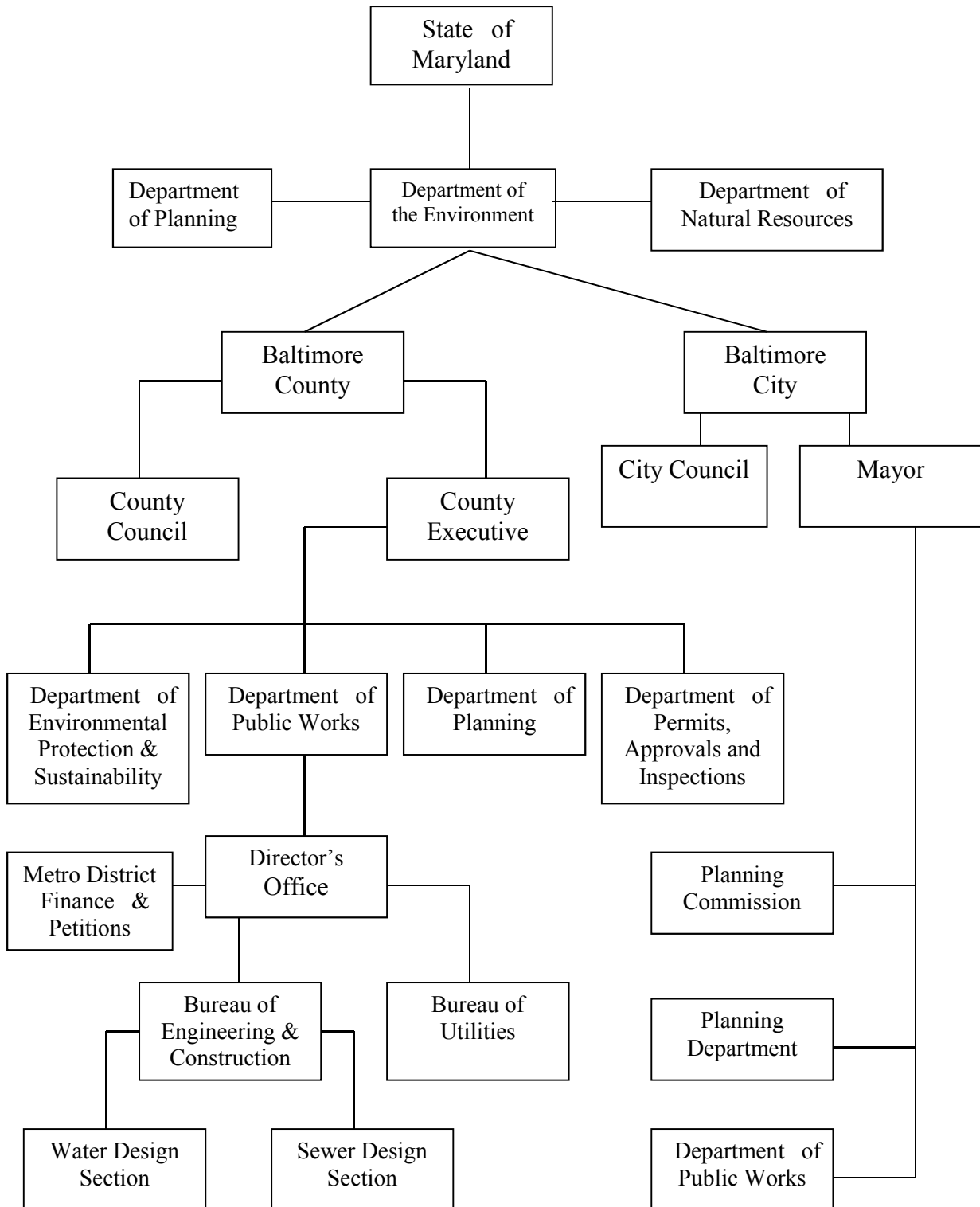
ARTICLE 66B, ANNOTATED CODE OF MARYLAND

In response to directives from the United States Environmental Protection Agency (EPA), the General Assembly of Maryland passed legislation amending Article 66B of the Annotated Code of Maryland. In 2012, the Maryland General Assembly repealed Article 66B and Article 28 and replaced them with the Land Use Article.

Specifically House Bill 1141 (HB 1141, 2006) required, among other items, a thorough examination of the safety and adequacy of all drinking water supplies and sewerage disposal systems for existing and future populations. The analysis contained in the master plan, called a Water Resources element (WRE), revealed that, with continued maintenance and protection, the public water supply and sewerage systems serving Baltimore County will be safe and adequate for the projected population until at least 2035. The WRE had a major influence on the policies and actions developed in *Master Plan 2020*, especially concerning protection of surface waters and the Chesapeake Bay. One of the primary goals is to direct virtually all new land development (or *redevelopment*) inside the Priority Funding Area (PFA), which is essentially the urban area closest to Baltimore City. Even with this anticipated population growth, there will be enough potable water in the public supply system, and adequate capacity in the public sewer system.

ORGANIZATIONAL CHART

State & Local Government as Related to Water & Sewer Management



COUNTY GOVERNMENT AS IT RELATES TO WATER AND SEWERAGE MANAGEMENT

In order for property to be served by public water and sewer in Baltimore County, it must meet two geographic conditions:

1. Located within the Baltimore County Metropolitan District, and
2. Located within an area designated as Capital Facilities or Existing Service on the Water and Sewerage Plan Maps.

METROPOLITAN DISTRICT

Under the Metropolitan District Act (established by the Acts of the General Assembly of Maryland of 1924, Chapter 539) the Baltimore County Metropolitan Sewer and Water Operating District (the “Metro District”) was created as a separate and financially self-supporting entity under the jurisdiction of the County to supply water and to provide sewer and wastewater systems to residents of the County living within certain prescribed areas primarily in the most densely populated areas. The extension of these boundaries is subject to the approval of the County Council with the consent and approval of the Mayor and City Council of Baltimore. The Department of Public Works under the direction of the County Administrative Office carries out the administration of the Metropolitan District. The Metro District has its own revenue and bond issuance powers, subject to authorization by the County Council. The Metropolitan District Act requires the City of Baltimore (the “City”) to provide water to the Metro District at cost. Although the Metro District constructs water facilities within its boundaries, under an agreement between the City and the County, the City maintains and operates the facilities at cost, including billing and collecting water usage. Under said agreements, the City and the County have also agreed to pay for certain new capital projects and the repair and enlargement of additions or improvements to certain existing water facilities on a specified pro-rata basis. In addition, the County, from time to time, has entered into agreement with adjacent Anne Arundel and Howard counties under which, certain of the County’s water facilities are made available to each of said counties. For such use, these other jurisdictions have agreed to pay for a pro-rate share of capital and operating costs.

The Metro District is operated like a regulated utility company. However, instead of using a quasi-public commission or appointed authority, the system is managed, financed and operated directly by Baltimore County. The County Charter states that all funds expended by the County must be appropriated and be contained in an operating or capital budget that has been approved by County Council. Therefore, the Metro District’s Capital Improvement Program (CIP) is part of the overall County CIP.

WATER AND SEWERAGE PLAN MAPS, ANNUAL AMENDMENT CYCLE

Owners of properties for which public water and sewer utility service is desired but are not within Capital Facilities or Existing Service areas must petition the County for a map amendment. The executive order of April 11, 1990, established an **annual amendment cycle** for this purpose. Petitions for map amendments must be submitted by May 1 of each year. After being reviewed by Planning, DEPS and DPW, staff recommendations are forwarded to the Planning Board for public hearing and report to the County Executive. The County Executive may then forward any favorable recommendations to the County Council for approval. The County Council resolution approving any map amendments is then forwarded to the State Department of the Environment (MDE) for final approval. MDE uses this information during review of permits under its jurisdiction.

Properties having designations W-4 or S-4, W-5 or S-5, W-6 or S-6 must petition for amendment to receive any service. The special designation W-5X or S-5X automatically becomes W-3 or S-3 when the property is included in the Metro district. When capital facilities are completed in W-3 or S-3 areas, those areas become W-1 or S-1 areas automatically (see map maintenance policy). Properties designated as W-7 or S-7 (No Planned Service) are served by private well water and sewage disposal systems. Properties using in excess of 5000 gallons per day must be added to the list of “multi-use facilities” and so designated on the maps. Two or more properties served by the same well water supply or sewage disposal system must be listed as a “community system” and so designated on the maps. Although the Water and Sewerage Plan is primarily intended as a tool for ensuring public health and safety, there are land uses permitted by right under certain RC zones for which density may be controlled only through the Water and Sewerage Plan cycle amendment process.

WATER AND SEWERAGE PLAN VARIANCES

Variances to the Water and Sewerage Plan Maps are given consideration under certain circumstances. A property designated W/S-1, 2, 3 or 4 but for which it is demonstrated that extension of public utility mains is not feasible may apply for a variance to allow private well or septic service as appropriate, subject to the approval of both DEPS and DPW. In such cases, the petitioner must execute and record an “interim agreement” which requires the owner of such property to connect to any future public utility main extension, including participation in all costs and assessments as required. Properties designated W/S-5 or 6 may be served by private water supply and/or sewage disposal systems not of an interim nature. See COMAR 26.03.01.05 for authority to allow interim systems.

CHAPTER II: BACKGROUND INFORMATION: PHYSICAL, POPULATION PROJECTION, LAND USE

COMPREHENSIVE PLAN

Master Plan 2020 is the guiding document for County's future development. The *Master Plan* embodies the broad goals, formulating policies for sustaining livable communities and achieving balanced development in Baltimore County. The County has begun the process of updating the *Master Plan*, *Master Plan 2030*, per the County Charter.

The County's water and sewer planning is based on the County's landmark Urban Rural Demarcation Line (URDL), which also corresponds to the state's Priority Funding Area (PFA) boundaries delineated for the state permitting and financing purposes. The ideal areas for redevelopment include adequate public water and sewer as well as other public facilities and services. Items to be analyzed in determining suitability of an area to accommodate population growth are the adequacy of existing and proposed infrastructure (*Master Plan 2020*, page 34).

Since the establishment of URDL in 1967, the residential construction and redevelopment within the URDL has continued to prove that the County excels in conserving its urban and rural communities by revitalizing existing communities and directing new development into the County's community conservation and designated growth areas. Water and sewer planning to allow those public utilities only in urban areas ensures development is concentrated inside the URDL, thus reducing sprawl (*Master Plan 2020*, page 2).

Public facilities such as water and sewer built in the urban area have been consistent with the County's pattern and timing of growth. Public infrastructure is important in determining the timing, location, and intensity of development, serving as a valuable tool for master plan implementation. Basic infrastructure provides the foundation for the location where private and public sector redevelopment and reinvestment take place (*Master Plan 2020*, page 46).

The County's *Master Plan* has language with regard to water or sewer extensions outside the URDL as public health projects. *Master Plan 2020* stipulates that the County must, "Ensure that sewer extensions to correct failing septic areas outside the URDL only address existing problems and do not stimulate growth and development" (p. 49).

For public health projects to proceed, the Executive Order [for the] Baltimore County Water & Sewerage Plan Amendment Process indicates that the Planning Board must find that there has been "a danger to public health" and water and sewerage facilities are necessary to resolve the health concerns. In practice, the extension of water and/or sewer services to areas outside the URDL, is initiated when it has been determined by the County Department of Environmental Protection and Sustainability (DEPS) that there is public health concern related to existing on-site water supplies and septic systems and where the County Department of Public Works (DPW) has determined that the extension is an economically feasible solution. The process for making

such extensions would be through the aforementioned Amendment process, which allows the Maryland Departments of Planning and the Environment as well as the County Planning Board, County Council, and the County Administration to weigh in, ensuring that the extension is appropriate and would not intensify development in areas outside the URDL.

The referenced *Master Plan* also stipulates that, “the proper siting, design, and construction of on-site sewerage disposal systems (OSDS) [in rural areas or places outside the URDL] is critical to protecting ground water supplies and public health. Should community health threats be documented in areas that are accessible to the Metropolitan District, extension of public water or sewerage is provided on a long-term financing basis” (p. 159).

The referenced *Master Plan* further states that the County must “continue to manage and protect groundwater supplies, particularly in areas where citizens, businesses, industry and agriculture rely solely on wells; review development proposals and permits to assure the proper siting, design, and construction of drinking water wells and OSDS in accordance with the Code of Maryland Regulations and Code of Baltimore County Regulations. The current regulations and standards for drinking water wells and OSDS are considered effective in protecting public health while ensuring that there is adequate supply for current and future demands.” (p. 160)

The growth tiers, as amended in *Master Plan 2020*, identify where major and minor residential subdivisions may develop and what type of sewage disposal system will serve them. The County’s Growth Tiers were developed in response to Maryland’s Sustainable Growth and Agricultural Preservation Act of 2012 (SB 236). A parcel divided into four or more lots is considered a major subdivision in Baltimore County. Existing geographic data such as existing and planned sewer areas, zoning, URDL and a variety of conservation or preservation layers (PDF) were analyzed and used to classify County land into one of four Growth Tiers:

- Tier I: Major or minor subdivisions served by public sewers are allowed.
- Tier II: Major or minor subdivisions served by public sewers are allowed. Minor Subdivisions on individual on-site disposal systems shall be viewed as interim.
- Tier III: Major subdivisions on individual on-site disposal systems are allowed, with the recommendation of approval by an approving authority. Minor subdivisions on individual on-site disposal systems are allowed.
- Tier IV: Only minor subdivisions on individual on-site disposal systems are allowed.

In addition to amendments to *Master Plan 2020* as reported in the 2017 Triennial Review, Chapter II, there are two new amendments to the *Master Plan* to ensure sustainable development, environmental protection, and resource conservation: *The 2017 Land Preservation, Parks and Recreation Plan* and renewal of sustainable communities.

The Land Preservation, Parks and Recreation Plan (LPPRP) serves as the advisory master plan for the Baltimore County Department of Recreation and Parks. The LPPRP outlines the County’s recreation, parks and open space policies, goals, objectives and priorities, particularly those associated with parklands and recreational facilities. The *Land Preservation, Parks and*

Recreation Plan, was adopted by the Baltimore County Council as a *Master Plan 2020* Addendum on June 5, 2017.

In 2019 and 2020, the Maryland Department of Housing and Community Development approved renewals for the following sustainable community designations. Those seven sustainable community designations are eligible to apply for the resources in order to strengthen reinvestment and revitalization in those communities within the URDL.

- Pulaski Highway Redevelopment Area approved in March 2019.
- Greater Dundalk-Sparrows Point Area approved in March 2019.
- Catonsville Patapsco Area approved in March 2019.
- Towson Area approved in November 2019.
- Hillendale-Parkville-Overlea Area approved in November 2019.
- Reisterstown Main Street approved in November 2019.
- Northwest Gateway, approved in 2020.

POPULATION TRENDS

Information in Table 1 is computed on the basis of the Baltimore County's Round 9A population forecasts. The population forecast dataset is prepared by transportation analysis zone (TZ) for the regional transportation planning purposes. The results of this analysis confirm that approximately 90% of the County's population resides within the URDL, which takes up one-third of the County's land area (640 square miles).

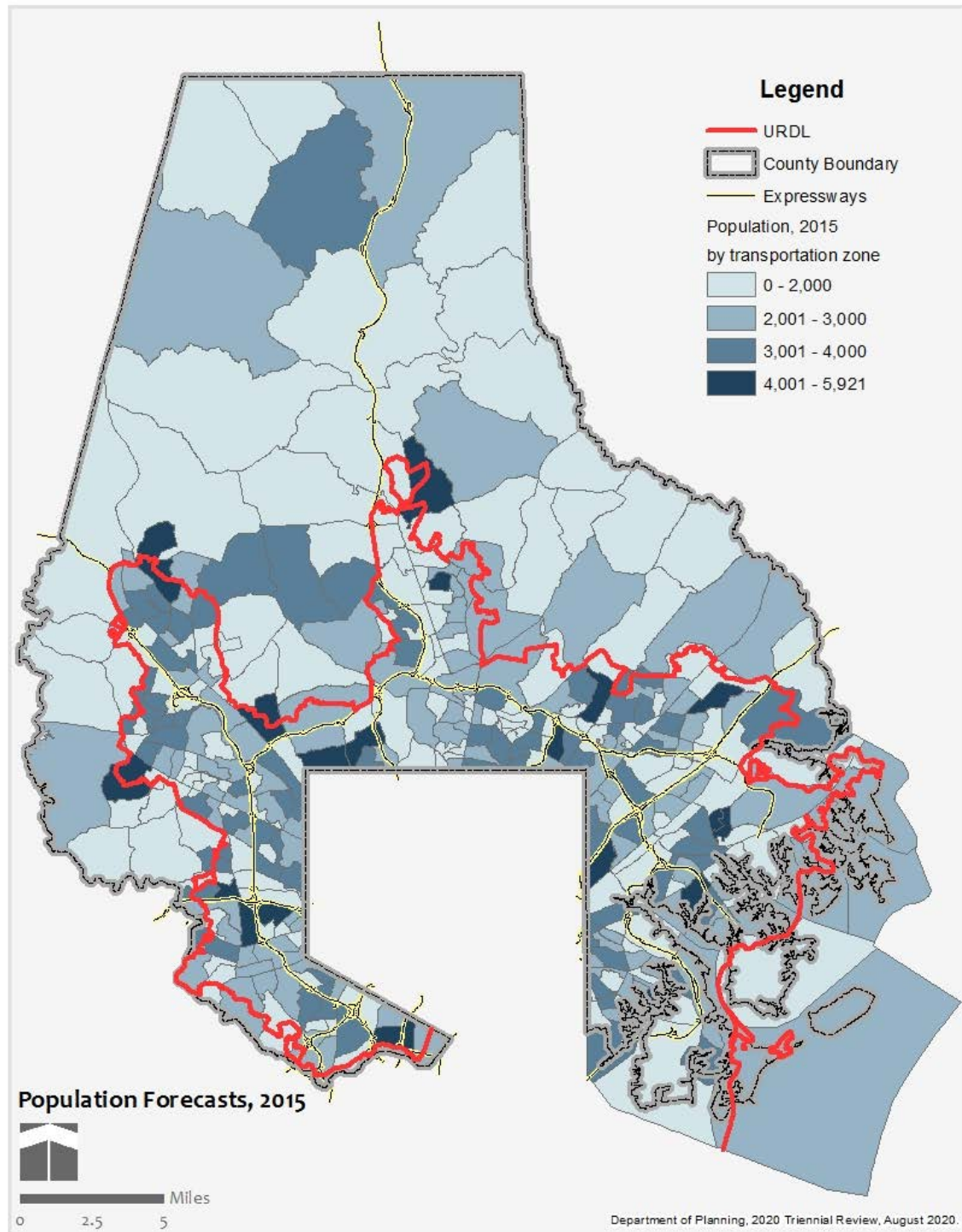
Table 1: Population Forecasts

| Forecast Year | Population Forecasts | | | | |
|---------------|----------------------|----------------|----------------------|----------------|---------|
| | Urban (Inside URDL) | | Rural (outside URDL) | | Total |
| | Total Urban | % County Total | Total Rural | % County Total | |
| 2015 | 741,714 | 89.26% | 89,203 | 10.74% | 830,918 |
| 2020 | 761,270 | 89.32% | 91,041 | 10.68% | 852,310 |
| 2025 | 769,059 | 89.37% | 91,497 | 10.63% | 860,556 |
| 2030 | 776,811 | 89.43% | 91,778 | 10.57% | 868,589 |
| 2035 | 788,399 | 89.50% | 92,518 | 10.50% | 880,917 |
| 2040 | 801,489 | 89.54% | 93,638 | 10.46% | 895,127 |
| 2045 | 811,600 | 89.58% | 94,379 | 10.42% | 905,979 |

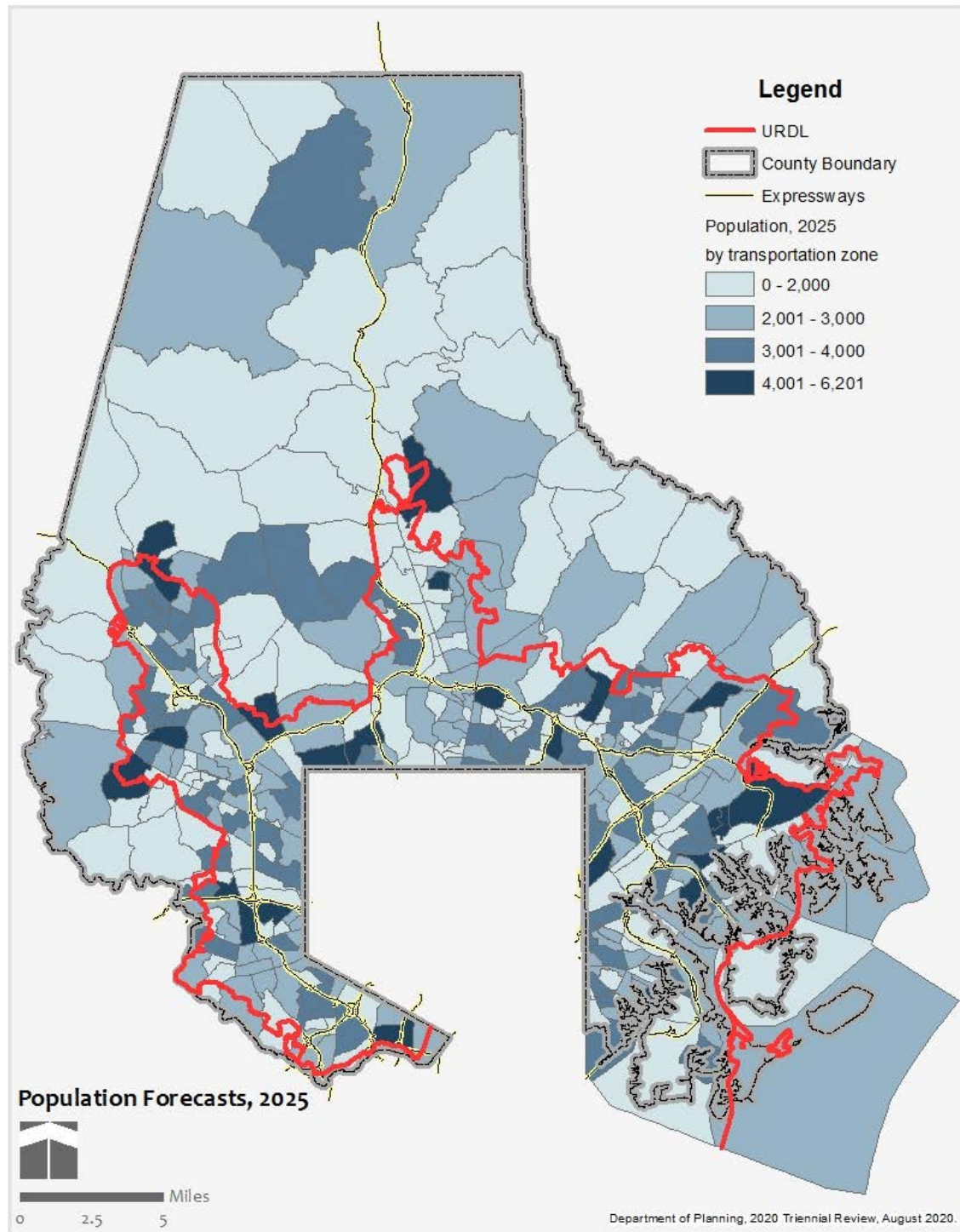
Source: Baltimore County Department of Planning, Round 9A Forecasts, February 2020.

The TZ structure does not exactly correspond to the URDL, the following maps (1 through 8) by TZ evidently help portray a meaningful picture of population distribution patterns and trends throughout the County based on Round 9A forecasts. Maps 1 to 4 show population distribution by TZ. Maps 5 to 8 exhibit population density by TZ. All maps display that population growth is projected to continue to be within the URDL taking into account the past trend, current development patterns, planned development, environmental constraints, and land use capacity.

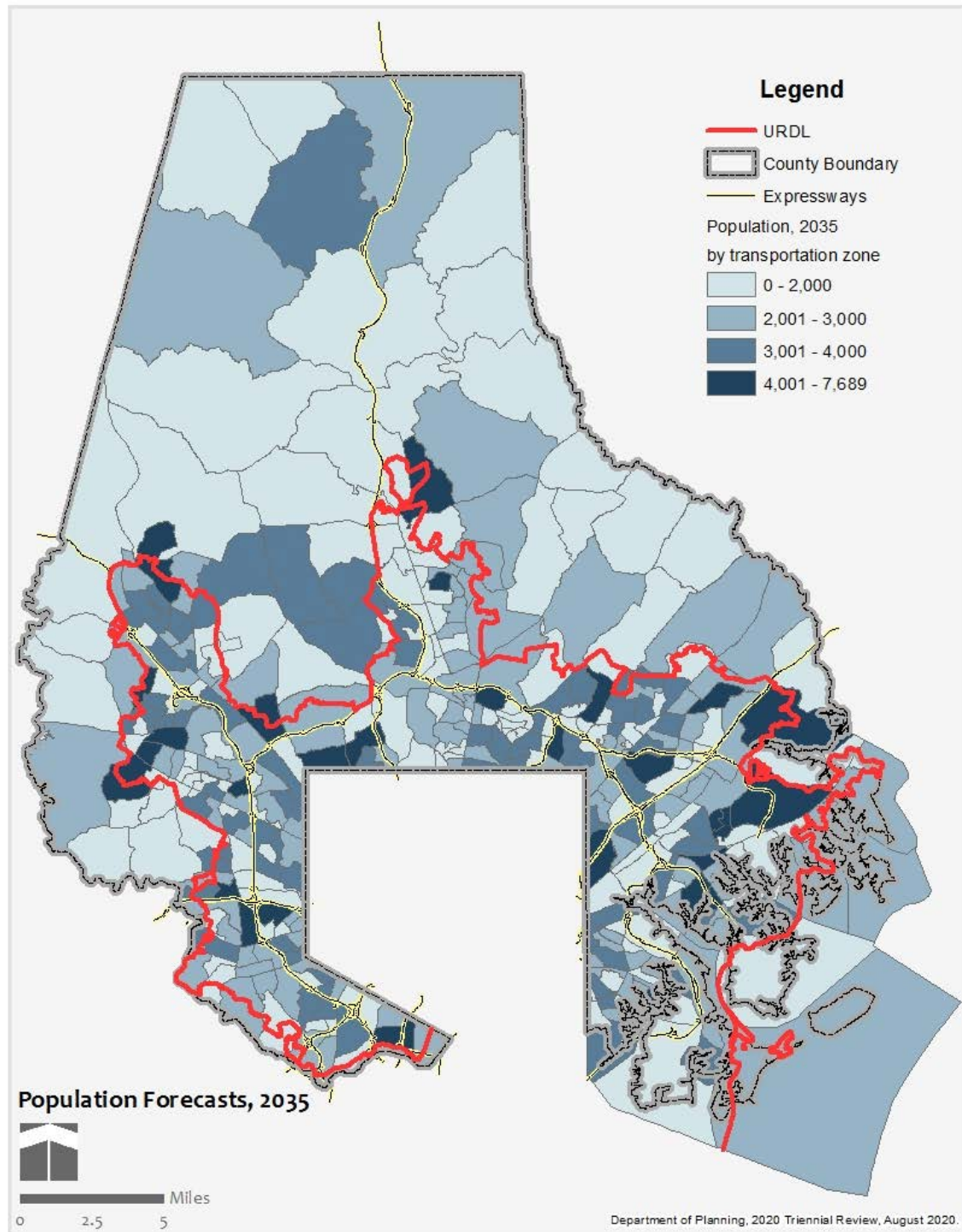
Map 1. Population Forecasts, 2015



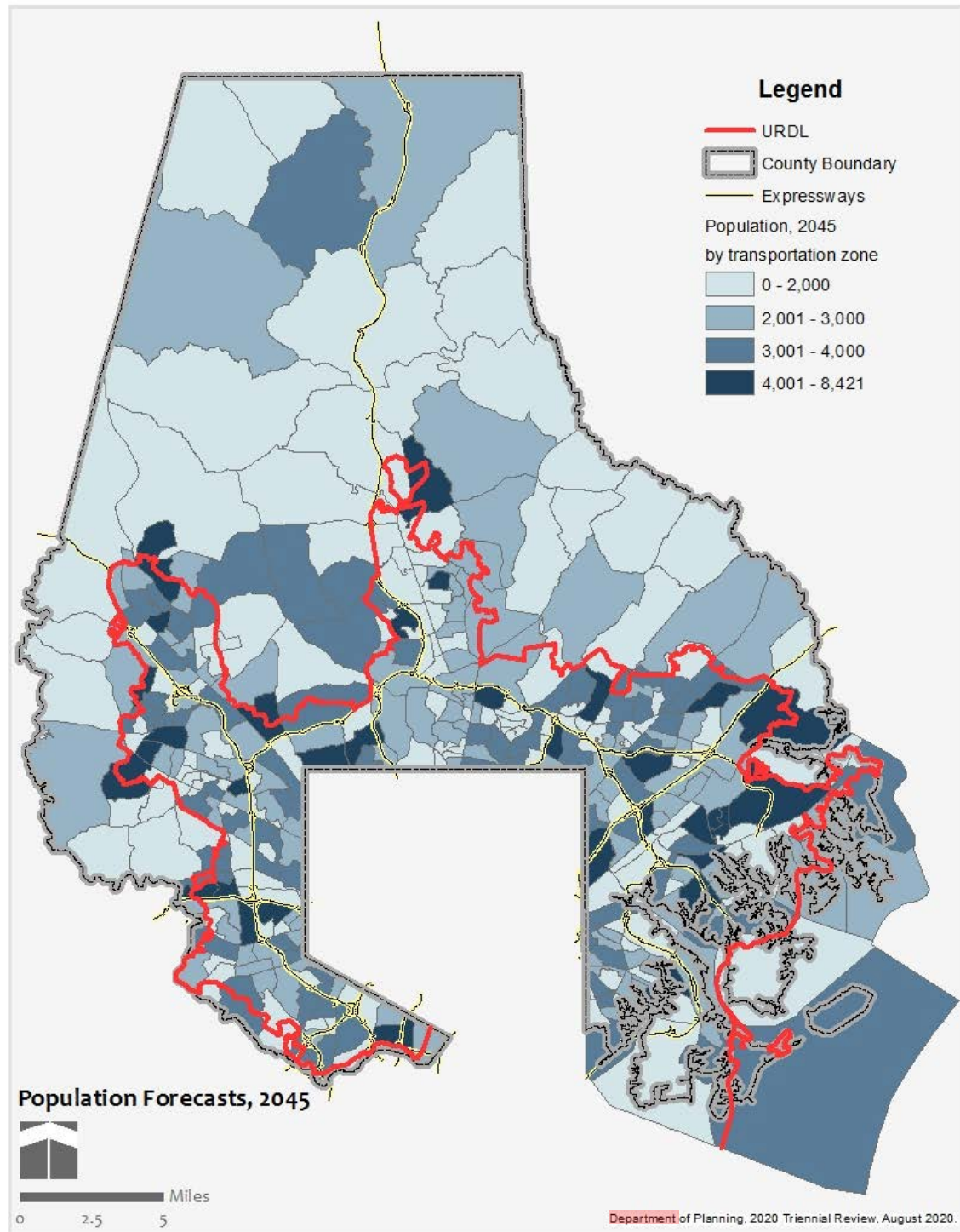
Map 2. Population Forecasts, 2025



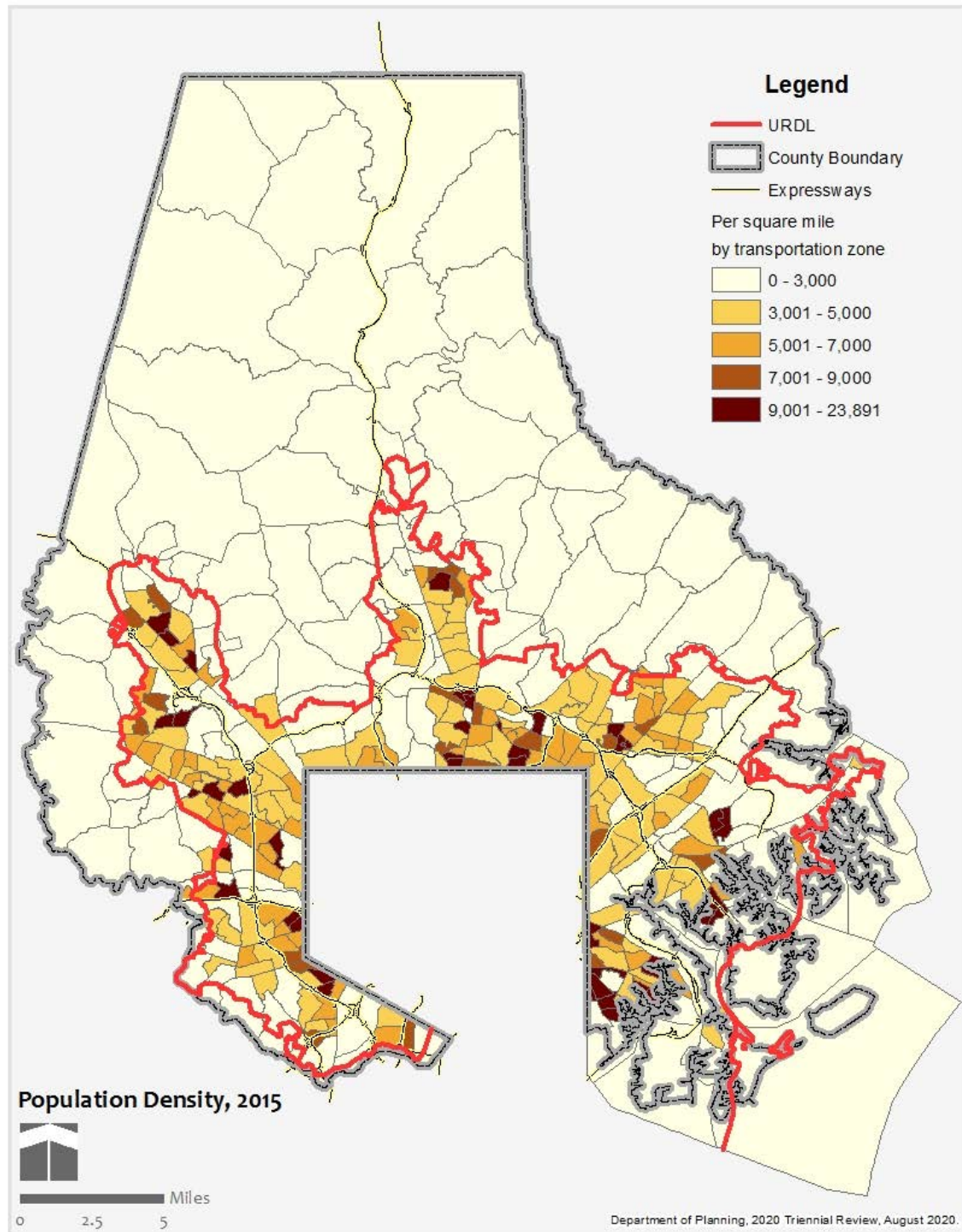
Map 3. Population Forecasts, 2035



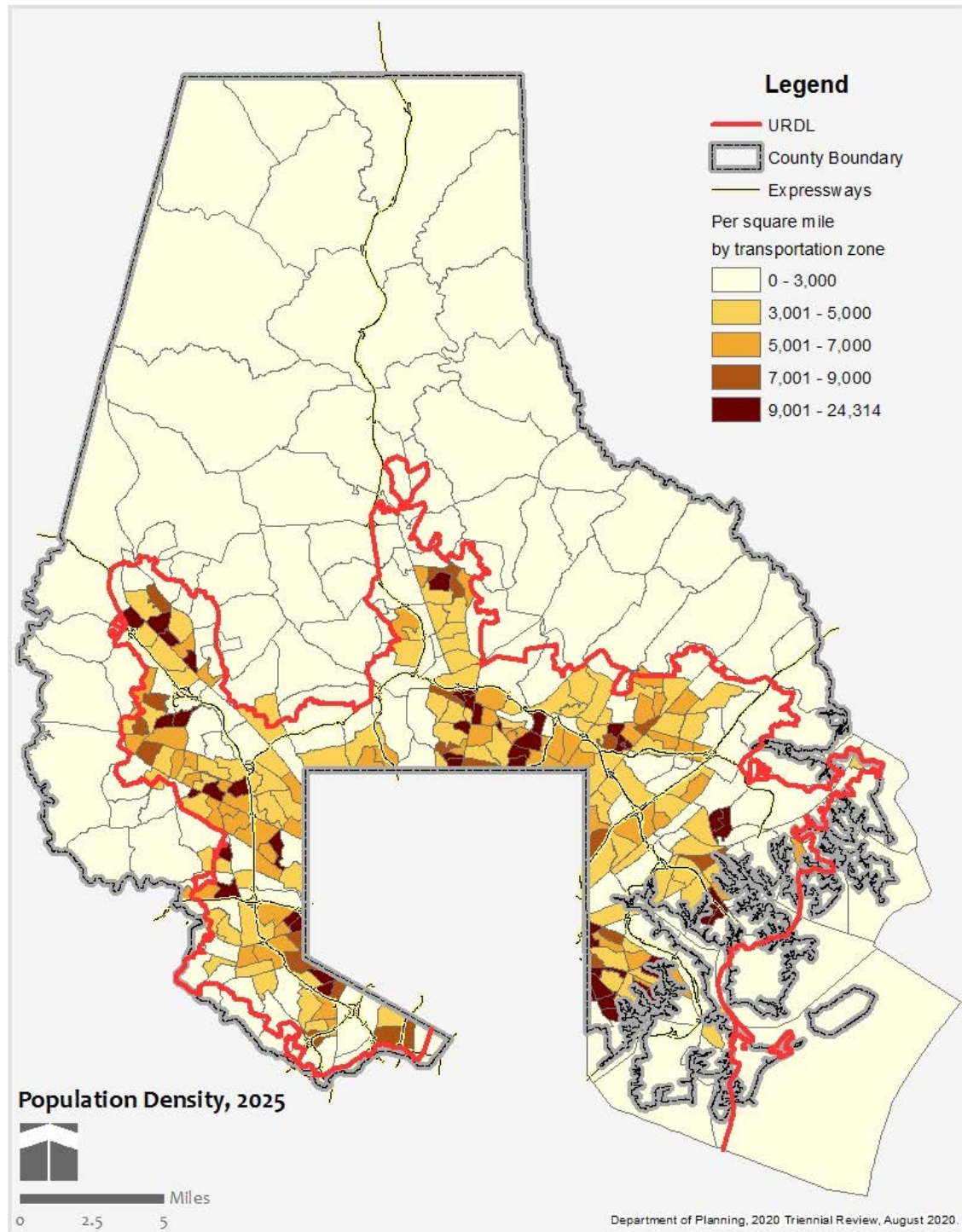
Map 4. Population Forecasts, 2045



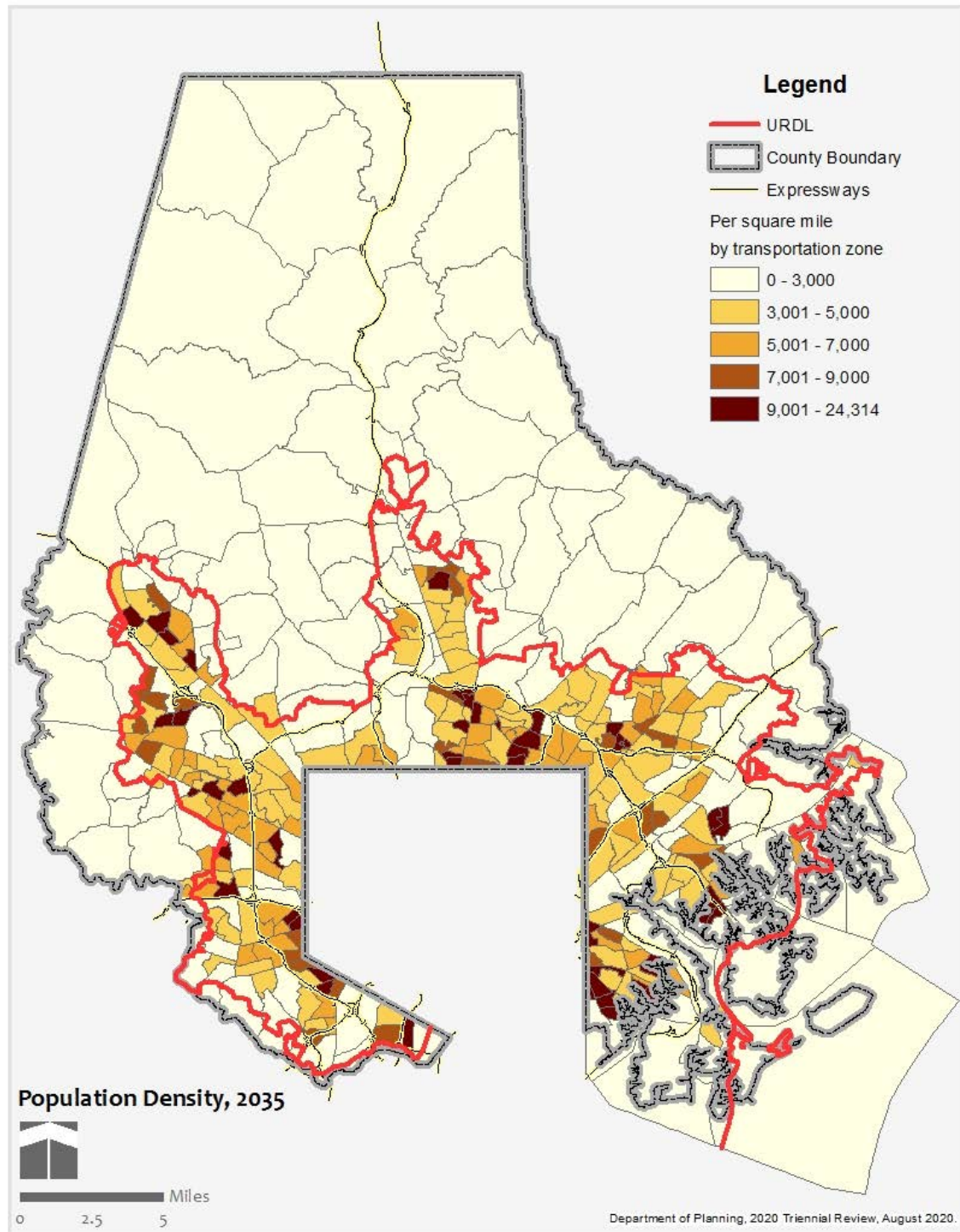
Map 5. Population Density, 2015



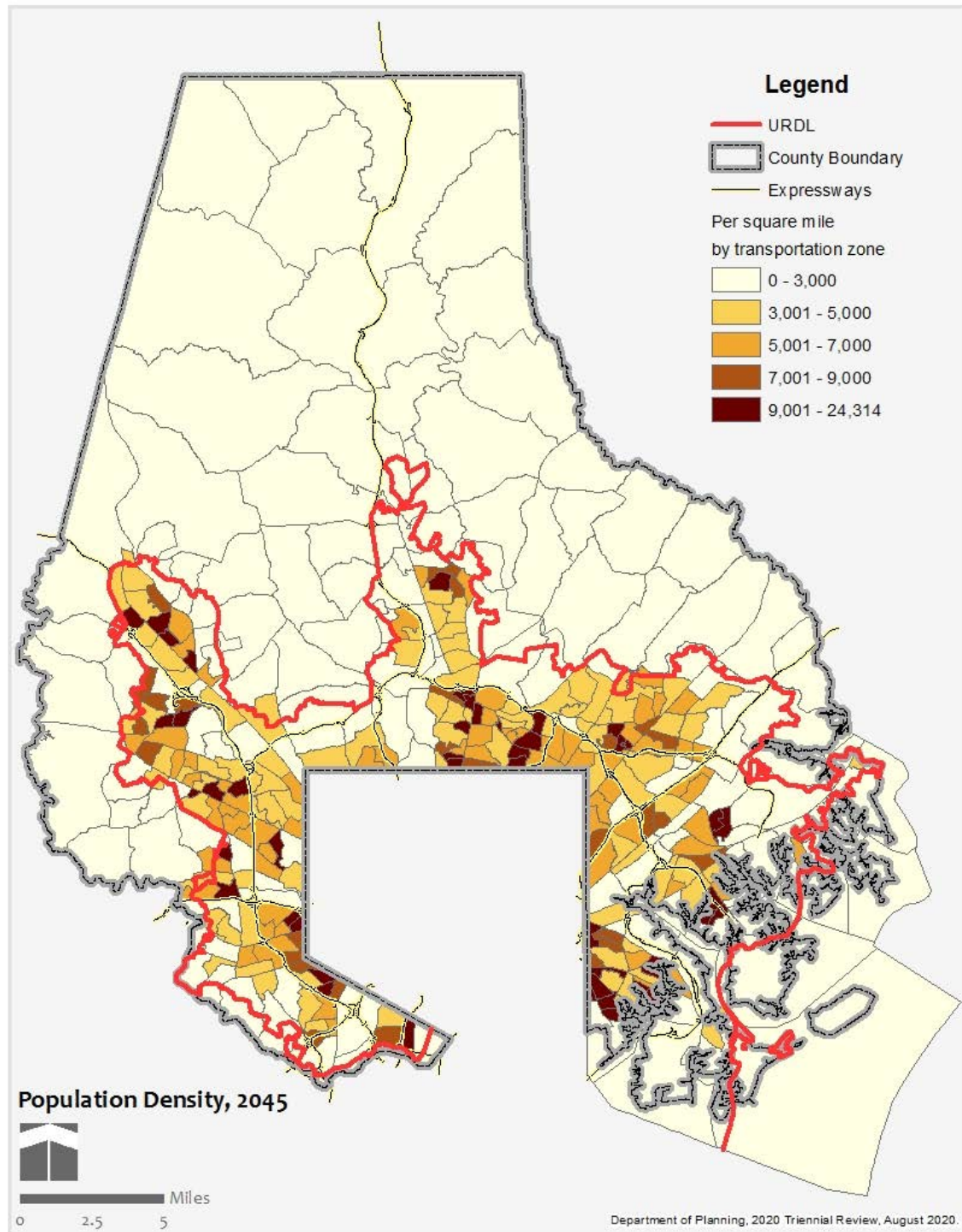
Map 6. Population Density, 2025



Map 7. Population Density, 2035



Map 8. Population Density, 2045



LAND USE AND ZONING

The existing land use data (Table 2a) show that among all the land use types, the largest amount and percent share of the County's total land area is rural residential, followed by land preservation (including agriculture and resources) as well as open space. Those types of land use account for 63.77% of the total land acreage of the County. Map 9 on page II-14 depicts existing land use patterns.

Table 2a: Existing Land Use

| Land Use Type | Acreage | Percent Total |
|-----------------------------|----------------|----------------|
| Commercial | 7,234 | 1.86% |
| Industrial | 11,421 | 2.93% |
| Institutions | 17,532 | 4.50% |
| Land Preservation | 81,206 | 20.85% |
| Landfill | 1,076 | 0.28% |
| Mixed Use | 1,130 | 0.29% |
| Multifamily | 5,239 | 1.35% |
| Office | 1,372 | 0.35% |
| Open Space | 63,356 | 16.27% |
| Rural Residential* | 103,784 | 26.65% |
| Single Family Attached** | 5,183 | 1.33% |
| Single Family Detached | 40,821 | 10.48% |
| Transportation | 27,547 | 7.07% |
| Environmentally Constrained | 1,056 | 0.27% |
| Utility | 6,161 | 1.58% |
| Vacant*** | 15,303 | 3.93% |
| TOTAL | 389,421 | 100.00% |

Data compiled by Baltimore County Department of Planning, July 2020.

*.Includes agricultural residential. **. Includes single family semi-detached. ***. Includes pipelines

The land use data demonstrate the County's commitment and endeavor on sensible development and resource preservation, which has been consistent with the County's Master Plan goals and in concert with the *Annual Report on Growth* series mandated by the Sections 1-207 and 1-208 of the Land Use Article in the *Annotated Code of Maryland*, aiming to monitor the growth patterns and trends in a charter county and denoting implementation of the County's Master Plan.

This land use pattern is determined by the zoning classifications, one of the most effective tools to implement *Master Plan 2020*. The zoning classification table (Table 2b) summarizes that the majority of the land acres is set aside for agricultural preservation and resource conservation (36.82% and 30.25% correspondingly). The zoning for residential uses ranks third, representing 24.36% of the County's land area, which includes low, medium, and high density residential. Land zoned for business, manufacturing, and office combined amount to 8.57% of the County's total acreage. Map 10 on page II-15 presents current zoning patterns throughout the County.

In addition, the CZMP 2020 process is currently under consideration by the County Council and could modify densities. The County Council will make a final vote before September 16, 2020 to decide the zoning for every issue.

Table 2b: Zoning Classifications

| Zoning Classification | Acreage | Percent Total | Zone(s) in Each Category |
|-----------------------------------|----------------|----------------|---|
| Agricultural Preservation | 143,399 | 36.82% | RC 2, RC 50 |
| Resource Conservation | 117,818 | 30.25% | RC 20, RC3, RC 4, RC 5, RC 6, RC 7, RC 8, RCC |
| Residential: | 94,850 | 24.36% | (As listed below): |
| <i>Low Density Residential</i> | 49,771 | 12.78% | <i>DR 1, DR 2, DR 3.5</i> |
| <i>Medium Density Residential</i> | 33,212 | 8.53% | <i>DR 5.5</i> |
| <i>High Density Residential</i> | 11,867 | 3.05% | <i>DR 10.5, DR 16, RAE 1, RAE 2</i> |
| Business | 20,645 | 5.30% | BL, BLR, BM, BMB, BMM, BMYC, BR, CB |
| Manufacturing | 9,838 | 2.53% | MH, ML, MLR, MR |
| Office | 2,870 | 0.74% | O 3, OR 1, OR 2, OT, RO, ROA, SE |
| TOTAL | 389,421 | 100.00% | - |

Data compiled by Baltimore County Department of Planning, July 2020.

The proposed land use in *Master Plan 2020* applies the transect zone concept. As indicated in *Master Plan 2020* (pages 27 to 31), the transect “T-zones” are a framework that identifies a range of habitats from the most natural to the most urban. Its continuum, when subdivided, lends itself to the creation of zoning categories (Table 2c). The standards overlap, reflecting the sequential pattern of development and ecosystems. The concept provides general direction for the County’s future land use decisions that are subject to amendments to *the Master Plan 2020* and new update to the Plan.

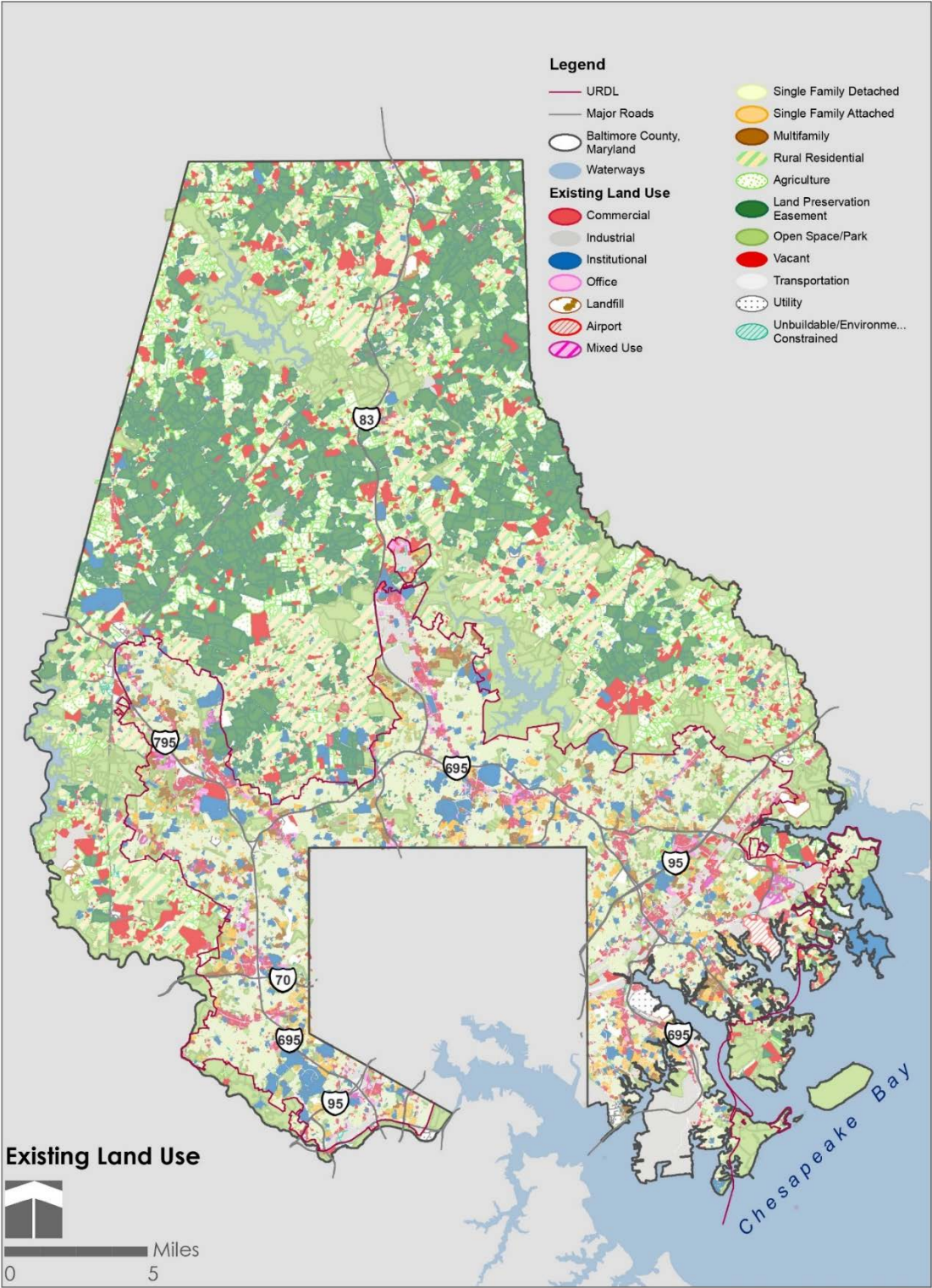
Table 2c: Proposed Land Use

| Smart Code | Land Use Type | Acreage | Percent Total |
|--------------|-------------------|----------------|----------------|
| T1 | Natural | 53,054 | 13.62% |
| T2 | Rural | 172,483 | 44.29% |
| T2 R | Rural Residential | 35,057 | 9.00% |
| T2 V | Rural Village | 175 | 0.04% |
| T3 | Suburban | 46,183 | 11.86% |
| T4 | General Urban | 67,730 | 17.39% |
| T5 | Urban Center | 14,420 | 3.70% |
| T6 | Urban Core | 320 | 0.08% |
| TOTAL | | 389,421 | 100.00% |

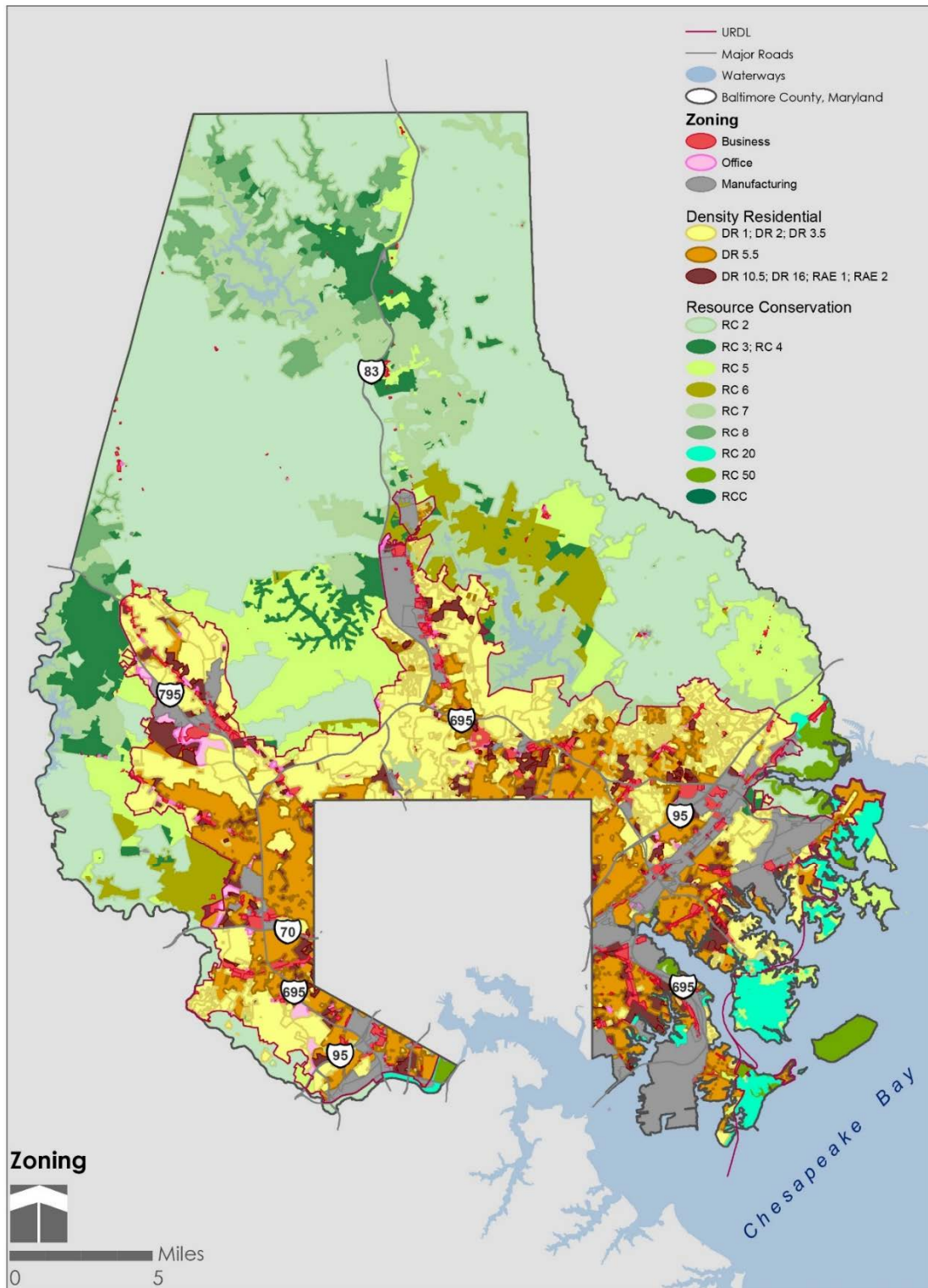
Data compiled by Baltimore County Department of Planning, July 2020.

The proposed land use map (Map 11 on page II-16) illustrates the transect “T-zones” designed for the intent to support compact mixed-use communities within the URDL and protect natural resources outside the URDL. In addition, Map 12 shows major public institutions throughout the County.

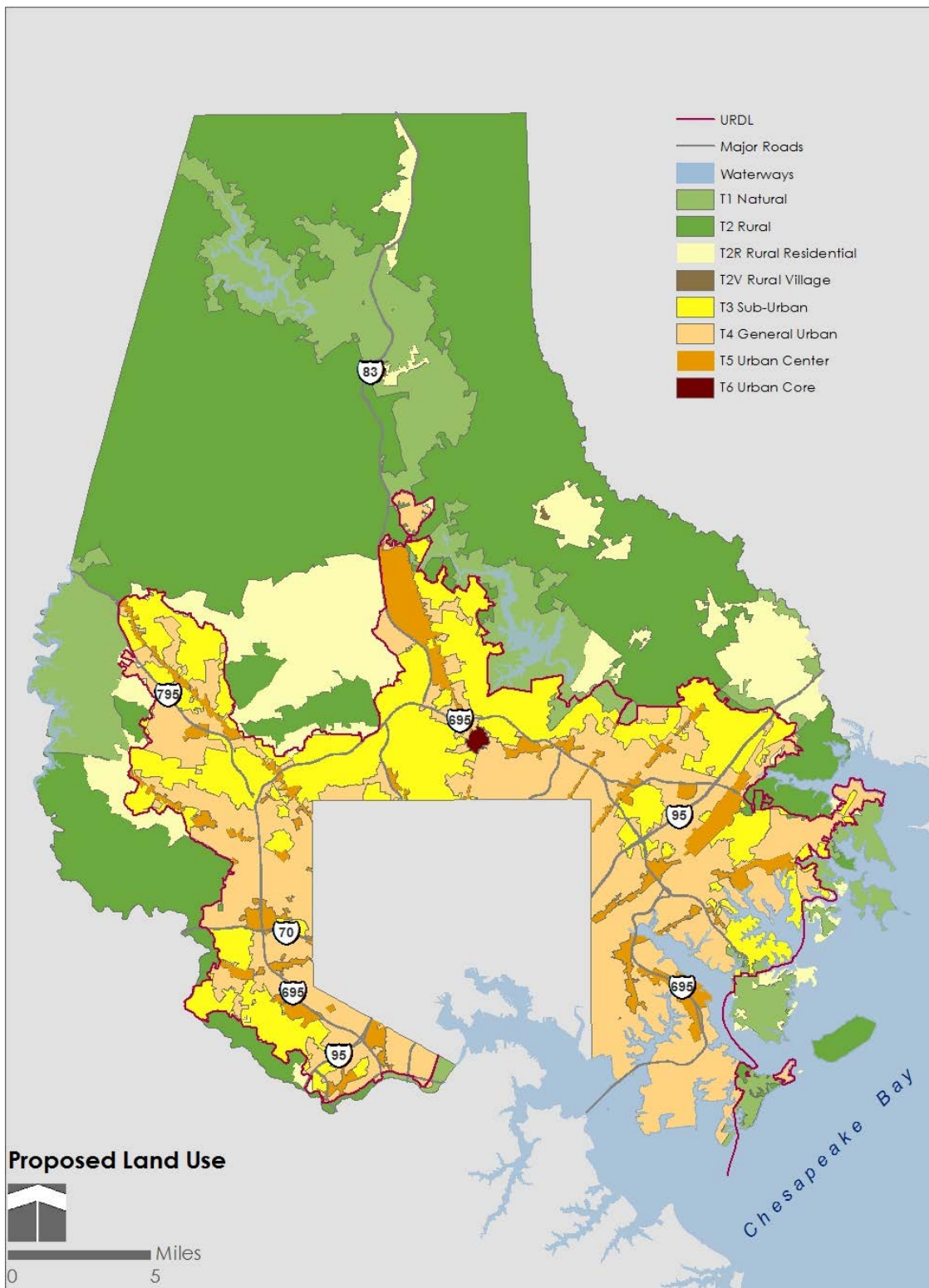
Map 9. Existing Land Use



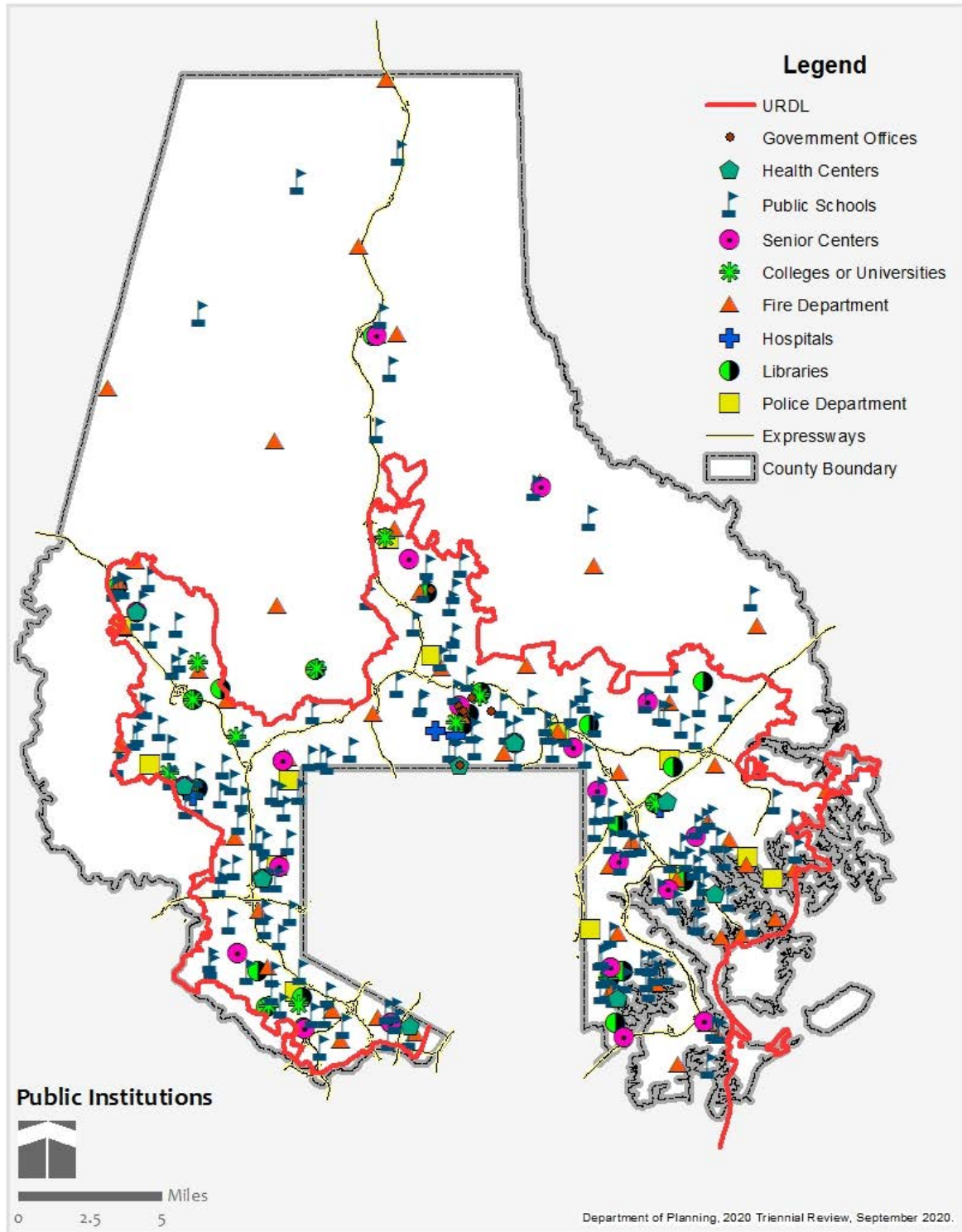
Map 10. Current Zoning



Map 11. Proposed Land Use



Map 12. Public Institutions



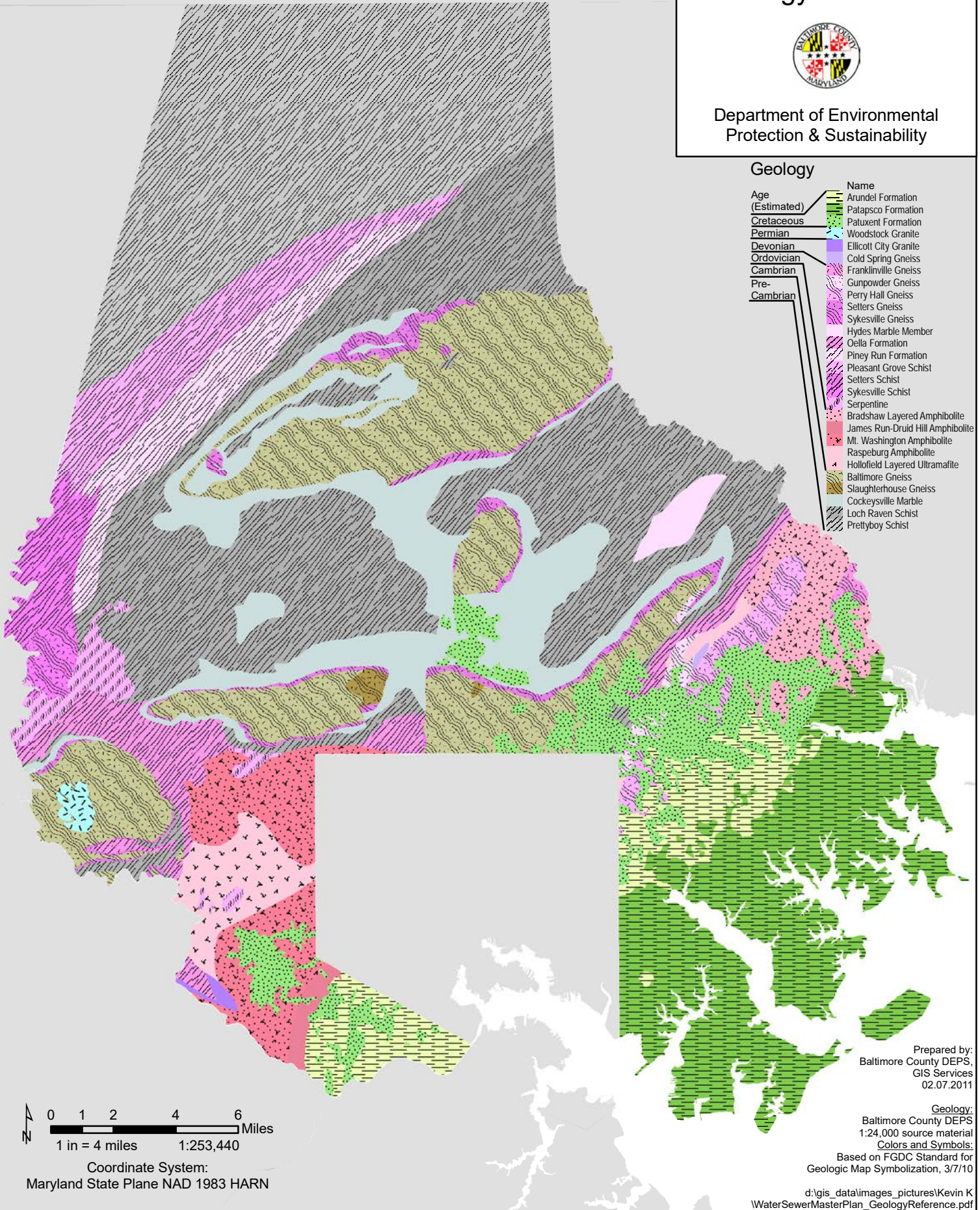
Baltimore County Geology Reference



Department of Environmental
Protection & Sustainability

Geology

| Age (Estimated) | Name |
|--------------------|----------------------------------|
| Cretaceous | Arundel Formation |
| Permian | Patuxent Formation |
| Devonian | Woodstock Granite |
| Ordovician | Ellicott City Granite |
| Cambrian | Cold Spring Gneiss |
| Pre-Cambrian | Franklinville Gneiss |
| | Gunpowder Gneiss |
| | Perry Hall Gneiss |
| | Setters Gneiss |
| | Sykesville Gneiss |
| | Hydes Marble Member |
| | Oella Formation |
| | Piney Run Formation |
| | Pleasant Grove Schist |
| | Setters Schist |
| | Sykesville Schist |
| | Serpentine |
| | Bradshaw Layered Amphibolite |
| | James Run-Druid Hill Amphibolite |
| | Mt. Washington Amphibolite |
| | Raspeburg Amphibolite |
| | Hollofield Layered Ultramafite |
| | Baltimore Gneiss |
| | Slaughterhouse Gneiss |
| | Cockeysville Marble |
| | Loch Raven Schist |
| | Prettyboy Schist |



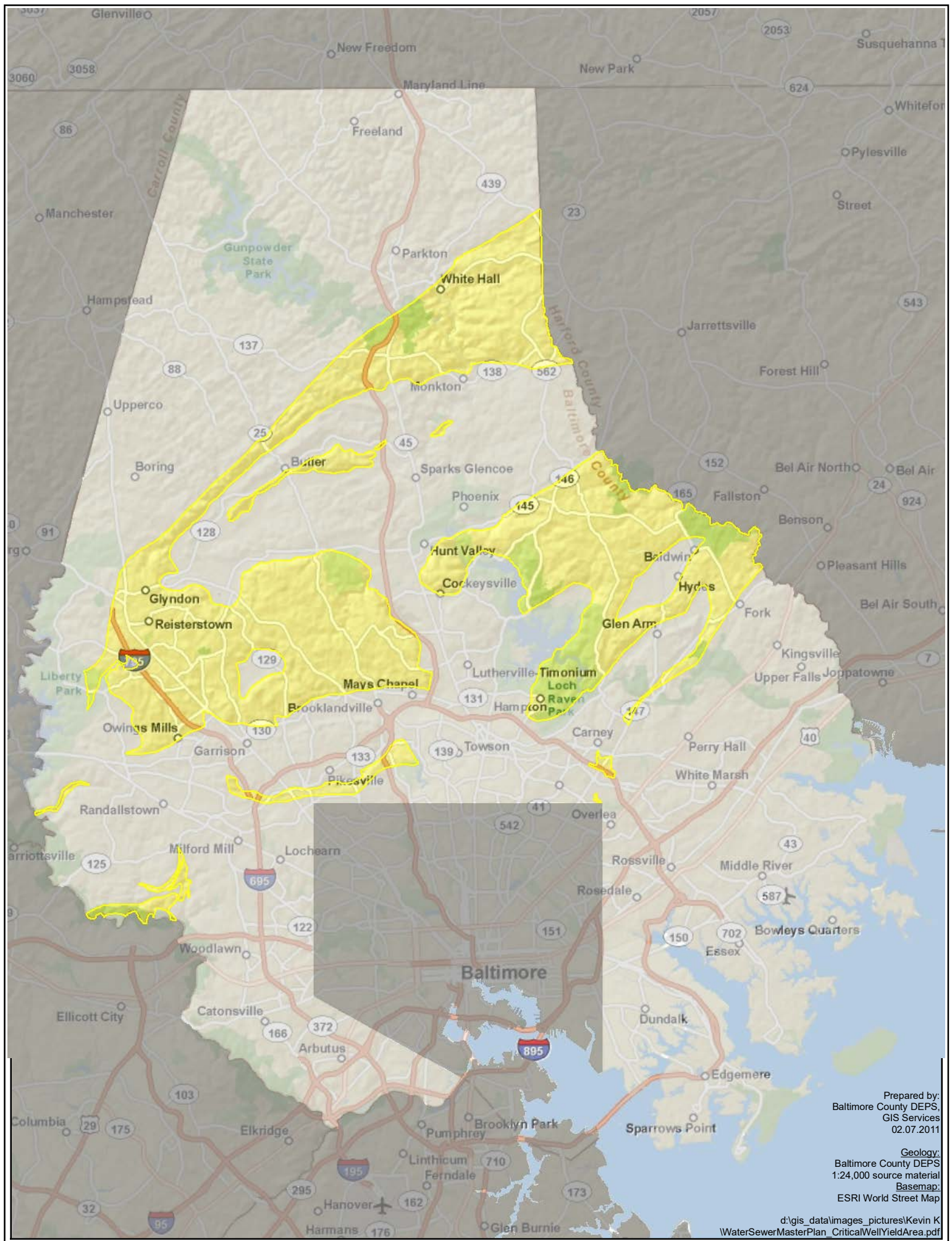
0 1 2 4 6 Miles
1 in = 4 miles 1:253,440

Coordinate System:
Maryland State Plane NAD 1983 HARN

Prepared by:
Baltimore County DEPS,
GIS Services
02.07.2011

Geology:
Baltimore County DEPS
1:24,000 source material
Colors and Symbols:
Based on FGDC Standard for
Geologic Map Symbolization, 3/7/10

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WaterSewerMasterPlan_GeologyReference.pdf



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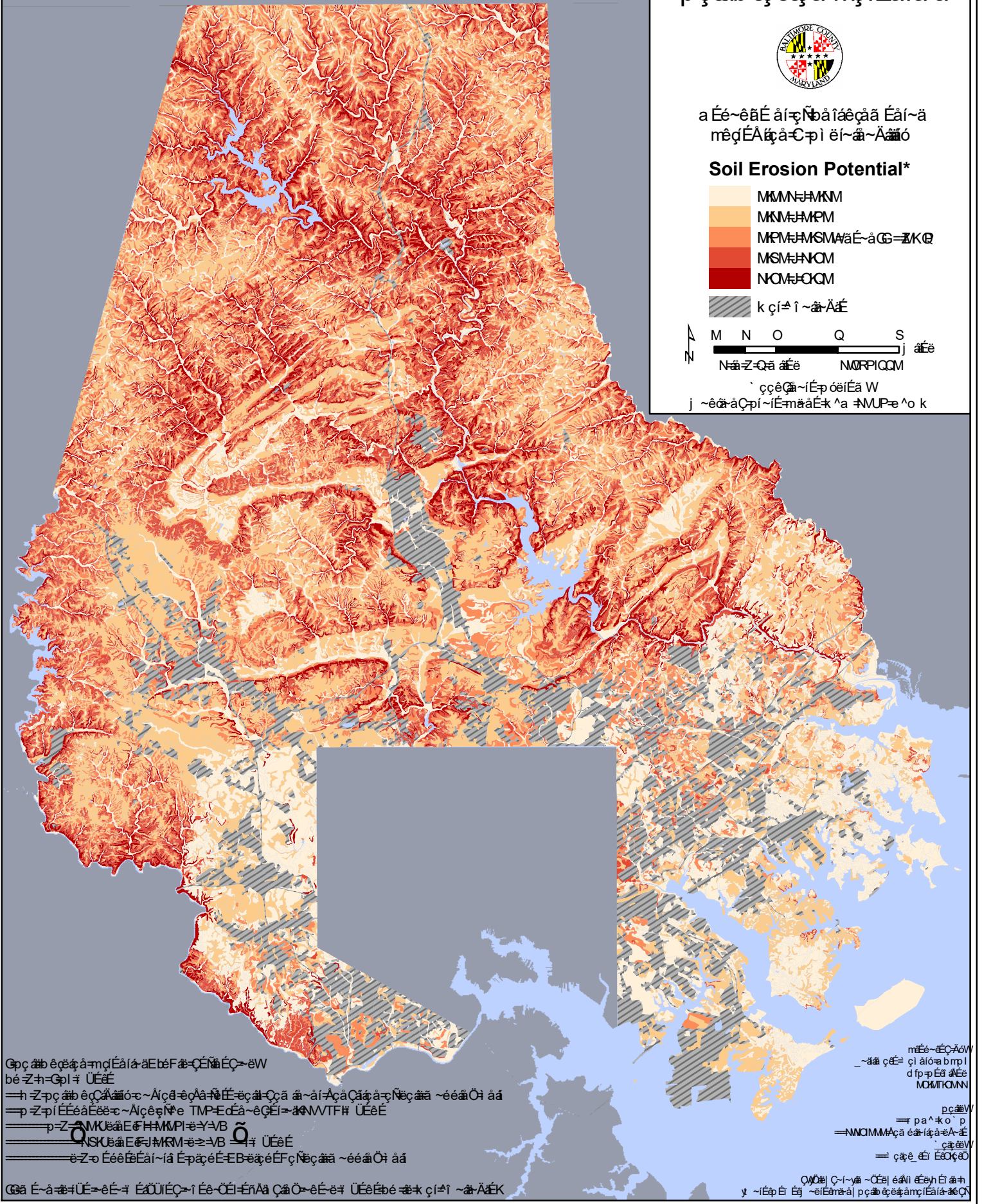
Soil Erosion Potential*

- MMN~HMKM
- MKN~HMPM
- MRM~HMSMA~äÉ~äÇ=ZKQ
- MSM~HNQM
- NQM~HMQM

k çí~í~ä~ÄÉ

M N O Q S
Nä-Z-Qä äÉä NQRPQQM

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~p-Z~píÉéäÉéèç~Äçéç~Ñé TMP~Éçä~èçÉí~ä~NMVTF# ÜÉÉÉ
~p-Z~NMKÉäE~HMMPI~è~Y~VB
~NSKÉäE~HMRM~è~Y~VB ~ÜÉÉÉ
~è-Z~ÉééÉÉáí~íä ÉpçéÉÉ~EB~èçéÉFçÑéçää ~ééäÖí ää
Öä É~ä~ä~ÜÉ~èÉ~É ÉäÖÜÉÇ~íÉè~Öéí~í~Ää ÇäÖ~èÉ~è~ ÜÉÉÉé~èç çí~í~ä~ÄÉK

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Baltimore County Hydrologic Soil Groups



Department of Environmental
Protection & Sustainability

Hydrologic Soil Group Saturated Runoff Potential, Undrained

- A - Low
- B - Moderately Low
- C - Moderately High
- D - High
- Not Available



Coordinate System:
Maryland State Plane NAD 1983 HARN

Prepared by:
Baltimore County DEPS,
GIS Services
02.08.2011

Soils:
USDA NRCS
1:12,000 compilation scale
Colors:
ColorBrewer2.org





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WaterSewerMasterPlan_HydrologicSoilGroups.pdf

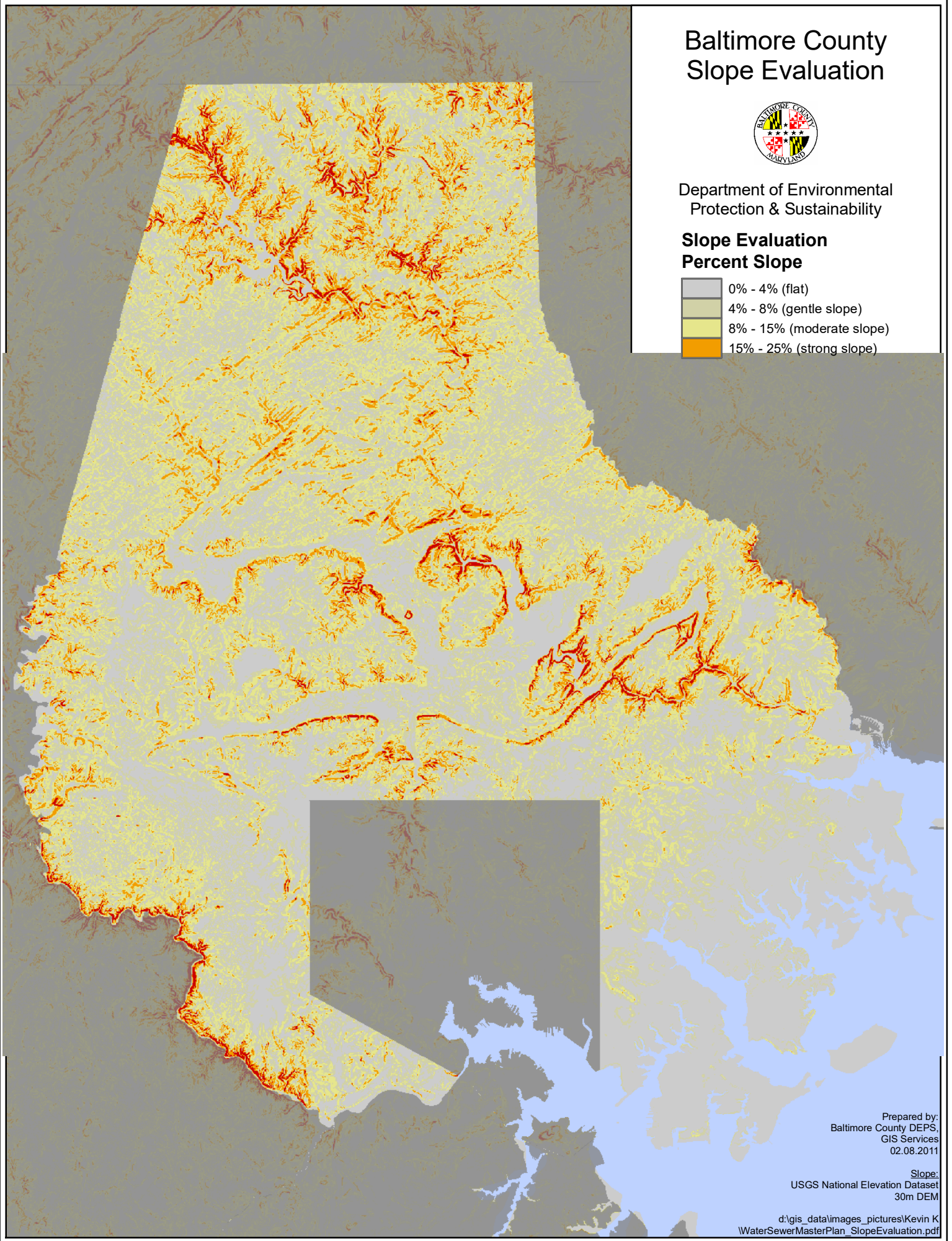
Baltimore County Slope Evaluation



Department of Environmental
Protection & Sustainability

Slope Evaluation Percent Slope

| | |
|---|---------------------------|
|  | 0% - 4% (flat) |
|  | 4% - 8% (gentle slope) |
|  | 8% - 15% (moderate slope) |
|  | 15% - 25% (strong slope) |



Prepared by:
Baltimore County DEPS,
GIS Services
02.08.2011

Slope:
USGS National Elevation Dataset
30m DEM

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WaterSewerMasterPlan_SlopeEvaluation.pdf

CHAPTER III - WATER SUPPLY PLAN

GENERAL BACKGROUND

Baltimore County has received virtually all its public water supply from the Metropolitan Water System which began in Baltimore City. As early as 1881, Baltimore built a stone dam across the Gunpowder River and a tunnel to bring water into the City. In 1915, a second dam was constructed across the river at Loch Raven which is being used today along with Prettyboy Dam, built in 1936.

Owing to the need for additional raw water, Baltimore erected Liberty Dam in 1954 to impound the Patapsco River. Twelve (12) years later the Susquehanna River was tapped as a third source of water by the City. Since all of the water sources in Maryland belong to the State, Baltimore secured the State's approval to use these rivers for water supply.

The Maryland State Legislature, in 1908, granted the City exclusive use of the entire Gunpowder River¹ watershed above Loch Raven. It also granted the City the right to use the entire Patapsco River² watershed in 1931; and in 1931 and in 1955, the City received the legislature's approval to withdraw water from the Susquehanna River³ above the Conowingo Dam.

The present Baltimore County water system is actually an extension of the City system. This resulted from the 1918 annexation⁴ of nearly 50 square miles of County land surrounding Baltimore and Acts of the Legislature previously mentioned. As development took place along primary County roads, the distribution system was extended to serve the people. Water was brought into the City filtration plants from the impoundment reservoirs in the County, treated, and returned to the County consumers. So both the City and County are physically and legally wedded to a common water system. In looking at the history of the marriage, one might say that it has been quite successful in view of the service rendered to the people.

¹ Acts of the Maryland General Assembly - 1908, Chapter 214, Sec. 1-16

² Acts of the Maryland General Assembly - 1931, Chapter 521, Sec. 1-8

³ Acts of the Maryland General Assembly - 1955, Chapter 203, Sec. 1-12

⁴ Acts of the Maryland General Assembly - 1918, Chapter 82, Sec. 1-18

DESCRIPTION OF EXISTING SYSTEM

Water served to consumers in Baltimore County is secured from three (3) surface supplies: the Gunpowder River, the North Branch of the Patapsco River and the Susquehanna River. Baltimore City developed these rivers as water supply sources as they were needed.

Gunpowder River

The Gunpowder River development consists of two (2) concrete gravity dams: one (1) at Loch Raven and the other near the mouth of Prettyboy Creek. Raw water is conveyed in a 12-foot-diameter tunnel from Loch Raven Dam to the Montebello Filtration Plant. These two dams impound 43-billion gallons of water collected as runoff from the 333 square mile watershed. Loch Raven is located about one-half (1/2) mile north of Cromwell Bridge Road, and Prettyboy Dam is located about three (3) miles southwest of Parkton.

North Branch of the Patapsco River

The Patapsco River development consists of the concrete, gravity Liberty Dam located near Falls Run on the North Branch of the river and a 10-foot diameter tunnel from the dam to the Ashburton Filtration Plant. Liberty Dam impounds 43-billion gallons of water. The reservoir collects runoff from the 164-square mile watershed.

See Impoundment and Safe Yield Data.

Susquehanna River

The Susquehanna River development consists of an intake structure at Conowingo, a 12-foot diameter tunnel and pipeline from the intake to the Deer Creek Pumping Station, a 9-foot diameter pipeline extending to Fullerton, and an 8-foot diameter pipeline from that point to the Montebello Filtration Plant. The intake structure and 12-foot line permit withdrawal of 500 million gallons per day (MGD) from the Susquehanna River which flows by gravity to the Deer Creek Pumping station and discharge line which are sized for an approximate flow of 200 MGD. At present, there are four (4) 62.5 MGD variable speed pumps in the station with one pump remaining on standby. The pipeline decreases in size to 8 feet at Fullerton in anticipation of the construction of a plant to filter the Susquehanna supply.

The Susquehanna River drains 27,000-square miles of land in New York, Pennsylvania and Maryland.

METHOD OF OPERATION

Under normal operating conditions, water flows by gravity from Loch Raven Reservoir to the Montebello Filtration Plant through the 12-foot diameter, concrete-lined tunnel which is 7 miles long.

When water in Loch Raven Reservoir recedes to about 9 feet below the crest of the dam, gates in Prettyboy Dam are opened and water flows down to Loch Raven to maintain the desired level in the reservoir. If the water level at Loch Raven continues to drop below certain elevations, low lift pumps must be started at Montebello to pump water into the filter plants and/or the Deer Creek Pumping Station must be brought into operation.

Water from the Liberty Reservoir flows by gravity through a 10-foot diameter concrete-lined tunnel to the Ashburton Filtration Plant. In low water situations, low lift pumps at Ashburton can be used to deliver water from Liberty Reservoir to the filtration plant.

All water from the Susquehanna River which enters the Baltimore System is presently pumped into the Montebello Filtration Plants. Currently, the Susquehanna supply is not used unless the water levels of the reservoirs on the Gunpowder and the Patapsco rivers drop below predetermined elevations. This method of operation is used so that water in the upland reservoirs can be drawn by gravity into the filter plants in quantities which approach what would be the total yield of the streams without the Susquehanna supply. This usually results in economical operation of the reservoirs. Some of the runoff which formerly flowed over the spillways and was lost during periods of heavy rainfall can be impounded behind the dams. This operation also diminishes pumping time and costs at Deer Creek.

FILTRATION

Water drawn from the three (3) rivers is filtered before it reaches the public. Gunpowder and Susquehanna water is treated at the Montebello Filtration Plant. There are two (2) complete filter plants at Montebello. The first plant was built in 1915, has 32 filter units and a capacity of 128 MGD. The second was constructed in 1928, has 28 filter units and a capacity of 112 MGD. The Ashburton Filtration Plant was erected in 1956, has 20 units and a capacity of 120 MGD.

The treatment process consists of chlorination, chemical treatment, coagulation, sedimentation, filtration and fluoridation. After the water leaves the filter plants, additional chlorine is added at each distribution reservoir and remote pumping station to keep it as sterile as possible.

Careful supervision is exercised in the treatment process with samples of water taken every two (2) hours at various points through the filter plant. Other samples are collected from many points in the distribution system by both the City Environmental Services Division and the State Health Department. These samples are analyzed for the chemical and bacteriological composition of the water.

FUTURE FULLERTON FILTRATION PLANT

The new Fullerton Water Treatment Plant, anticipated to be in operation in the year 2026, will be the most significant addition to Baltimore's regional water supply system since the development of the Susquehanna River supply and the construction of the Susquehanna Transmission Main and the Deer Creek Pumping Station in the 1960s.

The Fullerton Plant will be located on a large tract of land in the Fullerton area of Baltimore County north of the intersection of the Baltimore Beltway and Interstate-95. The land was acquired by the City as part of the implementation of the Susquehanna River system.

The Fullerton Plant will be designed to meet the following objectives:

- Facilitate more use of the Susquehanna River supply to augment other water supplies especially during times of drought
- Increase the total water filtration capacity for the regional system to help reliably meet future needs
- Help in distributing finished water to the growing areas of Northeast Baltimore County
- Increase the overall dependability of the regional system by providing alternative means to obtain, treat, and supply water in the event that another major component of the water system is out of service, under maintenance, or experiencing emergency conditions.

The Fullerton Plant's ultimate filtration capacity will be 120 MGD.

DISTRIBUTION

The Baltimore distribution system is one of the most complex systems in the United States. This is due not only to its size (although it is one of the ten (10) largest systems in the country), but also to the large number of zones of service which are established to serve areas with significantly different ground elevations. At present, there are thirteen (13) distinct zones of service. They are linked together by a series of pumping stations, transmission mains, storage reservoirs, and elevated tanks.

Water from Montebello flows by gravity into areas on the east side of the County adjacent to the harbor, and it is pumped into the north and northeast areas of Baltimore County through several pumping stations. Water leaving the Ashburton plant flows by gravity to the southwest area of the County and is pumped into the western and northwestern parts of the County.

SERVICE AREA

The service area contains about 120-square miles of land in Baltimore County in addition to the City and other adjacent counties. Elevations in the area vary from sea level at the harbor to 750 feet above sea level in Reisterstown. Most of the heavy industry is located near the harbor while commercial development is scattered throughout the County with primary land use devoted to residential subdivisions.

Residents in the Metropolitan District⁵ are eligible for water service although some people who live in the District have their own private systems. Water lines may be extended if property owners, who own 60% of the frontage, submit a petition to the County or if the Department of Environmental Protection and Sustainability deems there is a health problem.

WATER CONSUMPTION

In fiscal year 2016, Baltimore County used about 79 MGD from the Baltimore system. This amounts to about 40.5% of the average day water demand of 195.5 MGD. About 3.4% of the 79 MGD is used by commerce and industry. Residential consumption accounts for the remaining 96.6%.

FIRE PROTECTION

The County system also supplies water for fire protection. Currently, all fire flow data is collected by Baltimore City and is distributed to Baltimore County for permanent record and future inquiries. Those areas found to be deficient are included in a yearly list (the Basic Services Map; see section 4A02 of the Baltimore County Zoning Regulations) that precipitates capital improvement programs to eliminate these deficient areas. All Basic Services deficient areas identified in the water system have been addressed as of the 2017 Basic Services map update.

The American Insurance Association conducted a study in 2008 of fire flow in Baltimore County. This study is available from the Baltimore County Fire Department.

FINANCES

The County finances the water system from a number of charges including water rates, service charges, front-foot assessments, system connection charges, and water distribution charges. Revenue from the water rates is used to reimburse the City for the County's share of the City's operation and maintenance expenses. The Metropolitan District Operations Special Revenue Fund receives any net surplus on the sale of water or water service charge.

RELATIONSHIP WITH CITY AND ADJACENT COUNTIES

Baltimore County has as its neighbors the City, the four (4) counties of Anne Arundel, Howard, Carroll and Harford, and the State of Pennsylvania. All of these political subdivisions are interrelated by the use of water from the Baltimore System. Pennsylvania is involved only because of its location with respect to surface waters. The Gunpowder River has its origin in this state, and about 80% of the Susquehanna Basin lies in Pennsylvania.

Anne Arundel and Howard Counties are supplied with water from Baltimore City which flows through the Baltimore County distribution system. Although present consumption in these two (2) counties is relatively small (22.6 MGD for Howard and 4 MGD for Anne Arundel), both counties must rely heavily on the Baltimore System for future water supply. Howard County recognized

⁵ See Title 35, Baltimore County Code.

this fact in 1957 when it entered into an agreement with the City and Baltimore County for the joint financing of distribution facilities to supply them with 5 MGD from the Western Third Zone of service. The City and Baltimore, Howard and Anne Arundel counties also signed an agreement in 1969 for construction of pipelines in the western part of the Second Zone.

In 1968, Carroll County signed an agreement with the City to purchase a maximum of 3 MGD from the Liberty Reservoir to serve the Freedom District. Although Carroll County is not consuming filtered water, it is using part of the total raw water supply. Harford County is also a raw water customer. By legislative acts, they have the right to a maximum of 25 MGD from the Susquehanna pipeline. When the Deer Creek Pumping Station (Susquehanna water) is off, Harford County uses raw water from Loch Raven Reservoir.

The relationship between Baltimore County and the City includes legal, financial, and practical arrangements for the operation and maintenance of the County water system. Legally, the City must supply water to the County at cost.⁶ The question of cost has been the source of debate between the two (2) jurisdictions since 1945. An agreement resolving many cost problems was executed by the City and County on September 20, 1972⁷.

Under the present method of operation, Baltimore County builds and finances improvements to its distribution system; and the City operates and maintains it. The City reads the water meters and bills the County consumers. The water revenue is used to pay the City for its services. Any excess is returned to the County. Any deficit is paid to the City by the County.

⁶ See Title 35, Baltimore County Code.

⁷ See Water Agreement, Baltimore City and Baltimore County, dated September 20, 1972.

THE PRESENT SYSTEM – ITS STRENGTHS AND WEAKNESSES

The quality of water in the three reservoirs is usually excellent, but the Susquehanna River presents a serious quality problem during periods of low stream flow (less than 10,000 CFS) which occurs during drought years in the late summer and fall. During these periods, the sulfate hardness increases. When this water is used in the system, complaints can be expected from the consumers about the hardness and possible red-water conditions which may occur. In addition, when Susquehanna water is filtered at the Montebello Plant, complaints may occur from consumers regarding taste and odor conditions.

A problem of algae blooms has developed in Liberty Reservoir and Loch Raven Reservoir. This is primarily caused by nutrients in untreated waste effluents from industries which flow into the upper reaches of the reservoirs. The problem will intensify as the watersheds are urbanized and more wastes are discharged into the reservoirs. On June 29, 1979, Baltimore County entered into a reservoir Watershed Management Agreement⁸ with Carroll County and the City to continuously review and evaluate existing problems and proposed actions potentially affecting the water supply watersheds. It is of the utmost importance that the State Water Quality Standards be adhered to in order to secure a pure and constant supply of water.

The following is a summary of the improvements needed in the County water system in each zone of service:

First Zone

The southeastern part of the County is served by gravity flow from the Montebello Filtration Plants. Both of the Montebello Filtration plants are in need of extensive rehabilitation. There is currently a large infrastructure improvement construction project ongoing at Montebello plant #1. (The Fullerton Transmission Main, connecting the major transmission system to facilities located on the Fullerton site, was completed at the end of 1999). The future reservoir (62 MG) and filtration plant are scheduled to be built by 2020 and 2026 respectively.

Replacement covered reservoirs is scheduled to be built by 2022 to comply with the EPA LT2ESWTR mandate at Druid Lake.

Continued development will necessitate the construction of a 24" transmission main in Pulaski Highway and a 16" transmission main in Campbell Boulevard.

A new 16" transmission main will be needed in Ebenezer Road, between Stumpfs Road and Harewood Road, to provide a redundant source of water (to enhance system reliability) to the Chase area of Baltimore County.

Water main projects to replace fifty year old, failure-prone cast iron pipe are planned for Beachwood (6,000 ft.) and the Turkey Point Peninsula (15,000 ft.).

⁸ See Reservoir Watershed Management Agreement, Baltimore City, Baltimore County & Carroll County dated June 29, 1979.

Numerous rehabilitation and replacement projects need to be done on the existing piping network to ensure adequate pressure, fire protection, and water quality.

Second Zone

The Guilford Reservoir is scheduled to be replaced by covered reservoirs by the year 2020 to comply with the EPA LT2ESWTR mandate.

Replacement covered reservoirs is scheduled to be built by 2023 at Ashburton Reservoir to comply with the EPA LT2ESWTR mandate.

Numerous rehabilitation and replacement projects will be needed on the existing piping network to ensure adequate pressure, fire protection and water quality.

Eastern Third Zone

A new 12" water main is currently under construction in Joppa Road, between Walther Boulevard and Belair Road, to replace a deteriorated 12" cast iron pipe.

Numerous rehabilitation projects need to be done on the existing piping network to ensure adequate pressure, fire protection, and water quality.

Western Third Zone

Numerous rehabilitation and replacement projects need to be done on the existing piping network to ensure adequate pressure, fire protection, and water quality.

Catonsville Fourth Zone

A new suction and discharge main needs to be completed for the Catonsville Pumping Station.

Numerous rehabilitation and replacement projects are needed on the existing piping network in order to ensure adequate pressure, fire protection and water quality.

Pikesville Fourth Zone

Improvements to the transmission system around the Owings Mills Area will need to be completed.

Eventually, a 36" transmission main in Reisterstown Road, from Pikesville pumping Station to Pleasant Hill Road will be needed to support demand during the summer months and provide redundancy to ensure system reliability.

A new 0.3 MG Tank is needed to replace the deteriorated and old Randallstown Tank.

Numerous rehabilitation and replacement projects are needed on the existing piping network in order to ensure adequate pressure, fire protection and water quality.

Towson Fourth Zone

A new 24” water line is needed in York Road, from Padonia Road to Cockeysville Road and also from Cockeysville Road to Shawan Road to replace existing problem-prone water mains.

A new 12” water main is needed along E Joppa Road, from Perring Parkway to Old Harford Road to replace a deteriorating 12” cast iron pipe. As part of the same contract, a new 20” water main is needed along E Joppa Road from LaSalle Road to Drumwood Road and a new 16” water main along Oakleigh Road from E Joppa Road to Yakona Road. Furthermore, existing water services along E Joppa Road between Drumwood Road and Perring Parkway will be transferred from the existing deteriorating 12” cast iron water main to the existing 20” water main.

Numerous rehabilitation projects need to be done on the existing piping network to ensure adequate pressure, fire protection and water quality.

Sparks Fifth Zone

Improvements are needed at the Sparks Pumping Station and the Sparks Tank to improve safety and to maintain reliability.

Reisterstown Fifth Zone

The 16” transmission main in Reisterstown Road needs to be replaced from the Pleasant Hill Tanks to Butler Road.

Increasing demands in the Reisterstown/Glyndon areas of Baltimore County will require the construction of a 2.0 million gallon elevated water storage tank by the year 2025.

Zones not needing Planned Improvements

- Colgate Second Zone
- Pot Springs Fifth Zone
- Sherwood Fifth Zone
- Falls Fifth Zone

IMPOUNDMENT AND SAFE YIELD DATA

| <u>Parameter</u> | <u>Loch Raven</u> | <u>Prettyboy</u> | <u>Liberty</u> |
|---|-------------------|------------------|----------------|
| Elevation at Crest of Dam | 240 feet | 520 feet | 420 feet |
| Spillway Length | 288 feet | 274 feet | 480 feet |
| Total Length of Dam | 650 feet | 845 feet | 740 feet |
| Height of Crest Above Stream Bed | 82 feet | 130 feet | 160 feet |
| Capacity of Reservoir (in billions) | 23 gallons | 20 gallons | 43 gallons |
| Length of Shore Line at Crest Elevation | 50 miles | 46 miles | 82 miles |
| Area of Land Owned | 8,000 acres | 7,380 acres | 9,200 acres |
| <u>Safe Yield</u> | | | |
| • Loch Raven - Prettyboy | 148 MGD | | |
| • Liberty | 92 MGD | | |
| • Susquehanna | | | |
| 108-inch line | 250 MGD | | |
| Future Additional Allowance | <u>250 MGD</u> | | |
| <i>Total Available Water:</i> | 740 MGD* | | |

*Total available water is subject to the following:

1. Liberty yield is limited to 82 MGD without the use of Ashburton pumps.
2. Present agreements would allow up to 69 MGD average day for Howard and Anne Arundel Counties.
3. Harford County has State authority for 25 MGD from the Susquehanna.
4. Baltimore City has been approved by the Susquehanna River Basin Commission (SRBC) to withdraw a maximum of 250 mgd from the Conowingo pond depending on system hydraulics, but withdraw is currently limited by its aggregate pumping capacity with three pumps operating to a withdrawal of approximately 137 mgd,. During low flow periods on the Susquehanna River (i.e., when Federal Energy Regulatory Commission Flows (Q-FERC) or lower flows occur), withdraw is limited to 64 mgd measured as a maximum 30-day average and 107 mgd (equivalent to two pumps at Deer Creek Pumping Station) any one day.

WATER DEMANDS

Round 7C Population Forecasts by the Baltimore Metropolitan Council (see Chapter II) indicate over 790,000 persons in the urban area of Baltimore County by the year 2040. The provision of public water services to this many people will require capital expenditures in nearly every zone of water service.

DOMESTIC, COMMERCIAL AND INDUSTRIAL USES

The expected domestic and commercial uses were obtained from the population figures and per-capita consumption for each zone of service. The results indicate an increase of use in some zones by the year 2040.

Industrial use is not expected to increase. It is anticipated that industrial and commercial use will replace the industrial water that was subtracted with the loss of the steel operation at Sparrows Point. After reviewing reports and available data on existing industrial use, zoning, transportation, water requirements and other parameters, it is estimated that industrial and commercial usage should remain constant through the year 2040.

About 52% of the industrial use is expected to be concentrated in the First Zone where most of it is now located. The other 48% will probably be located in existing industrial parks. Substantial water-using industries are not expected to settle in the northern part of the County.

Baltimore County's economic health depends to a significant degree on industry, and water is a prerequisite. Ensuring new industry and an ample water supply will permit some growth and will encourage industrialization where consistent with the County's *Master Plan 2020*.

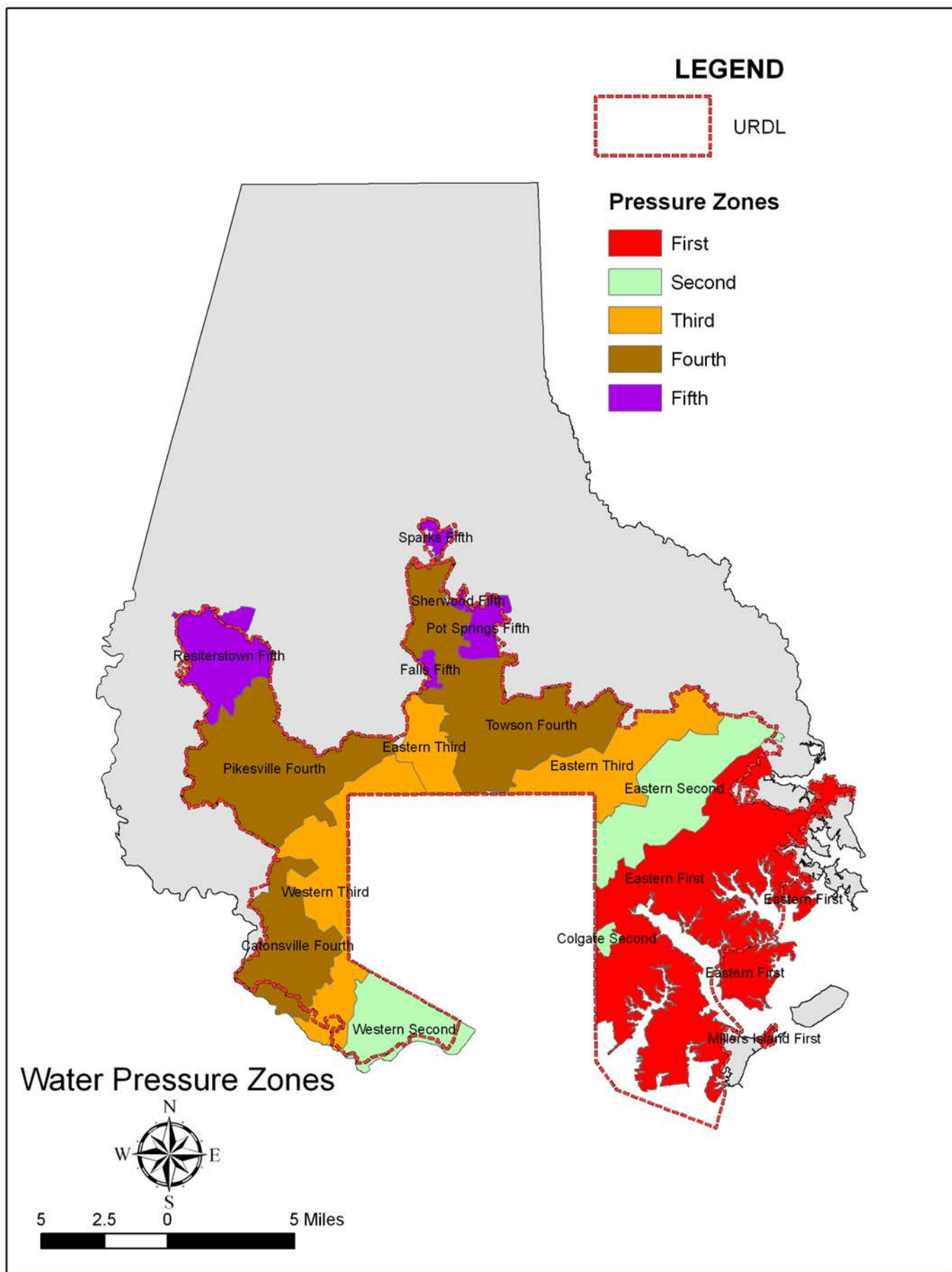
ESTIMATED DAILY USE IN THE YEAR 2040

The estimated Baltimore County 2040 average-day demand is 112.69 MGD. This quantity can be obtained from the existing sources of supply. The maximum-day demand of 201.46 MGD can be obtained from existing, raw water, reservoir storage and the Susquehanna River. Future distribution storage and pumping capacity must be designed to meet the maximum day demands. With the addition of the Fullerton Filtration Plant the water system will be able to handle anticipated future filtration water demands.

WATER DEMANDS – PRESENT TO 2040

Attempts to forecast long-range water use are only estimates based on the best available information and various engineering judgments. Fortunately, Baltimore County has some very valuable historical data which has been used to help predict the water demands through 2040. The present thinking of planners is that the water service area in the year 2040 will be virtually the same as the present one. The pressure zones (which also serve as the planning areas for public water service) are located generally within the URDL, with exceptions only for public health projects (such as in the eastern peninsula areas) and where mains are extended for redundancy

(“looping”) to meet system reliability and water quality requirements. The outline of the service area is shown on the following page.



PER-CAPITA CONSUMPTION

The per-capita consumption is expected to be highest in the First and Second Zones of service where industrial and commercial uses will probably be most extensive. Per-capita use in the upper zones is expected to increase gradually.

For engineering purposes, “per capita” usage figures are derived by dividing the actual observed flow by the population located within the pressure zone in question. This leads to confusion in that it does not accurately reflect actual domestic usage, since it assigns industrial and commercial usage as well as losses due to fire fighting operations, system leakage and water main breaks on a “per-capita” basis. It does, however, provide the information necessary to properly size and maintain the water system. These “per capita” figures were used historically in Table No. 3.

Domestic usage for design purposes is based on 90 gpcd (gallons per capita per day) (See Design Manual adopted August 2, 2010, Chapter 6, Section IV (B)3(c)2 (a) & (b) for complete details. This is the section on sewer design. Water systems are always designed for adequate fire flow and are not usually governed by domestic usage.) This is a conservative figure for system hydraulic design purposes. Actual residential domestic usage is closer to 80 gpcd.

Domestic usage is further refined in the Central System Report, varying from a low of 63 gpcd to a high of 83 gpcd in different pressure zones. The variation is the result of the consultant’s usage estimates based on lot size and type of dwelling typical in those service areas, with larger residences assumed to have a greater number of plumbing fixtures, more lawn watering and other outdoor usage. For all of these reasons, Table No. 3 has been modified to provide a better explanation of water demand.

OTHER SOURCES OF WATER

The rural areas of Baltimore County use ground water, predominantly in the northern part of the County. For more details about the use of ground water supplies, see the section on Rural Baltimore County.

THE FUTURE WATER SYSTEM

Water consumption in Baltimore County is expected to increase slowly through the year 2040.

The Water Analyzer Office has conducted extensive distribution studies of each zone of service. These studies were reviewed in detail to determine the distribution improvements which will be required to meet demands for the next twenty-five years. The improvements include additional pumping capacity, storage capacity, and transmission mains.

WATER CONSERVATION

COMPLIANCE WITH STATE REQUIREMENTS

The County Building Engineer, Building Code Official for the County in the Department of Permits, Approvals and Inspections, advised on January 24, 2011 that Baltimore County complies with the Maryland Water Conservation Plumbing Fixtures Act (see COMAR 26.03.01.07).

BALTIMORE COUNTY WATER CONSERVATION PLAN

The present Baltimore County water system is actually an extension of the City system. Raw water is brought into the City filtration plants from the City-owned impoundment reservoirs in the County, treated and returned to the County consumers through a complex system of transmission mains, distribution mains, storage facilities and pumping stations. Therefore the City and County are physically and legally bound to a common water system.

In fiscal 2016 Baltimore County used about 79 MGD from the Baltimore system. This amounts to about 40.5% of the average day water demand of 195.5 MGD. In fiscal 2016 there was 22.32% unaccountable water in the Baltimore Metropolitan Water System.

In recent years the County has financially participated at a rate of approximately 40% in the following City-managed contracts to reduce the amount of unaccountable water:

- SCADA (Supervisory Control and Data Acquisition) contract to replace or renew all of the telemetry in the system to gain more accurate readings.
- Water audit contracts to calibrate all large meters above 4" in size and to search for other unaccountable water causes.
- Valve and fire hydrant exercising and repair contract to limit leakage from these appurtenances.
- Leak detection contracts to survey large areas of the system to repair water leaks that do not reach the surface.
- Replacement of water tank altitude valves to stop unnecessary water overflows.
- Replacement of old water meters with new smart meters

In addition, Baltimore City and Baltimore County have made a comprehensive effort to find all buried meters in Baltimore County to gain a more accurate overall reading of metered water.

It is estimated that approximately 10% of the unaccountable water system wide is being lost through main breaks. Baltimore City and Baltimore County, like many large municipalities around the country, have a very old infrastructure with large inventories of old cast iron pipes that are prone to breakage, especially during the winter months. Each jurisdiction is allotting more money to replacing mains that have frequent breaks. In the fiscal year 2018 alone, Baltimore County will be replacing over 40,000 linear feet of old cast iron piping which have a history of main breaks. Baltimore City, through its emergency response network, is responding to breaks in a more timely manner to limit the amount of wasted water.

Also, over the last several years, both the City and the County public works officials, police and fire departments have put forth a lot of cooperative effort to stop illegal usage from the system's fire hydrants. Baltimore County has applied updated State standards in regard to plumbing fixtures in new construction to conform to the State's conservation requirements. Baltimore City also mails a water quality report annually to all metered accounts which gives guidance on how consumers can limit and conserve their daily water usage.

It is the objective of both Baltimore County and Baltimore City to reduce the system's unaccountable water to 15% within the next 5 years.

NEIGHBORHOOD EXTENSIONS

A petition process for facilities extensions in existing neighborhoods has been established to determine priorities for facilities planning, design, and construction as directed by Section 35-142 of the Baltimore County Code. In addition, priorities for facilities planning, design and construction are established by the Department of Environmental Protection and Sustainability and the Director of Public Works under procedures established pursuant to Section 35-144.

SUBDIVISION PROJECTS

Priorities for the extension of Metropolitan facilities for new developments (residential, commercial or industrial) are established by negotiation of Public Works Agreements pursuant to the authority of Section 32-4-304 of the Baltimore County Code.

CONSTRUCTION AT HIGHWAY SITES

Facilities are constructed at strategic locations crossing major highway projects to preclude future expenses involved in tunneling under the highways. The priority for this work is established by highway construction schedules.

RURAL BALTIMORE COUNTY

The areas outside of the Urban-Rural Demarcation Line (URDL) are predominantly served by individual “private” well water supplies. Ground water in Baltimore County may be obtained from two (2) geological and physiographical provinces that are separated by the “Fall Line” (which lies approximately along I-95 in Baltimore County). The Piedmont subarea is north of the Fall Line and the Coastal Plain subarea is south of the Fall Line.

Piedmont Subarea

Groundwater supplies in the Piedmont Subarea are generally sufficient to supply only domestic and moderate commercial demands because the yields from individual wells are relatively low, rarely exceeding 50 GPM. Crystalline rocks, including schist, gneiss, gabbro, granite, and marble are the chief aquifers. Groundwater generally occurs under water table conditions in the uppermost 250 feet of the rocks, and most wells and springs yield water from local recharge. The aquifers store groundwater in the more permeable zone of decomposed rock nearest to the land surface.

Well yields vary by geologic formation and within each formation. The following information is generalized yield data in Baltimore County:

| <u>Geologic Formation</u> | <u>Well Yield</u> |
|--|--|
| Marble | Varies from 1- 500 GPM and averages 12 GPM |
| Pleasant Grove Schist & Prettyboy Schist | Varies from 1- 100 GPM and averages 8.5 GPM |
| Gneiss & Granite | Varies from 1 - 100 GPM and averages 8.5 GPM |
| Mafic and Ultramafic | Varies from 1 - 75 GPM and averages 8.0 GPM |
| Loch Raven Schist | Varies from 1 - 100 GPM and averages 6.5 GPM |

Wells in the Loch Ravens Schist, particularly the area known as Chestnut Ridge, are generally the lowest yielding wells in Baltimore County. For this reason the Loch Raven Schist (and Jones Falls Schist) are known as Critical Water Areas (see map in Chapter II) as defined in the Baltimore County Code 34-2-103(f).

Coastal Plain Subarea

The Coastal Plain Subarea contains relatively large quantities of groundwater in artesian or semi-artesian and water-table conditions. Well yields vary from a few gallons per minute to as much as 1,000 GPM. The average yield is 200 GPM. Sand and gravel are the major aquifers that are separated by relatively impervious confining layers of clay.

Groundwater in the Coastal Plain Subarea is susceptible to salt water contamination. Groundwater contaminated by salt water is generally high in mineral content, high on the pH scale, and very hard. Detailed analyses can be obtained from the Geological Survey Water Supply Paper, 1499-F.

WATER QUALITY AND RELIABILITY

In general, residents of rural Baltimore County have little difficulty attaining an adequate and safe water supply from domestic wells use. The results of a County-wide 1998 study completed by the Maryland Geologic Survey entitled “Ground Water Quality in the Piedmont Region of Baltimore County” and a 2002 Supplemental Report indicate that there were no regional water quality concerns. However, subsequent water quality sampling has revealed a number of wells located in the Baltimore Gneiss Formation with elevated levels of naturally occurring radium in the ground water (see discussion below). The droughts of 1999 and 2002 raised concerns from many residents who rely on well water. Other localized ground water quality problems exist sporadically as a result of anthropogenic activities. Typically, areas of dense development and/or wells in close proximity to sources of contamination are more susceptible to groundwater quality problems. The discussion below details some of the more prevalent water quality issues that face rural Baltimore County property owners.

Radium

In 2005, a water quality survey of wells in the Baltimore Gneiss and Setters Gneiss formation revealed elevated levels of gross alpha particle emissions and radium (a human carcinogen) were present in roughly 10% of the wells. The areas of concern include Monkton, northern Phoenix, Sparks, Glencoe, Butler, and Woodstock. Radioactive elements such as uranium and radium are naturally occurring in the rock. Evaluation of the well construction data indicates no particular pattern in well depth, yield or age to wells with high gross alpha or radium concentrations. The occurrence of elevated concentrations of gross alpha and radium in ground water appears to be random within the gneiss formations and localized in various “hot spots.” The County recommends (and may require) that all potentially affected wells be tested for gross alpha and/or radium to minimize exposure. Water softeners have proven to be an effective removal technique for radium. In 2005, Baltimore County sent a mailing with information regarding radium to all Baltimore County residents located in areas of concern. Baltimore County Department of Environmental Protection and Sustainability continues to work with individual residents, and realtors to educate and assist in identifying those wells where treatment may be needed.

Drought

The drought of 2002 was marked by the lowest ground water levels on record in Baltimore County and an unprecedented number of replacement wells being drilled. Approximately 500 replacement wells were drilled which equates to nearly 1.5% of the total number of domestic wells estimated to be in service. Particularly hard hit were properties underlain by Loch Raven Schist and the Bradshaw Layered Amphibolite. These formations have long been known for their relatively low yielding wells and an increased likelihood of drilling “dry holes.” It was also noted that a large percentage of yield problems were experienced from hand dug wells or older shallow drilled wells that did not meet current construction and yield test standards.

Petroleum Constituents

Petroleum contamination of ground water, primarily from leaking underground storage tanks (UST) has been a known threat to drinking water supplies for many decades. The primary constituents of concern include volatile and semi-volatile compounds that the USEPA has designated as potential human carcinogens. The Baltimore County Department of Environmental Protection and Sustainability works in cooperation with Maryland Department of the Environment to monitor known cases of groundwater contamination related to petroleum fuel spills and advise residents when corrective action is necessary. The historical and current status of the major MDE remedial investigations in Baltimore County may be reviewed by accessing the Maryland Department of the Environment's web page:

<http://www.mde.state.md.us/programs/Land/OilControl/Pages/remediationsites.aspx>

Road Salt

Once applied, road salt or sodium chloride (the predominant form of salt used in Baltimore County) is easily dissolved with precipitation and may enter the ground water system through the nearby surface soils or discharge directly into streams through storm water run-off. Studies have shown that the sodium typically becomes bound in subsurface soils, and gradually displaces calcium, magnesium and potassium from the soil into the ground water system (Kaushal *et. al.*)⁹. However, chlorides move through the subsurface and into groundwater relatively unaffected by chemical or biological interaction. The US EPA has set a secondary maximum contaminant level (SMCL) for chlorides at 250 mg/l (parts per million (ppm)) in drinking water. An SMCL is a non-enforceable water quality standard that is recommended for aesthetic qualities such as taste and odor. While chlorides are not considered a concern for human health, they can impart a bitter taste in drinking water and increase corrosion of metal pipes and fixtures. Chlorides can also inhibit plant growth and in high concentrations cause damage to root systems. The US EPA has set a Health Advisory for sodium of 20 mg/l.

In a study by the Maryland Geological Survey, "Ground Water Quality in the Piedmont Region of Baltimore County" (Bolton 1998), it was found that approximately 5% of the 106 wells sampled throughout rural Baltimore County had chloride levels above 100 ppm, but only one well was above the SMCL of 250 ppm. In addition, it was found that chloride concentrations were significantly higher in wells located within 200 feet of a paved roadway. Impacts to wells from chlorides are generally localized and dependent on where storm water run-off is directed. No wells in the 1998 study were found to have elevated levels of sodium in the water. However, over the last decade, there has been a marked increase in the number of complaints and many documents cases (dozens) of chloride and sodium levels exceeding SMCLs and Health Advisory levels.

Baltimore County and the City of Baltimore have monitored salt concentrations from the drinking water reservoirs and streams leading to the reservoirs during base flow conditions (i.e.

⁹Kaushal, S.S., Groffman, P.M., Likens, G.E., Belt, K.T., Stack, W.P., Kelly, V.R., Band, L.E., & Fisher, G.T. (2005) *Proc. Natl. Acad. Sci. USA* 102, 13517 – 13520.

during dry weather). The data show a trend of increasing chloride levels that has more than doubled over the last 30 years. Sodium levels have increased 3 fold. Of most concern is that while chloride (and sodium) levels in streams are observed to peak during the winter months (as expected), the streams are not returning to baseline levels during the summer. The sodium and chlorides levels appear to be slowly building up in the groundwater system. Even if salt application were ceased today, it would take decades to the salt to be flushed out of the freshwater system.

While sodium chloride is not found naturally in this region, there are a number of anthropogenic sources of chlorides that are contributing to the observed trends. These include road salt, sanitary wastewater, fertilizers, and industrial discharges. The largest contribution of chlorides into Baltimore County watersheds by far is road salt. However, the other contributions should also be considered for proper management of this growing problem. For example, thousands of homeowners in Baltimore County use water softeners to treat their private water supplies. The spent brine from these systems solutions is usually discharged into the ground through their septic systems. While we are not seeing direct impacts to domestic wells from the use of water softeners (wells are intentionally sited to be upgradient and at least 100 feet from septic systems), chlorides from the brine are likely loading the ground water system and contributing to elevated chloride levels in downgradient streams. For further information related to chlorides and their environmental and health impacts, please see the Maryland Department of the Environment webpage:

<http://www.mde.state.md.us/programs/Marylander/Pages/roadSalt.aspx>

Regarding private water treatment systems, it is recommended that homeowners maintain an on-going service contract with a qualified professional to regularly monitor their well water quality and have their system upgraded or adjusted as needed to optimize the system efficiency.

Manor Shopping Center

In recent years, Manor Shopping Center, located in Jacksonville, has been unable to fully meet onsite water demand with its existing wells. Since at least 2005, the shopping center has been purchasing water trucked in from Baltimore City. In addition, the shopping center has been in violation of the lead and nitrate standards. The shopping center's wells are also high in total dissolved solids and chlorides, exceeding national secondary standards. While Baltimore County EPS and MDE were working with the system to install treatment to address the lead and nitrate concerns, it was discovered that the onsite sewage disposal system is either at capacity or at the point of failure. Due to the limited land owned by this system, it may be difficult or impossible to pump enough water to meet potable demand and have enough space to adequately dispose of wastewater. A long term solution to this shopping center's water and wastewater needs are needed.

SMALL COMMUNITY WATER SUPPLIES

There are currently nine small community water supply systems located in Baltimore County, together serving approximately 2,124 people. With the exception of Phoenix and Sunnybrook, these systems are privately owned and operated.

Small Community Public Water Supply Systems in Baltimore County

| Name | Location | Population Served |
|--|---|--------------------------|
| Glen Meadows Retirement Community | 11630 Glen Arm Rd., Glen Arm | 468 ² |
| The Gramercy Mansion Bed & Breakfast | 1400 Greenspring Valley Rd., Stevenson | 40 |
| Granite Trailer Court | 10600 Davis Ave Woodstock | 100 |
| Oldfields School | 1500 Glencoe Rd. Glencoe | 200 |
| Phoenix Community Water Supply ¹ | Sweet Air Rd. Phoenix | 50 |
| Chapel Hill Nursing Center | 4511 Robosson Rd. Randallstown | 125 ² |
| Sunnybrook Community Water Supply ¹ | Club View La. Phoenix | 416 ² |
| Woodstock Job Corp | 10900 Old Court Rd., Woodstock | 675 |
| Villa Julie Infirmary | 1531 Greenspring Valley Rd., Stevenson | 50 |
| Total Population Served | | 2,124 |

1 Maintained by Baltimore County Department of Public Works

2 Figure provided by MDE

WATER PROGRAM COST SUMMARY

ESTIMATED 5-YEAR (2019-2023)

(Source: Capital Budget FY 2018, Capital Improvement Program FY 2019 – FY 2023)

| | |
|--|----------------------|
| Neighborhood Water Extensions (Petitions) | \$1,500,000 |
| Construction at Highway Sites..... | \$1,500,000 |
| Rehabilitation & Replacement of Water Mains..... | \$75,000,000 |
| TOTAL NEIGHBORHOOD FACILITIES | \$78,000,000 |
| Major County Projects | \$109,165,000 |
| Joint City-County Projects (Baltimore County's Share Only) | \$462,820,000 |
| GRAND TOTAL ALL WATER FACILITIES | \$649,985,000 |

Table No. 3
Projected Water Supply Demands and Planned Capacity

| SERVICE AREA | 2020 | | | | | | | | 2025 | | | | | | | | 2030 | | | | | | | |
|--------------------|---------------------------|--------------------|--------------------------|--------------------------------|--|--------------------------------|-----------------------|---------------------------|---------------------------|-------------------|-------------------------|--------------------------------|--|----------------------------|-----------------------|---------------------------|---------------------------|-------------------|-------------------------|--------------------------------|--|----------------------------|-----------------------|---------------------------|
| | Population (Thousands) | GPCD* (Gallons) | Total Gallons* (GPCD) | Residential Demand (MGD) | Commercial Industrial Demand (MGD) | Unaccounted Water* (MGD) | Total Demand (MGD) | Planned Capacity (MGD) | Population (Thousands) | GPCD (Gallons) | Total Gallons (GPCD) | Residential Demand (MGD) | Commercial Industrial Demand (MGD) | Unaccounted Water (MGD) | Total Demand (MGD) | Planned Capacity (MGD) | Population (Thousands) | GPCD (Gallons) | Total Gallons (GPCD) | Residential Demand (MGD) | Commercial Industrial Demand (MGD) | Unaccounted Water (MGD) | Total Demand (MGD) | Planned Capacity (MGD) |
| FIRST | 157.1 | 76 | 175 | 11.94 | 11.43 | 4.12 | 27.49 | 34.0 | 161 | 78 | 179 | 12.53 | 12.00 | 4.33 | 28.86 | 34.0 | 165 | 80 | 184 | 13.16 | 12.59 | 4.54 | 30.29 | 34.0 |
| SECOND | 98.5 | 74 | 108 | 7.29 | 0.69 | 2.66 | 10.64 | 13.5 | 102 | 77 | 112 | 7.81 | 0.74 | 2.85 | 11.39 | 13.5 | 104 | 78 | 114 | 8.11 | 0.77 | 2.96 | 11.84 | 13.5 |
| CATONSVILLE FOURTH | 57.4 | 98 | 149 | 5.63 | 1.64 | 1.28 | 8.55 | 10.0 | 58 | 99 | 151 | 5.74 | 1.68 | 1.31 | 8.73 | 10.0 | 59 | 101 | 153 | 5.94 | 1.74 | 1.35 | 9.03 | 10.0 |
| COLGATE SECOND | 6 | 63 | 74 | 0.38 | 0.00 | 0.07 | 0.44 | 0.7 | 6 | 63 | 74 | 0.38 | 0.00 | 0.07 | 0.44 | 0.7 | 6 | 63 | 74 | 0.38 | 0.00 | 0.07 | 0.44 | 0.7 |
| EASTERN THIRD | 90.5 | 78 | 102 | 7.06 | 0.33 | 1.85 | 9.23 | 13.0 | 92 | 79 | 104 | 7.29 | 0.34 | 1.91 | 9.54 | 13.0 | 93 | 80 | 105 | 7.45 | 0.34 | 1.95 | 9.74 | 13.0 |
| FALLS FIFTH | 7.7 | 64 | 107 | 0.49 | 0.13 | 0.21 | 0.82 | 1.8 | 8 | 66 | 111 | 0.53 | 0.13 | 0.22 | 0.89 | 1.8 | 8 | 66 | 111 | 0.53 | 0.13 | 0.22 | 0.89 | 1.8 |
| PIKESVILLE FOURTH | 104.6 | 80 | 128 | 8.37 | 3.01 | 2.01 | 13.39 | 16.0 | 107 | 82 | 131 | 8.75 | 3.15 | 2.10 | 14.00 | 16.0 | 109 | 83 | 133 | 9.08 | 3.27 | 2.18 | 14.53 | 16.0 |
| POT SPRINGS FIFTH | 12.3 | 77 | 127 | 0.95 | 0.38 | 0.23 | 1.56 | 1.9 | 12 | 75 | 124 | 0.90 | 0.36 | 0.22 | 1.49 | 1.9 | 12 | 75 | 124 | 0.90 | 0.36 | 0.22 | 1.49 | 1.9 |
| REISTERSTOWN FIFTH | 40 | 78 | 115 | 3.12 | 0.56 | 0.92 | 4.60 | 5.7 | 40 | 78 | 115 | 3.12 | 0.56 | 0.92 | 4.60 | 5.7 | 41 | 80 | 118 | 3.28 | 0.59 | 0.97 | 4.83 | 5.7 |
| SHERWOOD FIFTH | 0.5 | 111 | 127 | 0.06 | 0.00 | 0.01 | 0.06 | 0.2 | 1 | 167 | 191 | 0.17 | 0.00 | 0.03 | 0.19 | 0.2 | 1 | 167 | 191 | 0.17 | 0.00 | 0.03 | 0.19 | 0.2 |
| SPARKS FIFTH | 1.8 | 71 | 156 | 0.13 | 0.11 | 0.04 | 0.28 | 0.6 | 2 | 78 | 172 | 0.16 | 0.14 | 0.05 | 0.34 | 0.6 | 2 | 78 | 172 | 0.16 | 0.14 | 0.05 | 0.34 | 0.6 |
| TOWSON FOURTH | 94.1 | 87 | 147 | 8.19 | 2.88 | 2.77 | 13.83 | 15.5 | 95 | 88 | 148 | 8.34 | 2.93 | 2.82 | 14.10 | 15.5 | 96 | 89 | 150 | 8.52 | 3.00 | 2.88 | 14.39 | 15.5 |
| WESTERN THIRD | 71.6 | 72 | 111 | 5.16 | 1.20 | 1.59 | 7.95 | 9.6 | 72 | 72 | 112 | 5.21 | 1.22 | 1.61 | 8.04 | 9.6 | 73 | 73 | 113 | 5.36 | 1.25 | 1.65 | 8.26 | 9.6 |
| TOTAL | 742 | | | 58.74 | 22.36 | 17.76 | 98.86 | 122.5 | 756 | | | 60.94 | 23.24 | 18.43 | 102.61 | 122.5 | 769 | | | 63.03 | 24.17 | 19.07 | 106.27 | 122.5 |

| SERVICE AREA | 2035 | | | | | | | | 2040 | | | | | | | |
|--------------------|---------------------------|-------------------|-------------------------|--------------------------------|--|-------------------------------|-----------------------|------------------------------|---------------------------|-------------------|-------------------------|--------------------------------|--|-------------------------------|-----------------------|------------------------------|
| | Population (Thousands) | GPCD (Gallons) | Total Gallons (GPCD) | Residential Demand (MGD) | Commercial Industrial Demand (MGD) | Unaccounted Water (MGD) | Total Demand (MGD) | Planned Capacity (MGD) | Population (Thousands) | GPCD (Gallons) | Total Gallons (GPCD) | Residential Demand (MGD) | Commercial Industrial Demand (MGD) | Unaccounted Water (MGD) | Total Demand (MGD) | Planned Capacity (MGD) |
| FIRST | 169 | 82 | 188 | 13.79 | 13.20 | 4.76 | 31.76 | 34.0 | 172 | 83 | 191 | 14.28 | 13.67 | 4.93 | 32.89 | 34.0 |
| SECOND | 107 | 80 | 117 | 8.58 | 0.81 | 3.13 | 12.52 | 13.5 | 109 | 82 | 119 | 8.90 | 0.84 | 3.25 | 12.99 | 13.5 |
| CATONSVILLE FOURTH | 60 | 102 | 156 | 6.14 | 1.80 | 1.40 | 9.34 | 10.0 | 61 | 104 | 158 | 6.35 | 1.86 | 1.45 | 9.65 | 10.0 |
| COLGATE SECOND | 6 | 63 | 74 | 0.38 | 0.00 | 0.07 | 0.44 | 0.7 | 6 | 63 | 74 | 0.38 | 0.00 | 0.07 | 0.44 | 0.7 |
| EASTERN THIRD | 94 | 81 | 106 | 7.61 | 0.35 | 1.99 | 9.95 | 13.0 | 95 | 82 | 107 | 7.77 | 0.36 | 2.03 | 10.17 | 13.0 |
| FALLS FIFTH | 8 | 66 | 111 | 0.53 | 0.13 | 0.22 | 0.89 | 1.8 | 8 | 66 | 111 | 0.53 | 0.13 | 0.22 | 0.89 | 1.8 |
| PIKESVILLE FOURTH | 111 | 85 | 136 | 9.41 | 3.39 | 2.26 | 15.06 | 16.0 | 112 | 86 | 137 | 9.58 | 3.45 | 2.30 | 15.33 | 16.0 |
| POT SPRINGS FIFTH | 12 | 75 | 124 | 0.90 | 0.36 | 0.22 | 1.49 | 1.9 | 12 | 75 | 124 | 0.90 | 0.36 | 0.22 | 1.49 | 1.9 |
| REISTERSTOWN FIFTH | 41 | 80 | 118 | 3.28 | 0.59 | 0.97 | 4.83 | 5.7 | 41 | 80 | 118 | 3.28 | 0.59 | 0.97 | 4.83 | 5.7 |
| SHERWOOD FIFTH | 1 | 167 | 191 | 0.17 | 0.00 | 0.03 | 0.19 | 0.2 | 1 | 167 | 191 | 0.17 | 0.00 | 0.03 | 0.19 | 0.2 |
| SPARKS FIFTH | 2 | 78 | 172 | 0.16 | 0.14 | 0.05 | 0.34 | 0.6 | 2 | 78 | 172 | 0.16 | 0.14 | 0.05 | 0.34 | 0.6 |
| TOWSON FOURTH | 97 | 90 | 151 | 8.70 | 3.06 | 2.94 | 14.69 | 15.5 | 98 | 91 | 153 | 8.88 | 3.12 | 3.00 | 15.00 | 15.5 |
| WESTERN THIRD | 74 | 74 | 115 | 5.50 | 1.28 | 1.70 | 8.49 | 9.6 | 74 | 74 | 115 | 5.50 | 1.28 | 1.70 | 8.49 | 9.6 |
| TOTAL | 782 | | | 65.15 | 25.11 | 19.74 | 110.00 | 122.5 | 791 | | | 66.68 | 25.80 | 20.22 | 112.69 | 122.5 |

Notes:

- 1) Water projections are determined as a function of changes in population.
 - 2) Water projections assume the percentage of unaccounted for water remains constant per zone.
- * Data provided from Baltimore City Project 658, Comprehensive Plan for Water Facilities, Central System Report, Table II-13, Filtered Water Supplied by Zone, 2015 projections (March, 2003)

Table No. 4
Inventory of Existing Community / Multi-use Wells

| Water Supply | Well ID | Public Water Supply ID | Aquifer | Coordinates (NAD 27 in thousands of feet) | Map No. | Depth (feet) | Well Diameter (Inches) | Maximum Safe Yield (gpd) | Pumping Capacity (gpd) | Comments |
|---|--|------------------------|-----------------------|---|---------|--------------------------|------------------------|--------------------------|------------------------|--------------------------------|
| Municipal (Publicly Owned) | | | | | | | | | | |
| Glen Arm Maintenance Facility (fka Grumman Aircraft) (MU) | BA-81-1777 BA-81-2071 Well #3 | 103-0052 | Cockeysville Marble | 942-591 | W-17 A | 200 100 ? | 6 | 11,000 | 15,000 | Added* |
| Oregon Ridge Park (MU) | BA-81-5810 BA-81-5811 BA-81-5812 BA-81-5898 | 103-1121 | Cockeysville Marble | 890-603 | W-10 B | 250 300 275 300 | 6 | 6,000 | 22,000 | Added* |
| Phoenix Water Supply (CS) | BA-81-6482 BA-81-6524 BA-81-6525 | 003-0017 | Baltimore Gneiss | 918-610 | W-11 A | 200 200 200 | 6 | 5,000 | 7,000 | |
| Sunnybrook Water Supply (CS) | Well #1 Well #2 Well #3 | 003-0011 | Loch Raven Schist | 923-606 | W-11 A | | 6 | 31,000 | 60,000 | |
| Manor Water Supply (MU) | BA-94-3562 BA-94-3633 | 103-1103 | Baltimore Gneiss | 920-628 | W-11 A | 400 400 | 6 | 5,000 | 15,000 | Serves Manor Tavern Restaurant |
| Private Community/Institutional | | | | | | | | | | |
| Bais Yaakov School for Girls (MU) | BA-73-3724 | 103-0002 | Loch Raven Schist | 877-581 | W-16 A | 200 | 6 | 10,300 | 15,500 | |
| Baptist Home (MU) | BA-81-2904 BA-81-4577 BA-88-1436 BA-88-1437 | 003-0201 | Baltimore Gneiss | 877-577 | W-16 A | 300 300 200 250 | 6 | | | Inactive |
| Camp Fretterd (fka Montrose School) (MU) | BA-81-6687 BA-88-1731 | 103-0055 | Piney Run Formation | 843-607 | W-9 B | 305 300 | 6 | 10,000 | 25,000 | |
| Camp Milldale (aka, Pearlstone Retreat) (MU) | BA-92-0995 BA-94-3778 | 103-1331 | Pleasant Grove Schist | 841-640 | W-9 B | 205 250 | 6 | 12,000 | 32,000 | |
| Caves Valley Golf Club (MU) | BA-88-1831 BA-88-1828 | 103-0065 | Cockeysville Marble | 874-587 | W-16 A | 140 400 | 6 | 3,000 | 5,000 | |

Table No. 4 (Continued)
Inventory of Existing Community / Multi-use Wells

| Water Supply | Well ID | Public Water Supply ID | Aquifer | Coordinates (NAD 27 in thousands of feet) | Map No. | Depth (feet) | Well Diameter (Inches) | Maximum Safe Yield (gpd) | Pumping Capacity (gpd) | Comments |
|--|--|------------------------|-----------------------|---|---------|---------------------------------|------------------------|--------------------------|------------------------|---------------|
| Chapel Hill Nursing Center (MU) | BA-94-3881; BA-81-7250, Well #3 | 003-0202 | Serpentine | 840-569 | W-15 B | 500 300 ? | 6 | 6,500 | 10,000 | |
| Glen Arm LLC (fka Marquip Ward United, fka Koppers) (MU) | BA-73-2480 BA-81-0481 | 103-0040 | Cockeysville Marble | 941-591 | | 202 525 | 6 | 10,000 | 35,000 | Added* |
| Glen Meadows Retirement Community (aka Notchcliff Lifecare Community) (MU) | BA-73-5149 BA-81-2562 | 003-0208 | Cockeysville Marble | 936-589 | W-17 A | 150 100 | 6 | | (50,000) | |
| Gramercy Mansion Bed & Breakfast (CS) | 2 Wells | 003-0023 | Cockeysville Marble | | W16B | ? | | | | Multiple OSDS |
| Granite Trailer Court (MU) | BA-81-0968 Spring | 003-0204 | Baltimore Gneiss | 838-544 | W-15 B | 185 | 6 | 9,700 | 16,200 | |
| Greystone Country Club (MU) | BA-94-1645 | 103-0074 | Loch Raven Schist | 911-655 | W-4 B | 300 | 6 | 4,000 | 5,500 | |
| Hayfields County Club (MU) | BA-94-3289 BA-94-0329 BA-94-0328 | 103-0071 | Cockeysville Marble | 892-608 | W-10 B | 256 156 200 | 6 | | | |
| Hereford High School (MU) (See Cycle 30 Issue 12-01) | BA-94-3100 BA-94-3101 BA-93-0492 BA-94-4235 | 103-0017 | Loch Raven Schist | 895-644 | W-4 B | 300 400 300 250 | 6 | 7,300 | 12,900 | Added* |
| Hereford Middle School (MU) | BA-81-0033 BA-73-8284 | 103-0018 | Setters Formation | 898-635 | W-10 B | 275 273 | 6 | 6,100 | 9,200 | Added* |
| Hillendale Country Club (MU) | BA-94-0008 BA-94-0268 BA-94-1239 BA-94-2698 BA-94-2697 | 103-0061 | Loch Raven Schist | 925-607 | W-11 A | 350 400 300 300 300 | 6 | 10,000 | 17,000 | Added* |
| Hunt Valley Golf Club | BA-71-0081 | 102-1071 | Cockeysville Marble | 910-610 | W-10 B | 200 | 6 | 8,200 | 12,300 | Added* |
| Life Point Church (fka Carroll Community Church) (MU) | BA-94-7313 BA-95-0730 | 103-0093 | Pleasant Grove Schist | 841-616 | W-9B | 180 130 | 6 | 3,900 | 10,800 | |

Table No. 4 (Continued)
Inventory of Existing Community / Multi-use Wells

| Water Supply | Well ID | Public Water Supply ID | Aquifer | Coordinates (NAD 27 in thousands of feet) | Map No. | Depth (feet) | Well Diameter (Inches) | Maximum Safe Yield (gpd) | Pumping Capacity (gpd) | Comments |
|--|--|------------------------|---------------------|---|---------|---------------------------------|------------------------|--------------------------|------------------------|---|
| Manor Shopping Center (MU) | BA-73-2251 BA-73-2423 BA-81-7734 BA-73-5311 Well #5 | 103-0054 | Loch Raven Schist | 924-613 | W-11 A | 200 300 400 110 ? | 6 | 9,000 | 15,000 | Owner is reportedly hauling in water due to poor well yield |
| Maryvale Trinity Prep School | BA-81-0767 BA-94-6047 | 103-0025 | Loch Raven Schist | 888-582 | | 200 700 | 6 | 7,500 | 11,000 | Added* |
| Oldfields School (MU) | BA-81-7175 BA-81-5475 BA-88-1108 BA-81-1180 BA-94-1075 | 003-0210 | Baltimore Gneiss | 905-630 | W-10 B | 450 300 700 450 500 | 6 | 22,000 | 30,000 | |
| Paper Mill Village (MU) | BA-81-6233; Well #2 | 103-0060 | Loch Raven Schist | 924-614 | W-11 A | 298 | 6 | 5,000 | 7,500 | |
| Stevenson University (fka, Villa Julie College (CS)) | BA-81-0564 BA-81-5471 BA-94-3047 | 103-0042 | Cockeysville Marble | 883-579 | W-16 B | 200 200 200 | 6 | 60,000 | 100,000 | |
| Woodstock Job Corps Center (MU) | BA-94-2124 BA-81-0222 BA-81-0223 BA-81-0224 BA-92-0449 | 103-0012 | Baltimore Gneiss | 837-547 | W-15 B | 460 400 400 300 300 | 6 | 45,000 | 50,000 | |

* Existing facilities that use greater than 5,000 gpd, but were not included in the plan prior to the 2007 Triennial Review

Table No. 5
Inventory of Existing Impounded Supplies

| Owner | Crest Elevation Above Sea Level (Feet) | Spillway Length (Feet) | Total Length of Dam (Feet) | Height of Crest Above Stream Bed (Feet) | Flooded Area of Crest Elevation (Acres) | Length of Shore Line at Crest Elevation (Miles) | Area of Land Owned (Acres) | Water Over Flowed Crest For First Time (Date) | Capacity of Reservoir (BIL/GALS) | Safe Yield (MGD) | Average Flow (MGD) |
|--------------------|--|------------------------------|-------------------------------------|---|--|---|-------------------------------------|---|--|------------------------|--------------------------|
| Municipal | 520.0' | 448.0' | 692.5' | 130.0' | 1,500 | 46 | 7,380 | 9/23/33 | 20 | 48 | |
| Prettyboy Dam (1) | (158.5 m) | (136.5 m) | (210.9 m) | (39.6 m) | (607 ha) | (74 km) | (2987 ha) | | (76 MCM) | (182 TCMD) | |
| | | | | | | | | | | | |
| Municipal | 240.0' | 288.0' | 650.0' | 82.0' | 2,400 | 50 | 8,000 | 5/20/23 | 23 | 100 | 264 |
| Loch Raven Dam (1) | (73.2 m) | (87.8 m) | (198.1 m) | (25 m) | (971 ha) | (80 km) | (3237 ha) | | (87 MCM) | (379 TCMD) | (999 TCMD) |
| | | | | | | | | | | | |
| Municipal | 420.0' | 480.0' | 704.0' | 160.0' | 3,100 | 82 | 9,200 | 2/6/56 | 43 | 95 | 122 |
| Liberty Dam (2) | (128 m) | (146.3 m) | (214.6 m) | (48.8 m) | (1254 km) | (132 km) | (3723 ha) | | (163 MCM) | (360 TCMD) | (462 TCMD) |

PUMPED SUPPLIES
Conowingo Dam (3)

| | | |
|--------------------------------------|-------------------------|-----------------|
| Intake (Initial) | 250 MGD | (946 TCMD) |
| Intake (Ultimate) | 500 MGD | (1893 TCMD) |
| Deer Creek Pumping Station (Maximum) | 4 Pumps @ 62.5 MGD each | (237 TCMD each) |

- (1) Gunpowder River
- (2) Patapsco River
- (3) Susquehanna River

Table No. 6
Inventory of Existing Water Treatment Facilities

| | OWNER | | | | |
|---------------------------------------|--|---|---|---|---|
| | Municipal: Montebello Plant No. 1 | Municipal: Montebello Plant No. 2 | Municipal: Ashburton | BALTIMORE COUNTY Community Water Systems | |
| | | | | Sunnybrook | Phoenix |
| WATER SOURCE | Gunpowder & Susquehanna Rivers | | Patapsco River | Aquifer (2 wells) | Aquifer (2 wells) |
| TYPE OF TREATMENT | Chlorination, Chemical Treatment, Coagulation Sedimentation, Filtration, Fluoridation | | | Chlorination Chemical Treatment | Chlorination Chemical Treatment Filtration |
| PLANT COORDINATE LOCATION - NAD 27 | 917,124E 547,464N | 915,923E 547,759N | 895,645E 542,673N | 923,200E 606,800N | 918,500E 614,500N |
| PLANT COORDINATE LOCATION - NAD 83 | 1,429,542E 608,214N | 1,428,341E 608,509N | 1,408,063E 603,423N | 1,435,617E 667,551N | 1,430,917E 675,251N |
| RATED PLANT CAPACITY | 128 MGD (485 TCMD) | 112 MGD (424 TCMD) | 120 MGD (454 TCMD) | 70,000 GPD | 36,000 GPD |
| AVERAGE PRODUCTION | Total of Plants 1 & 2 160.62 MGD (607.95 TCMD) | | 103.96 MGD (393.49 TCMD) | 32,500 GPD | 3,000 GPD |
| MAXIMUM PEAK FLOW | Total of Plants 1 & 2 237.24 MGD (897.65 TCMD) | | 158.65 MGD (600.49 TCMD) | 52,000 GPD | 7,000 GPD |
| STORAGE CAPACITY | Total of Plants 1 & 2 15.1 MG (57.2 TCM) | Druid Lake 193 MG (730.6 TCM) | Lake Ashburton 220 MG (832.8 TCM) | 70,000 GAL | 8,000 GAL |
| PLANNED EXPANSION | None | None | None | None | None |
| METHOD OF SLUDGE (*) REMOVAL | Sedimentation Lagoon | Sedimentation Lagoon | Sedimentation Lagoon | None | Pump Out |
| OPERATING AGENCY | Baltimore City | Baltimore City | Baltimore City | Baltimore County | Baltimore County |

* Ultimate Disposal of Sludge: Co-disposal with BRWWTP Sludge

Table No. 7
Problem Areas

-
1. Susquehanna River: Red Water and hardness. Potential taste and odor problems.
 2. Loch Raven Reservoir: Algae Growth.

Table No. 8
Baltimore County Water Facilities
Capital Improvement Program

| Project Job Order | Construction Start Date Fiscal Year | Priority | Maryland State Plane Coordinates NAD 83 | | Map | Project Description | Estimated Costs | | Project Construction Capital Budget Program Number | Status Start (Design) Fiscal Year |
|--------------------|-------------------------------------|----------|---|------------------------|------|---|-----------------|---------------------|--|-----------------------------------|
| | | | | | | | Total \$ | Baltimore County \$ | | |
| First Zone | | | | | | | | | | |
| 3-36-007 | 2014 | W-3 | 610750.6 611750.6 | 1479418.5 1484418.6 | W17B | 5,500 LF of 20” water main from Bengies Rd. to Eastern Ave. to Earles Rd. | 4,000,000 | 4,000,000 | 0036 | 2016 |
| 3-67-278 | 2018 | W-1 | 585750.1 | 1467418.8 | W23B | Replacement of 6,000 LF of cast iron water main for Beechwood. | 3,000,000 | 3,000,000 | 0067 | 2017 |
| 3-36-017 | 2020 | W-3 | 610750.6 | 1479418.5 | W17B | Rehabilitation of 37,000 LF of 36” water main Pulaski-Orem-Leland from Golden Ring Rd. to Bengies Rd. | 6,000,000 | 6,000,000 | 0036 | 2018 |
| 3-36-028 | 2020 | W-3 | 617750.6 624750.7 | 1469418.4 1474418.4 | W17B | 9,000 LF of 24” water main in Pulaski Hwy from Mohrs La. to Ebenezer Rd. | 4,500,000 | 4,500,000 | 0036 | 2018 |
| 3-35-308 | 2018 | W-6 | 617750.8 | 1487418.5 | W17B | 9,500 LF of 16” water main in Ebenezer Rd. from Stumpfs Rd. to Harewood Rd. | 2,000,000 | 2,000,000 | 0035 | 2011 |
| 3-36-021 | 2017 | W-3 | 620750.5 | 1456418.3 | W17A | Fullerton Reservoir | 72,000,000 | 32,800,000 | 0036 | 2008 |
| Eastern Third Zone | | | | | | | | | | |
| 3-67- | 2022 | W-1 | 626750.3 628750.3 | 1431417.9 1427417.8 | W17A | 27,000 LF of water main. Hillen Rd. & Goucher Blvd. Rehabilitation | 4,000,000 | 4,000,000 | 0067 | 2020 |
| 3-11- | 2020 | W-1 | 619559.2 615038.9 | 1449239.0 1444910.5 | W17A | 5,500 LF of 24” water main in Belair Rd. between Northern Pkwy and I-695 | 5,000,000 | 5,000,000 | 0011 | 2016 |
| 3-35- | 2022 | W-1 | 640750.3 | 1407417.4 | W16B | 8,000 LF of 16” main in Timonium Rd. and Mays Chapel Rd. between Thornton Rd. and Falls Rd. to improve fire flow and system reliability | 2,000,000 | 2,000,000 | 0035 | 2020 |

Table No. 8 (continued)
Baltimore County Water Facilities
Capital Improvement Program

| Project Job Order | Construction Start Date Fiscal Year | Priority | Maryland State Plane Coordinates NAD 83 | | Map | Project Description | Estimated Costs | | Project Construction Capital Budget Program Number | Status Start (Design) Fiscal Year |
|-------------------------|-------------------------------------|----------|---|------------------------|------|--|-----------------|---------------------|--|-----------------------------------|
| | | | | | | | Total \$ | Baltimore County \$ | | |
| Pikesville Fourth | | | | | | | | | | |
| 3-35- | 2022 | W-1 | 625749.5 620749.5 | 1361417.4 1367417.4 | W16A | 7,700 LF of 20” main Liberty & Deer Park Rds. from Chapman Rd. to Deer Park Tank | 3,000,000 | 3,000,000 | 0035 | 2020 |
| 3-67-304 | 2018 | W-1 | 625749.9 | 1388417.4 | W16A | 7,000 LF of 36” main between Painters Mill Rd. and Pleasant Hill Rd. in Reisterstown Rd. | 10,000,000 | 10,000,000 | 0067 | 2016 |
| 3-12-489 | 2019 | W-1 | | | W16A | Pikesville PS Discharge Main-42” | 10,000,000 | 10,000,000 | 0012 | 2016 |
| Towson Fourth Zone | | | | | | | | | | |
| 3-35-445 | 2018 | W-1 | | | W16B | Towson PS Rehab | 6,500,000 | 6,500,000 | 0035 | 2014 |
| 3-50-466 | 2015 | W-1 | | | W16B | 24” water main in York Rd. from Cockeysville Rd. to Shawan Rd. | 7,000,000 | 7,000,000 | 0050 | 2013 |
| 3-6-288 | 2018 | W-2 | 651750.5 | 1416417.4 | W10B | 15,000 LF of 24” water main in York Rd. from Padonia Rd. to Cockeysville Rd. | 9,600,000 | 9,600,000 | 0006 | 2009 |
| Catonsville Fourth Zone | | | | | | | | | | |
| 3-35-332 | 2018 | W-1 | | | W22A | Catonsville PS Rehab-New 36” Suction and Discharge Main | 8,000,000 | 8,000,000 | 0035 | 2012 |
| Sparks Fifth Zone | | | | | | | | | | |
| 3-35-151 | 2018 | W-3 | 670750.8 | 1412417.1 | W10B | Improvements at the Sparks Pumping Station and Elevated Tank | 4,000,000 | 4,000,000 | 0035 | 2015 |
| Reisterstown Fifth Zone | | | | | | | | | | |
| 3-78 | 2018 | W-1 | 641749.9 | 1372417.1 | W16A | Replace 20,000 LF of 16” Main in Reisterstown Rd. from Pleasant Hill PS to Butler Rd. | 15,000,000 | 15,000,000 | 0078 | 2016 |
| 3-78-0002 | 2020 | W-3 | 655804.6 | 1371593.7 | W16A | 2.0 MG Bond Avenue Tank | 5,500,000 | 5,500,000 | 0078 | 2008 |

Table No. 8 *(continued)*
Baltimore County Water Facilities
Capital Improvement Program

| Project Job Order | Construction Start Date Fiscal Year | Priority | Maryland State Plane Coordinates NAD 83 | | Map | Project Description | Estimated Costs | | Project Construction Capital Budget Program Number | Status Start (Design) Fiscal Year |
|-------------------|-------------------------------------|----------|---|-----------|------|---------------------------------|-----------------|---------------------|--|-----------------------------------|
| | | | | | | | Total \$ | Baltimore County \$ | | |
| Central System | | | | | | | | | | |
| 3-71-147 | 2015 | | 608682.8 | 1429227.4 | | Montebello Plant Rehabilitation | 112,125,000 | 41,487,000 | | 2018 |
| 3-71-202 | 2020 | W-3 | 619338.9 | 1456415.9 | W17A | Fullerton Treatment Plant | 530,782,000 | 232,412,000 | | 2013 |
| 3-71-239 | 2017 | | 611199.9 | 1421278.1 | | Guilford Reservoir Replacement | 67,000,000 | 44,000,000 | | 2011 |
| 3-71-474 | 2017 | | | | | Druid Lake Storage Replacement | 120,000,000 | 53,000,000 | | 2013 |
| 3-71-475 | 2017 | | | | | Ashburton Storage Replacement | 110,000,000 | 48,000,000 | | 2013 |

CAPITAL BUDGET 2018

**CAPITAL IMPROVEMENT PROGRAM FY 2019 - 2023
STAGE 7 - DEPT. 203 WATER SYSTEM**

| Project No. | Title | Total Estimated Cost | Prior Authorizations | Total for 6-year Program | FY 2018* | FY 2020* | FY 2022* |
|-------------|--|----------------------|----------------------|--------------------------|--------------------|--------------------|--------------------|
| 0002 | Neighborhood Petitions Water Ext. | 5,194,484 | 3,694,484 | 1,500,000 | 500,000 | 500,000 | 500,000 |
| 0006 | Towson Fourth Zone | 52,489,140 | 48,489,140 | 4,000,000 | 4,000,000 | 0 | 0 |
| 0011 | Eastern Third Zone | 32,536,660 | 8,536,660 | 24,000,000 | 10,000,000 | 14,000,000 | 0 |
| 0012 | Pikesville Fourth Zone | 42,543,918 | 20,543,918 | 22,000,000 | 5,000,000 | 17,000,000 | 0 |
| 0035 | Misc. Distribution System Improvements | 75,423,146 | 46,923,146 | 28,500,000 | 8,500,000 | 10,000,000 | 10,000,000 |
| 0036 | First Zone | 137,301,432 | 125,711,432 | 11,590,000 | 11,590,000 | 0 | 0 |
| 0050 | Construction at Highway Sites | 5,800,888 | 4,300,888 | 1,500,000 | 500,000 | 500,000 | 500,000 |
| 0067 | Main Replacement and Rehabilitation | 202,287,582 | 127,287,582 | 75,000,000 | 20,000,000 | 25,000,000 | 30,000,000 |
| 0068 | Special Water House Connections | 735,000 | 720,000 | 15,000 | 5,000 | 5,000 | 5,000 |
| 0070 | Fire Hydrants | 790,778 | 730,778 | 60,000 | 20,000 | 20,000 | 20,000 |
| 0071 | City/County Joint Use Facilities | 1,001,544,774 | 538,724,774 | 462,820,000 | 140,320,000 | 152,000,000 | 170,500,000 |
| 0078 | Reisterstown Fifth Zone | 25,222,000 | 6,222,000 | 19,000,000 | 19,000,000 | 0 | 0 |
| | TOTAL | 1,581,869,802 | 931,884,802 | 649,985,000 | 219,435,000 | 219,025,000 | 211,525,000 |

* Baltimore County employs a Biennial Capital Budget.

CHAPTER IV - SEWERAGE PLAN

GENERAL BACKGROUND

Baltimore County constructs, operates and maintains all sewage collection and pumping facilities within the County. There are twenty-three (23) sewersheds which contain 2,060 miles of gravity sewer and 163 miles of pressure sewer. Baltimore County operates one hundred twenty (120) pumping stations and one (1) 90-thousand gallon per day treatment plant at Richlyn Manor, east of Belair Road, adjacent to the Gunpowder River.

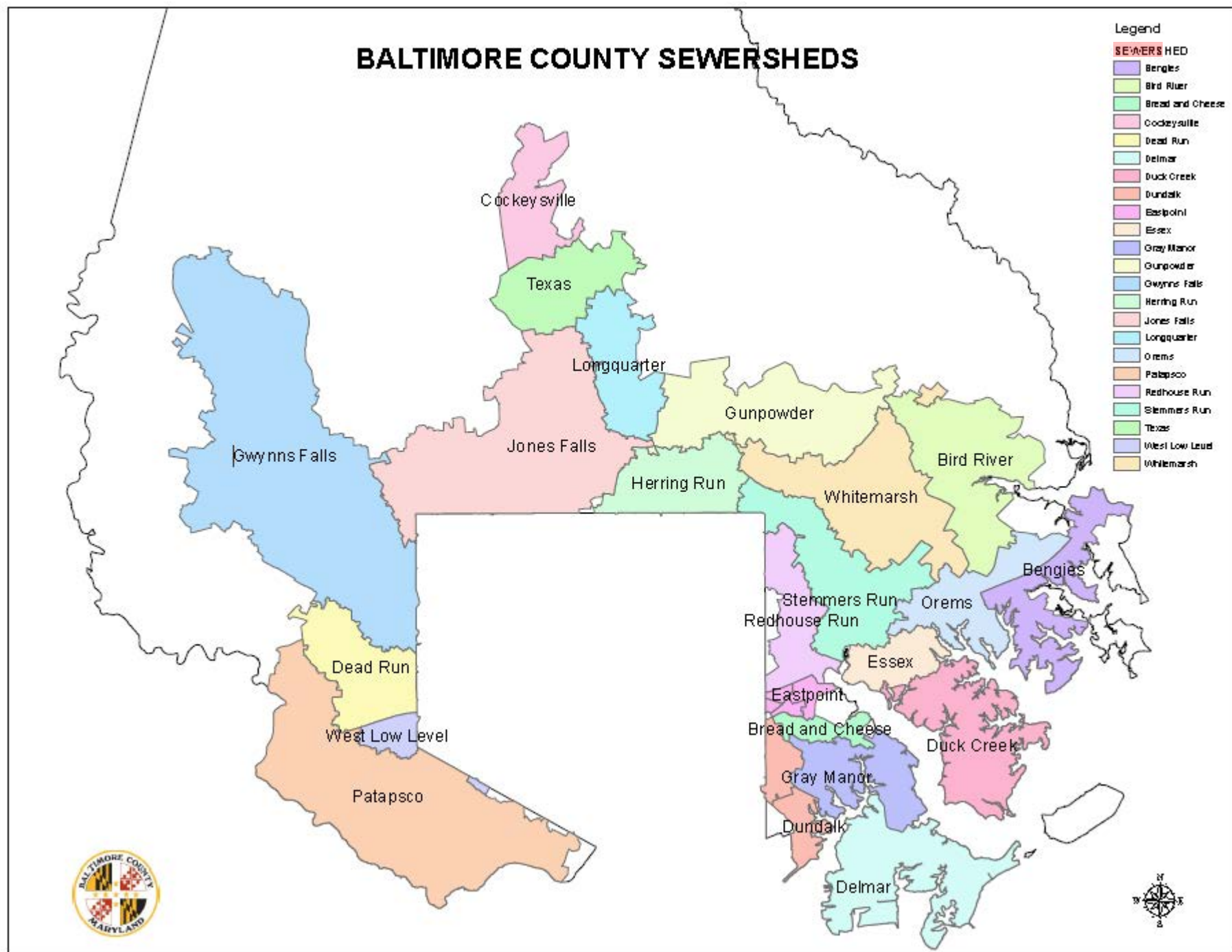
County generated sewage is treated and disposed of at the City-owned and operated treatment plants, Back River and Patapsco. The City and County agree to pay for new capital projects and for the repair to, and enlargement of, additions or improvements to sewerage facilities. The total flow conveyed from the County to the treatment plants determines the County's portion of capital improvement and/or operation and maintenance cost.

Baltimore County receives flow from Anne Arundel and Howard Counties. By agreement, these counties pay their portion of operating and capital costs. Copies of the sewer agreements with Baltimore City, Anne Arundel County and Howard County are included in the Appendices.

On September 20, 2005, Baltimore County entered into a Consent Decree with the U.S. Department of Justice, the U.S. Environmental Protection Agency and the Maryland Department of the Environment. This document requires Baltimore County to completely evaluate its sewer system and make corrections in order to eliminate sanitary overflows in the collection system. This massive effort will involve field investigations, studies, reports, designs and construction projects. As of September 29, 2016 MDE and the EPA approved all Sewershed Repair, Replacement and Rehabilitation (SRRR) Plans. The County is in the process of implementing the corrective actions from these plans.

System Overview

The following is a description of each of the twenty-three (23) sewersheds with a discussion of their location, major system components, pumped flow, existing conditions and proposed projects:



STEMMERS RUN

Location

This area includes Parkville, Fullerton, Rossville, and Victory Villa and is located between Parkville and Essex in Eastern Baltimore County. The area encompassed by the drainage basin is approximately 3,950 acres serving a population of 32,916 people.

System Components

| <u>Major Sewers</u> | <u>Length (Miles)</u> | <u>Pipe Size</u> |
|---------------------|-----------------------|------------------|
| Brien Run | 2.57 | 30" to 54" |
| Montross Farms | 0.45 | 10" to 16" |
| Northeast Creek | 1.40 | 12" to 24" |
| Stemmers Run | 4.90 | 18" to 27" |
| Parkville | 0.77 | 10" to 18" |
| Carney Heights | 0.85 | 15" to 18" |
| Orems Road | 1.05 | 30" to 36" |

Pumped Flow

Stemmers Run receives flow from the Orems Road and White Marsh Pumping Stations via the Brien Run Interceptor. Flow is then split between the 42.0 MGD Stemmers Run and the 71.7 MGD New Stemmers Run Pumping Stations. The sewage is then transported through 48" and 54" force mains discharging into the outfall sewer at Back River Treatment Plant, located approximately three (3) miles south of the Stemmers Run Pumping Station.

Existing Conditions

The Stemmers Run SRRR Plan was accepted by the EPA on September 9, 2013, and is scheduled to be implemented by September 6, 2024.

Proposed Projects

There are multiple projects under design in Stemmers Run. The list of the proposed projects is shown below.

| Project | Description | Estimated Cost |
|---------------------------|-----------------------------------|----------------|
| SR02B & 03 Rehabilitation | 32,527 LF of sewer rehabilitation | \$4,197,690 |
| SR05 Rehabilitation | 26,692 LF of sewer rehabilitation | \$2,818,085 |
| SR06 Rehabilitation | 50,784 LF of sewer rehabilitation | \$6,232,490 |
| Total | | \$13,248,265 |

BIRD RIVER

Location

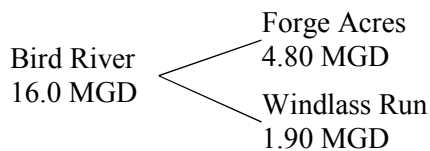
This area is in eastern Baltimore County includes Perry Hall and White Marsh and is bordered on the east by the Big Gunpowder Falls. The area encompassed by the drainage basin is approximately 5,710 acres serving a population of 14,222 people.

System Components

| <u>Major Sewers</u> | <u>Length (Miles)</u> | <u>Pipe Size</u> |
|-------------------------|-----------------------|------------------|
| Honeygo Run Interceptor | 3.34 | 24" to 27" |
| Bird River Interceptor | 4.58 | 16" to 42" |

Pumped Flow

The 16.0 MGD Bird River Pumping Station receives flow from two (2) pumping stations, Forge Acres and Windless Run.



Existing Conditions

The Bird River SRRR Plan was accepted by the EPA on September 29, 2016. Implementation of the SRRR plan recommendations have been delayed by real estate acquisition issues and will occur after the original September 29, 2020 deadline.

Proposed Projects

There are two projects under design in Bird River, below is a list of the proposed projects.

| Project | Description | Estimated Cost |
|------------------------------------|-----------------------------------|----------------|
| Chapel Road Sewer Extension | 2200 LF of sewer (health project) | \$819,000 |
| Bird River Sewer Rehab | 1064 LF of sewer rehabilitation | \$102,000 |
| Windlass Run Interceptor Extension | 2055 LF of sewer | \$940,000 |
| Total | | \$1,861,000 |

OREMS

Location

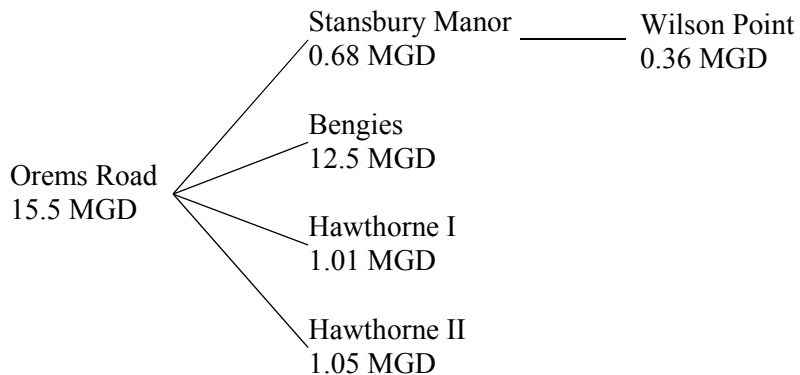
This area is in eastern Baltimore County, between Essex and Bengies, and encompasses the areas around Aero Acres, Martin Plaza, Ballard Gardens, Hawthorn, and Wilson Point including the Chesapeake Industrial Park and the Glen L. Martin State Airport. It serves approximately 1,600 acres with a population of 17,379 people.

System Components

| <u>Major Sewers</u> | <u>Length (Miles)</u> | <u>Pipe Size</u> |
|---------------------------|-----------------------|------------------|
| Middle River Diversion | 1.27 | 15" to 36" |
| Middlesex Outfall | 0.62 | 12" to 30" |
| Leland Avenue Interceptor | 2.34 | 42" to 48" |
| Aero Acres Outfall | 0.45 | 12" to 18" |

Pumped Flow

The 15.5 MGD Orem's Road Pumping station receives flows from five (5) pumping stations as shown below:



The sewage is then transported from Orem's Road Pumping Station through a 30" force main to the Brien Run Interceptor in the Stemmers Run System

Existing Conditions

The Orem's Sewershed SRRR Plan was accepted by the EPA on September 29, 2016. Implementation of the Orem's SRRR plan recommendations have been delayed by real estate acquisition issues and will occur after the original September 29, 2020 deadline.

Proposed Projects

There are multiple projects under design in Orem, below is a list of the proposed projects.

| Project | Description | Estimated Cost |
|------------------------------------|------------------------|----------------|
| Stansbury Manor Force Main Repairs | Replace force main | \$282,995 |
| Orem 03 Relief Sewer | 930 LF of relief sewer | \$330,500 |
| Stansbury Manor Pump Station | Station upgrade | \$2,700,000 |
| Total | | \$3,313,495 |

BENGIES

Location

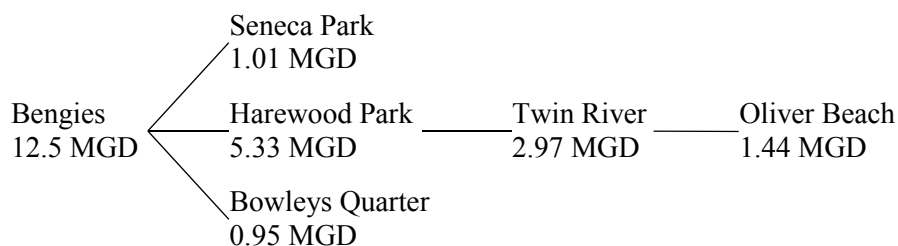
The Bengies Sewershed is in eastern Baltimore County and includes the Bowleys Quarters Peninsula and the area along Eastern Avenue northeast of Carroll Island Road. The area serves approximately 1,450 acres with a population of 13,758 people.

System Components

| <u>Major Sewers</u> | <u>Length (Miles)</u> | <u>Pipe Size</u> |
|-------------------------------|-----------------------|------------------|
| Eastern Avenue Int. West | 0.93 | 18" to 42" |
| Bowleys Quarters Interceptor | 1.19 | 18" to 24" |
| Eastern Avenue Int. East | 3.31 | 24" to 48" |
| Olivia Road Outfall Sewer | 0.29 | 12" to 15" |
| Oliver Beach PS Outfall Sewer | 0.63 | 15" to 18" |
| Middle River Neck Interceptor | 1.44 | 20" |

Pumped Flow

The 12.5 MGD Bengies Pumping Station receives flow from five (5) pumping stations.



Existing Conditions

The Bengies SRRR Plan was accepted by the EPA on September 29, 2016. Implementation of the Bengies SRRR plan recommendations have been delayed by real estate acquisition issues and will occur after the original September 29, 2020 deadline.

Proposed Projects

There is one project under design in Bengies Sewershed. The project is shown below.

| Project | Description | Estimated Cost |
|----------------------------|-----------------------------------|----------------|
| Bengies Structural Repairs | 11,857 LF of sewer rehabilitation | \$1,566,369 |
| Total | | \$1,566,369 |

WHITE MARSH

Location

This area includes Perry Hall, Carney and the White Marsh Town Center and is located in eastern Baltimore County. The area encompassed by the drainage basin is approximately 4,025 acres serving a population of 52,581 people.

System Components

| <u>Major Sewers</u> | <u>Length (Miles)</u> | <u>Pipe Size</u> |
|-------------------------------|-----------------------|------------------|
| North Branch White Marsh | 4.75 | 30" to 54" |
| White Marsh South Interceptor | 0.82 | 12" to 18" |
| South Branch White Marsh | 2.29 | 12" to 24" |
| Barrington Outfall | 0.59 | 10" to 20" |
| West Branch White Marsh | 4.41 | 10" to 27" |
| Belmont Outfall Sewer | 0.58 | 12" to 18" |
| Bird River Interceptor | 2.50 | 24" to 48" |

Pumped Flow

The 72.8 MGD White Marsh Pumping Station receives flows from the Gunpowder and Bird River Pumping stations. The sewage is then transported through dual 42" force mains extending southerly to Compass Road and the Brien Run Interceptors.

Existing Conditions

The White Marsh sewershed SRRR Plan was accepted by the EPA on April 18, 2016, and is scheduled to be implemented by April 18, 2024.

Proposed Projects

There are multiple projects under design in White Marsh, below is a list of the proposed projects.

| Project | Description | Estimated Cost |
|-----------------------------------|-----------------------------------|----------------|
| White Marsh Force Main Repairs | Force main rehabilitation | \$13,200 |
| White Marsh Relief Interceptor | Relief sewer | \$16,108,114 |
| White Marsh Rehabilitation - East | 10,864 LF of sewer rehabilitation | \$2,543,980 |
| White Marsh Rehabilitation - West | 42,719 LF of sewer rehabilitation | \$3,483,978 |
| Richlyn Manor WWTP Decommission | Treatment Plant removal study | \$258,759.53 |
| Total | | \$22,408,032 |

GUNPOWDER

Location

The Gunpowder Sewershed is located in northeast Baltimore County, generally north of Joppa Road and south of the Gunpowder River. The area served by this Sewershed is approximately 4,100 acres with a population of 36,509 people.

System Components

| <u>Main Sewers</u> | <u>Length (Miles)</u> | <u>Pipe Size</u> |
|-------------------------|-----------------------|------------------|
| Gunpowder Interceptor | 6.60 | 27" to 42" |
| Perry Hall Interceptor | 1.94 | 12" to 24" |
| Jenifer Run Interceptor | 1.85 | 12" to 18" |
| Satyr Hill Interceptor | 1.84 | 12" to 16" |

Pumped Flow

There are two (2) pumping stations tributary to Gunpowder Pumping Station, the Campus Hills and Longquarter Pumping Stations. The 37.0 MGD Gunpowder Pumping Station pumps flow through a 36" force main to the northern end of the Whitmarsh Sewershed.

Existing Conditions

The Gunpowder SRRR Plan was accepted by the EPA on April 18, 2016, and is scheduled to be implemented by April 18, 2026.

Proposed Projects

There are multiple projects under design in Gunpowder, below is a list of the proposed projects.

| Project | Description | Estimated Cost |
|------------------------------------|-----------------------------------|----------------|
| Campus Hills Force Main Repairs | Force main rehabilitation | \$22,600 |
| Jennifer Branch Relief | Relief sewer | \$2,465,400 |
| Gunpowder Interceptor Relief Sewer | Relief sewer | \$22,376,124 |
| Gunpowder Structural Repair | 71,460 LF of sewer rehabilitation | \$10,309,548 |
| Gunpowder Supplemental Force Main | Relief sewer | \$10,000,000 |
| Total | | \$45,173,672 |

LONGQUARTER

Location

The Longquarter Sewershed is located in north-central Baltimore County, between Towson and the Loch Raven Reservoir. The area served by this Sewershed is approximately 4,150 acres with a population of 20,177 people.

System Components

| <u>Major Sewers</u> | <u>Length (Miles)</u> | <u>Pipe Size</u> |
|-------------------------------|-----------------------|------------------|
| Greenridge (Fairmount Avenue) | 2.30 | 10" to 24" |
| Spring Branch Outfall | 1.12 | 16" to 66" |
| Timonium Interceptor | 1.54 | 33" to 42" |
| Spring Branch Interceptor | 1.02 | 10" to 15" |

Pumped Flow

The Longquarter System receives flows from the Texas Pumping Station. The present capacity at Longquarter Pumping Station is 36.0 MGD. The sewage from Longquarter Pumping Station is pumped through dual force mains to the top of the Gunpowder System.

Existing Conditions

The Longquarter SRRR Plan was accepted by the EPA on April 18, 2016, and is scheduled to be implemented by April 18, 2024.

Proposed Projects

There are multiple projects under design in Longquarter, below is a list of the proposed projects.

| Project | Description | Estimated Cost |
|--|-----------------------------------|----------------|
| Longquarter Structural Repair On road | 48,052 LF of sewer rehabilitation | \$5,518,290 |
| Longquarter Structural Repair Off Road | 51,534 LF of sewer rehabilitation | \$8,112,915 |
| Longquarter Force Main Replacement | Force main replacement | \$5,260,000 |
| Total | | \$18,891,205 |

TEXAS

Location

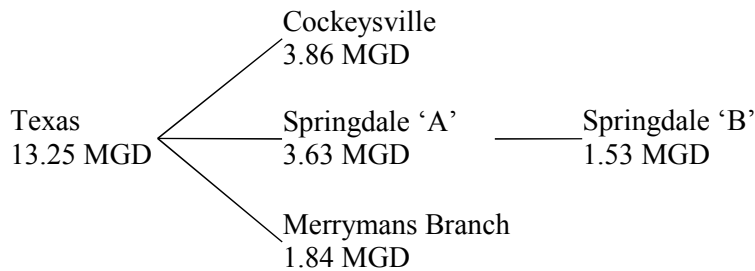
The Texas Sewershed is located between Cockeysville and Timonium in north-central Baltimore County. The Texas System serves approximately 2,100 acres with a population of 25,794 people.

System Components

| <u>Major Sewers</u> | <u>Length (Miles)</u> | <u>Pipe Sizes</u> |
|-------------------------|-----------------------|-------------------|
| Texas East Interceptor | 1.86 | 12" to 24" |
| Texas South Interceptor | 1.77 | 15" to 24" |
| Padonia Road West | 1.38 | 10" to 16" |

Pumped Flow

There are four (4) pumping stations tributary to the Texas Pump Station as shown below:



The Texas Pumping Station pumps through a 30" force main to the Longquarter Sewershed.

Existing Conditions

The Texas SRRR Plan was accepted by the EPA on April 18, 2016, and is scheduled to be implemented by April 18, 2022.

Proposed Projects

There are multiple projects under design in Texas, below is a list of the proposed projects.

| Project | Description | Estimated Cost |
|--------------------------|----------------------------------|----------------|
| Texas Force Main repairs | Force main rehabilitation | \$805,000 |
| Texas Structural Repair | 3,006 LF of sewer rehabilitation | \$619,394 |
| Total | | \$1,424,394 |

COCKEYSVILLE

Location

The Cockeysville Sewershed is located in north-central Baltimore County. The area served by this system is approximately 1,400 acres with a population of 5,931 persons.

System Components

| <u>Major Sewers</u> | <u>Length (Miles)</u> | <u>Pipe Size</u> |
|----------------------------|-----------------------|------------------|
| Oregon Branch Interceptor | 1.14 | 21" to 36" |
| Beaver Dam Run Interceptor | 1.02 | 27" to 30" |
| Western Run Interceptor | 3.67 | 12" to 36" |

Pumped Flow

There is one (1) pumping station tributary to the Cockeysville Pump Station, Loveton Estates. The sewage is pumped from the 3.86 MGD Cockeysville Pumping Station through a 24-inch force main southerly along the Pennsylvania Railroad to the Texas Pumping Station.

Existing Conditions

The Cockeysville SRRR Plan was accepted by the EPA on September 29, 2016. Implementation of the Cockeysville SRRR plan recommendations have been delayed by real estate acquisition issues and will occur after the original September 29, 2020 deadline.

Proposed Projects

There are two (2) projects under design in Cockeysville, below is a list of the proposed projects.

| Project | Description | Estimated Cost |
|--------------------------------|----------------------------------|----------------|
| Cockeysville Structural Repair | 2,346 LF of sewer rehabilitation | \$766,607 |
| Cockeysville Force Main Repair | Force main rehabilitation | \$194,358 |
| Total | | \$960,965 |

ESSEX

Location

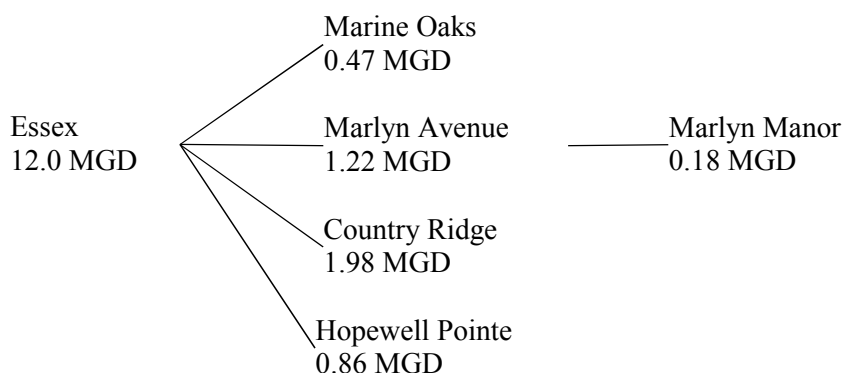
The Essex Sewershed consists of the Essex area in eastern Baltimore County. The area served is approximately 1,900 acres with a population of 17,193 people.

System Components

| <u>Major Sewers</u> | <u>Length (Miles)</u> | <u>Pipe Size</u> |
|-----------------------------|-----------------------|------------------|
| Essex Outfall Sewer | 1.94 | 12" to 18" |
| Cedar-Taylor Avenue Outfall | 1.33 | 12" to 30" |
| Cedar Avenue Outfall | 2.77 | 18" to 30" |

Pumped Flow

The 12.0 MGD Essex Pumping Station receives flows from five (5) pumping stations as shown below:



The sewage is then pumped through one of two 20" force mains, either under the Back River or along Eastern Avenue, and outfalls to the Back River Wastewater Treatment Plant.

Existing Conditions

The Essex SRRR Plan was accepted by the EPA on April 18, 2016, and is scheduled to be implemented by April 18, 2022.

Proposed Projects

There are multiple projects being evaluated or under design in Essex. Below is a list of the proposed projects.

| Project | Description | Estimated Cost |
|---------------------------------|------------------------------------|----------------|
| Essex Structural Repairs | 18,491 LF of sewer rehabilitation | \$7,185,565 |
| Essex Relief Sewers | 2036 LF of relief sewer | \$956,186 |
| Essex Pump Station | Pump station upgrade | \$26,381,614 |
| Essex Bridge Force Main Repairs | Force main exterior rehabilitation | \$288,900 |
| Essex Force Main Replacement | Force main replacement | \$5,811,855 |
| Total | | \$40,624,120 |

DUCK CREEK

Location

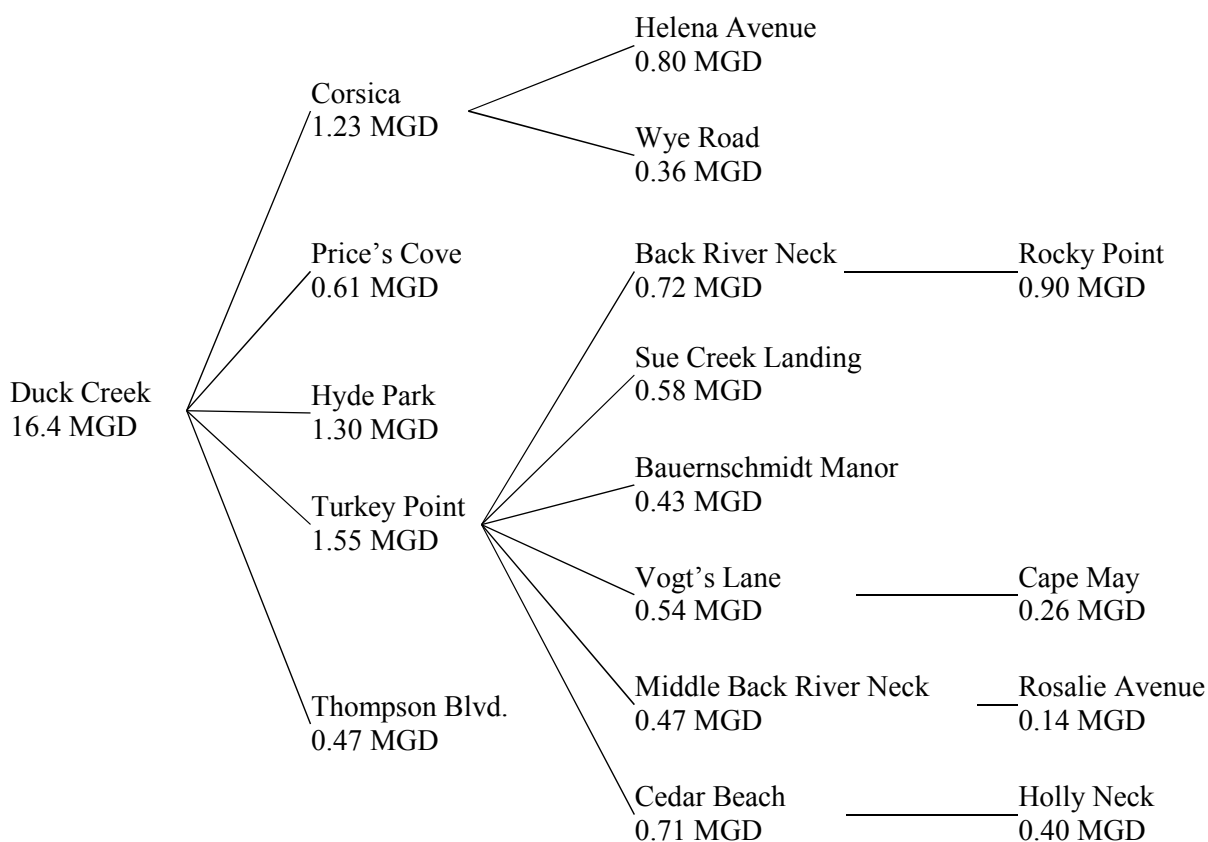
The Duck Creek Sewershed is located south of Essex in eastern Baltimore County and includes Cape May, Turkey Point and the Back River Neck Peninsula. The area encompassed by the drainage basin is approximately 1,475 acres serving a population of 18,544 people.

System Components

| <u>Major Sewers</u> | <u>Length (Miles)</u> | <u>Pipe Size</u> |
|---------------------------|-----------------------|------------------|
| Marlyn Avenue Hyde Park | 1.41 | 12" to 42" |
| Middleborough Interceptor | 1.54 | 12" to 24" |
| Turkey Point Interceptor | 0.99 | 8" to 24" |

Pumped Flow

The existing capacity of the Duck Creek Pumping Station is 16.4 MGD. The pumping station receives flows from seventeen (17) pumping stations as shown below:



The sewage is then transported through a 30" force main along Eastern Avenue and outfalls to the Back River Treatment Plant.

Existing Conditions

The Duck Creek SRRR Plan was accepted by the EPA on April 18, 2016. Implementation of the Cockeysville SRRR plan recommendations are expected to go beyond April 18, 2022 due to expansion of project scope.

Proposed Projects

There are multiple projects under design in Duck Creek, below is a list of the proposed projects.

| Project | Description | Estimated Cost |
|-------------------------------------|--------------------------------------|----------------|
| Duck Creek Force Main repairs | Force main exterior cleaning & rehab | \$500,000 |
| Duck Creek structural | 4,184 LF of sewer rehabilitation | \$1,885,141 |
| Corsica Pump Station Capacity | Pump station upgrade | \$2,879,494 |
| Middle Back River Neck Pump Station | Pump station upgrade | \$575,489 |
| Corsica Pump Station Force Main | Force main replacement | \$1,947,050 |
| Total | | \$7,787,174 |

BREAD & CHEESE

Location

The Bread and Cheese Sewershed is located in the south eastern portion of Baltimore County, generally southeast of Eastern Avenue, along the south side of North Point Boulevard to a point where it intersects Bread and Cheese Creek and then both sides of North Point Boulevard to Coves Road. The area encompassed by the drainage basin is approximately 700 acres serving a population of 5,925 people.

System Components

| <u>Major Sewers</u> | <u>Length (Miles)</u> | <u>Pipe Size</u> |
|------------------------------------|-----------------------|------------------|
| North Point Blvd. Interceptor | 1.02 | 18" to 24" |
| Bread and Cheese Creek Interceptor | 1.13 | 12" to 24" |
| Gray Manor FM Outfall | 0.64 | 30" to 36" |

Pumped Flow

The 16.7 MGD Bread and Cheese Pumping Station normally has no other pump stations tributary to it. However, the Gray Manor Pumping Station has the option of pumping a small percentage of its flow to Bread and Cheese. The Bread and Cheese Pumping Station transports sewage through a force main that outfalls to the Back River Treatment Plant.

Existing Conditions

The Bread & Cheese SRRR Plan was accepted by the EPA on September 29, 2016, and is scheduled to be implemented by March 2, 2022.

Proposed Projects

There is one project under design in Bread & Cheese, below is a list of the proposed project.

| Project | Description | Estimated Cost |
|---------------------------------|-----------------------------------|----------------|
| Bread & Cheese Structural Rehab | 13,612 LF of sewer rehabilitation | \$3,546,000 |
| Total | | \$3,546,000 |

GRAY MANOR

Location

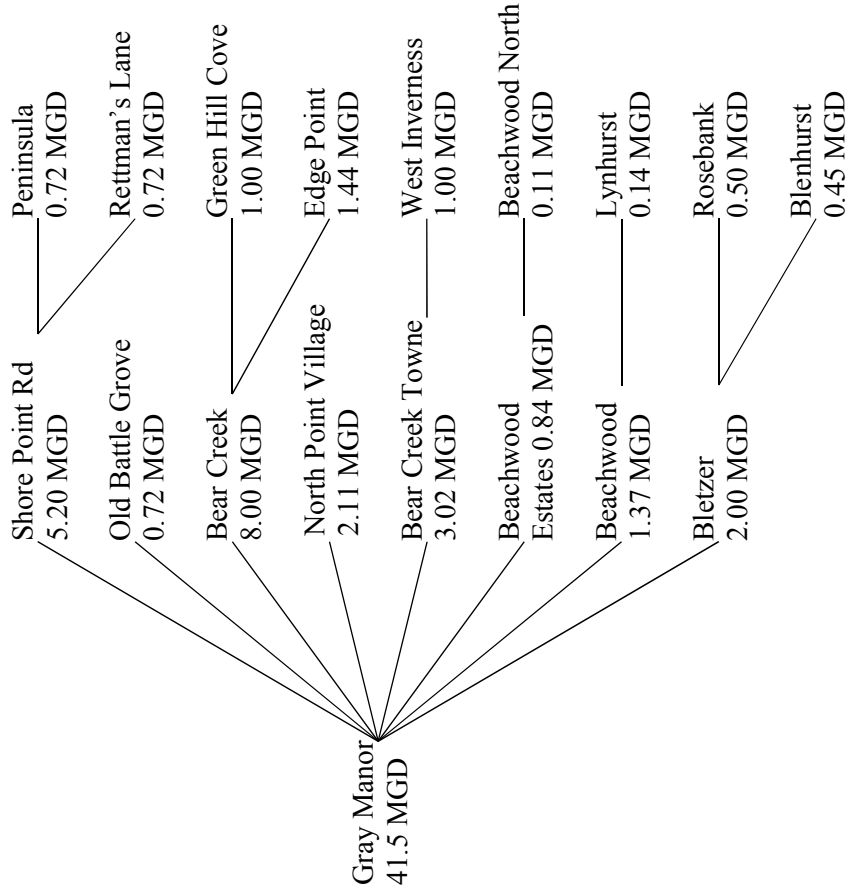
The Gray Manor Sewershed is in the southeastern portion of Baltimore County, generally bounded by Back River on the east, German Hill Road and North Point Road on the north, Sollers Point Road and Merrit Boulevard on the west, and Patapsco Freeway and North Point Boulevard on the south. The area encompassed by the drainage basin is approximately 2,225 acres serving a population of 30,219 people.

System Components

| <u>Major Sewers</u> | <u>Length (Miles)</u> | <u>Pipe Size</u> |
|-------------------------------------|-----------------------|------------------|
| Lynch Road - Wise Avenue Sewer | 0.78 | 30" to 48" |
| Patapsco Neck Outfall | 2.03 | 33" to 48" |
| Shore Road PS Collector Sewer | 0.94 | 12" to 18" |
| Wise Avenue (Bear Creek PS Outfall) | 1.20 | 24" to 30" |

Pumped Flow

There is a total of seventeen (17) pumping stations that are tributary to the Gray Manor Pump Station as shown below:



The 41.5 MGD Gray Manor Pumping Station has the option of pumping a small percentage of its flow to the Bread and Cheese Sewershed but normally pumps directly to the main outfall sewer at Back River Wastewater Treatment Plant.

Existing Conditions

The Gray Manor SRRR Plan was accepted by the EPA on April 18, 2016, and is scheduled to be implemented by April 18, 2022.

Proposed Projects

There are multiple projects under design in Gray Manor, below is a list of the proposed projects.

| Project | Description | Estimated Cost |
|-------------------------------|-----------------------------------|----------------|
| Gray Manor Force Main repairs | Force main inspection | \$43,200 |
| Bear Creek Towne Pump Station | Station upgrade | \$545,200 |
| West Inverness Pump Station | Station upgrade | \$3,907,266 |
| Grey Manor Basin 11 Upsize | 2,585 LF of sewer rehabilitation | \$1,085,742 |
| Grey Manor Basin 20 Upsize | 535 LF of sewer rehabilitation | \$187,250 |
| Grey Manor Basin 01 Upsize | 4,367 LF of sewer rehabilitation | \$1,755,845 |
| Gray Manor Structural Rehab | 37,369 LF of sewer rehabilitation | \$3,363,000 |
| Gray Manor Interceptor Rehab | 14,972 LF of sewer rehabilitation | \$6,976,000 |
| Grey Manor Basin 16 Relief | Relief sewer | \$1,010,055 |
| Total | | \$18,873,558 |

DELMAR

Location

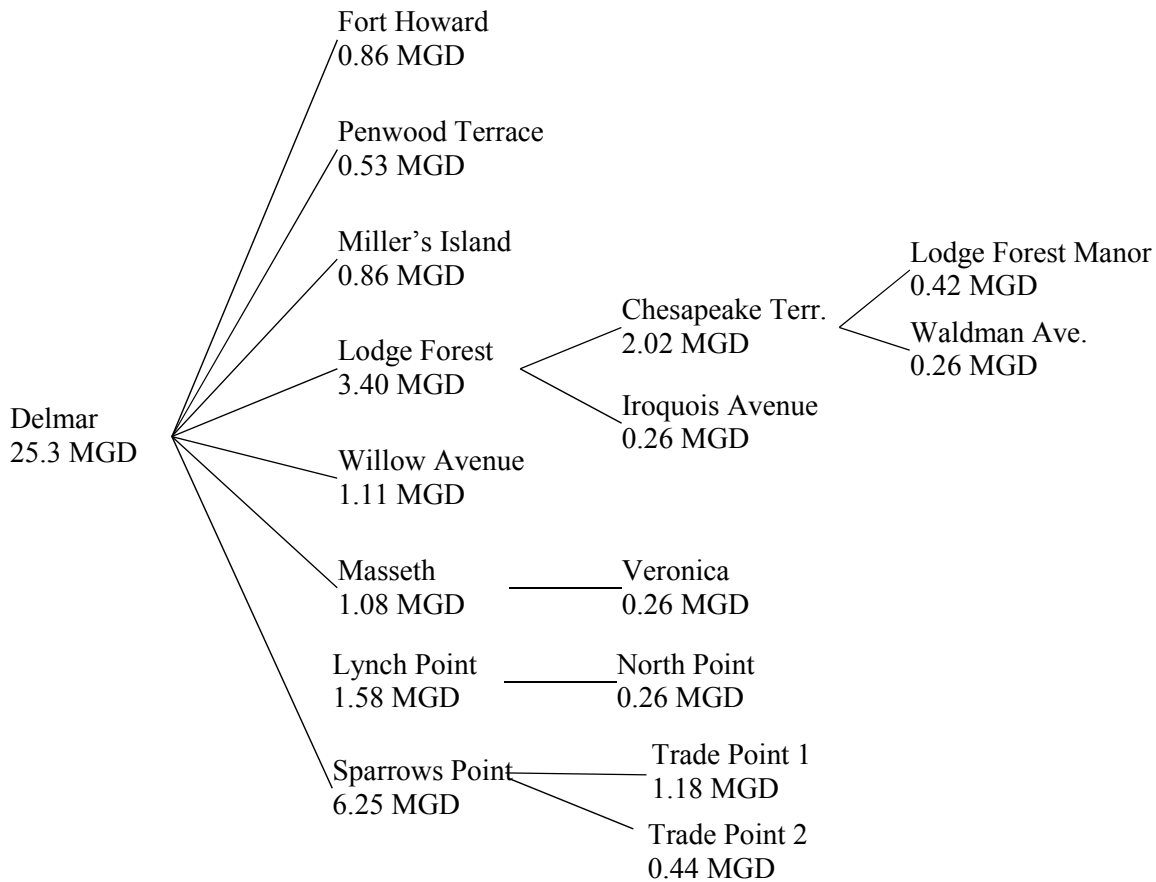
The Delmar Sewershed is located in the extreme southeastern end of Baltimore County, south and east of North Point Boulevard and Patapsco Freeway. The area encompassed by the drainage basin is approximately 1,600 acres serving a population of 8,210 people.

System Components

| <u>Major Sewers</u> | <u>Length (Miles)</u> | <u>Pipe Size</u> |
|------------------------------------|-----------------------|------------------|
| Glen Echo Interceptor | 1.38 | 15" to 36" |
| Sparrows Point Force Main Outfall | 0.47 | 24" |
| Chesapeake Terrace Collector Sewer | 0.89 | 10" to 24" |

Pumped Flows

The 25.3 MGD Delmar Pumping Station receives flows from sixteen (16) pumping stations as shown below:



The sewage is then pumped through a 30” force main to the Patapsco Neck Outfall Sewer at the upper end of the Gray Manor Sewershed.

Existing Conditions

The Delmar SRRR Plan was accepted by the EPA on April 18, 2016. Implementation of the Delmar SRRR plan recommendations have been delayed by real estate acquisition issues and will occur after the original April 18, 2022 deadline.

Proposed Projects

There are multiple projects under design in Delmar, below is a list of the proposed projects.

| Project | Description | Estimated Cost |
|---------------------------------|-----------------------------------|----------------|
| Delmar structural repair | 18,583 LF of sewer rehabilitation | \$3,360,702 |
| Glen Echo Interceptor Upsize | 4,035 LF of sewer | \$2,261,756 |
| Lodge Forest Manor Pump Station | Wet pit submersible station | \$1,500,000 |
| Millers Island Pump Station | Pump station upgrade | \$1,181,266 |
| Pennwood Terrace Pump Station | Pump station upgrade | \$2,635,133 |
| Penwood Force Main | Force main relocation | \$1,100,000 |
| Total | | \$12,038,857 |

EASTPOINT

Location

The Eastpoint Sewershed is a small area in eastern Baltimore County. The system is along Eastern Boulevard in the area of North Point Boulevard. The system has one (1) pumping station and a small gravity system all tributary to the Back River Treatment Plant. The system serves 226 acres with a population of 5,578 people.

System Components

| <u>Major Sewers</u> | <u>Length (Miles)</u> | <u>Pipe Size</u> |
|-------------------------|-----------------------|------------------|
| Eastpoint Outfall Sewer | 0.58 | 8" to 12" |

Pumped Flow

The Eastpoint Pumping Station has a capacity of 2.7 MGD and pumps to outfall to the Back River Wastewater Treatment Plant.

Existing Conditions

The Eastpoint SRRR Plan was accepted by the EPA on April 18, 2016. Implementation of the Eastpoint SRRR plan recommendations have been delayed by real estate acquisition issues and will occur after the original April 18, 2022 deadline.

Proposed Projects

There are multiple projects under design in Eastpoint, below is a list of the proposed projects.

| Project | Description | Estimated Cost |
|------------------------------------|----------------------------------|----------------|
| Eastpoint structural repairs | 8,524 LF of sewer rehabilitation | \$1,563,426 |
| Eastpoint Basin 04 relief & upsize | Relief sewer | \$1,314,600 |
| Eastpoint Force Main Improvements | Force main relocation | \$146,000 |
| Total | | \$3,024,026 |

REDHOUSE RUN

Location

The Redhouse Run Sewershed is on the east side of Baltimore County along the eastern boundary of Baltimore City, north of the Back River Treatment Plant. The system serves 2,500 acres and 17,508 people.

System Components

| <u>Major Sewers</u> | <u>Length (Miles)</u> | <u>Pipe Size</u> |
|--------------------------|-----------------------|------------------|
| Redhouse Run Interceptor | 4.35 | 18" to 30" |
| Chesaco Park Outfall | 0.64 | 15" to 24" |

Pumped Flow

There are two (2) pumping stations tributary to the Redhouse Run Pumping Station. The 3.44 MGD Chesaco Park Pumping Station pumps to the Chesaco Park Outfall Sewer and 1.15 MGD Quad Avenue Pumping Station pumps directly to Redhouse Run Pumping Station. The 15.0 MGD Redhouse Run Pumping Station pumps directly to outfall line to the Back River Wastewater Treatment Plant.

Existing Conditions

The Redhouse Run SRRR Plan was accepted by the EPA on April 18, 2016, and needs to be implemented by April 18, 2024.

Proposed Projects

There are multiple projects under design or in evaluation in Redhouse Run, below is a list of the proposed projects.

| Project | Description | Estimated Cost |
|---------------------------------|---------------------------------------|----------------|
| Redhouse Run Structural Repairs | 59,686 LF of sewer rehabilitation | \$21,391,423 |
| Redhouse Run Relief Sewer | 7,716 LF of relief sewer and upsizing | \$6,370,364 |
| Storage Tank | Storage tank in basin RR13 | \$2,573,220 |
| Total | | \$30,335,007 |

DUNDALK

Location

The Dundalk Sewershed is located in southeastern Baltimore County west of Baltimore City. The area served is approximately 1,500 acres with a population of 23,663 people.

System Components

| <u>Major Sewers</u> | <u>Length (Miles)</u> | <u>Pipe Size</u> |
|---------------------------|-----------------------|------------------|
| Woodland Avenue | 0.31 | 20" to 24" |
| Cameron Drive Outfall | 0.76 | 10" to 24" |
| Liberty Parkway (Dundalk) | 0.70 | 12" to 24" |

Pumped Flow

The 7.5 MGD Dundalk Pumping Station receives flows from the Day Village and Lyons Homes Pumping Stations. The sewage is then transported through a force main into Baltimore City before eventually being pumped to outfall to the Back River Wastewater Treatment Plant.

Existing Conditions

In accordance with the requirements of the Consent Decree, Baltimore County has developed a Sewershed Repair, Replacement and Rehabilitation Plan (SRRR) for Dundalk. This SRRR Plan was accepted by the EPA on April 18, 2016, and needs to be implemented by April 18, 2022.

Proposed Projects

There are multiple projects under design in Dundalk, below is a list of the proposed projects.

| Project | Description | Estimated Cost |
|----------------------------|-----------------------------------|----------------|
| Dundalk Force Main | Force main Replacement | \$2,000,000 |
| Dundalk Structural Repairs | 68,013 LF of sewer rehabilitation | \$6,119,752 |
| Total | | \$8,119,752 |

HERRING RUN

Location

The Herring Run Sewershed is located at the north boundary of Baltimore City south of the Baltimore Beltway, between Harford Road and York Road. The system serves an area of approximately 3,200 acres with a population of 44,493 people.

System Components

| <u>Major Sewers</u> | <u>Length (Miles)</u> | <u>Pipe Size</u> |
|-------------------------------|-----------------------|------------------|
| East Branch Herring Run | 2.32 | 12" to 24" |
| West Branch Herring Run | 2.17 | 12" to 24" |
| E. Fork W. Branch Herring Run | 1.30 | 12" to 18" |
| W. Fork E. Branch Herring Run | 1.55 | 12" to 15" |

Pumped Flow

There are no pumping stations located in the Herring Run Sewershed.

Existing Conditions

The Herring Run SRRR Plan was accepted by the EPA on September 9, 2013 and certified by the County as substantially complete on September 6, 2018.

Proposed Projects

There are multiple projects under design in Herring Run, below is a list of the proposed projects.

| Project | Description | Estimated Cost |
|--------------------------------------|-----------------------------------|----------------|
| East Branch Herring Run Relief Sewer | Interceptor relief sewer | \$9,287,646 |
| Herring Run Structural Repairs ph 2 | 13,381 LF of sewer rehabilitation | \$2,050,000 |
| Herring Run 17 & 33 Relief Sewer | 4200 LF of relief sewer | \$1,735,860 |
| Total | | \$13,073,506 |

JONES FALLS

System Components Location

The Jones Falls Sewershed is located in central Baltimore County from the north boundary of Baltimore City to Green Spring Valley and from York Road on the east to Reisterstown on the west. The system serves approximately 7,100 acres and 64,217 people.

| <u>Major Sewers</u> | <u>Length (Miles)</u> | <u>Pipe Size</u> |
|-------------------------|-----------------------|------------------|
| Jones Falls Interceptor | 5.23 | 8" to 42" |
| Towson Run Interceptor | 3.83 | 8" to 24" |
| Roland Run Interceptor | 5.60 | 15" to 42" |
| Moore's Branch | 3.11 | 12" to 18" |

Pumped Flow

There are four (4) pumping stations in the Jones Falls System, Stevenson at Anton, Templegate, Stanton Woods and Buchanan Road. The sewage from these stations flows to the Jones Falls Interceptor and then to the Mt. Washington Flume at the Baltimore City Line.

Existing Conditions

The Jones Falls SRRR Plan was accepted by the EPA on December 9, 2013 and certified by the County as substantially complete on September 6, 2018.

Proposed Projects

Below is the list of the proposed projects in Jones Falls.

| Project | Description | Estimated Cost |
|-------------------------|----------------------------------|----------------|
| Towson Run Relief Sewer | 4,899 LF of 24"-27" relief sewer | \$9,300,000 |
| Total | | \$9,300,000 |

WEST LOW LEVEL

Location

The West Low Level Sewershed is located in the southwest part of Baltimore County. The area is south of Baltimore National Pike to south of Frederick Road and from an area west of the Baltimore Beltway (I-695) easterly to the boundary of Baltimore City. The area served by this system is approximately 880 acres with a population of 10,870 people.

System Components

| <u>Major Sewers</u> | <u>Length (Miles)</u> | <u>Pipe Size</u> |
|----------------------------|-----------------------|------------------|
| West Low Level Interceptor | 1.51 | 10" to 21" |

Pumped Flow

There are no pump stations within the West Low Level Sewershed.

Existing Conditions

The West Low Level SRRR Plan was accepted by the EPA on December 9, 2013 and certified by the County as substantially complete on September 6, 2017.

Proposed Projects

There are currently no planned projects in the West Low Level Sewershed.

DEAD RUN

Location

The Dead Run Sewershed is located on the west side of Baltimore County from an area south of Windsor Mill Road southerly to Baltimore National Pike and from west of Rolling Road easterly to the west boundary of Baltimore City. The area served is approximately 3,250 acres with a population of 32,175 people.

System Components

| <u>Major Sewer</u> | <u>Length (Miles)</u> | <u>Pipe Size</u> |
|---------------------------|-----------------------|------------------|
| Dead Run Interceptor | 3.25 | 15" to 30" |
| Ingleside Avenue Outfall | 1.63 | 12" to 16" |
| Catonsville Manor Outfall | 0.65 | 12" to 15" |
| Dead Run Branch | 1.85 | 16" to 24" |

Pumped Flow

There is one (1) County maintained pump station in Dead Run, Putnam Green Pumping Station.

Existing Conditions

The Dead Run SRRR Plan was accepted by the EPA on December 9, 2013 and was certified by the County as substantially complete on September 6, 2017.

Proposed Projects

There are currently no planned projects in the Dead Run Sewershed.

GWYNNS FALLS

Location

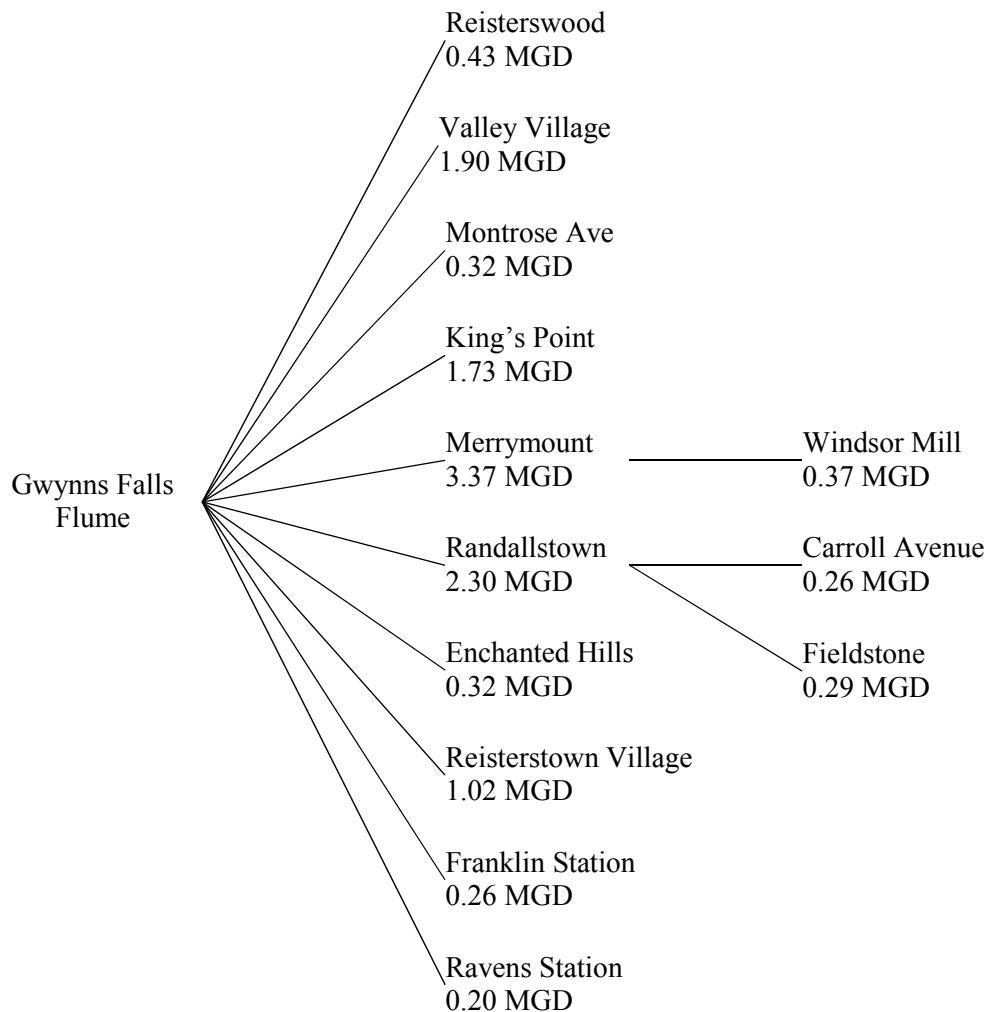
The Gwynns Falls sewershed covers a large portion of the northwest part of Baltimore County, from the northwest corner of Baltimore City, generally northwest along Garrison Forest Road, and out to the area of Hanover Pike north of Butler Road then southerly along Berrymans Lane and Deer Park Road to the area of Lyons Mill and Liberty Roads then southeasterly along Windsor Mill Road to the Baltimore City Line. The area served is approximately 13,600 acres with a population of 168,867 people.

System Components

| <u>Major Sewers</u> | <u>Length (Miles)</u> | <u>Pipe Size</u> |
|-----------------------------------|-----------------------|------------------|
| Gwynns Falls Interceptor | 30.39 | 10" to 60" |
| Powder Mill Interceptor | 3.17 | 12" to 31" |
| Scotts Level Interceptor | 9.81 | 10" to 24" |
| Horse Head Branch Interceptor | 1.14 | 18" to 21" |
| Red Run Interceptor | 4.71 | 16" to 36" |
| Lyons Mill Road North Interceptor | 1.32 | 12" to 16" |
| Roaches Run Interceptor | 2.62 | 10" to 18" |

Pumped Flow

There are thirteen (13) pump stations in the Gwynns Falls area as shown below. Flow from the Gwynns Falls Flume has the option of a diverting a portion of flow to the Back River Treatment Plant but normal operation directs flow to the Patapsco Treatment Plant.



Existing Conditions

The Gwynns Falls SRRR Plan was accepted by the EPA on December 9, 2013 and certified by the County as substantially complete on September 6, 2018.

Proposed Projects

There are multiple projects under design in Gwynns Falls, below is a list of the proposed projects.

| Project | Description | Estimated Cost |
|-------------------------------|------------------------------|----------------|
| Montbel Relief Sewer | 1,600 LF relief sewer | \$640,000 |
| Powder Mill Relief Sewer ph 2 | 7,120 LF relief sewer | \$7,000,000 |
| Lower Powder Mill Rehab | 5535 LF interceptor rehab | \$1,348,000 |
| Gwynns Falls Misc Rehab | Miscellaneous rehabilitation | \$50,000 |
| Total | | \$9,038,000 |

PATAPSCO

Location

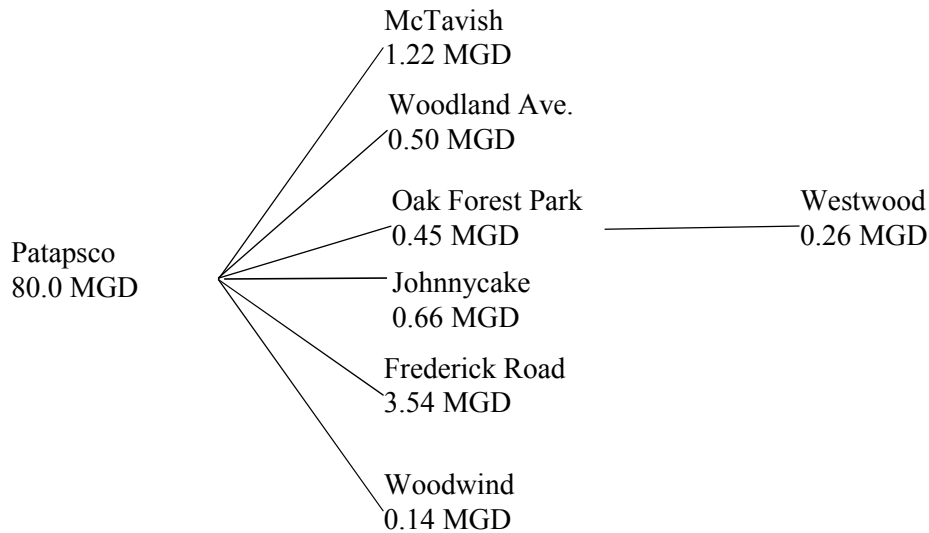
The Patapsco River Basin is located in the southwest end of Baltimore County. The area covers everything south and west of the southwest corner of Baltimore City, along Frederick Road to the Baltimore Beltway, and then Baltimore National Pike west to Rolling Road north to Route 70 then west to the Patapsco River and then along the River south and east back to the Baltimore City Line. The area served is approximately 8,775 acres with a population of 80,221 people.

System Components

| <u>Major Sewers</u> | <u>Length (Miles)</u> | <u>Pipe Size</u> |
|-----------------------------------|-----------------------|------------------|
| Patapsco (Top to MH34848) | 9.40 | 42" to 54" |
| Old Patapsco, 85-15 to 85-10 | 0.84 | 54" |
| Old Patapsco, 85-10 to 85-01 | 2.72 | 42" to 54" |
| Patapsco Supplemental Interceptor | 3.64 | 48" to 72" |
| Baltimore Highlands | 2.08 | 12" to 24" |
| Herbert Run | 4.10 | 12" to 30" |
| Herbert Run West | 2.88 | 12" to 30" |
| UMBC Outfall Sewer | 0.84 | 12" to 18" |
| Maiden Choice Outfall | 0.57 | 10" to 12" |
| Bull Branch Interceptor | 3.53 | 18" to 24" |
| Mellor Avenue Diversion | 1.05 | 12" to 15" |
| Thistle Branch Interceptor | 1.84 | 10" to 12" |
| Coopers Branch Interceptor | 1.33 | 10" to 15" |

Pumped Flow

The 80.0 MGD Patapsco Pump Station receives flow from six (6) pumping stations as shown below.



Existing Conditions

The Patapsco SRRR Plan was accepted by the EPA on December 9, 2013 and is scheduled to be implemented by September 6, 2021.

Proposed Projects

There are multiple projects under design in Patapsco, below is a list of the proposed projects.

| Project | Description | Estimated Cost |
|-----------------------------|------------------------------------|----------------|
| Patapsco Basin 07 | 68,405 LF of sewer rehabilitation | \$4,838,802 |
| Patapsco Basin 10 | 61,101 LF of sewer rehabilitation | \$3,954,902 |
| Patapsco Structural Repairs | 107,431 lf of sewer rehabilitation | \$2,200,000 |
| Cedar Branch North | 5,266 LF 12” to 15” relief sewer | \$4,500,000 |
| Total | | \$15,493,704 |

RURAL BALTIMORE COUNTY

The use of private onsite sewage disposal systems (OSDS), commonly known as septic systems are predominantly in the areas outside of the Urban-Rural Demarcation Line (URDL). However, there are also clusters and isolated occurrences of developed properties within the URDL that are served by OSDS due to the proximity of existing public sewer to the properties and the relative cost/complication of extending the sewer to serve them. Currently it is estimated that there are approximately 36,000 septic systems in Baltimore County, of which approximately 5,000 are located inside the URDL and within the existing sewer service area.

Generally speaking, soils in Baltimore County are conducive to the installation of reliable septic systems that meet state and county regulations. However, there are also certain areas where there are generally poor soils for onsite sewage disposal and as a result, these areas have a higher incidence of septic system failures and complicated repairs.

In northern Baltimore County, several older communities continue to experience septic system failures due to limited areas for repair (small lot sizes), poor soils, and high water tables. These areas were developed prior to zoning and environmental protection regulations (i.e., prior to 1970) that were designed to protect against building on poor soils and on undersized lots. These areas include the following: the old town of Phoenix, Hereford, Monkton, Butler, Baldwin, Freeland, Trenton and Kingsville. Because these problems involve a relatively small number of privately owned properties that are far removed from the metropolitan district, there is no straightforward mechanism or procedure to accomplish community-wide septic system corrections. Efforts to organize a Rural Sanitary District to resolve these types of problems were initiated in the early 1990s, but were ultimately put on hold due to complexity of establishing such a district, and the concerns for increased development as a result.

Since 2015, Baltimore County has been focusing on efforts to identify where septic systems are located within the metropolitan district and assess the feasibility of getting these facilities connected to public sewerage through the Bay Restoration Fund Grant Program. The grant program assists residents as well as businesses and non-profit organizations with the dual purpose of resolving septic system problems and reducing nitrogen loading to the Chesapeake Bay and its tributaries.

TABLES

Table 9A
Projected Sewerage Demands and Planned Capacity
Back River Waste Water Treatment Plant

| JURISDICTION | POPULATION | | | PER CAPITA DEMAND (GPCD) NOTE 1. | TREATMENT CAPACITY | |
|------------------|------------|---------|----------|--|--------------------|------------------|
| | TOTAL | SERVED | UNSERVED | | DEMAND (MGD) | PLANNED (MGD) |
| 2015 | | | | | | |
| City | | | | | | |
| Baltimore County | 540,338 | 453,033 | 87,305 | 150.23 | 68.06 | |
| Total | | | | | 129.70 | 180.00 |
| 2020 | | | | | | |
| City | | | | | | |
| Baltimore County | 554,837 | 465,670 | 89,167 | 150.23 | 69.96 | |
| Total | | | | | | 180.00 |
| 2025 | | | | | | |
| City | | | | | | |
| Baltimore County | 560,765 | 471,275 | 89,490 | 150.23 | 70.80 | |
| Total | | | | | | |
| 2030 | | | | | | |
| City | | | | | | |
| Baltimore County | 566,008 | 476,130 | 89,878 | 150.23 | 71.53 | |
| Total | | | | | | 180.00 |
| 2035 | | | | | | |
| City | | | | | | |
| Baltimore County | 573,603 | 483,329 | 90,274 | 150.23 | 72.61 | |
| Total | | | | | | |
| 2040 | | | | | | |
| City | | | | | | |
| Baltimore County | 583,565 | 492,835 | 90,730 | 150.23 | 74.04 | |
| Total | | | | | | 180.00 |
| 2045 | | | | | | |
| City | | | | | | |
| Baltimore County | 591,160 | 500,035 | 91,125 | 150.23 | 75.12 | |
| Total | | | | | | 180.00 |

NOTES:

1. GPCD (gallons per capita per day) includes residential commercial industrial and infiltration/inflow.
2. Population and flows from the Gwynns Falls sewershed have been allocated to the Patapsco Wastewater Treatment Plant reflecting the typical system operations. Flows can be diverted from the Gwynns Falls sewershed through the Southwest Diversion pressure sewer to the Back River Wastewater Treatment Plant if required.

Table 9B
Projected Sewerage Demands and Planned Capacity
Patapsco Waste Water Treatment Plant

| JURISDICTION | POPULATION | | | PER CAPITA | TREATMENT CAPACITY | |
|------------------|------------|---------|----------|-------------------------|--------------------|------------------|
| | TOTAL | SERVED | UNSERVED | DEMAND (GPCD) NOTE 1 | DEMAND (MGD) | PLANNED (MGD) |
| 2015 | | | | | | |
| City | | | | | | |
| Baltimore County | 288,232 | 285,656 | 2,576 | 155.67 | 44.47 | |
| Howard County | 74,572 | 74,572 | 0 | 73.49 | 5.48 | 12.40 |
| A. Arundel Co. | 37630 | 37630 | 0 | 116.13 | 4.37 | 6.39 |
| Total | | | | | | 73.00 |
| 2020 | | | | | | |
| City | | | | | | |
| Baltimore County | 294,854 | 292,134 | 2,720 | 155.67 | 45.48 | |
| Howard County | 83,970 | 83,970 | 0 | 71.45 | 6.00 | 12.40 |
| A. Arundel Co. | 39,002 | 39,002 | 0 | 141.02 | 5.50 | 6.39 |
| Total | | | | | | 73.00 |
| 2025 | | | | | | |
| City | | | | | | |
| Baltimore County | 297,029 | 294,314 | 2,715 | 155.67 | 45.82 | |
| Howard County | 88,534 | 88,534 | 0 | 72.06 | 6.38 | 12.40 |
| A. Arundel Co. | 39,913 | 39,913 | 0 | 144.37 | 5.69 | 6.39 |
| Total | | | | | | 73.00 |
| 2030 | | | | | | |
| City | | | | | | |
| Baltimore County | 299,707 | 296,983 | 2,724 | 155.67 | 46.23 | |
| Howard County | 91,158 | 91,158 | 0 | 72.29 | 6.59 | 12.40 |
| A. Arundel Co. | 40,797 | 40,797 | 0 | 149.52 | 6.10 | 6.39 |
| Total | | | | | | 73.00 |
| 2035 | | | | | | |
| City | | | | | | |
| Baltimore County | 304,291 | 301,517 | 2,774 | 155.67 | 46.94 | |
| Howard County | 92,320 | 92,320 | 0 | 72.36 | 6.68 | 12.40 |
| A. Arundel Co. | 41,569 | 41,569 | 0 | 153.72 | 6.39 | 6.39 |
| Total | | | | | | 73.00 |
| 2040 | | | | | | |
| City | | | | | | |
| Baltimore County | 308,329 | 305,496 | 2,833 | 155.67 | 47.56 | |
| Howard County | 92,399 | 92,399 | 0 | 72.84 | 6.73 | 12.40 |
| A. Arundel Co. | 42,233 | 42,233 | 0 | 158.17 | 6.68 | 6.39 |
| Total | | | | | | 73.00 |
| 2040 | | | | | | |
| City | | | | | | |
| Baltimore County | 311,437 | 308,553 | 2,884 | 155.67 | 48.48 | |
| Howard County | | | | | | |
| A. Arundel Co. | | | | | | |
| Total | | | | | | 73.00 |

NOTES:

1. GPCD (gallons per capita per day) includes residential commercial industrial and infiltration/inflow.
2. Population and flows from the Gwynns Falls sewershed have been allocated to the Patapsco Wastewater Treatment Plant reflecting the typical system operations. Flows can be diverted from the Gwynns Falls sewershed through the Southwest Diversion pressure sewer to the Back River Wastewater Treatment Plant if required.
3. Howard County data based on "Howard County Maryland Master Plan for Water and Sewerage, 2015 Amendment".
4. Anne Arundel County data based on "Master Plan for Water Supply & Sewerage Systems, 2017".

Table 10
Inventory of Small Sewage Treatment Facilities

| Owner | NPDES Permit Number | Treatment Type* | Location (NAD 27) | Map No. | Population Equivalent | Point of Discharge | Design Flow (MGD) | Operating Agency | Comments |
|---|---------------------|---------------------|-------------------|---------|-----------------------|--------------------|-------------------|------------------|--------------------------------------|
| Municipal (Publicly Owned) | | | | | | | | | |
| Richlyn Manor | MD0022713 | f, k, l, q, w | 959-579 | S-17B | 500 | Gunpowder Falls | 0.090 | Baltimore County | Scheduled to be taken out of service |
| Private / Community / Institutional | | | | | | | | | |
| Bais Yaakov School For Girls | MDG766211 | h | 877-581 | S-16A | 940 | North Branch | 0.010 | Private | |
| Camp Milldale (Pearlstone Retreat) | 99-DP-3305 | h,a | 841-640 | S-9B | 200 | Sycamore Creek | 0.012 | Private | |
| Camp Fretterd (fka, Montrose School) | 01-DP-318 | e, f, k, l, q, u, v | 847-608 | S-10A | 310 | Patapsco River | 0.0105 | State | 3 separate septic systems |
| Cargill Sal | MDR003280 | h, b, k | 962-568 | S-17B | 47 | Bird River Trib. | 0.002 | Private | Public Water Res. 49-92 |
| Caves Valley Golf Club | Not Available | h | 872-588 | S-16A | | | 0.012 | Private | |
| Glen Arm LLC (fka Marquip Ward United, fka Koppers) | MD0024635 | b, g, k, l, v, w | 943-592 | S-17A | 250 | Long Green Creek | 0.014 | Private | |
| Glen Arm Maintenance Facility (fka Grumman Aircraft) | MD0067903 | b, g, k, l, v, w | 942-591 | S-17A | 50 | Long Green Creek | 0.010 | Baltimore County | |
| Glen Meadows Retirement Community (aka Notch Cliff Life Care Comm.) | MD0022951 | h, p | 937-587 | S-17A | 150 | Minebank Run | 0.050 | Private | |
| Granite Trailer Court | Not Available | h | 842-545 | S-15B | 100 | Patapsco River | 0.007 | Private | 3 separate septic systems; |
| Greystone Golf Course | MD0012C17 | h | 911-655 | S-4B | 25 | First Mine Branch | 0.005 | Baltimore County | |
| Hayfields Country Club | MDG766499 | h | 892-608 | S-10B | 200 | Oregon Branch | 0.005 | Private | |
| Hereford High School (See Cycle 30 Issue 12-01) | MD3785D13 | h | 895-644 | S-4B | 1100 | Panther Branch | 0.014 | Baltimore County | |
| Hereford Middle School | Not Available | h | 898-635 | S-10B | 1100 | Gunpowder Falls | 0.006 | Baltimore County | |

Table 10 (continued from previous page)
Inventory of Small Sewage Treatment Facilities

| Owner | NPDES Permit Number | Treatment Type* | Location (NAD 27) | Map No. | Population Equivalent | Point of Discharge | Design Flow (MGD) | Operating Agency | Comments |
|---|---------------------|-----------------|-------------------|---------|-----------------------|--------------------|-------------------|------------------|--------------------------------|
| Private / Community / Institutional | | | | | | | | | |
| Hunt Valley Golf Club | MDG766274 | h | 910-610 | S-10B | 250 | Greene Branch | 0.010 | Private | |
| Hillendale Country Club | MDG767197 | h, a | 925-607 | S-11A | 200 | Overshot Run | 0.015 | Private | |
| Life Point Church (fka, Carroll Community Church) | Not Available | h | 841-616 | S-9B | 25 | Broad Run | 0.005 | Private | |
| Manor Shopping Center | MD3848C18 | h | 924-613 | S-11A | 75 | Overshot Run | 0.010 | Private | |
| Manor Tavern Restaurant | Not Available | h | 620-628 | S-11A | 25 | Nelson Branch | 0.005 | Private | |
| Maryvale Trinity Prep School | Not Available | h, | 888-582 | S-16B | 380 | Dipping Pond Run | 0.005 | Private | |
| Oldfields School | MD3428C03 | h, a | 905-630 | S-10B | 200 | Gunpowder Falls | 0.022 | Private | |
| Oregon Ridge Park | MDG675142 | h | 890-603 | S-10B | 25 | Baisman Run | 0.005 | Baltimore County | |
| Paper Mill Village | Not Available | h | 924-614 | S-11A | 25 | Greene Branch | 0.007 | Private | |
| Saint Paul's School | MDG767013 | h, b | 891-582 | S-16B | 1450 | Deep Run | 0.015 | Private | GWDP Pending |
| State Aviation Admin. | Not Available | d, g, k, l, u | 968-540 | S-23B | 450 | Frog Mortar Creek | 0.015 | State | Public Water |
| Stevenson Univ (fka Villa Julie College) | MD0066001 | | 885-579 | S-16B | 1300 | Jones Falls | 0.025 | Private | Zoning Case No. 92-285 - SPHXA |
| Woodstock Job Corp Center | MD0023906 | a, k, l, t, w | 836-546 | S-15B | 500 | Patapsco River | 0.050 | State | |

Treatment Types
(Footnotes from Table 10)

| | | |
|--|---|---|
| (a) Aeration Activated Sludge, Difused Air | (h) Septic Tank | (q) Filters, High Capacity |
| (b) Extended Aeration | (i) Digester (Separate Sludge Stirring Mechanism) | (r) Filters, Fixed Nozzle, Standard Capacity |
| (c) Open Sludge Beds | (j) Digester (Separate Sludge Open Top) | (s) Filters, Rotary Distributors, Standard Capacity |
| (d) Two Story (Imhoff Settling Tanks) | (k) Chlorination with Contact Tank | (t) Sludge Storage Tanks, Covered |
| (e) Clarigester Settling Tanks | (l) Chlorination by Chlorine Gas | (u) Sludge Tanks, Open |
| (f) Mechanically Equipped Settling Tanks | (m) Chlorination by Hypochlorite | (v) Screens, Comminutor |
| (g) Plain Hopper Bottom Settling Tanks | (o) Filters, Rapid Sand | (w) Screens, Bar |
| | (p) Filters, Intermittent Sand | |

Table 11
Inventory of Problem Septic Areas
Individual and Community - Active

| Service Area | Location | Number of Properties | Date of DEPS Memo | Status |
|-------------------------|---|-----------------------------|--------------------------|--|
| White Marsh | 4832, 4838, 4842, 4900, 4902, and 4904 Joppa Rd | 6 | 9-12-07 | Designed but on Hold |
| | 4323 – 4364 Chapel Road | 14 | 6-21-07 | Designed but on Hold |
| | Babikow Rd and Shirleybrook Rd | 30 | 11-14-05 | No Current Plans to Correct |
| Duck Creek | Browns Rd | 8 | 4-4-17 | In Design |
| Gwynns Falls | Clifmar Rd | 23 | 10-12-17 | Project Bid July 2020 |
| Longquarter | Merediths Ford Rd | 5 | 3-31-18 | Sewer construction completed July 2020. |
| Orems | Bengies, Bourque, and Gladway Rds | 28 | 6-1-18 | In Design |
| Bird River | Perry Hall Manor | 129 | 11-8-18 | Study completed. Pending approval to begin design. |
| Delmar | North Point Rd @ Millers Island Rd | 6 | 7-1-20 | In design |
| No Planned Service Area | Baldwin | 10 | | Outside URDL; No Current Plans to Correct |
| | Monkton | 22 | | Outside URDL; No Current Plans to Correct |
| | Freeland | 16 | | Outside URDL; No Current Plans to Correct |
| | Old Town of Phoenix | 43 | | Outside URDL; No Current Plans to Correct |
| | Kingsville | 53 | | Outside URDL; No Current Plans to Correct |
| | Trenton | 16 | | Outside URDL; No Current Plans to Correct |

Table 12
Water Quality Problems due to Storm Drainage
Outfalls and to Non-Point Sources

Baltimore County has no combined sanitary sewer and storm drain systems that would be tabulated under this item. Please refer to the Water Resources Element of *Master Plan 2020* for a detailed discussion of water quality issues throughout the County.

Table 13**Sewer Capital Program**

(Additional information on individual projects is available on the Baltimore County Web Site at <http://www.baltimorecountymd.gov/Agencies/budfin/budget/index.html>)

| Job Order | Project Name | Construction Funding | Budget Program |
|------------------|---|-----------------------------|-----------------------|
| 201-0002 | Neighborhood Petition/Health Extensions | \$7,500,000 | FY21 thru 26 |
| 201-0052 | Construction at Highway Sites | \$300,000 | FY21 thru 26 |
| 201-0072 | City/County Joint Use Facilities | \$357,346,236 | FY21 thru 26 |
| 201-0073 | Special Sewer House Connections | \$3,000,000 | FY21 thru 26 |
| 201-0077 | Main Relining, Rehab & Replacement | \$312,900,000 | FY21 thru 26 |
| 201-0090 | Miscellaneous System Improvements | \$60,000,000 | FY21 thru 26 |
| 201-0104 | Gunpowder Relief Sewer | 63,500,000 | FY21 thru 26 |

CAPITAL BUDGET 2021

CAPITAL IMPROVEMENT PROGRAM FY 2022 - 2026 DEPT. 201 SEWER SYSTEM

| Proj. No. | Title | Total Estimated Cost | Prior Authorizations | Total for 6-year Program | Budget Year FY 2021 | FY2022* | FY 2024* | FY 2026* |
|-----------|------------------------------------|----------------------|----------------------|--------------------------|---------------------|--------------------|--------------------|--------------------|
| 0002 | Neighborhood Petition / Health Ext | 29,046,672 | 21,546,672 | 7,500,000 | 0 | 2,500,000 | 2,500,000 | 2,500,000 |
| 0052 | Construction at Highway Sites | 2,255,636 | 1,955,636 | 300,000 | 0 | 100,000 | 100,000 | 100,000 |
| 0072 | City/County Joint Use Facilities | 1,139,859,540 | 782,513,304 | 357,346,236 | 57,346,236 | 100,000,000 | 100,000,000 | 100,000,000 |
| 0073 | Special Sewer House Connections | 13,944,628 | 10,944,628 | 3,000,000 | 0 | 1,000,000 | 1,000,000 | 1,000,000 |
| 0077 | Main Relining, Rehab & Replacement | 969,585,780 | 656,685,780 | 312,900,000 | 28,000,000 | 57,300,000 | 130,800,000 | 96,800,000 |
| 0090 | Miscellaneous System Replacements | 408,701,143 | 348,701,143 | 60,000,000 | 0 | 20,000,000 | 20,000,000 | 20,000,000 |
| 0104 | Gunpowder Relief Sewers | 63,500,000 | 0 | 63,500,000 | 0 | 63,500,000 | 0 | 0 |
| | TOTAL | 2,626,893,399 | 1,822,347,163 | 804,546,236 | 85,346,236 | 244,400,000 | 254,400,000 | 220,400,000 |

* Baltimore County employs a Biennial Capital Budget.

MAPS

MAP MAINTENANCE POLICY (From 1993 Triennial Review)

WHEREAS, it is a benefit to the general public, the Baltimore County Council, the Baltimore County Executive, and appropriate agencies of both local and state government to have access to the WATER SUPPLY AND SEWERAGE PLAN which is as current as possible; and

WHEREAS, each capital improvement program adopted by the County Council may introduce water or sewer facilities, 12 inch in diameter or larger, which may not appear on the plan; and

WHEREAS, each capital improvement contract which is completed in the field automatically changes the map designation of a project from a proposed to an existing facility; and

WHEREAS, any capital facilities area (W-3 or S-3) in which a capital, development, or neighborhood improvement project has been completed and put in service becomes legally and automatically an existing service area (W-1 or S-1);

NOW THEREFORE, the Department of Public Works is directed by the County Council of Baltimore County to maintain the original water and sewer maps in as current a condition as possible with regard to the capital improvement program, as adopted by the County Council, and with regard to construction completed in the field, and to any changes from a W-3 or S-3 designation to a W-1 or S-1 designation, without recourse to further public hearings or Council action; and

Further, it is directed that copies of such maps which are as current as possible be available to members of the County Council, the Baltimore County Executive, agencies of local and state government, and the general public through the Engineering Records Section, Bureau of Engineering, Room 206 Baltimore County Office Building, 111 West Chesapeake Avenue, Towson, Maryland, and that they be available under the same conditions as apply to the production of any other record from that unit.

February, 1993

WATER SUPPLY & SEWERAGE PLAN DESIGNATIONS

Areal designations noted on each page of analysis and on the petition exhibits:

W-1 or S-1 EXISTING SERVICE AREAS Areas in which Metropolitan water and sewerage facilities are presently available to 90 % of the properties.

W-3 or S-3 CAPITAL FACILITIES AREAS Areas in which water and sewerage facilities are required, and are possible, within the framework of the six-year capital program, subject to annual budgeting, neighborhood petitions, determination of health hazards and the negotiation of Public Works Agreements.

W-4 or S-4 STUDY AREAS Areas, rural centers, outside the Metropolitan District which shall be studied to determine the feasibility of future community water supply and sewer service.

W-5 or S-5 MASTER PLAN AREAS Areas in which water and sewerage facilities are required and are intended within the framework of the Baltimore County Master Plan.

W-5 X or S-5 X MASTER PLAN AREAS Areas to become CAPITAL FACILITIES AREAS upon annexation into the Baltimore County Metropolitan District.

W-6 or S-6 AREAS OF FUTURE CONSIDERATION Areas which are to be considered in the design of major facilities for growth and development beyond the Land Use Master Plan.

W-7 or S-7 NO PLANNED COMMUNITY OR MULTI-USE SERVICE (NPS) Areas of planned, low-density growth (also known as "Resource Conservation Zoning") for which Metropolitan water and sewerage facilities are neither planned nor intended.

The following definitions have been derived from Maryland State Law and the Baltimore County Code and are set forth here as they relate specifically to Water Supply and Sewerage Planning in Baltimore County:

INDIVIDUAL WATER SUPPLY A water supply well and plumbing system within a single property, intended for domestic use of less than 5,000 gallons of ground water per day.

INDIVIDUAL SEWERAGE SYSTEM A sewerage system, within a single property, comprising a treatment system (septic tank) which receives waste water from a plumbing system and has a ground water recharge system of less than 5,000 gallons per day.

MULTI-USE SYSTEM A water supply or sewerage system which is identical to an individual system, as defined above, except that use and recharge of ground water is equal to or greater than 5,000 gallons per day.

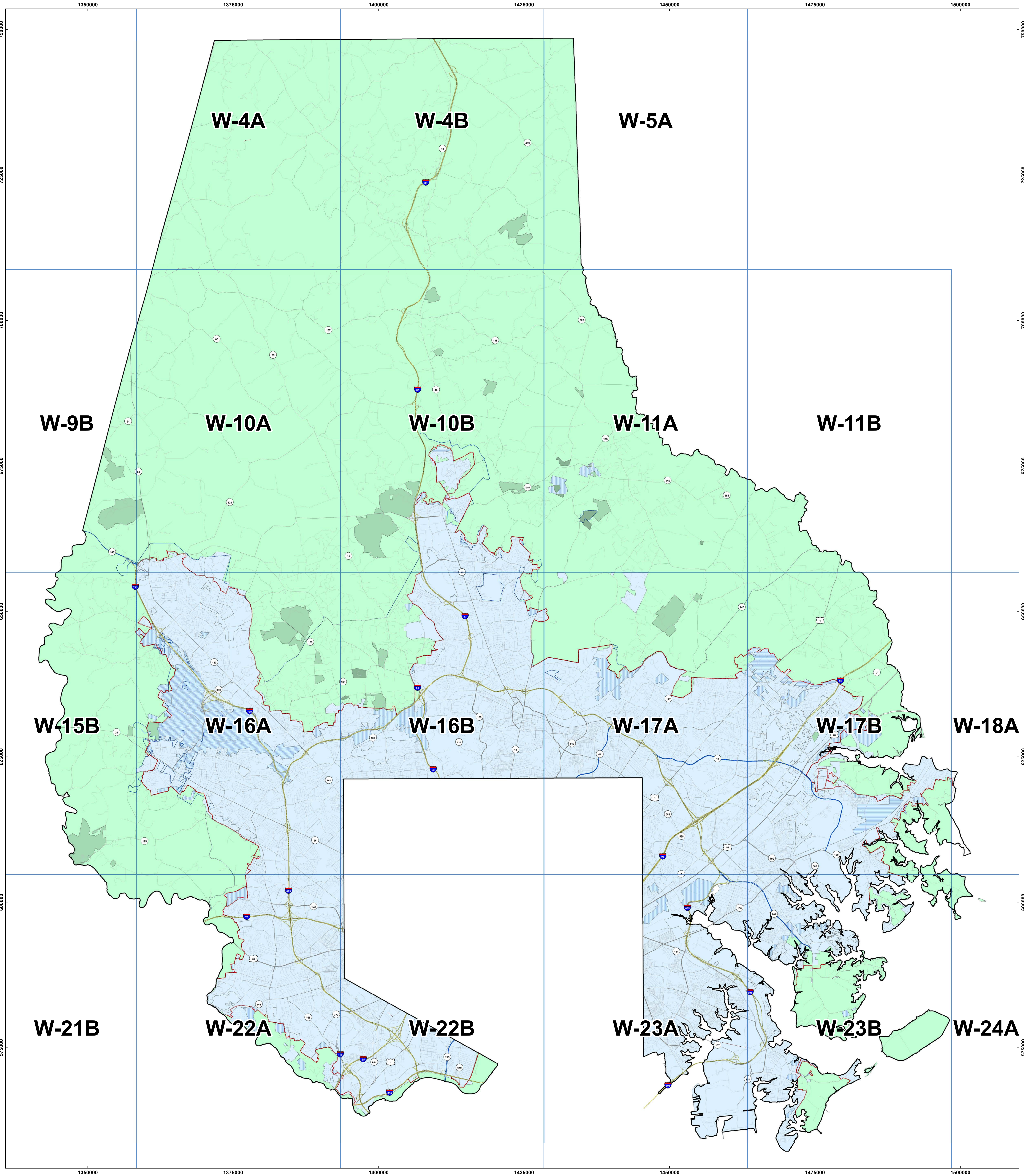
COMMUNITY SYSTEM (Public or Private)

A system of water supply or sewerage disposal involving two or more property owners, regardless of the quantity or point of disposal.

Note: Any of the above may be a community system under the Clean Water Act of the Federal Government relative to the required water quality and frequency of testing.

Disclaimer

Information shown on the maps in this document **does not guarantee** that public water or sewerage service is available in any given area.



Baltimore County Water Supply Plan 2020 Triennial Review

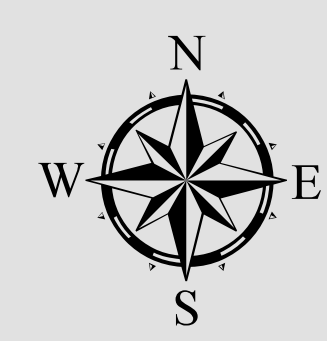


Water Supply Plan Area Designations

- | | | |
|-----------------------------|----------------------------------|---|
| W-1 Existing Service Area | W-5 Master Plan Area | W-7 CS No Planned Service: Community System |
| W-3 Capital Facilities Area | W-5 X Master Plan Area | W-7 MU No Planned Service: Multi-Use System |
| W-4 Study Area | W-6 Area of Future Consideration | W-7 No Planned Community or Multi-Use Service (NPS) |

Boundaries

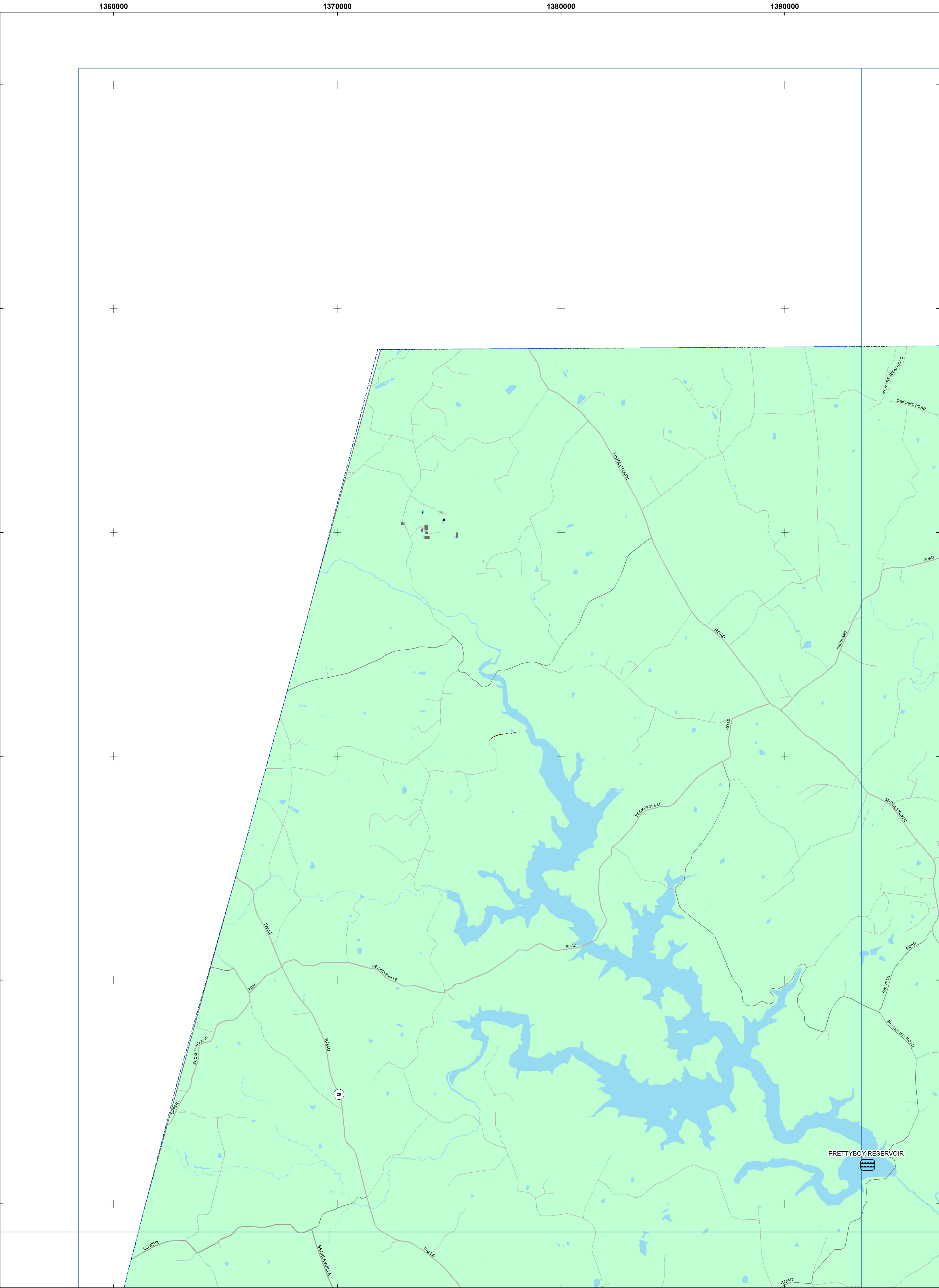
- | |
|------------------------------|
| Triennial Master Plan Grid |
| Urban Rural Demarcation Line |
| Metropolitan District |



1:63,360



1 in = 1 mile



Baltimore County Water Supply Plan



2020 Triennial Review Map W-4A

Maryland State Plane Coordinate System
North American Datum 1983 HARN, U.S. Survey Foot

Produced by Baltimore County, Department of Public Works
Published August 2020

System Facilities

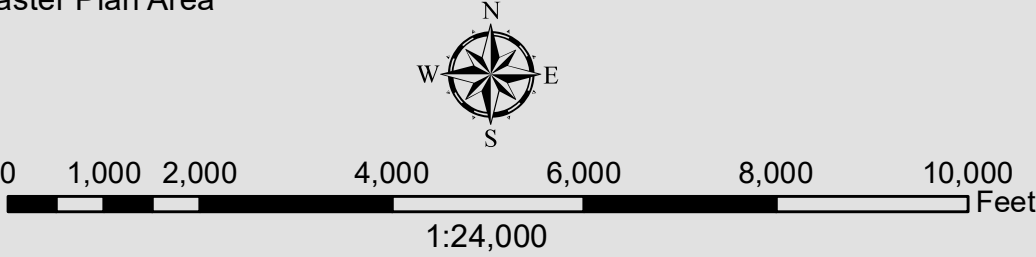
- Pumping Station
- Reservoir
- Tank
- Treatment Plant
- Mains 12" and Greater

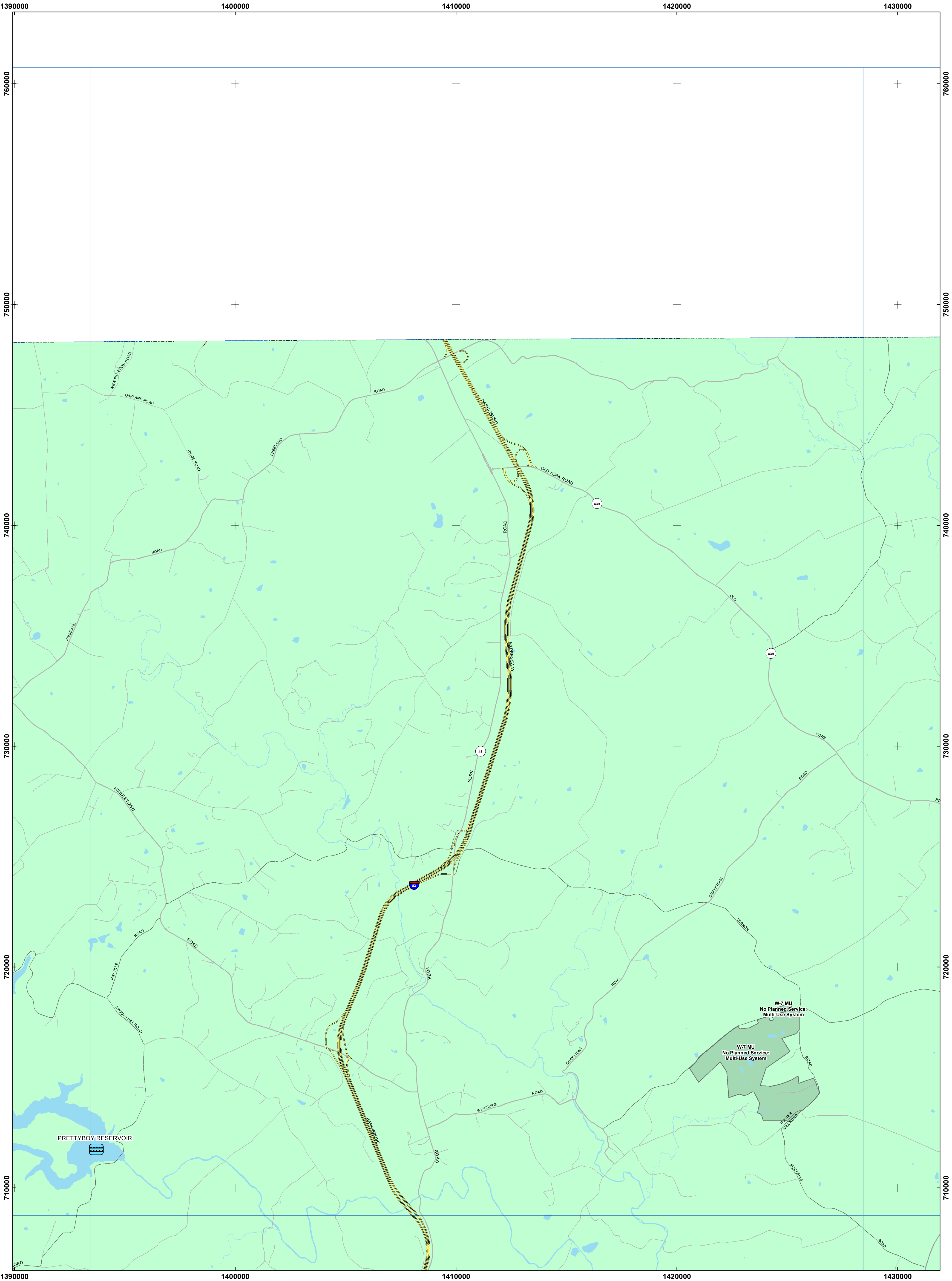
Water Supply Plan Areal Designations

- W-1 Existing Service Area
- W-3 Capital Facilities Area
- W-4 Study Area
- W-5 Master Plan Area
- W-5 X Master Plan Area
- W-6 Area of Future Consideration
- W-7 CS No Planned Service: Community System
- W-7 MU No Planned Service: Multi-Use System
- W-7 No Planned Community or Multi-Use Service (NPS)

Boundaries

- Triennial Master Plan Grid
 - Urban Rural Demarcation Line
 - Metropolitan District
-





Baltimore County Water Supply Plan



2020 Triennial Review Map W-4B

Maryland State Plane Coordinate System
North American Datum 1983 HARN, U.S. Survey Foot
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Published August 2020

System Facilities

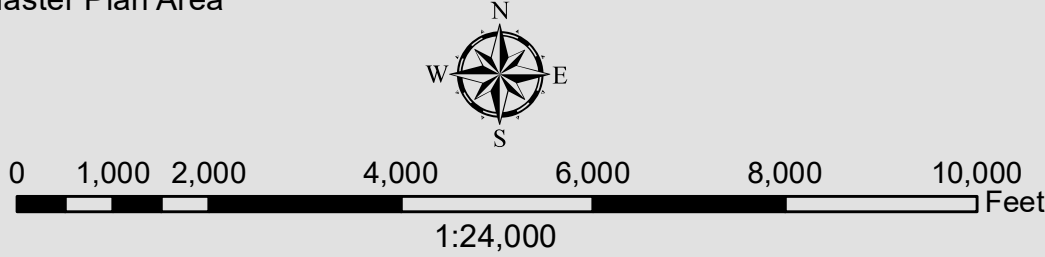
- Pumping Station
- Reservoir
- Tank
- Treatment Plant
- Mains 12" and Greater

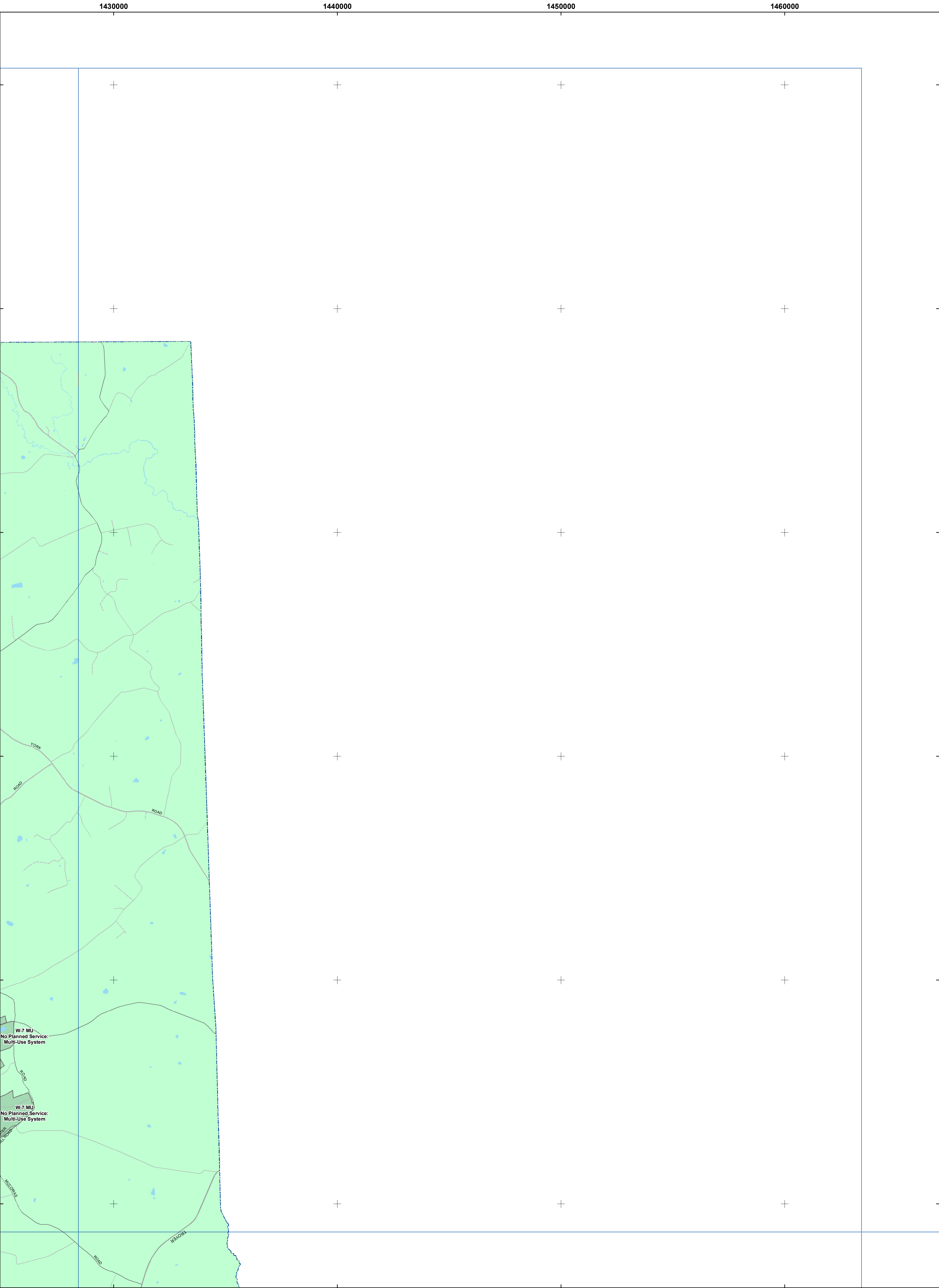
Water Supply Plan Areal Designations

- W-1 Existing Service Area
- W-3 Capital Facilities Area
- W-4 Study Area
- W-5 Master Plan Area
- W-5 X Master Plan Area
- W-6 Area of Future Consideration
- W-7 CS No Planned Service: Community System
- W-7 MU No Planned Service: Multi-Use System
- W-7 No Planned Community or Multi-Use Service (NPS)


Boundaries

- Triennial Master Plan Grid
 - Urban Rural Demarcation Line
 - Metropolitan District
-





Baltimore County Water Supply Plan



2020 Triennial Review Map W-5A

Maryland State Plane Coordinate System
North American Datum 1983 HARN, U.S. Survey Foot

Produced by Baltimore County, Department of Public Works
Published August 2020

System Facilities

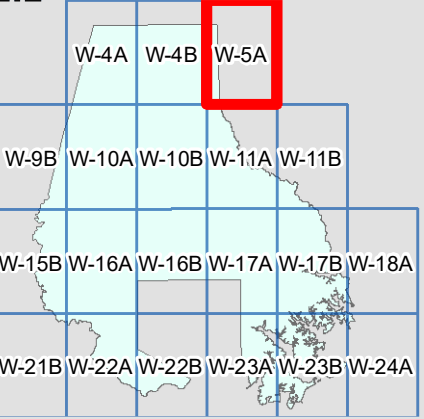
| | |
|-----|-----------------------|
| PS | Pumping Station |
| | Reservoir |
| | Tank |
| WTP | Treatment Plant |
| | Mains 12" and Greater |

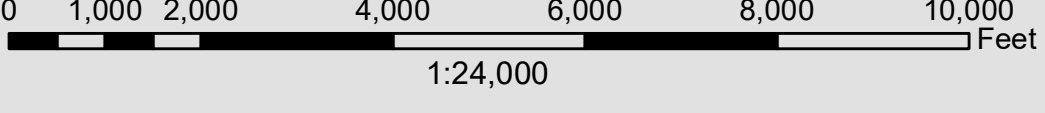

Water Supply Plan Areal Designations

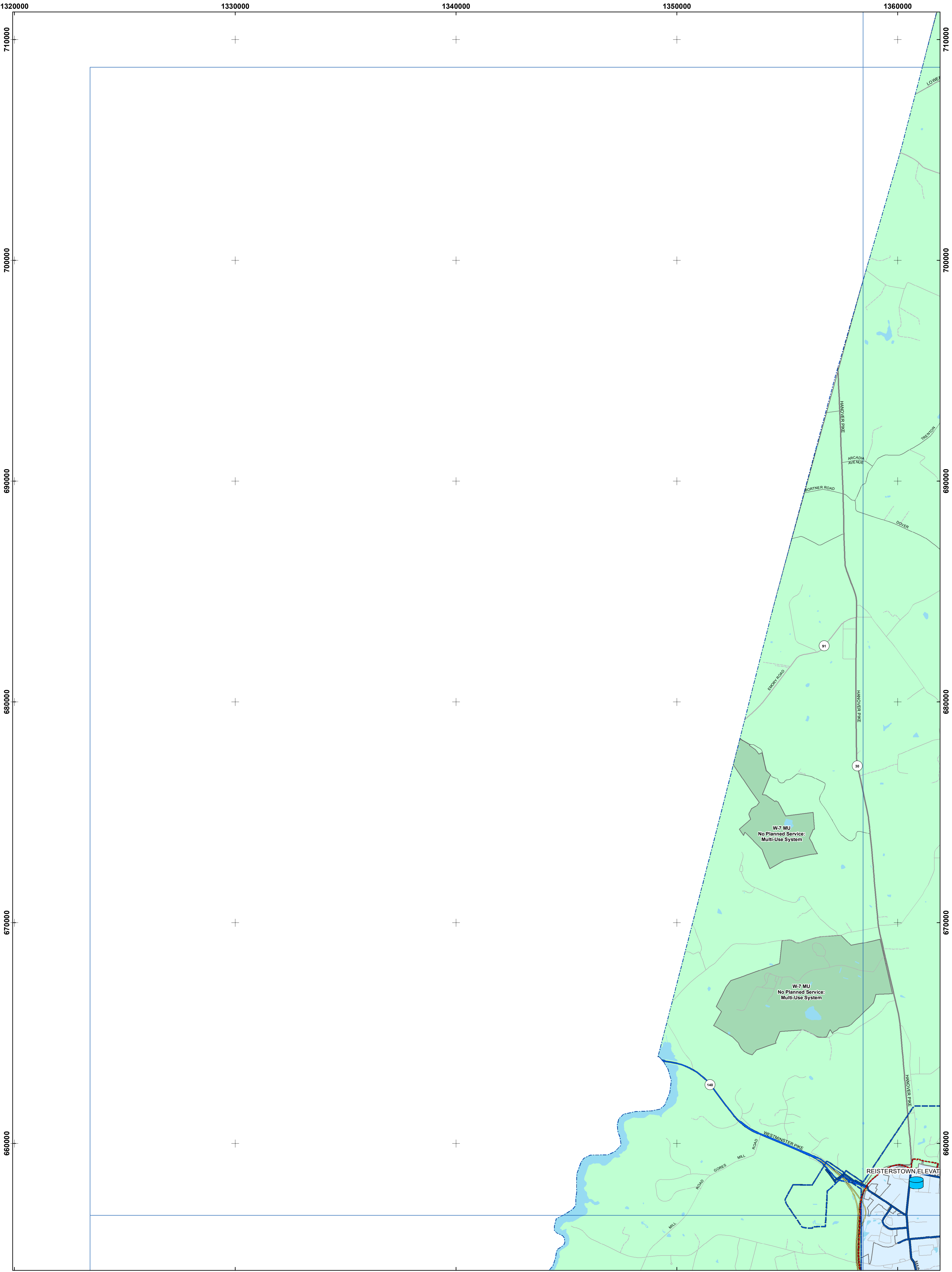
| | | | |
|--|-----------------------------|--|---|
| | W-1 Existing Service Area | | W-6 Area of Future Consideration |
| | W-3 Capital Facilities Area | | W-7 CS No Planned Service: Community System |
| | W-4 Study Area | | W-7 MU No Planned Service: Multi-Use System |
| | W-5 Master Plan Area | | W-7 No Planned Community or Multi-Use Service (NPS) |
| | W-5 X Master Plan Area | | |

Boundaries

| | |
|--|------------------------------|
| | Triennial Master Plan Grid |
| | Urban Rural Demarcation Line |
| | Metropolitan District |







Baltimore County Water Supply Plan



2020 Triennial Review Map W-9B

Maryland State Plane Coordinate System
North American Datum 1983 HARN, U.S. Survey Foot

Produced by Baltimore County, Department of Public Works
Published August 2020

System Facilities

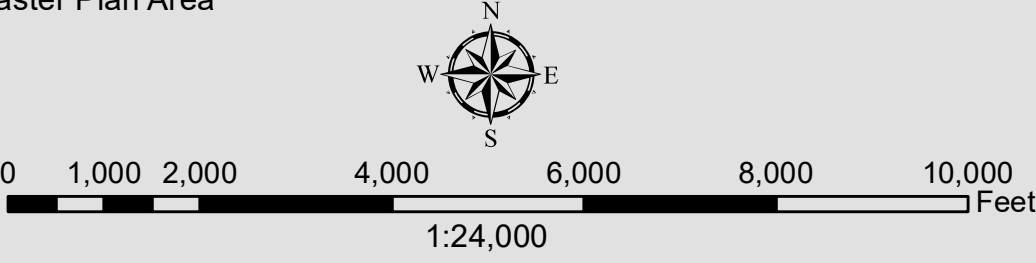
- PS Pumping Station
- Reservoir
- Tank
- WTP Treatment Plant
-

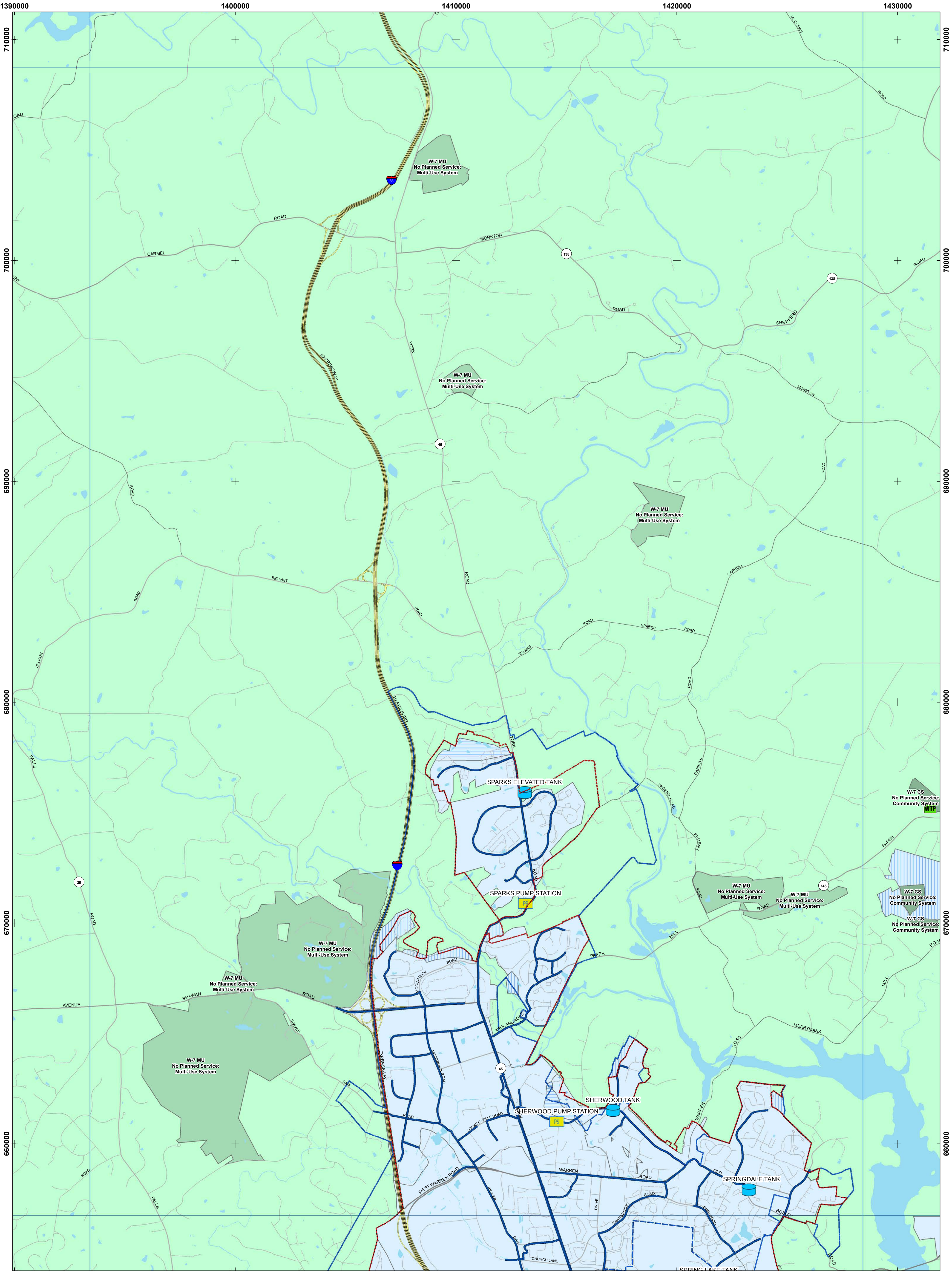
Water Supply Plan Areal Designations

- W-1 Existing Service Area
- W-3 Capital Facilities Area
- W-4 Study Area
- W-5 Master Plan Area
- W-5 X Master Plan Area
- W-6 Area of Future Consideration
- W-7 CS No Planned Service: Community System
- W-7 MU No Planned Service: Multi-Use System
- W-7 No Planned Community or Multi-Use Service (NPS)

Boundaries

- Triennial Master Plan Grid
 - Urban Rural Demarcation Line
 - Metropolitan District
-





Baltimore County Water Supply Plan



2020 Triennial Review Map W-10B

Maryland State Plane Coordinate System
North American Datum 1983 HARN, U.S. Survey Foot

Produced by Baltimore County, Department of Public Works
Published August 2020

System Facilities

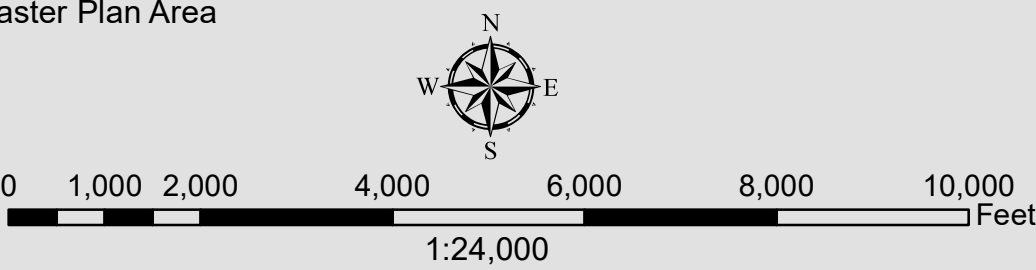
- Pumping Station
- Reservoir
- Tank
- Treatment Plant
- Mains 12" and Greater

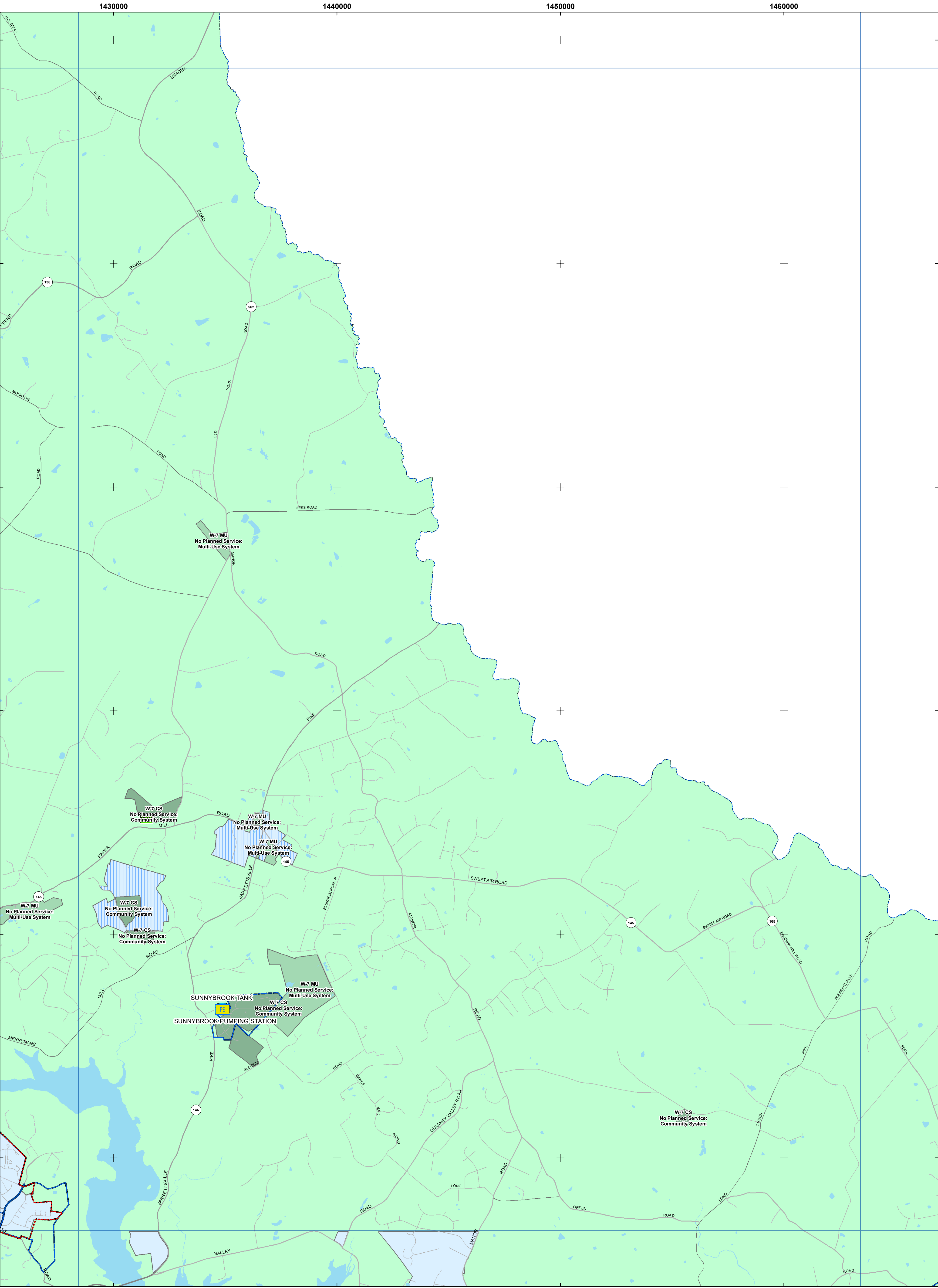
Water Supply Plan Area Designations

- W-1 Existing Service Area
- W-3 Capital Facilities Area
- W-4 Study Area
- W-5 Master Plan Area
- W-5 X Master Plan Area
- W-6 Area of Future Consideration
- W-7 CS No Planned Service: Community System
- W-7 MU No Planned Service: Multi-Use System
- W-7 No Planned Community or Multi-Use Service (NPS)


Boundaries

- Triennial Master Plan Grid
 - Urban Rural Demarcation Line
 - Metropolitan District
-





Baltimore County Water Supply Plan



2020 Triennial Review Map W-11A

Maryland State Plane Coordinate System
North American Datum 1983 HARN, U.S. Survey Foot
Produced by Baltimore County, Department of Public Works
Published August 2020

System Facilities

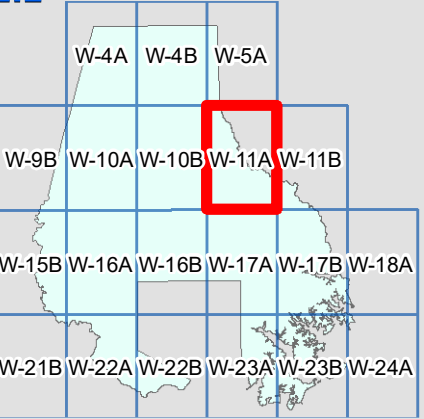
- Pumping Station
- Reservoir
- Tank
- Treatment Plant
- Mains 12" and Greater

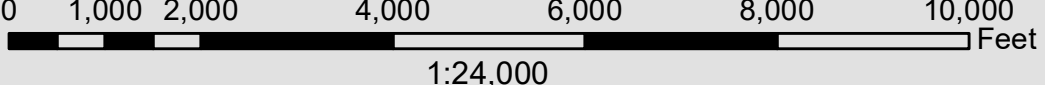

Water Supply Plan Area Designations

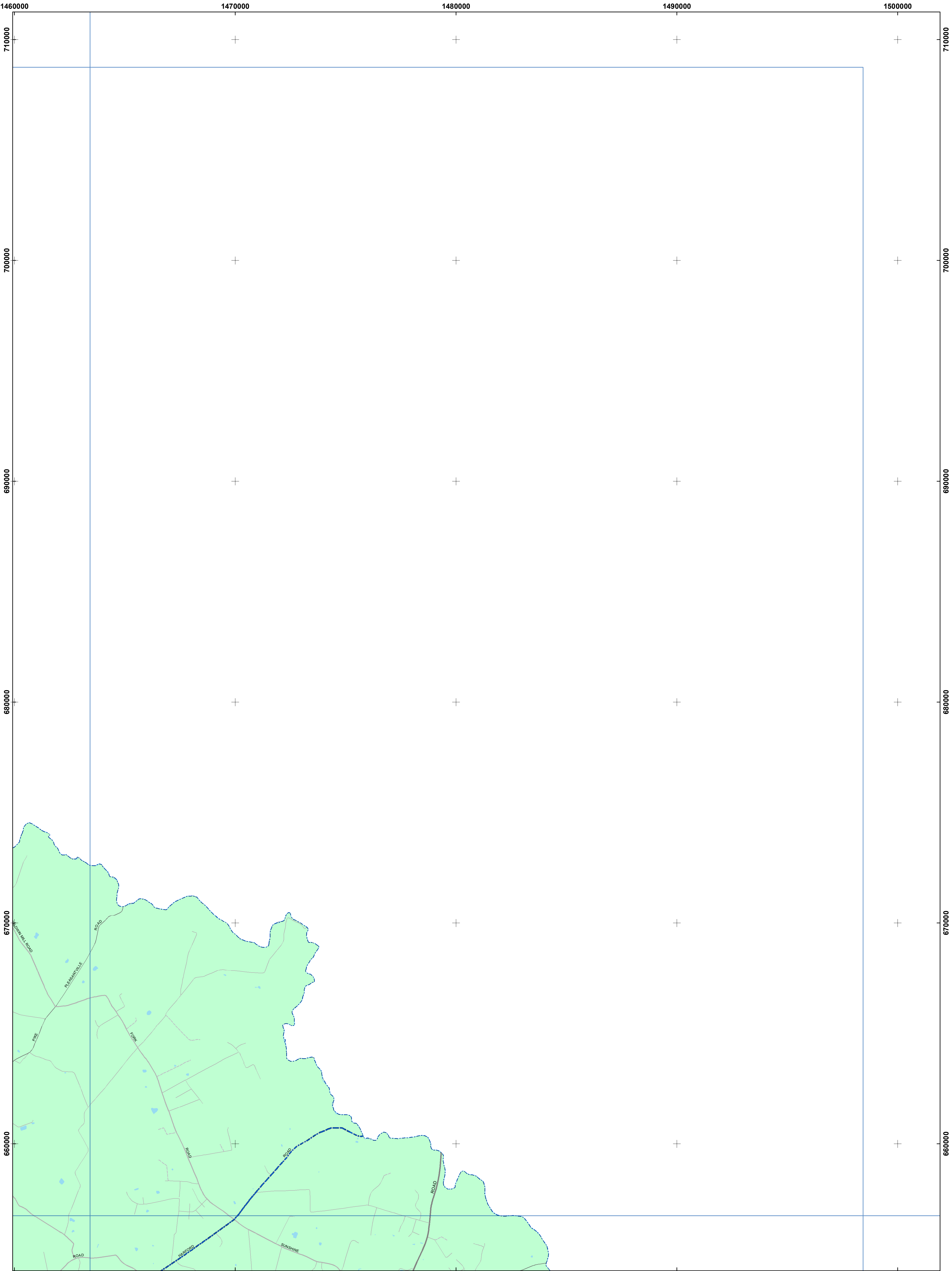
| | |
|-----------------------------|---|
| W-1 Existing Service Area | W-6 Area of Future Consideration |
| W-3 Capital Facilities Area | W-7 CS No Planned Service: Community System |
| W-4 Study Area | W-7 MU No Planned Service: Multi-Use System |
| W-5 Master Plan Area | W-7 No Planned Community or Multi-Use Service (NPS) |
| W-5 X Master Plan Area | |

Boundaries


- Triennial Master Plan Grid
- Urban Rural Demarcation Line
- Metropolitan District











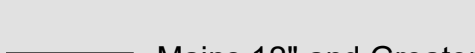
Baltimore County Water Supply Plan









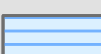
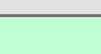
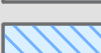
2020 Triennial Review Map W-11B

Maryland State Plane Coordinate System
North American Datum 1983 HARN, U.S. Survey Foot
Produced by Baltimore County, Department of Public Works
Published August 2020

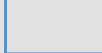
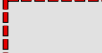

System Facilities

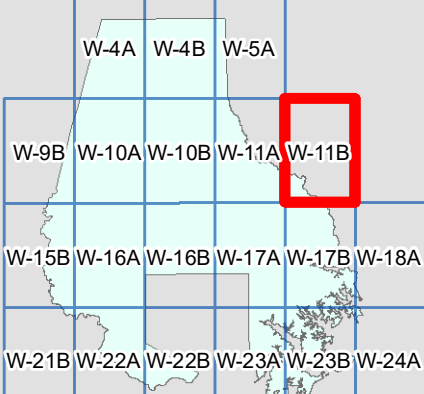
-  Pumping Station
-  Reservoir
-  Tank
-  Treatment Plant
-  Mains 12" and Greater

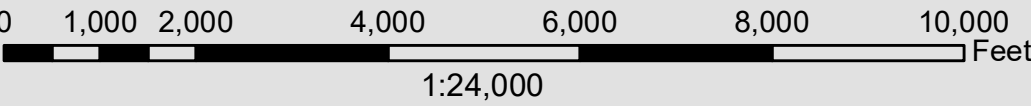

Water Supply Plan Areal Designations

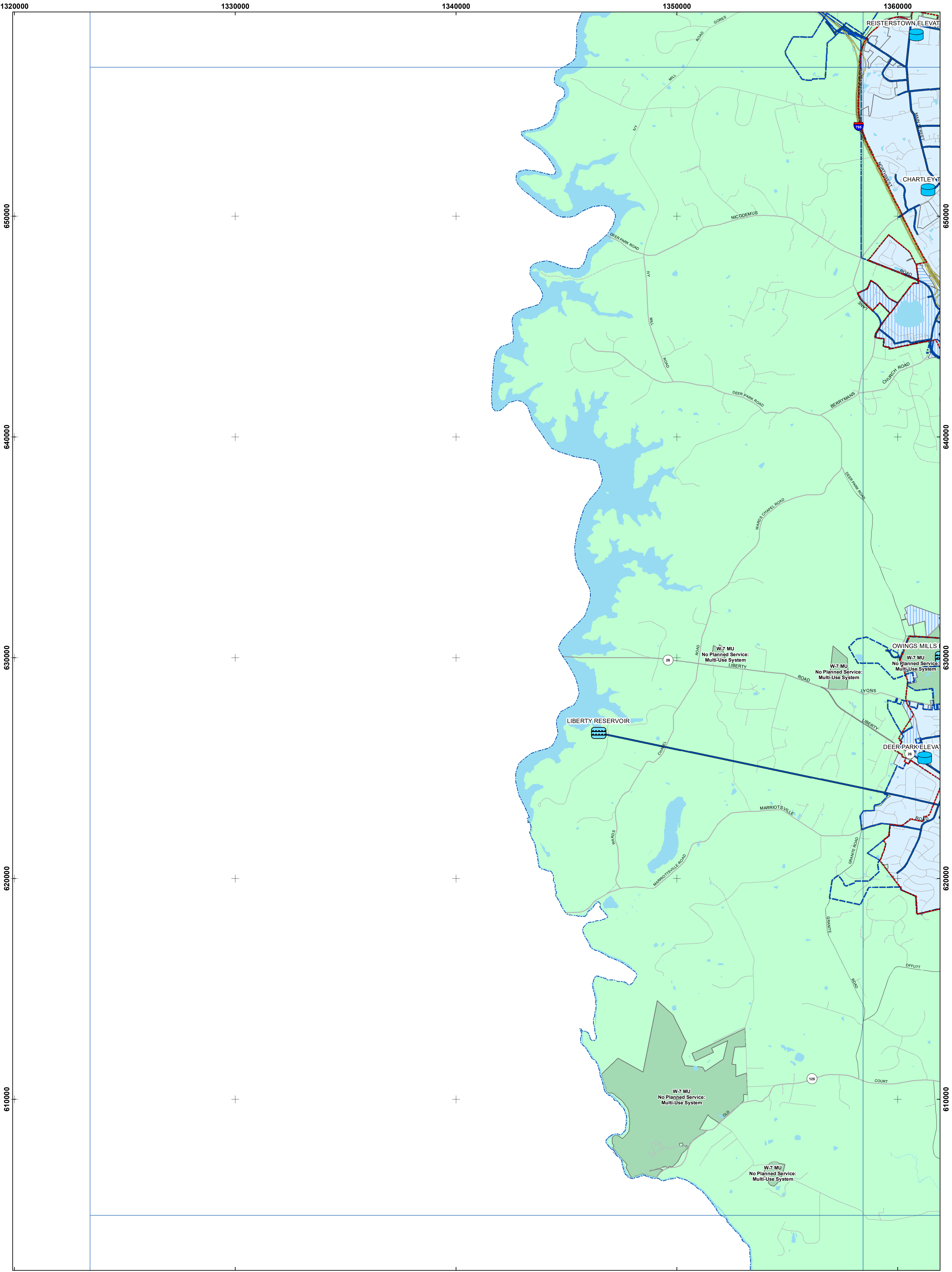
| | |
|---|---|
|  W-1 Existing Service Area |  W-6 Area of Future Consideration |
|  W-3 Capital Facilities Area |  W-7 CS No Planned Service: Community System |
|  W-4 Study Area |  W-7 MU No Planned Service: Multi-Use System |
|  W-5 Master Plan Area |  W-7 No Planned Community or Multi-Use Service (NPS) |
|  W-5 X Master Plan Area | |

Boundaries

-  Triennial Master Plan Grid
-  Urban Rural Demarcation Line
-  Metropolitan District








Baltimore County

Water Supply Plan




2020 Triennial Review


Map W-15B


Maryland State Plane Coordinate System
North American Datum 1983 HARN, U.S. Survey Foot


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Published August 2020

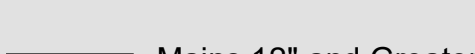
System Facilities

 Pumping Station


 Reservoir


 Tank


 Treatment Plant

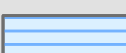
 Mains 12" and Greater

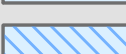
Water Supply Plan Areal Designations


 W-1 Existing Service Area


 W-3 Capital Facilities Area


 W-4 Study Area

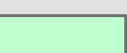
 W-5 Master Plan Area

 W-5 X Master Plan Area

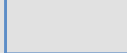
 W-6 Area of Future Consideration


 W-7 CS No Planned Service: Community System


 W-7 MU No Planned Service: Multi-Use System

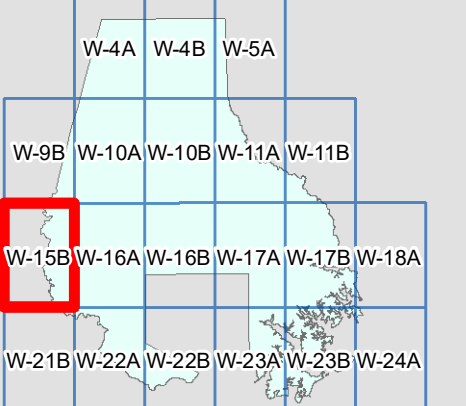
 W-7 No Planned Community or Multi-Use Service (NPS)


Boundaries

 Triennial Master Plan Grid

 Urban Rural Demarcation Line

 Metropolitan District



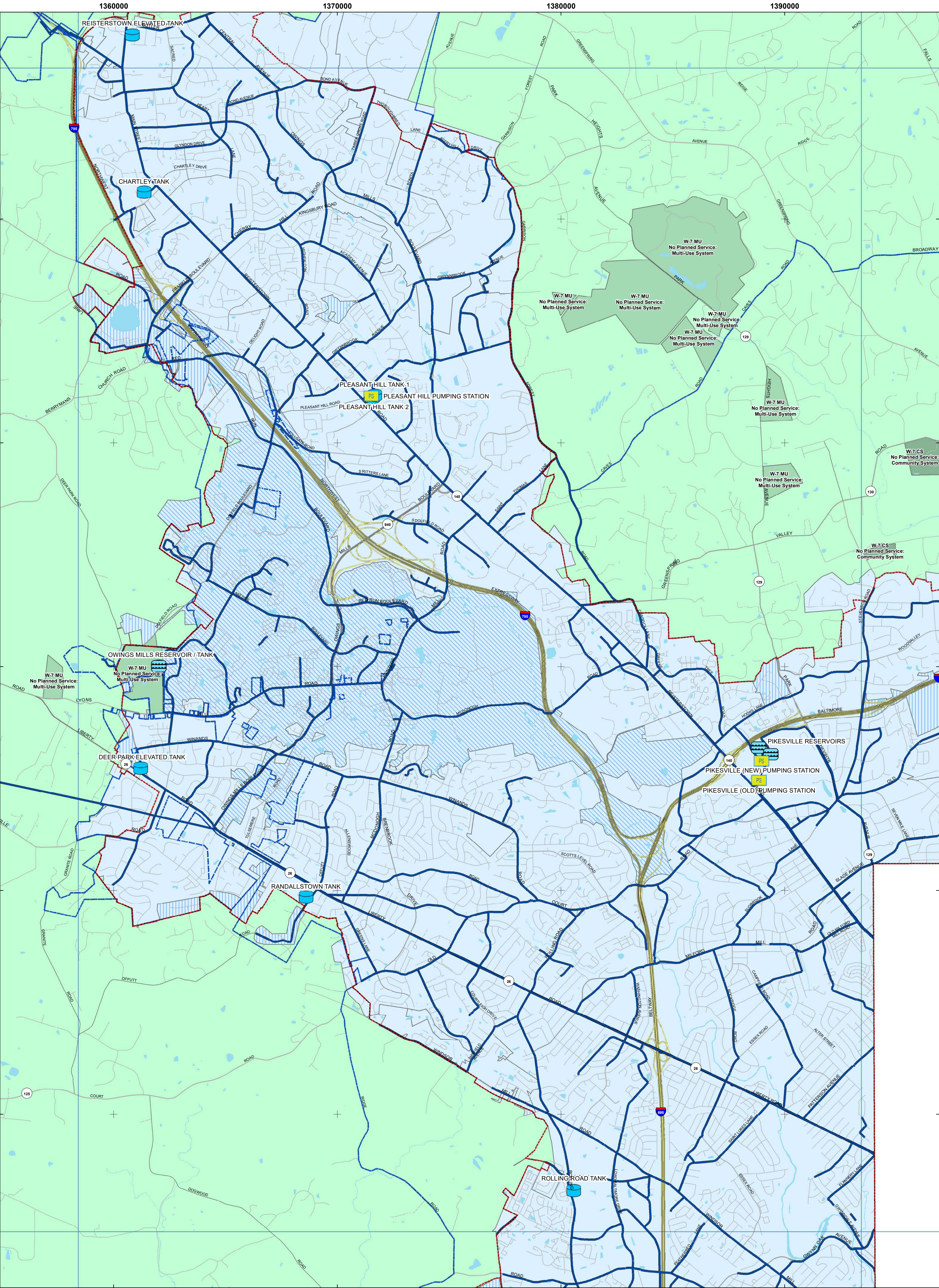


01,0002,0004,0006,0008,00010,000


Feet

1:24,000

Map 9 of 20



Baltimore County Water Supply Plan



2020 Triennial Review Map W-16A

Maryland State Plane Coordinate System
North American Datum 1983 HARN, U.S. Survey Foot

Produced by Baltimore County, Department of Public Works
Published August 2020

System Facilities

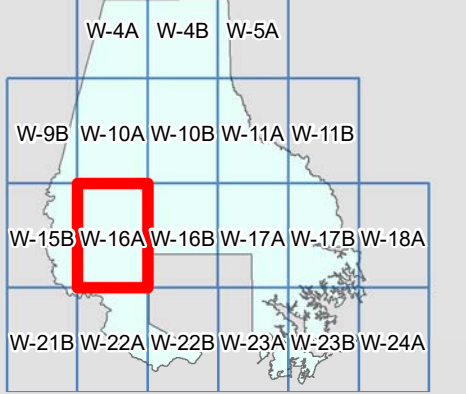
- Pumping Station
- Reservoir
- Tank
- Treatment Plant
- Mains 12" and Greater

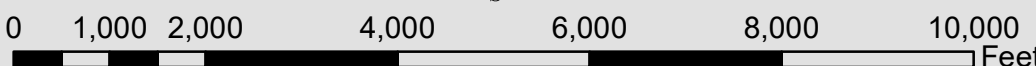

Water Supply Plan Area Designations

| | |
|-----------------------------|---|
| W-1 Existing Service Area | W-6 Area of Future Consideration |
| W-3 Capital Facilities Area | W-7 CS No Planned Service: Community System |
| W-4 Study Area | W-7 MU No Planned Service: Multi-Use System |
| W-5 Master Plan Area | W-7 No Planned Community or Multi-Use Service (NPS) |
| W-5 X Master Plan Area | |

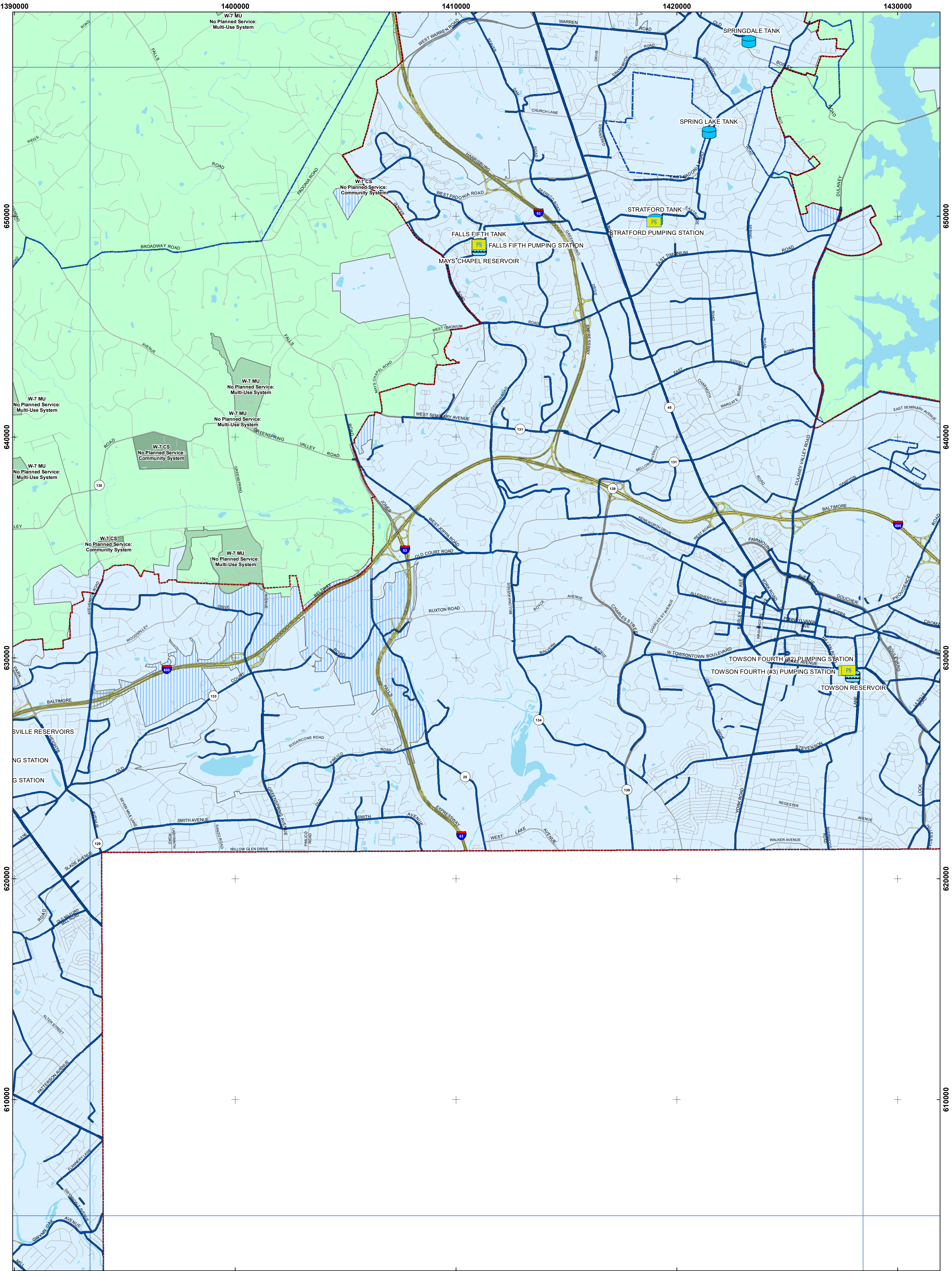
Boundaries

- Triennial Master Plan Grid
- Urban Rural Demarcation Line
- Metropolitan District





1:24,000



Baltimore County Water Supply Plan



2020 Triennial Review Map W-16B

Maryland State Plane Coordinate System
North American Datum 1983 HARN, U.S. Survey Foot
Produced by Baltimore County, Department of Public Works
Published August 2020

System Facilities

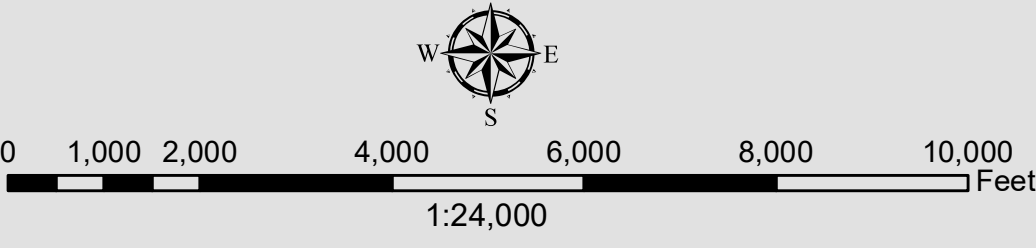
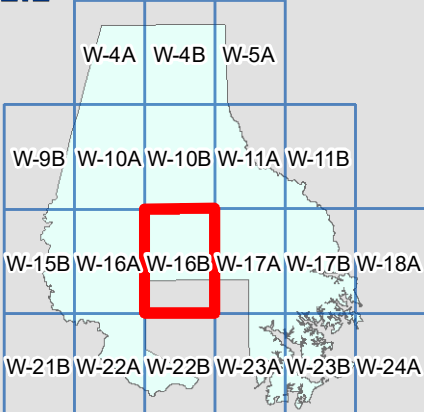
- Pumping Station
- Reservoir
- Tank
- Treatment Plant
- Mains 12" and Greater

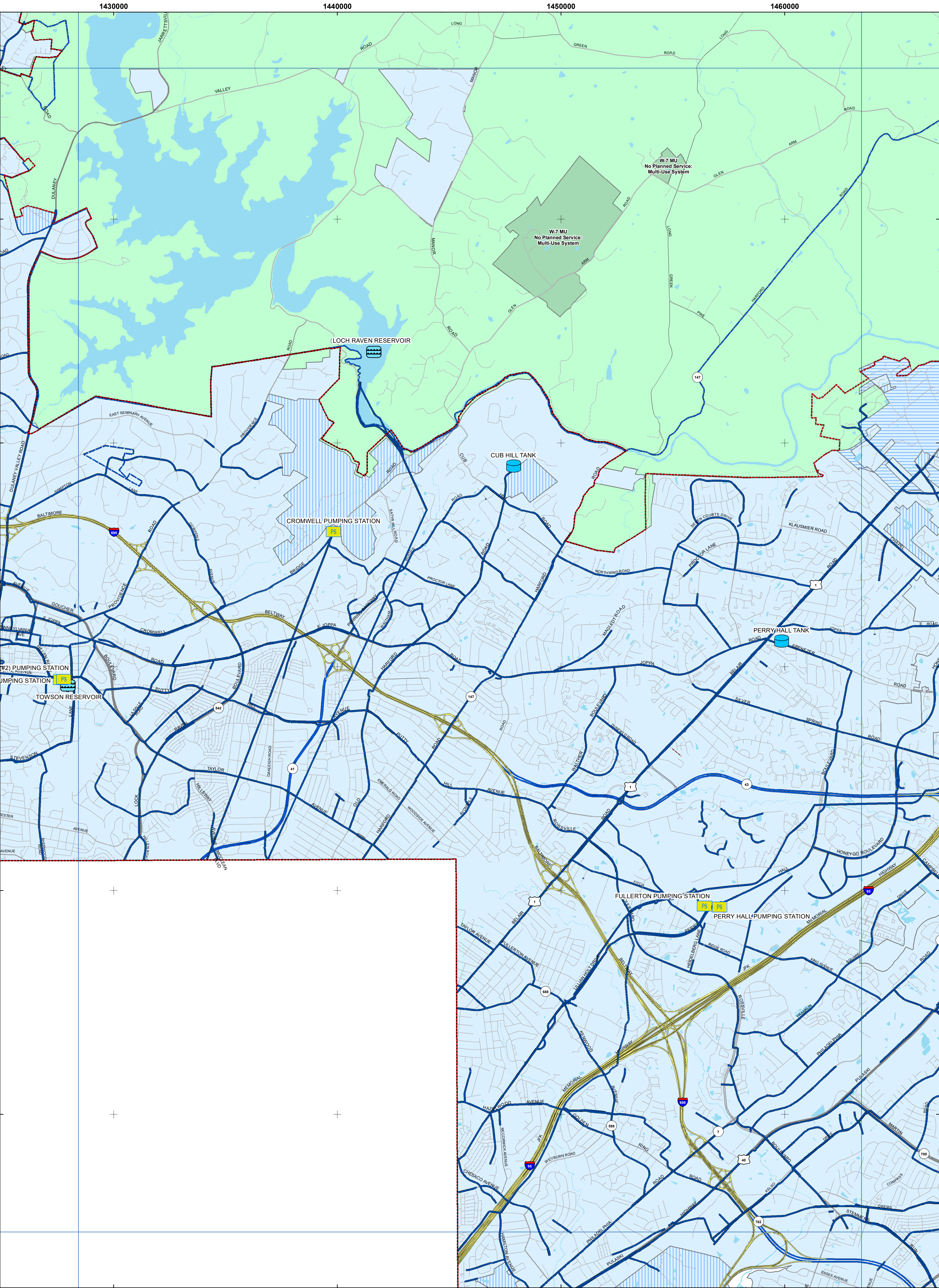
Water Supply Plan Area Designations

- W-1 Existing Service Area
- W-3 Capital Facilities Area
- W-4 Study Area
- W-5 Master Plan Area
- W-5 X Master Plan Area
- W-6 Area of Future Consideration
- W-7 CS No Planned Service: Community System
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- W-7 No Planned Community or Multi-Use Service (NPS)


Boundaries

- Triennial Master Plan Grid
- Urban Rural Demarcation Line
- Metropolitan District





Baltimore County Water Supply Plan



2020 Triennial Review Map W-17A

Maryland State Plane Coordinate System
North American Datum 1983 HARN, U.S. Survey Foot
Produced by Baltimore County, Department of Public Works
Published August 2020

System Facilities

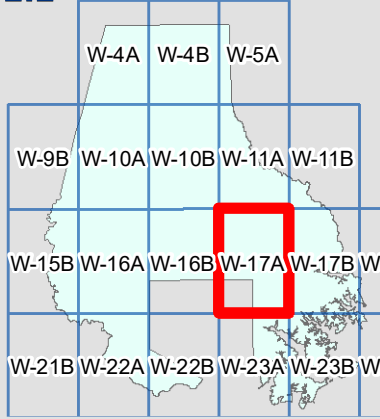
| | |
|--|-----------------------|
| | Pumping Station |
| | Reservoir |
| | Tank |
| | Treatment Plant |
| | Mains 12" and Greater |

Water Supply Plan Area Designations

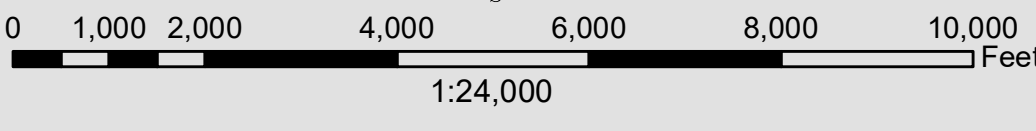

| | | | |
|--|-----------------------------|--|---|
| | W-1 Existing Service Area | | W-6 Area of Future Consideration |
| | W-3 Capital Facilities Area | | W-7 CS No Planned Service: Community System |
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| | W-5 Master Plan Area | | W-7 No Planned Community or Multi-Use Service (NPS) |
| | W-5 X Master Plan Area | | |

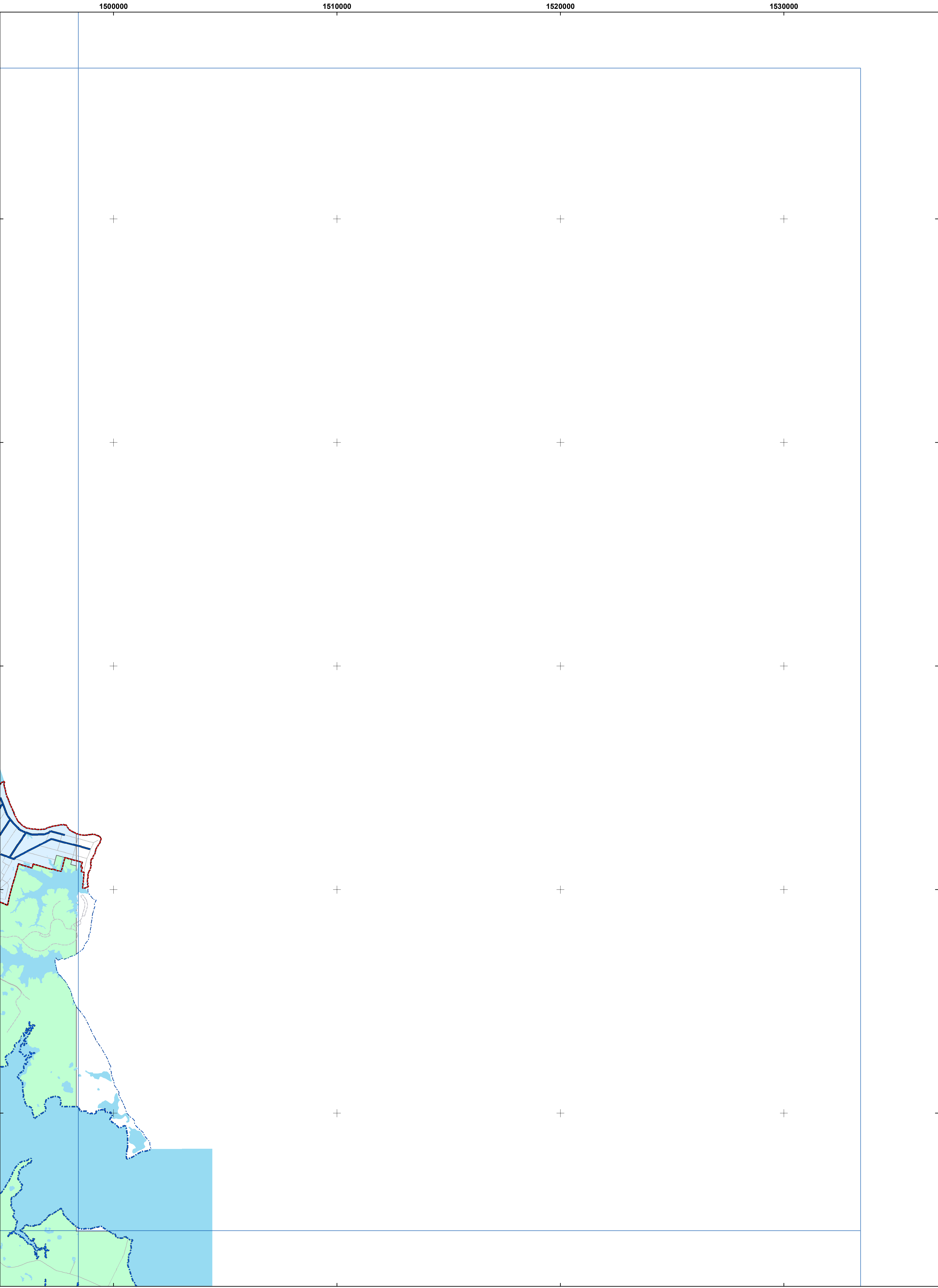
Boundaries

| | |
|--|------------------------------|
| | Triennial Master Plan Grid |
| | Urban Rural Demarcation Line |
| | Metropolitan District |




W-4A W-4B W-5A
W-9B W-10A W-10B W-11A W-11B
W-15B W-16A W-16B W-17A W-17B W-18A
W-21B W-22A W-22B W-23A W-23B W-24A





Baltimore County Water Supply Plan



2020 Triennial Review Map W-18A

Maryland State Plane Coordinate System
North American Datum 1983 HARN, U.S. Survey Foot

Produced by Baltimore County, Department of Public Works
Published August 2020

System Facilities

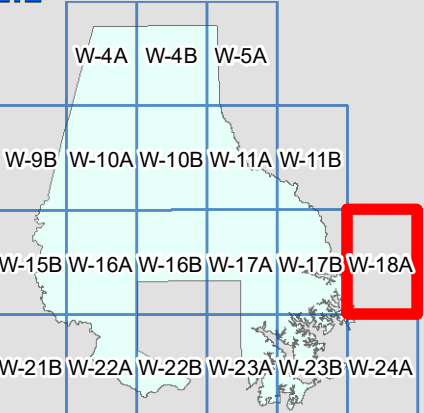
- Pumping Station
- Reservoir
- Tank
- Treatment Plant
- Mains 12" and Greater

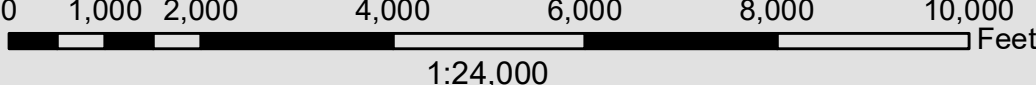

Water Supply Plan Areal Designations

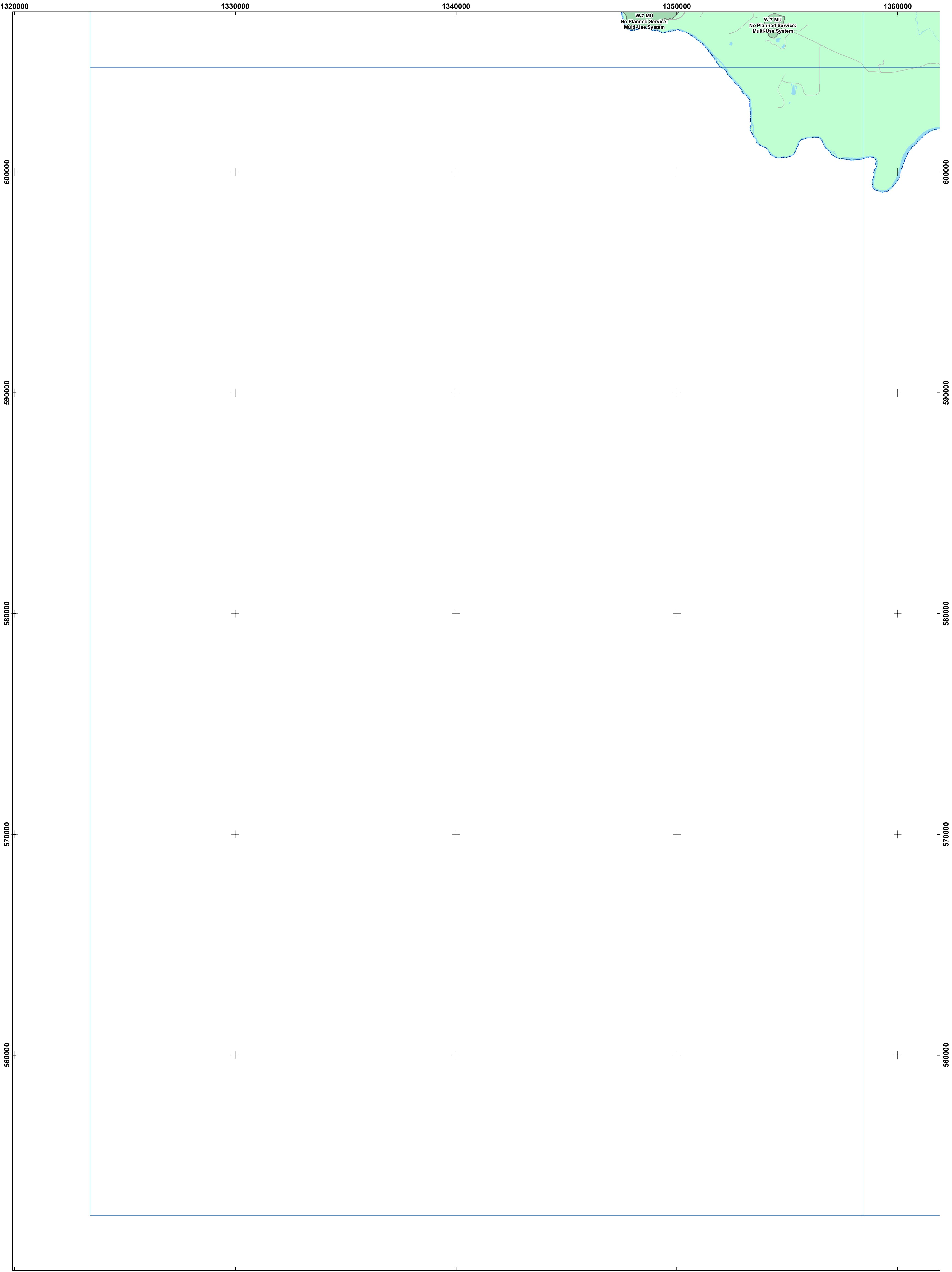
| | |
|-----------------------------|---|
| W-1 Existing Service Area | W-6 Area of Future Consideration |
| W-3 Capital Facilities Area | W-7 CS No Planned Service: Community System |
| W-4 Study Area | W-7 MU No Planned Service: Multi-Use System |
| W-5 Master Plan Area | W-7 No Planned Community or Multi-Use Service (NPS) |
| W-5 X Master Plan Area | |

Boundaries

- Triennial Master Plan Grid
- Urban Rural Demarcation Line
- Metropolitan District







Baltimore County Water Supply Plan



2020 Triennial Review Map W-21B

Maryland State Plane Coordinate System
North American Datum 1983 HARN, U.S. Survey Foot
Produced by Baltimore County, Department of Public Works
Published August 2020

System Facilities

- Pumping Station
- Reservoir
- Tank
- Treatment Plant
- Mains 12" and Greater

Water Supply Plan Areal Designations

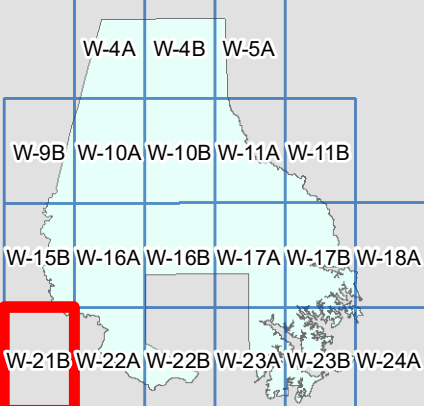
- W-1 Existing Service Area
- W-3 Capital Facilities Area
- W-4 Study Area
- W-5 Master Plan Area
- W-5 X Master Plan Area
- W-6 Area of Future Consideration
- W-7 CS No Planned Service: Community System
- W-7 MU No Planned Service: Multi-Use System
- W-7 No Planned Community or Multi-Use Service (NPS)

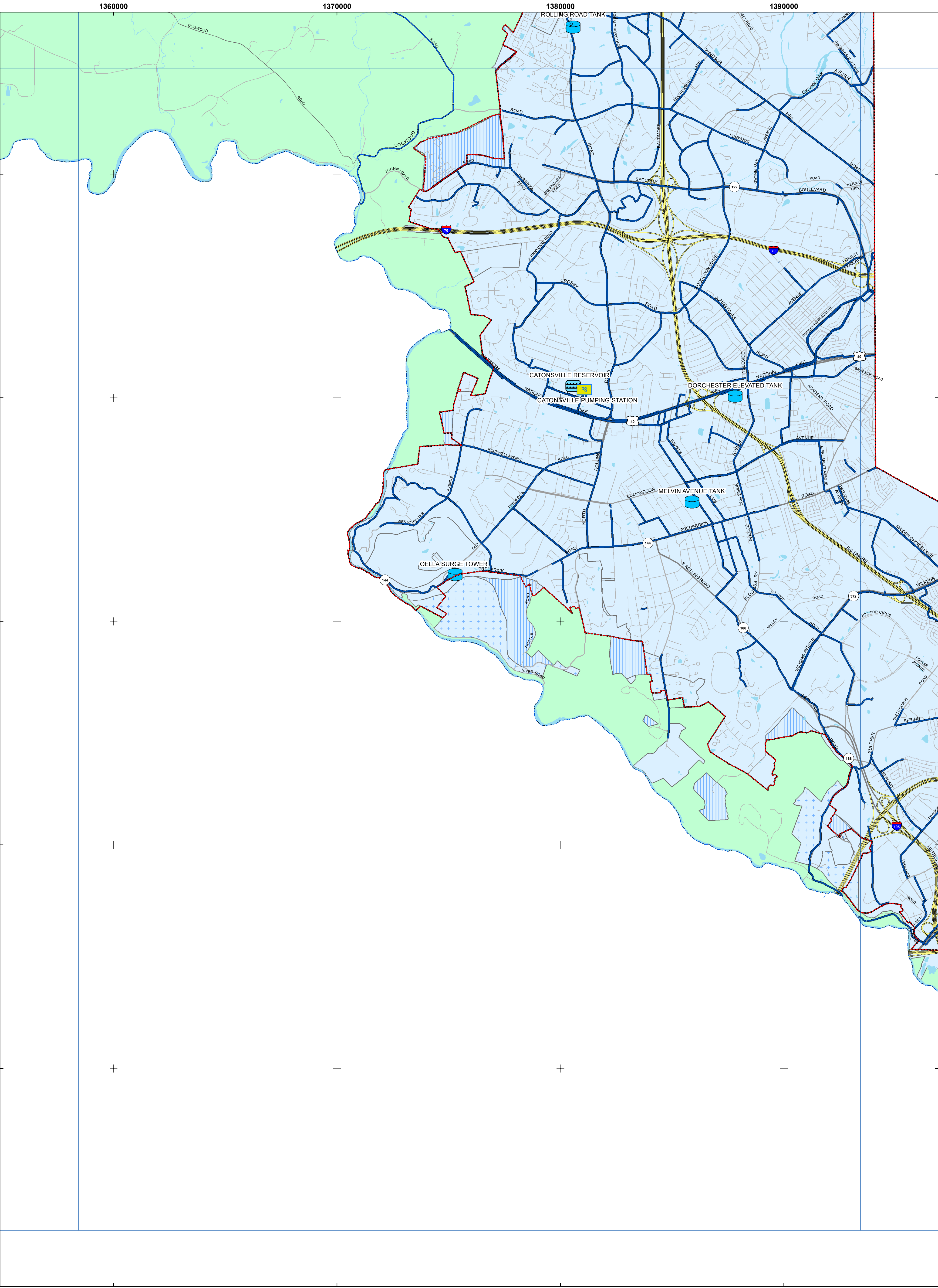
Boundaries

- Triennial Master Plan Grid
- Urban Rural Demarcation Line
- Metropolitan District




0 1,000 2,000 4,000 6,000 8,000 10,000 Feet
1:24,000





Baltimore County

Water Supply Plan



2020 Triennial Review

Map W-22A

Maryland State Plane Coordinate System
North American Datum 1983 HARN, U.S. Survey Foot

Produced by Baltimore County, Department of Public Works
Published August 2020

System Facilities

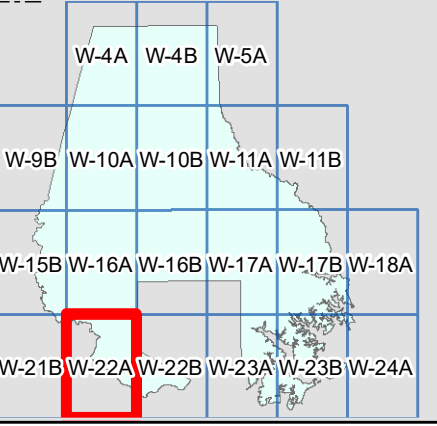
- Pumping Station
- Reservoir
- Tank
- Treatment Plant
- Mains 12" and Greater

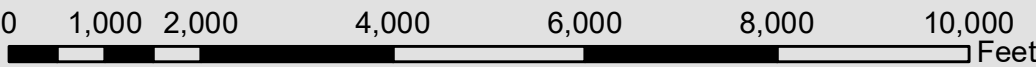

Water Supply Plan Area Designations

- W-1 Existing Service Area
- W-3 Capital Facilities Area
- W-4 Study Area
- W-5 Master Plan Area
- W-5 X Master Plan Area
- W-6 Area of Future Consideration
- W-7 CS No Planned Service: Community System
- W-7 MU No Planned Service: Multi-Use System
- W-7 No Planned Community or Multi-Use Service (NPS)

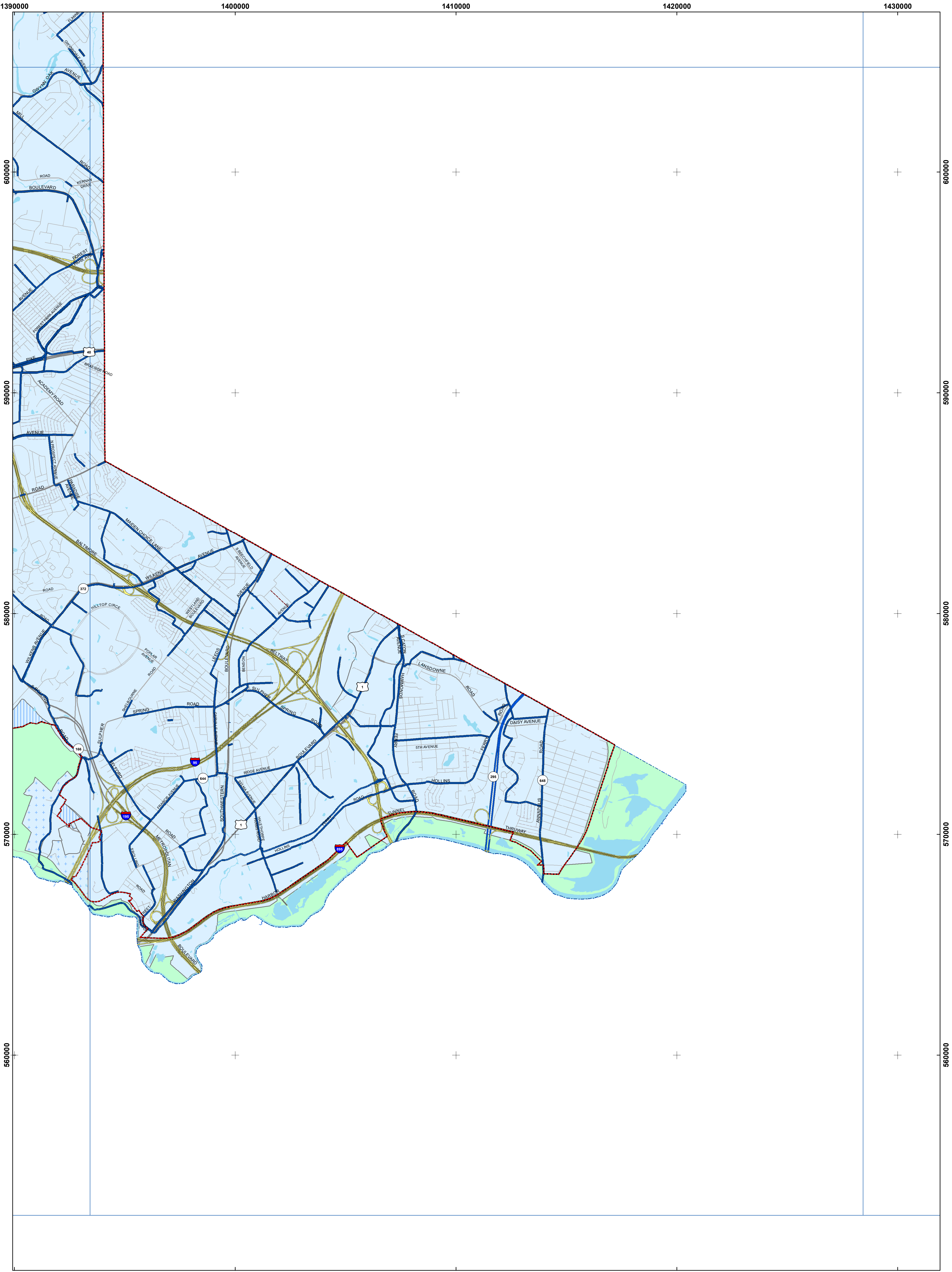
Boundaries

- Triennial Master Plan Grid
- Urban Rural Demarcation Line
- Metropolitan District






1:24,000



Baltimore County

Water Supply Plan



2020 Triennial Review

Map W-22B

Maryland State Plane Coordinate System
North American Datum 1983 HARN, U.S. Survey Foot

Produced by Baltimore County, Department of Public Works
Published August 2020

System Facilities

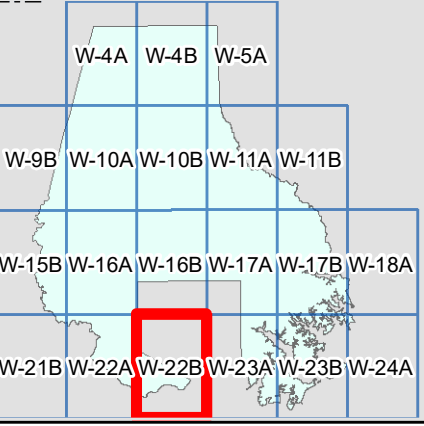
| | |
|--|-----------------------|
| | Pumping Station |
| | Reservoir |
| | Tank |
| | Treatment Plant |
| | Mains 12" and Greater |

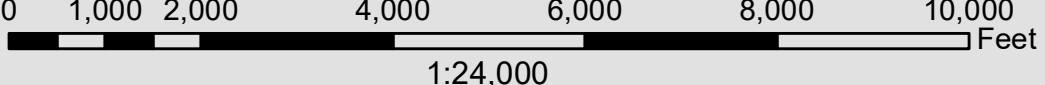

Water Supply Plan Areal Designations

| | | | |
|--|-----------------------------|--|---|
| | W-1 Existing Service Area | | W-6 Area of Future Consideration |
| | W-3 Capital Facilities Area | | W-7 CS No Planned Service: Community System |
| | W-4 Study Area | | W-7 MU No Planned Service: Multi-Use System |
| | W-5 Master Plan Area | | W-7 No Planned Community or Multi-Use Service (NPS) |
| | W-5 X Master Plan Area | | |

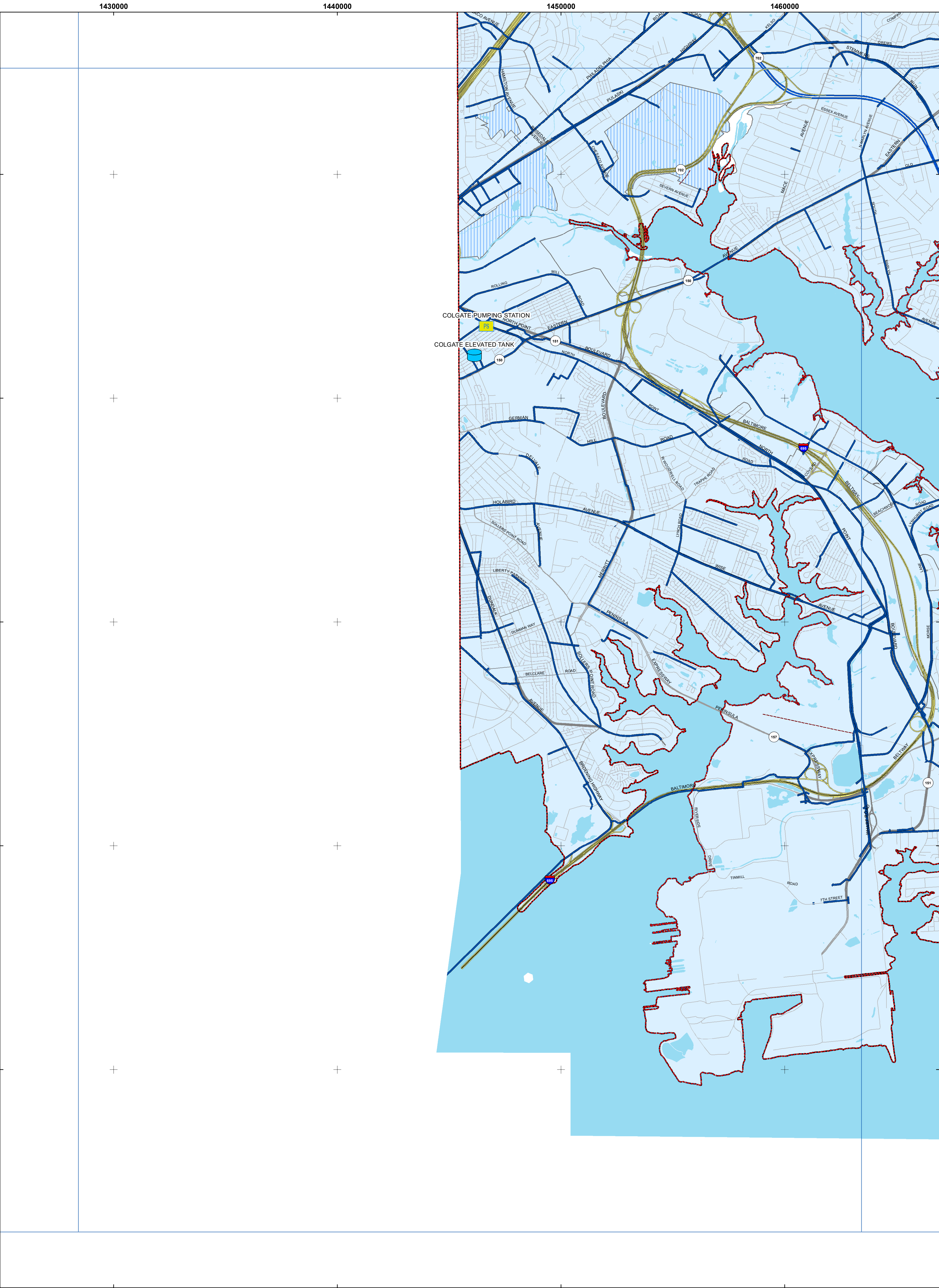
Boundaries

| | |
|--|------------------------------|
| | Triennial Master Plan Grid |
| | Urban Rural Demarcation Line |
| | Metropolitan District |






Map 17 of 20



Baltimore County Water Supply Plan



2020 Triennial Review Map W-23A

Maryland State Plane Coordinate System
North American Datum 1983 HARN, U.S. Survey Foot
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Published August 2020

System Facilities

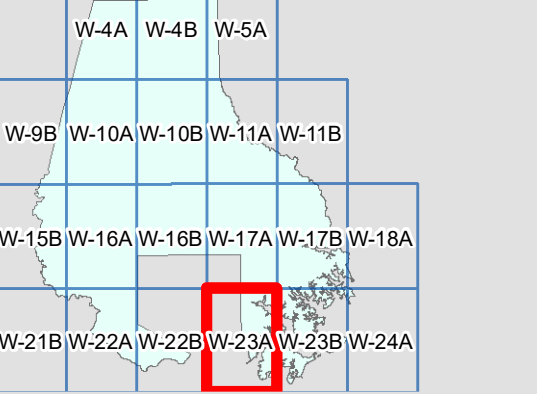
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|--|-----------------------|
| | Pumping Station |
| | Reservoir |
| | Tank |
| | Treatment Plant |
| | Mains 12" and Greater |

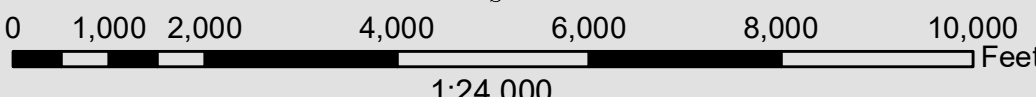

Water Supply Plan Area Designations

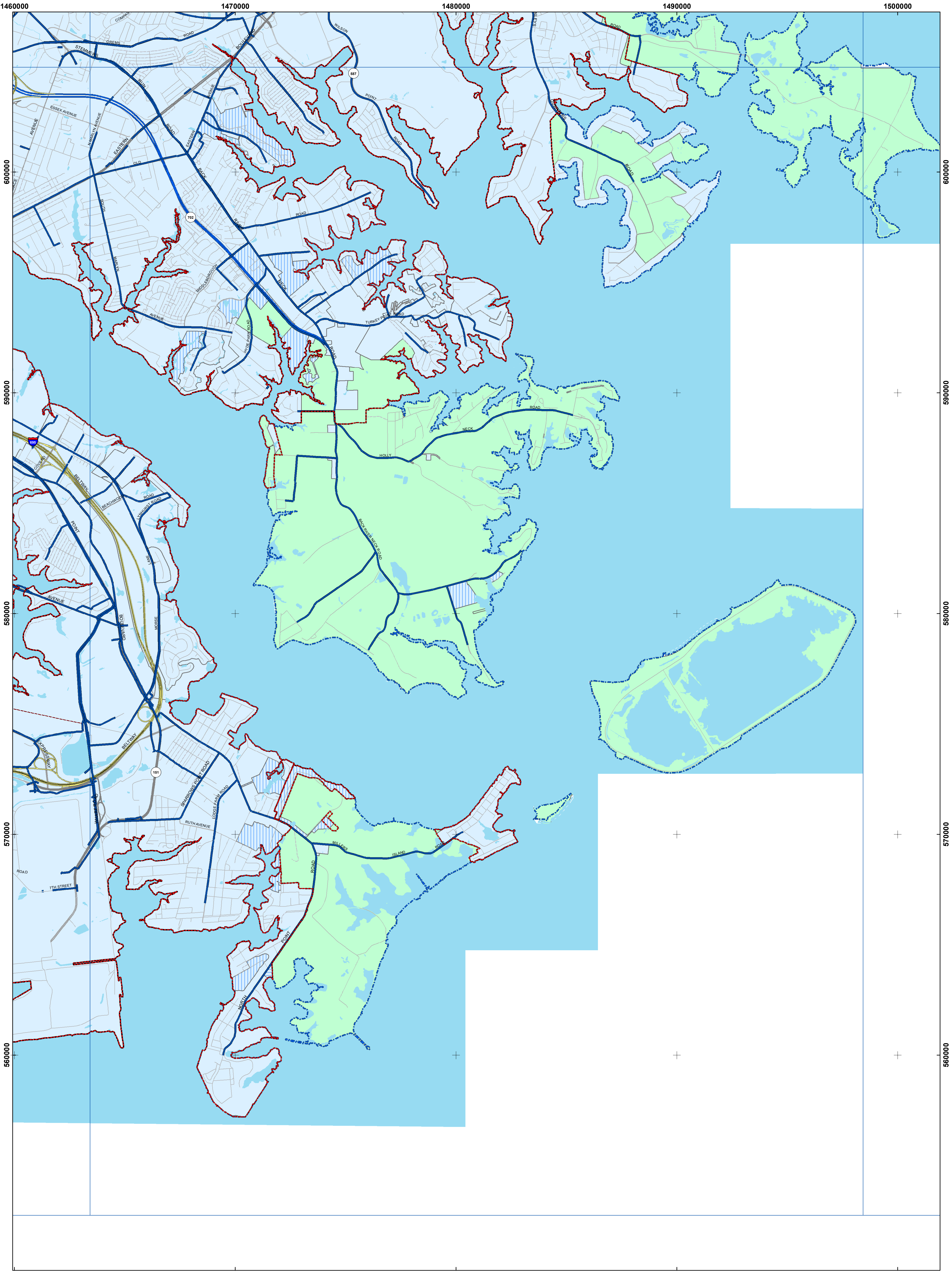
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|--|-----------------------------|--|---|
| | W-1 Existing Service Area | | W-6 Area of Future Consideration |
| | W-3 Capital Facilities Area | | W-7 CS No Planned Service: Community System |
| | W-4 Study Area | | W-7 MU No Planned Service: Multi-Use System |
| | W-5 Master Plan Area | | W-7 No Planned Community or Multi-Use Service (NPS) |
| | W-5 X Master Plan Area | | |

Boundaries

| | |
|--|------------------------------|
| | Triennial Master Plan Grid |
| | Urban Rural Demarcation Line |
| | Metropolitan District |








Baltimore County

Water Supply Plan



2020 Triennial Review

Map W-23B

Maryland State Plane Coordinate System
North American Datum 1983 HARN, U.S. Survey Foot

Produced by Baltimore County, Department of Public Works
Published August 2020

System Facilities

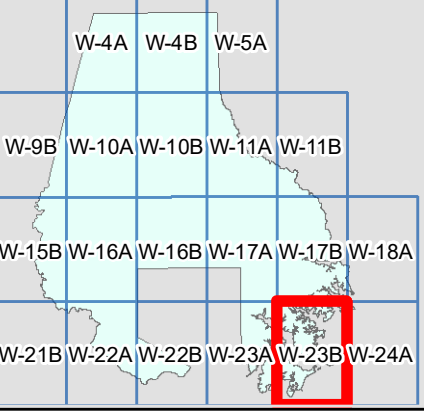
- Pumping Station
- Reservoir
- Tank
- Treatment Plant
- Mains 12" and Greater

Water Supply Plan Areal Designations

- W-1 Existing Service Area
- W-3 Capital Facilities Area
- W-4 Study Area
- W-5 Master Plan Area
- W-5 X Master Plan Area
- W-6 Area of Future Consideration
- W-7 CS No Planned Service: Community System
- W-7 MU No Planned Service: Multi-Use System
- W-7 No Planned Community or Multi-Use Service (NPS)

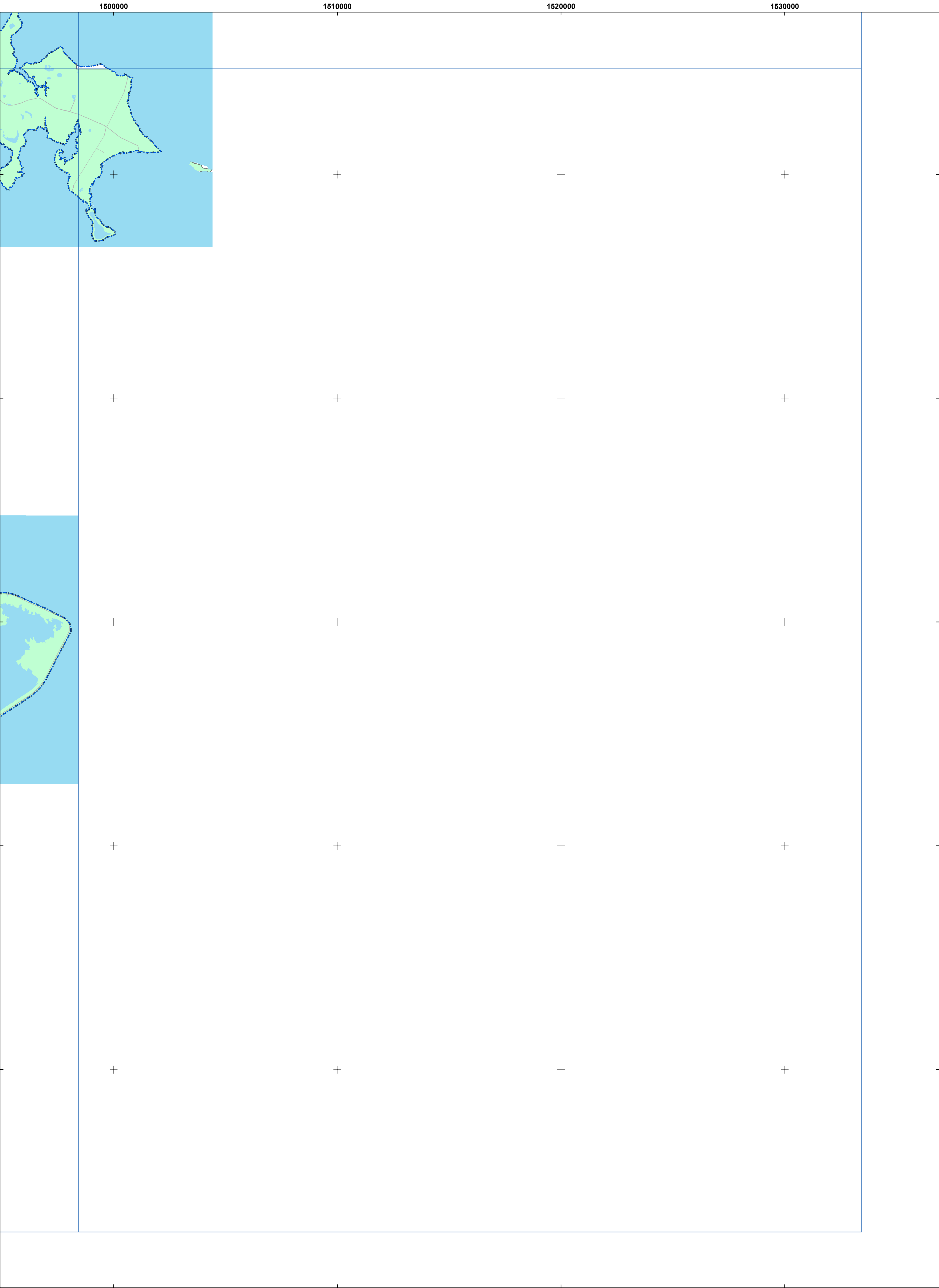
Boundaries

- Triennial Master Plan Grid
- Urban Rural Demarcation Line
- Metropolitan District




0 1,000 2,000 4,000 6,000 8,000 10,000 Feet

1:24,000







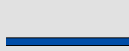
Baltimore County Water Supply Plan









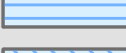
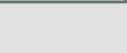
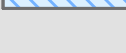
2020 Triennial Review Map W-24A

Maryland State Plane Coordinate System
North American Datum 1983 HARN, U.S. Survey Foot
Produced by Baltimore County, Department of Public Works
Published August 2020

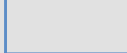

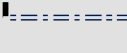
System Facilities

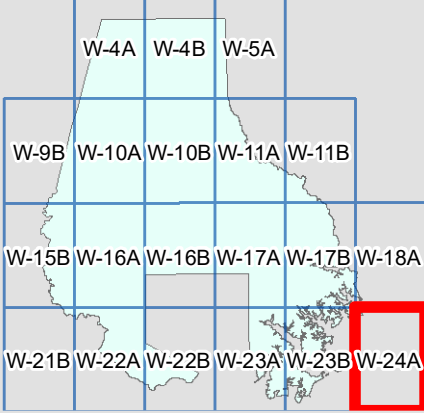
| | |
|--|-----------------------|
|  | Pumping Station |
|  | Reservoir |
|  | Tank |
|  | Treatment Plant |
|  | Mains 12" and Greater |



Water Supply Plan Areal Designations

| | | | |
|---|-----------------------------|---|---|
|  | W-1 Existing Service Area |  | W-6 Area of Future Consideration |
|  | W-3 Capital Facilities Area |  | W-7 CS No Planned Service: Community System |
|  | W-4 Study Area |  | W-7 MU No Planned Service: Multi-Use System |
|  | W-5 Master Plan Area |  | W-7 No Planned Community or Multi-Use Service (NPS) |
|  | W-5 X Master Plan Area | | |

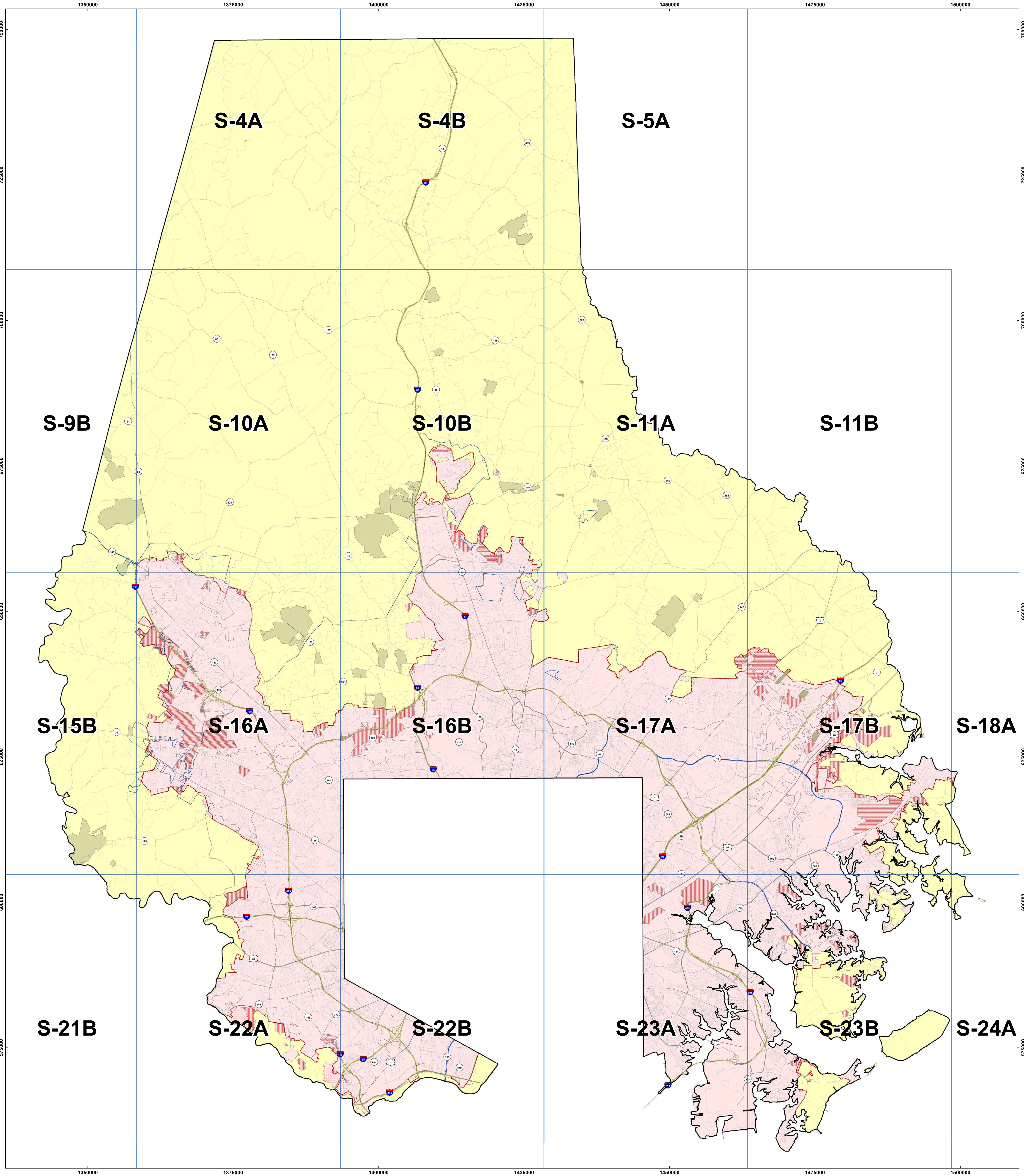
Boundaries

| | |
|---|------------------------------|
|  | Triennial Master Plan Grid |
|  | Urban Rural Demarcation Line |
|  | Metropolitan District |





0 1,000 2,000 4,000 6,000 8,000 10,000 Feet
1:24,000



Baltimore County Sewerage Plan 2020 Triennial Review

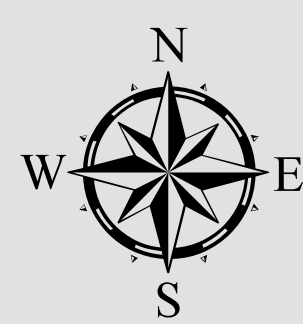


Sewerage Plan Area Designations

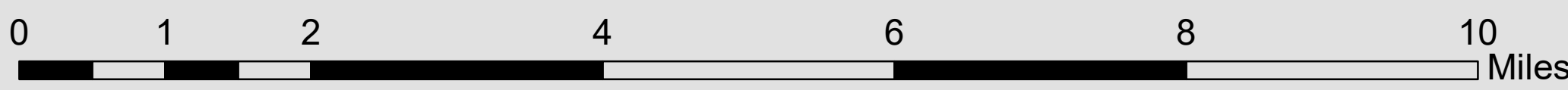
- | | | |
|-----------------------------|----------------------------------|---|
| S-1 Existing Service Area | S-5 Master Plan Area | S-7 CS No Planned Service: Community System |
| S-3 Capital Facilities Area | S-5 X Master Plan Area | S-7 MU No Planned Service: Multi-Use System |
| S-4 Study Area | S-6 Area of Future Consideration | S-7 No Planned Community or Multi-Use Service (NPS) |

Boundaries

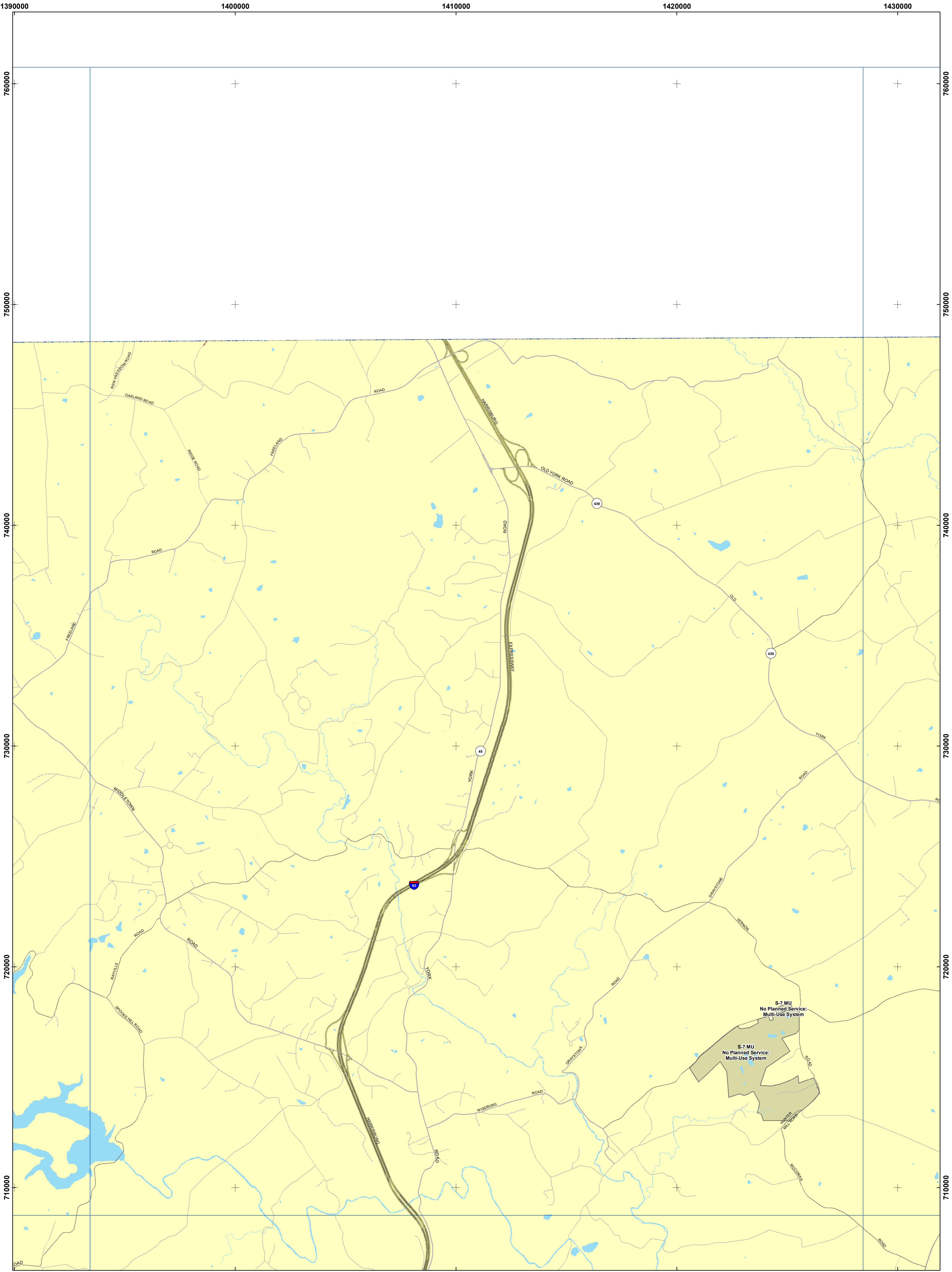
- | |
|------------------------------|
| Triennial Master Plan Grid |
| Urban Rural Demarcation Line |
| Metropolitan District |



1:63,360



1 in = 1 mile



Baltimore County Sewerage Plan



2020 Triennial Review Map S-4B

Maryland State Plane Coordinate System
North American Datum 1983 HARN, U.S. Survey Foot

Produced by Baltimore County, Department of Public Works
Published August 2020

System Facilities

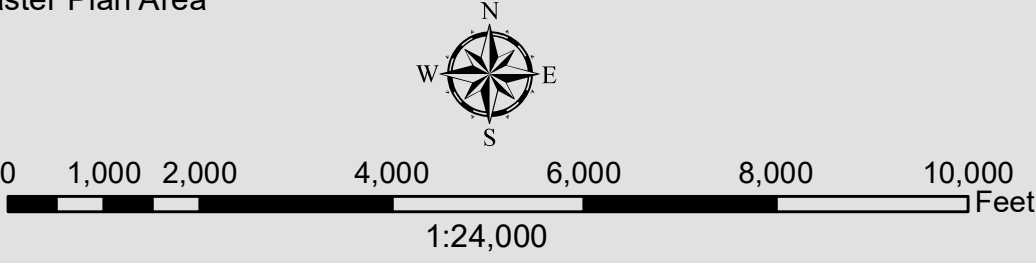
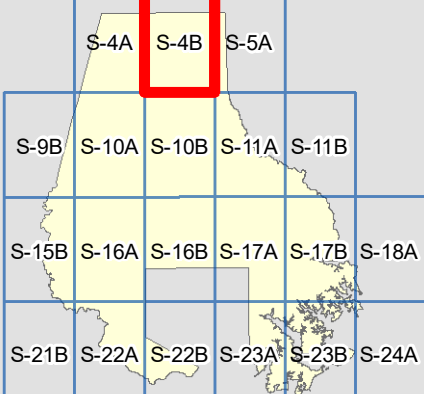
- Grinder Pump
- Pump Station
- Force Mains
- Gravity Mains 12" and Greater
- Low Pressure Mains

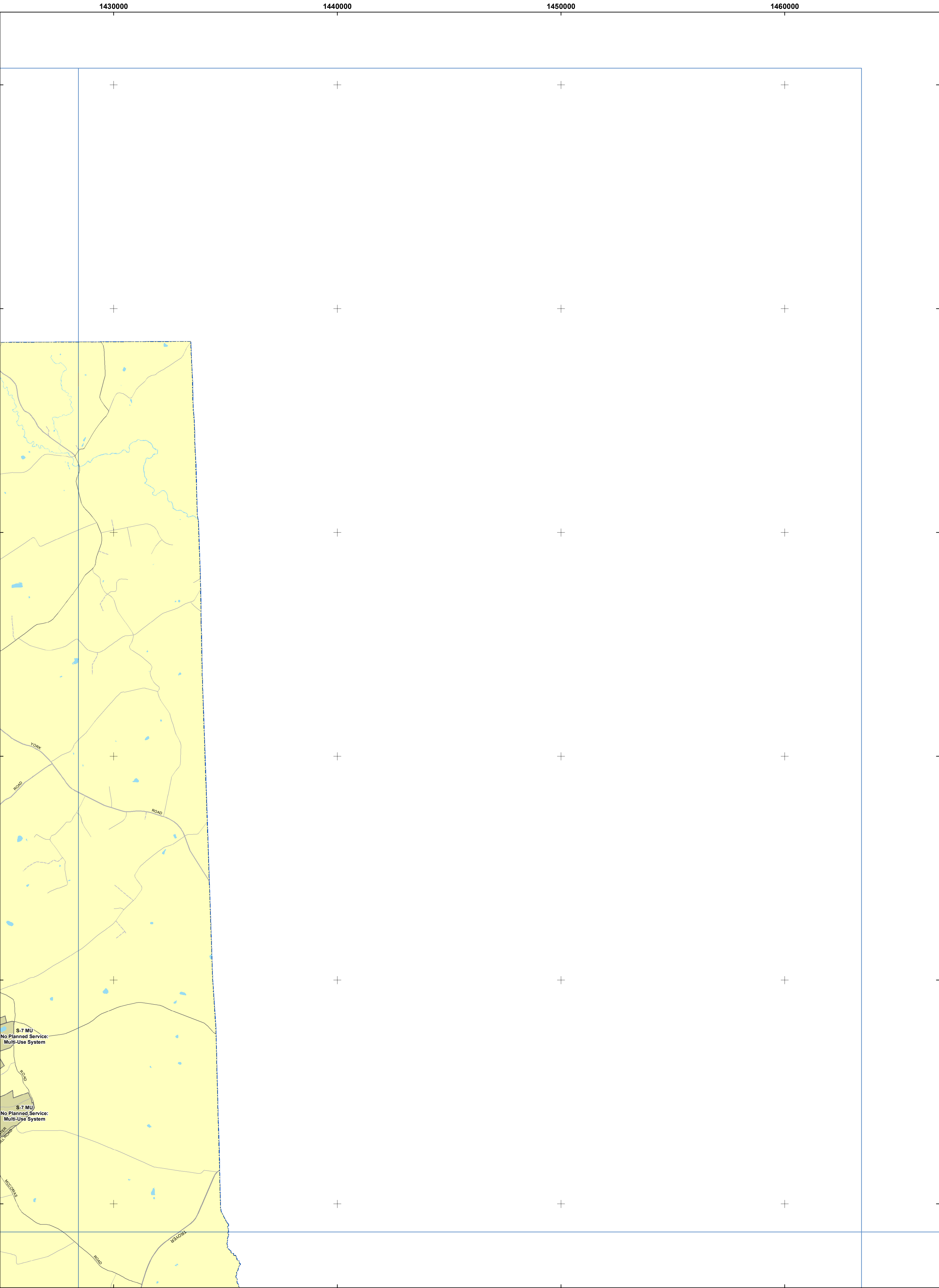
Sewerage Plan Area Designations

- S-1 Existing Service Area
- S-3 Capital Facilities Area
- S-4 Study Area
- S-5 Master Plan Area
- S-5 X Master Plan Area
- S-6 Area of Future Consideration
- S-7 CS No Planned Service: Community System
- S-7 MU No Planned Service: Multi-Use System
- S-7 No Planned Community or Multi-Use Service (NPS)


Boundaries

- Triennial Master Plan Grid
- Urban Rural Demarcation Line
- Metropolitan District





Baltimore County Sewerage Plan



2020 Triennial Review Map S-5A

Maryland State Plane Coordinate System
North American Datum 1983 HARN, U.S. Survey Foot
Produced by Baltimore County, Department of Public Works
Published August 2020

System Facilities

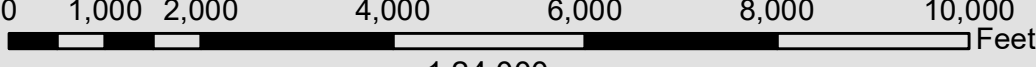

- Grinder Pump
- Pump Station
- Force Mains
- Gravity Mains 12" and Greater
- Low Pressure Mains

Sewerage Plan Area Designations

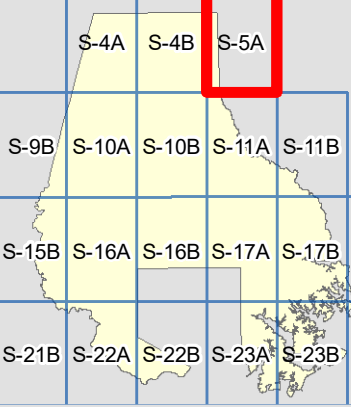
- S-1 Existing Service Area
- S-3 Capital Facilities Area
- S-4 Study Area
- S-5 Master Plan Area
- S-5 X Master Plan Area
- S-6 Area of Future Consideration
- S-7 CS No Planned Service: Community System
- S-7 MU No Planned Service: Multi-Use System
- S-7 No Planned Community or Multi-Use Service (NPS)

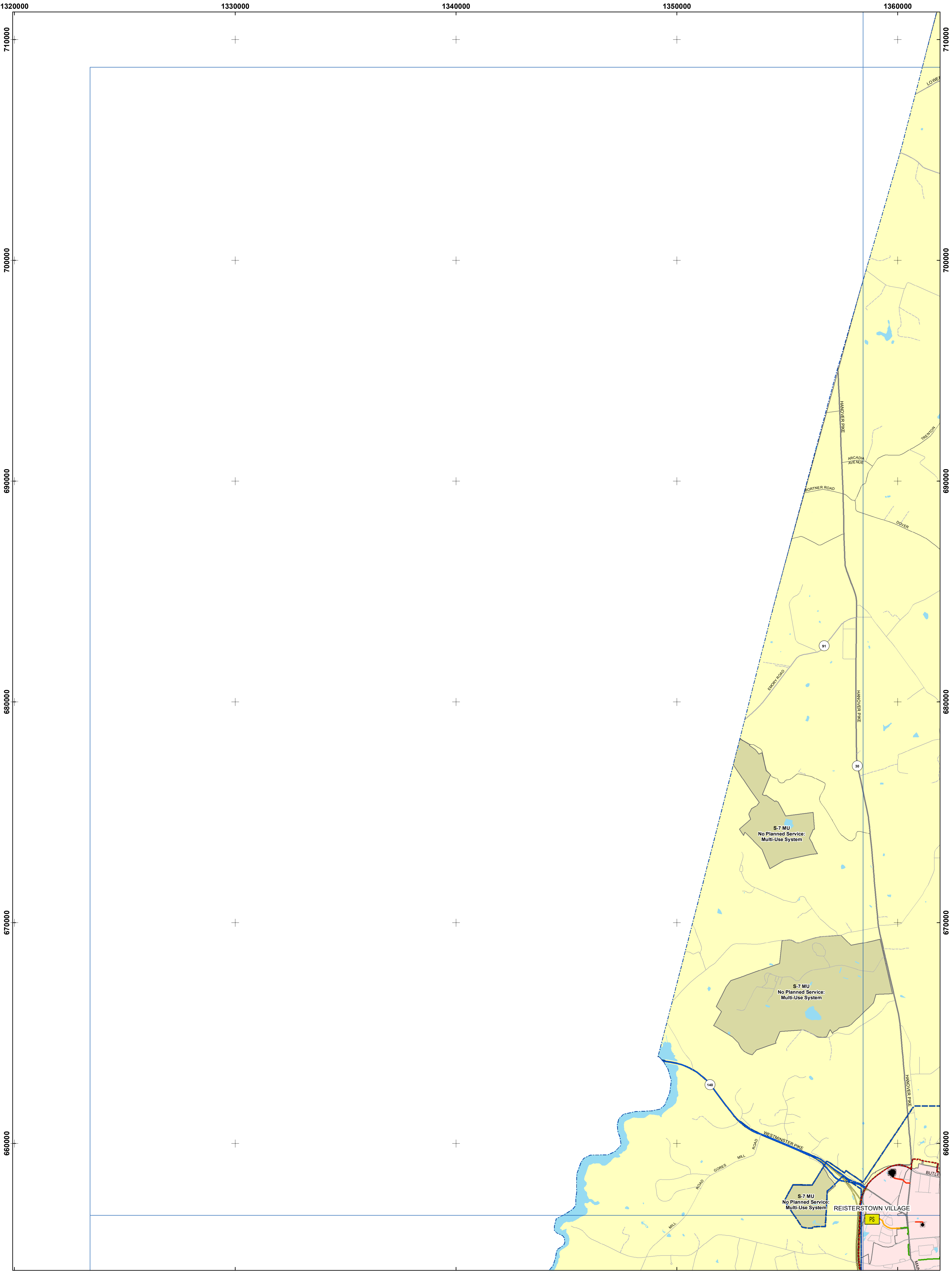
Boundaries

- Triennial Master Plan Grid
- Urban Rural Demarcation Line
- Metropolitan District



1:24,000





Baltimore County Sewerage Plan



2020 Triennial Review Map S-9B

Maryland State Plane Coordinate System
North American Datum 1983 HARN, U.S. Survey Foot
Produced by Baltimore County, Department of Public Works
Published August 2020

System Facilities

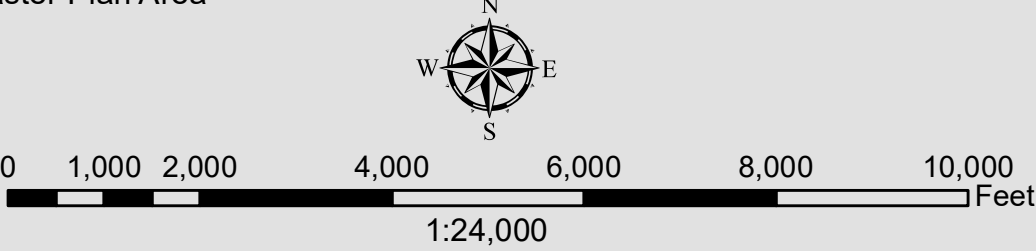
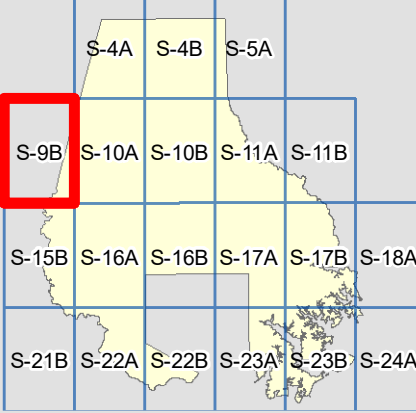
- Grinder Pump
- Pump Station
- Force Mains
- Gravity Mains 12" and Greater
- Low Pressure Mains

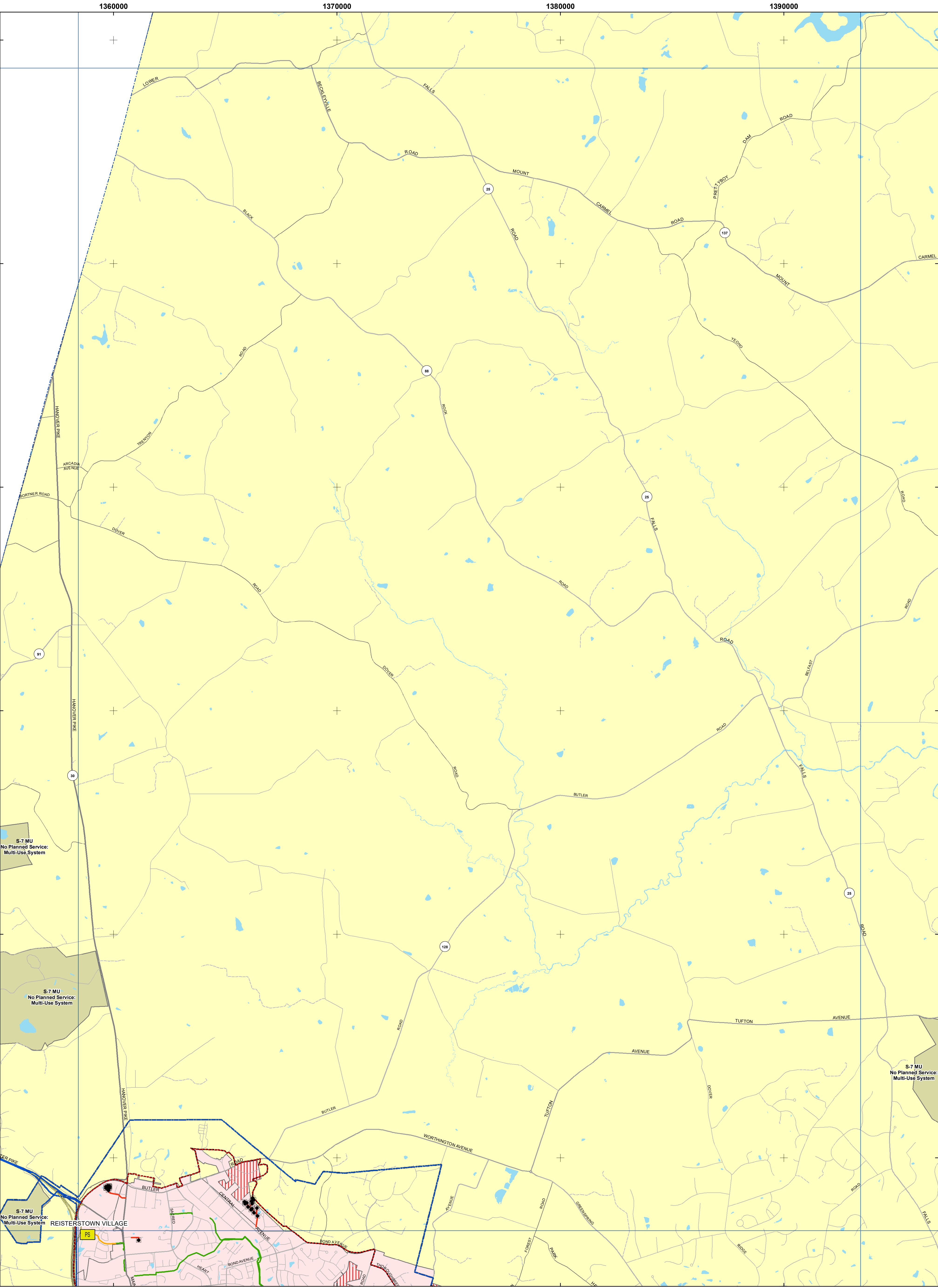
Sewerage Plan Area Designations

- S-1 Existing Service Area
- S-3 Capital Facilities Area
- S-4 Study Area
- S-5 Master Plan Area
- S-5 X Master Plan Area
- S-6 Area of Future Consideration
- S-7 CS No Planned Service: Community System
- S-7 MU No Planned Service: Multi-Use System
- S-7 No Planned Community or Multi-Use Service (NPS)

Boundaries

- Triennial Master Plan Grid
- Urban Rural Demarcation Line
- Metropolitan District





Baltimore County Sewerage Plan



2020 Triennial Review Map S-10A

Maryland State Plane Coordinate System
North American Datum 1983 HARN, U.S. Survey Foot

Produced by Baltimore County, Department of Public Works
Published August 2020

System Facilities

- Grinder Pump
- Pump Station
- Force Mains
- Gravity Mains 12" and Greater
- Low Pressure Mains

Sewerage Plan Area Designations

- S-1 Existing Service Area
- S-3 Capital Facilities Area
- S-4 Study Area
- S-5 Master Plan Area
- S-5 X Master Plan Area
- S-6 Area of Future Consideration
- S-7 CS No Planned Service: Community System
- S-7 MU No Planned Service: Multi-Use System
- S-7 No Planned Community or Multi-Use Service (NPS)

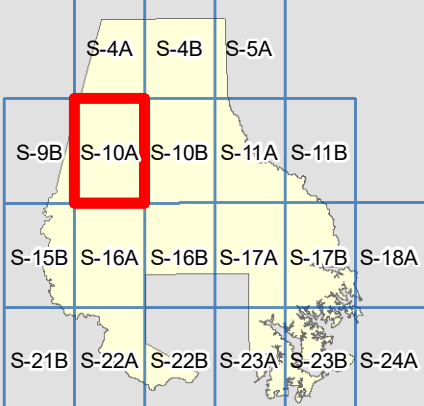


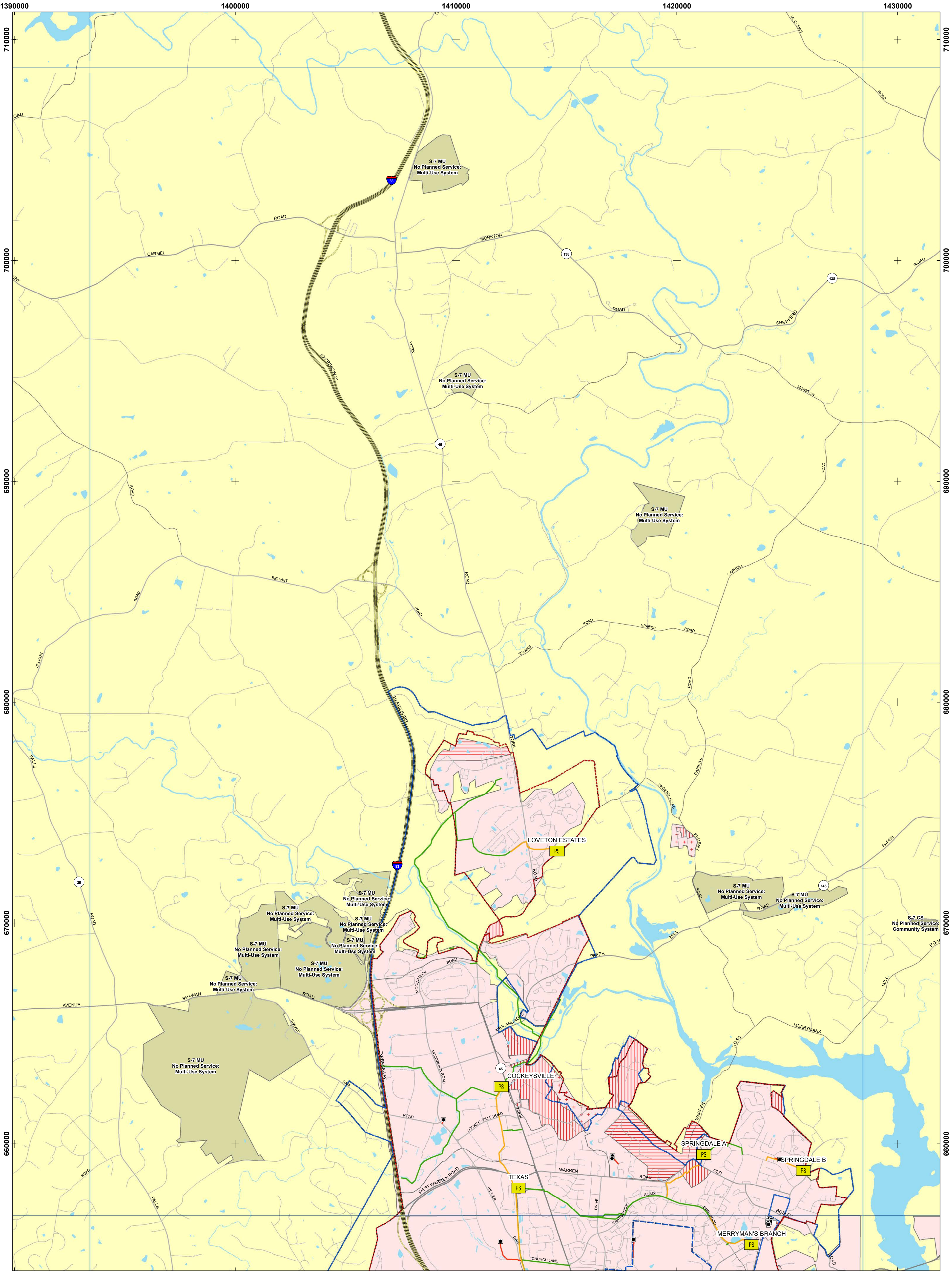
0 1,000 2,000 4,000 6,000 8,000 10,000 Feet

1:24,000

Boundaries

- Triennial Master Plan Grid
- Urban Rural Demarcation Line
- Metropolitan District





Baltimore County Sewerage Plan



2020 Triennial Review Map S-10B

Maryland State Plane Coordinate System
North American Datum 1983 HARN, U.S. Survey Foot
Produced by Baltimore County, Department of Public Works
Published August 2020

System Facilities

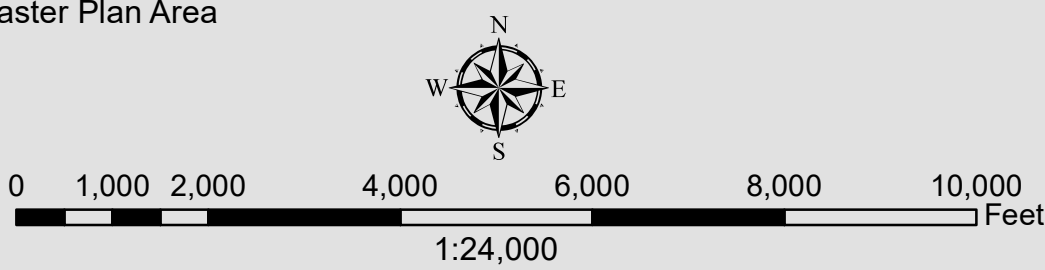
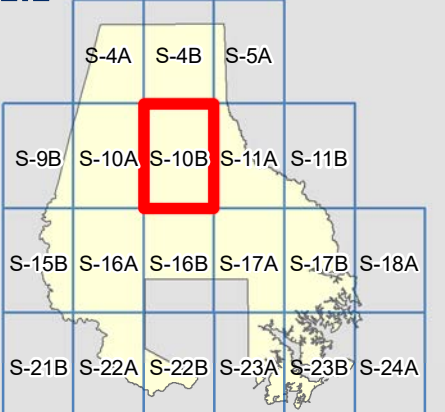
- Grinder Pump
- Pump Station
- Force Mains
- Gravity Mains 12" and Greater
- Low Pressure Mains

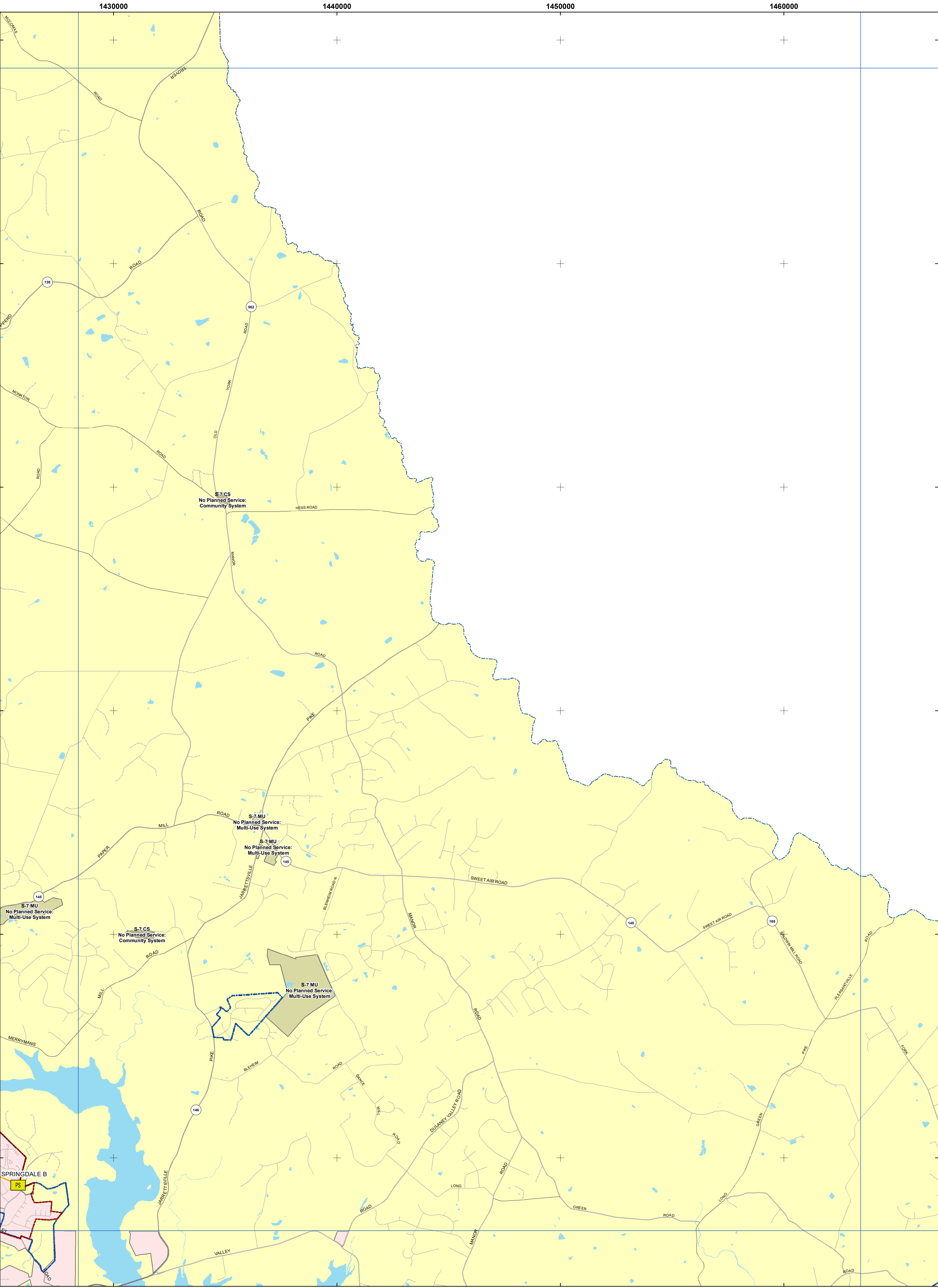
Sewerage Plan Area Designations

- S-1 Existing Service Area
- S-3 Capital Facilities Area
- S-4 Study Area
- S-5 Master Plan Area
- S-5 X Master Plan Area
- S-6 Area of Future Consideration
- S-7 CS No Planned Service: Community System
- S-7 MU No Planned Service: Multi-Use System
- S-7 No Planned Community or Multi-Use Service (NPS)

Boundaries

- Triennial Master Plan Grid
- Urban Rural Demarcation Line
- Metropolitan District





Baltimore County Sewerage Plan



2020 Triennial Review Map S-11A

Maryland State Plane Coordinate System
North American Datum 1983 HARN, U.S. Survey Foot

Produced by Baltimore County, Department of Public Works
Published August 2020

System Facilities

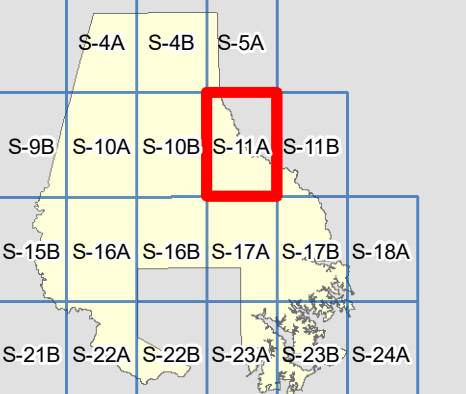
- Grinder Pump
- Pump Station
- Force Mains
- Gravity Mains 12" and Greater
- Low Pressure Mains

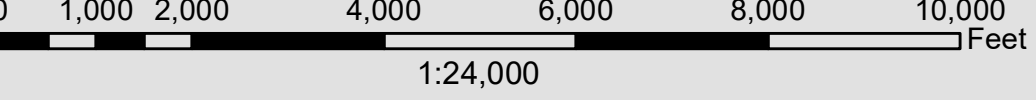

Sewerage Plan Area Designations

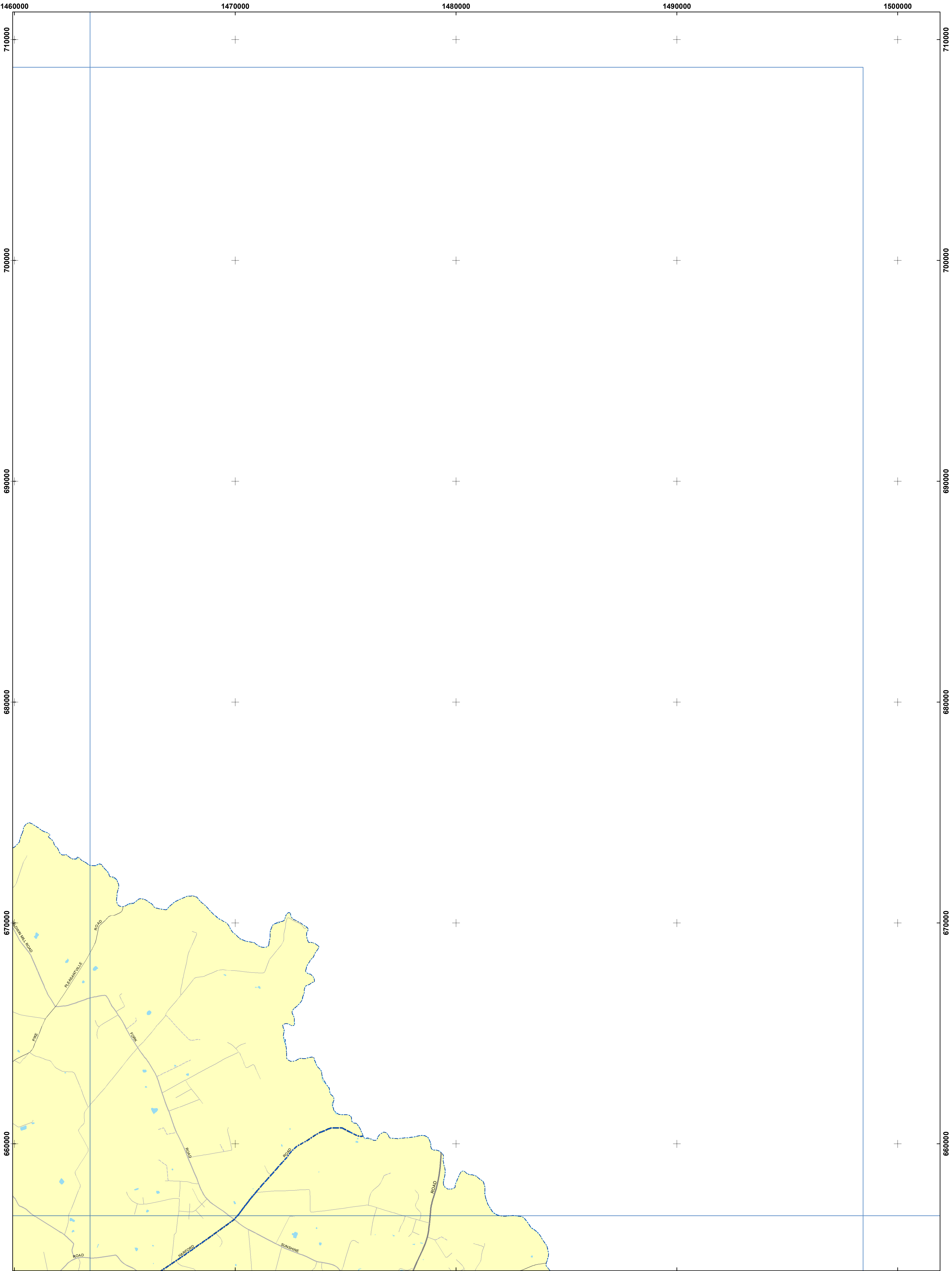
| | |
|-----------------------------|---|
| S-1 Existing Service Area | S-6 Area of Future Consideration |
| S-3 Capital Facilities Area | S-7 CS No Planned Service: Community System |
| S-4 Study Area | S-7 MU No Planned Service: Multi-Use System |
| S-5 Master Plan Area | S-7 No Planned Community or Multi-Use Service (NPS) |
| S-5 X Master Plan Area | |

Boundaries

- Triennial Master Plan Grid
- Urban Rural Demarcation Line
- Metropolitan District







Baltimore County Sewerage Plan



2020 Triennial Review Map S-11B

Maryland State Plane Coordinate System
North American Datum 1983 HARN, U.S. Survey Foot
Produced by Baltimore County, Department of Public Works
Published August 2020

System Facilities

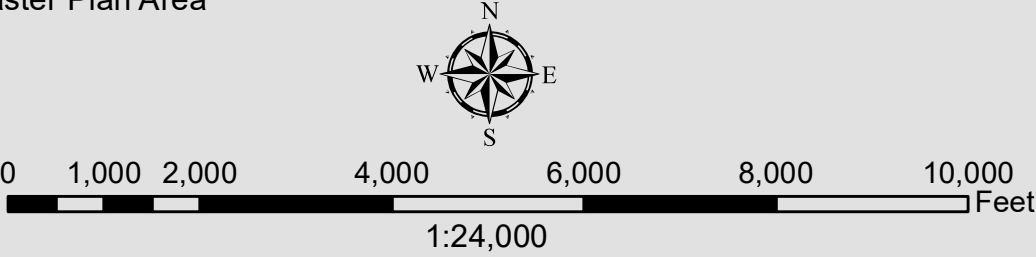
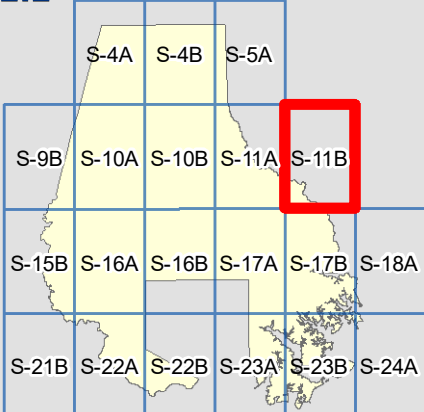
- Grinder Pump
- Pump Station
- Force Mains
- Gravity Mains 12" and Greater
- Low Pressure Mains

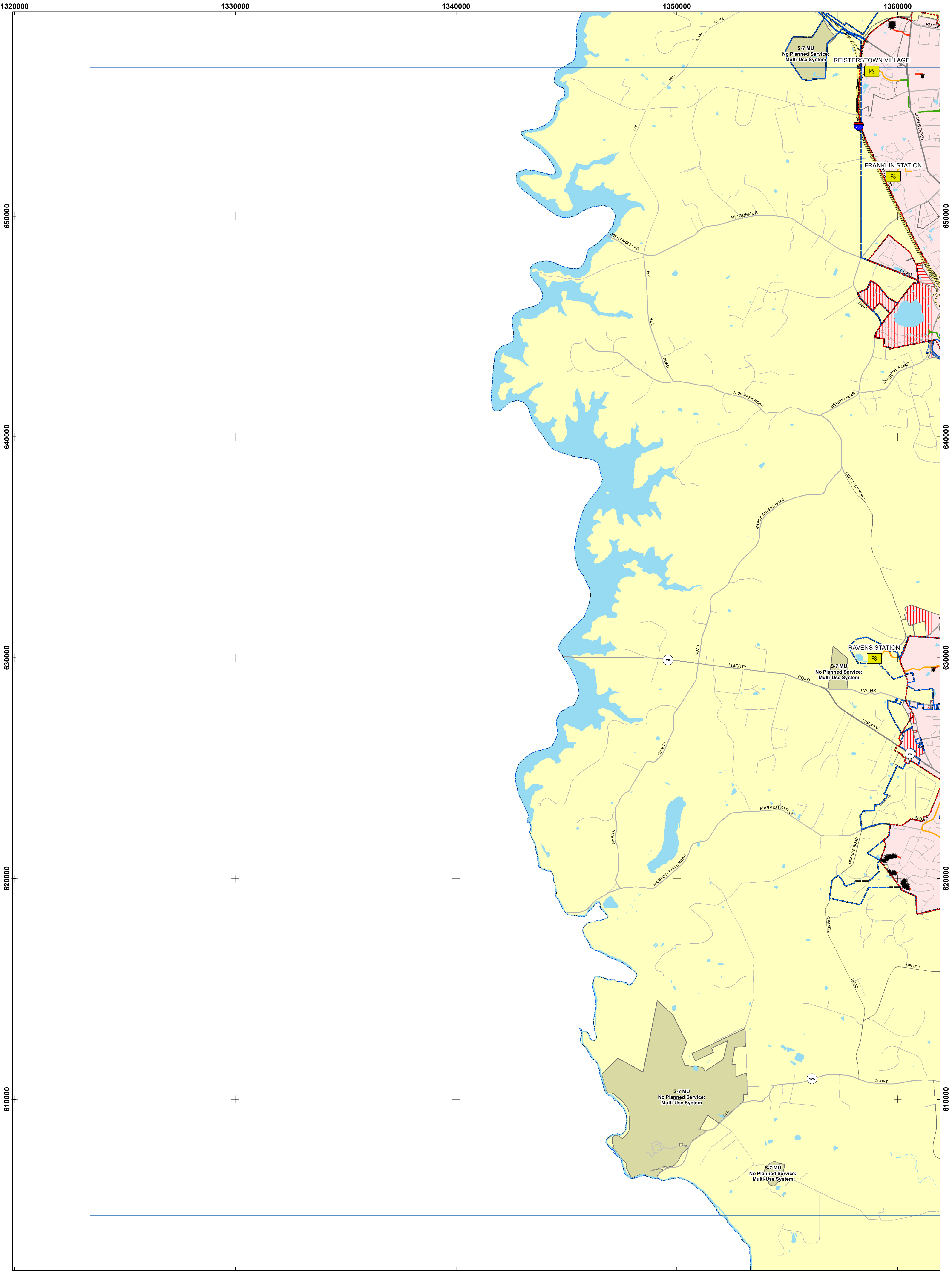
Sewerage Plan Area Designations

- S-1 Existing Service Area
- S-3 Capital Facilities Area
- S-4 Study Area
- S-5 Master Plan Area
- S-5 X Master Plan Area
- S-6 Area of Future Consideration
- S-7 CS No Planned Service: Community System
- S-7 MU No Planned Service: Multi-Use System
- S-7 No Planned Community or Multi-Use Service (NPS)

Boundaries

- Triennial Master Plan Grid
- Urban Rural Demarcation Line
- Metropolitan District





Baltimore County Sewerage Plan



2020 Triennial Review Map S-15B

Maryland State Plane Coordinate System
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Published August 2020

System Facilities

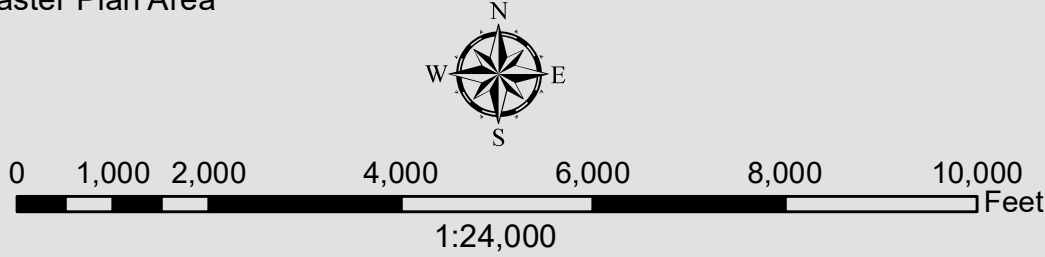
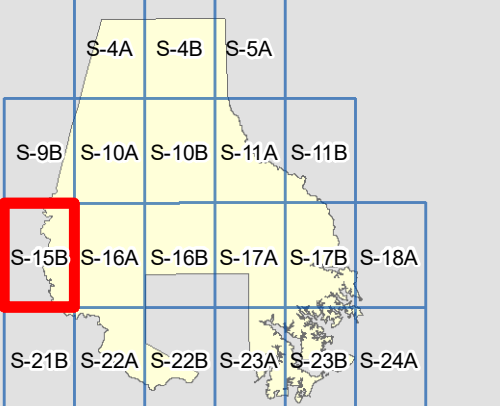
- Grinder Pump
- Pump Station
- Force Mains
- Gravity Mains 12" and Greater
- Low Pressure Mains

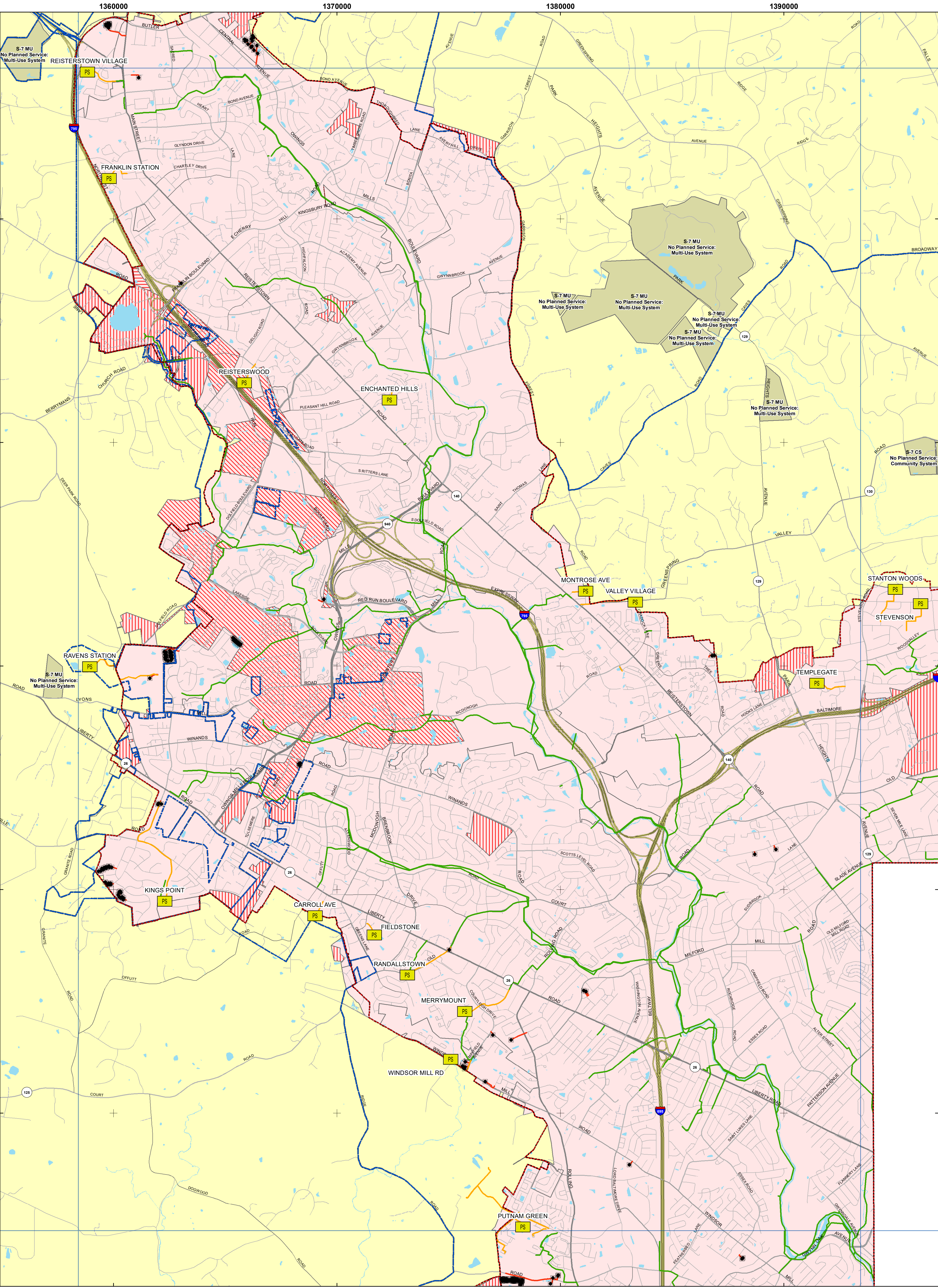
Sewerage Plan Area Designations

- S-1 Existing Service Area
- S-3 Capital Facilities Area
- S-4 Study Area
- S-5 Master Plan Area
- S-5 X Master Plan Area
- S-6 Area of Future Consideration
- S-7 CS No Planned Service: Community System
- S-7 MU No Planned Service: Multi-Use System
- S-7 No Planned Community or Multi-Use Service (NPS)


Boundaries

- Triennial Master Plan Grid
- Urban Rural Demarcation Line
- Metropolitan District





Baltimore County Sewerage Plan



2020 Triennial Review Map S-16A

Maryland State Plane Coordinate System
North American Datum 1983 HARN, U.S. Survey Foot

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Published August 2020

System Facilities

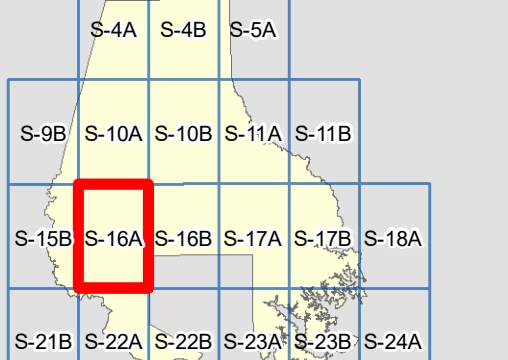
- Grinder Pump
- Pump Station
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- Gravity Mains 12" and Greater
- Low Pressure Mains

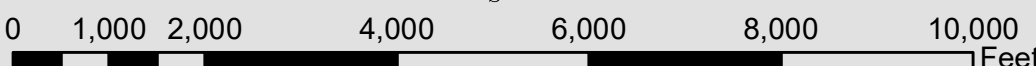

Sewerage Plan Area Designations

| | |
|-----------------------------|---|
| S-1 Existing Service Area | S-6 Area of Future Consideration |
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| S-5 X Master Plan Area | |

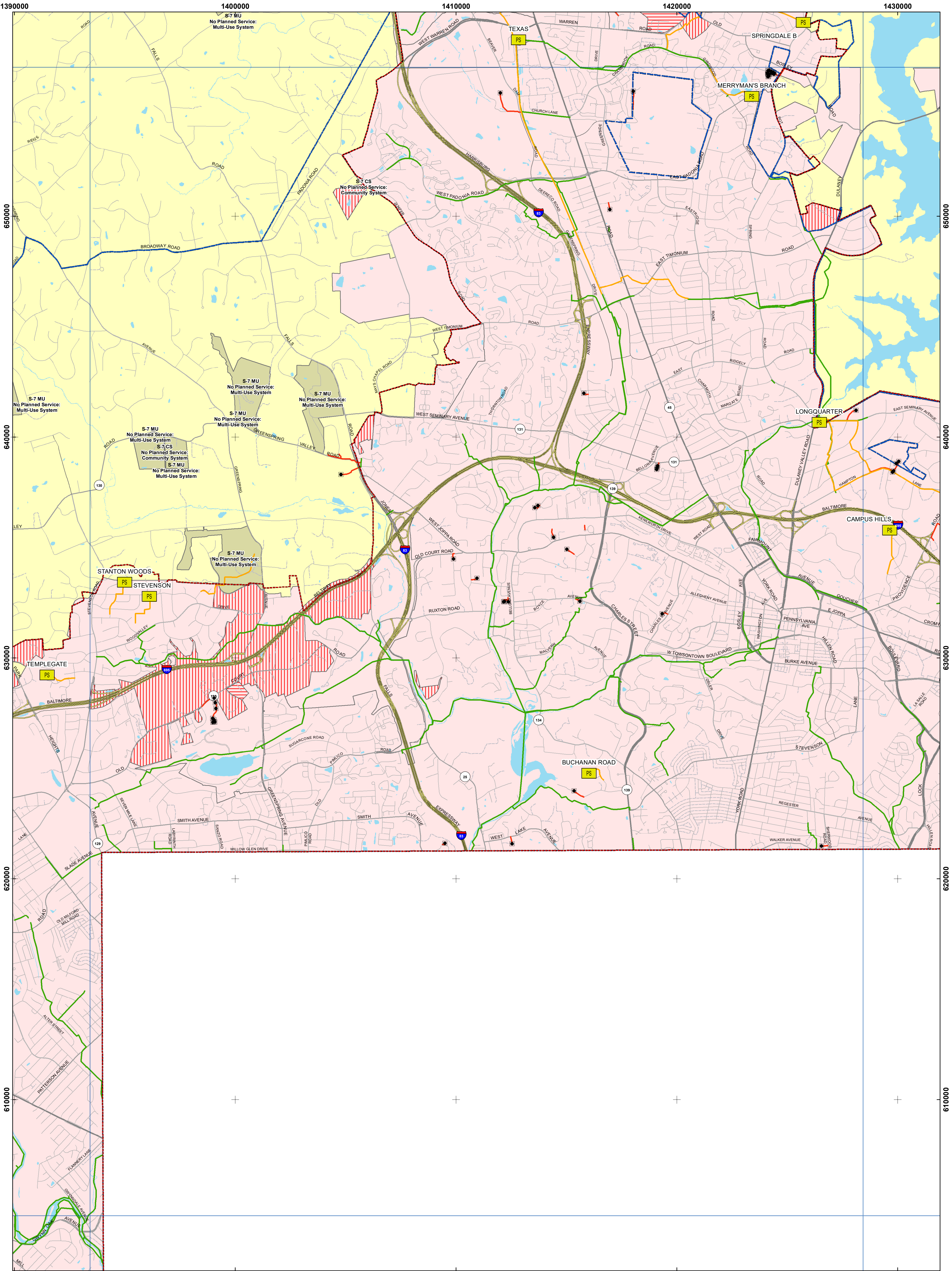
Boundaries

- Triennial Master Plan Grid
- Urban Rural Demarcation Line
- Metropolitan District






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Baltimore County Sewerage Plan



2020 Triennial Review Map S-16B

Maryland State Plane Coordinate System
North American Datum 1983 HARN, U.S. Survey Foot
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Published August 2020

System Facilities

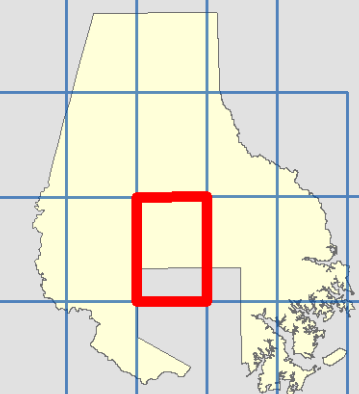
- Grinder Pump
- Pump Station
- Force Mains
- Gravity Mains 12" and Greater
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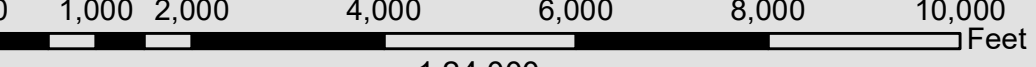

Sewerage Plan Area Designations

| | |
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| S-1 Existing Service Area | S-6 Area of Future Consideration |
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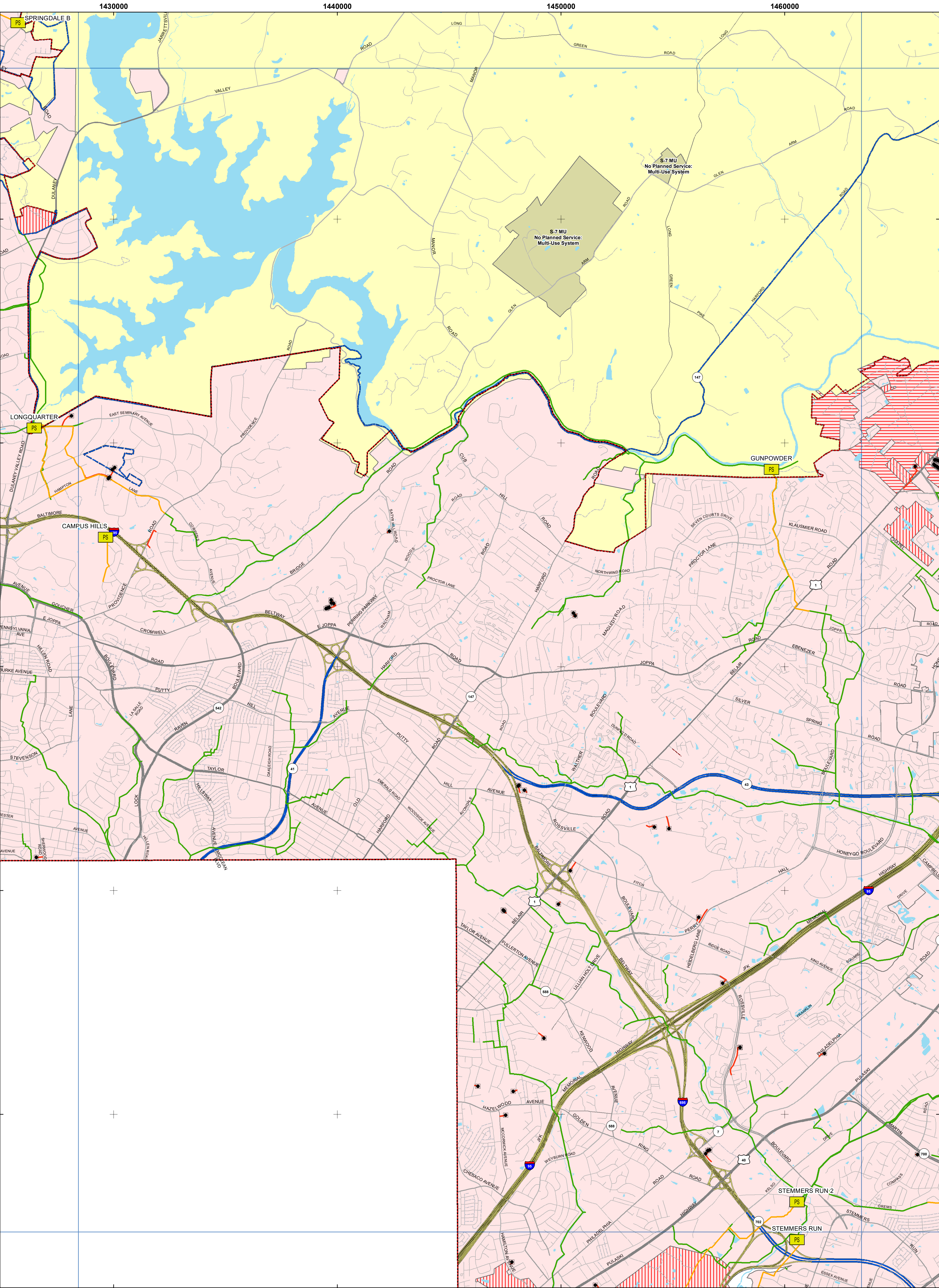
Boundaries

- Triennial Master Plan Grid
- Urban Rural Demarcation Line
- Metropolitan District





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Baltimore County Sewerage Plan



2020 Triennial Review Map S-17A

Maryland State Plane Coordinate System
North American Datum 1983 HARN, U.S. Survey Foot
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System Facilities

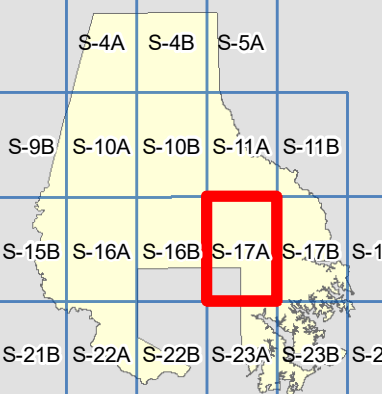
- Grinder Pump
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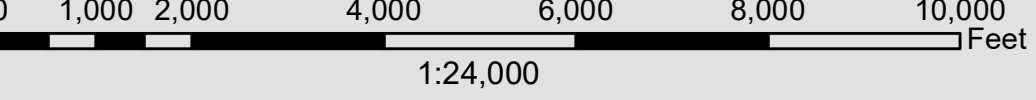

Sewerage Plan Area Designations

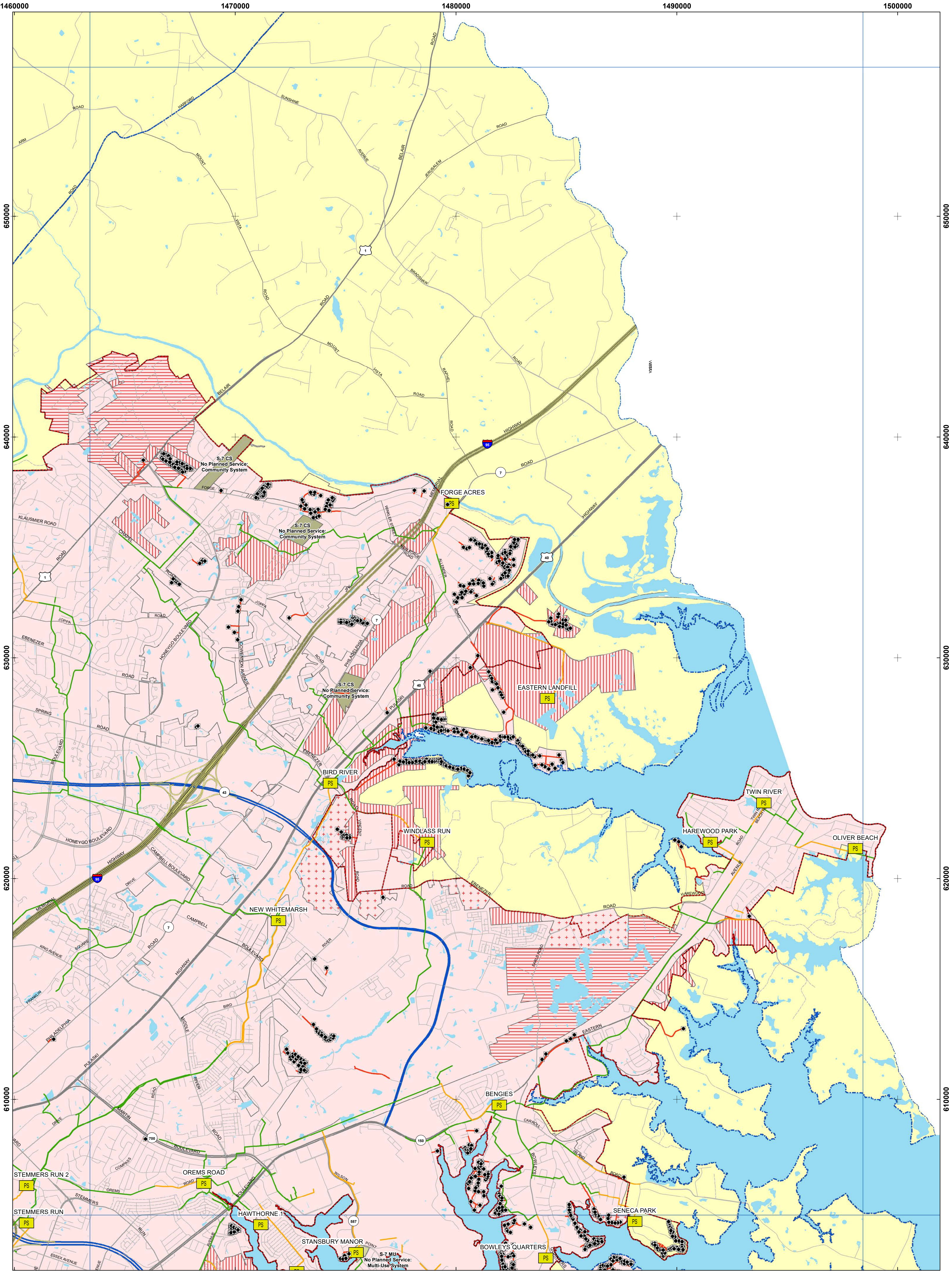
| | |
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| S-1 Existing Service Area | S-6 Area of Future Consideration |
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Boundaries

- Triennial Master Plan Grid
- Urban Rural Demarcation Line
- Metropolitan District







Baltimore County
Sewerage Plan



2020 Triennial Review
Map S-17B

Maryland State Plane Coordinate System
North American Datum 1983 HARN, U.S. Survey Foot

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Published August 2020

System Facilities

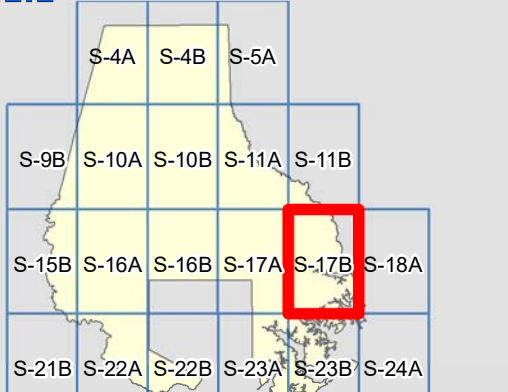
- Grinder Pump
- Pump Station
- Force Mains
- Gravity Mains 12" and Greater
- Low Pressure Mains


Sewerage Plan Area Designations

- S-1 Existing Service Area
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Boundaries

- Triennial Master Plan Grid
- Urban Rural Demarcation Line
- Metropolitan District



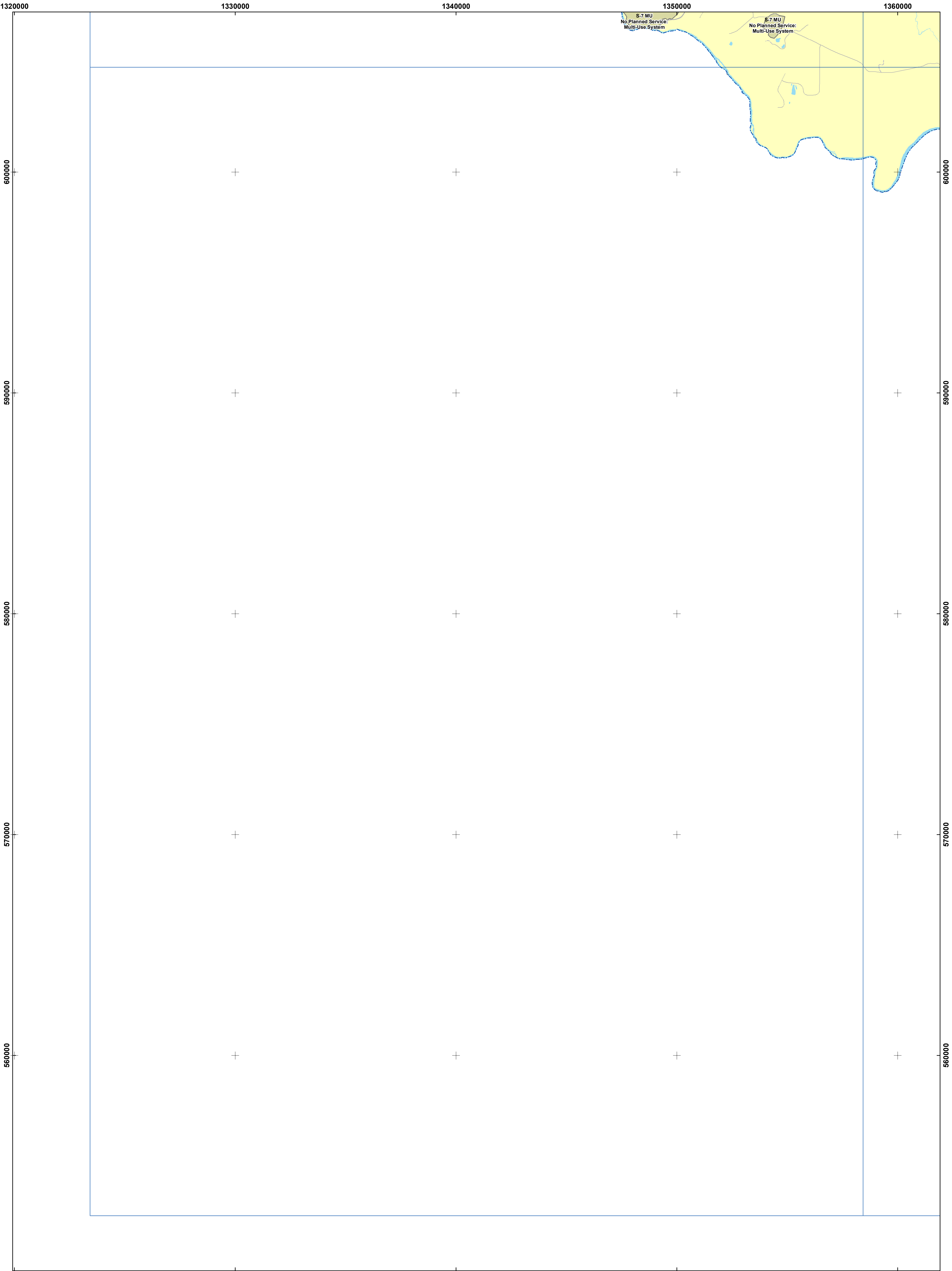


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Feet

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Map 13 of 20



Baltimore County Sewerage Plan



2020 Triennial Review Map S-21B

Maryland State Plane Coordinate System
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Published August 2020

System Facilities

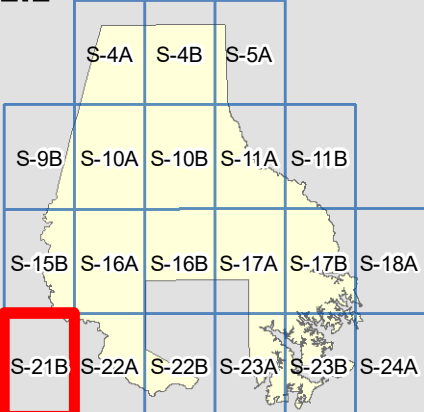
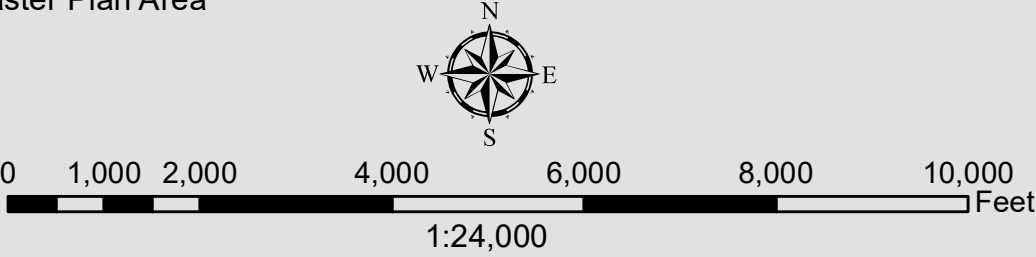
- Grinder Pump
- Pump Station
- Force Mains
- Gravity Mains 12" and Greater
- Low Pressure Mains

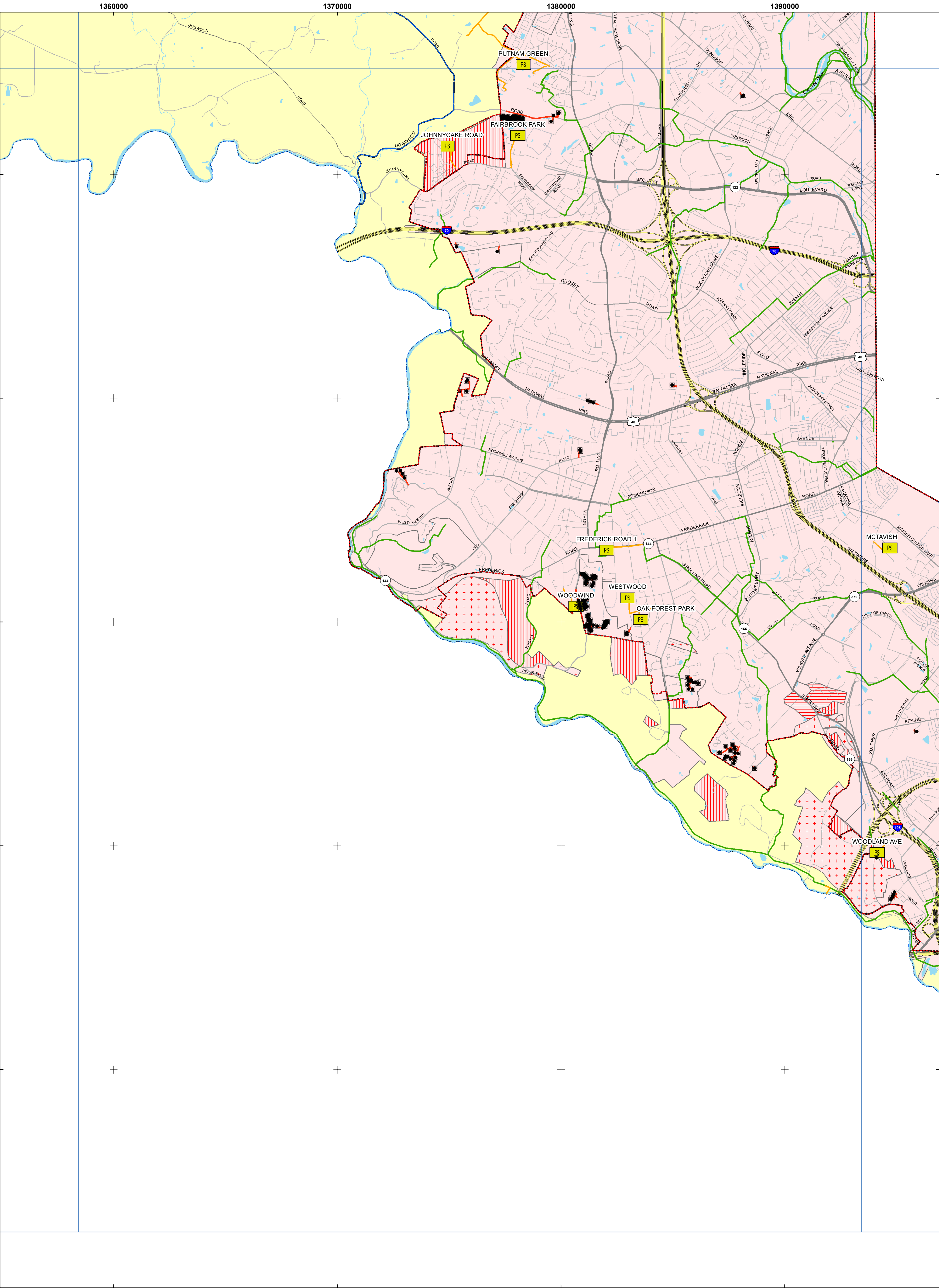
Sewerage Plan Area Designations

- S-1 Existing Service Area
- S-3 Capital Facilities Area
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Boundaries

- Triennial Master Plan Grid
- Urban Rural Demarcation Line
- Metropolitan District





Baltimore County Sewerage Plan



2020 Triennial Review Map S-22A

Maryland State Plane Coordinate System
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System Facilities

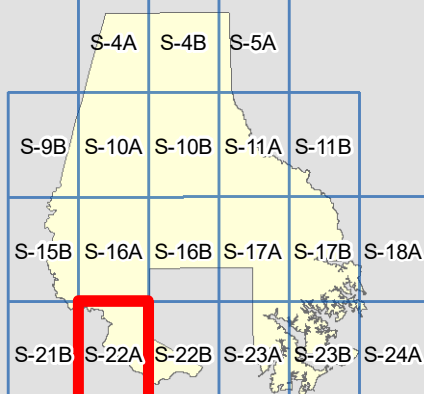
- Grinder Pump
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- Gravity Mains 12" and Greater
- Low Pressure Mains

Sewerage Plan Area Designations

| | |
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Boundaries

- Triennial Master Plan Grid
- Urban Rural Demarcation Line
- Metropolitan District

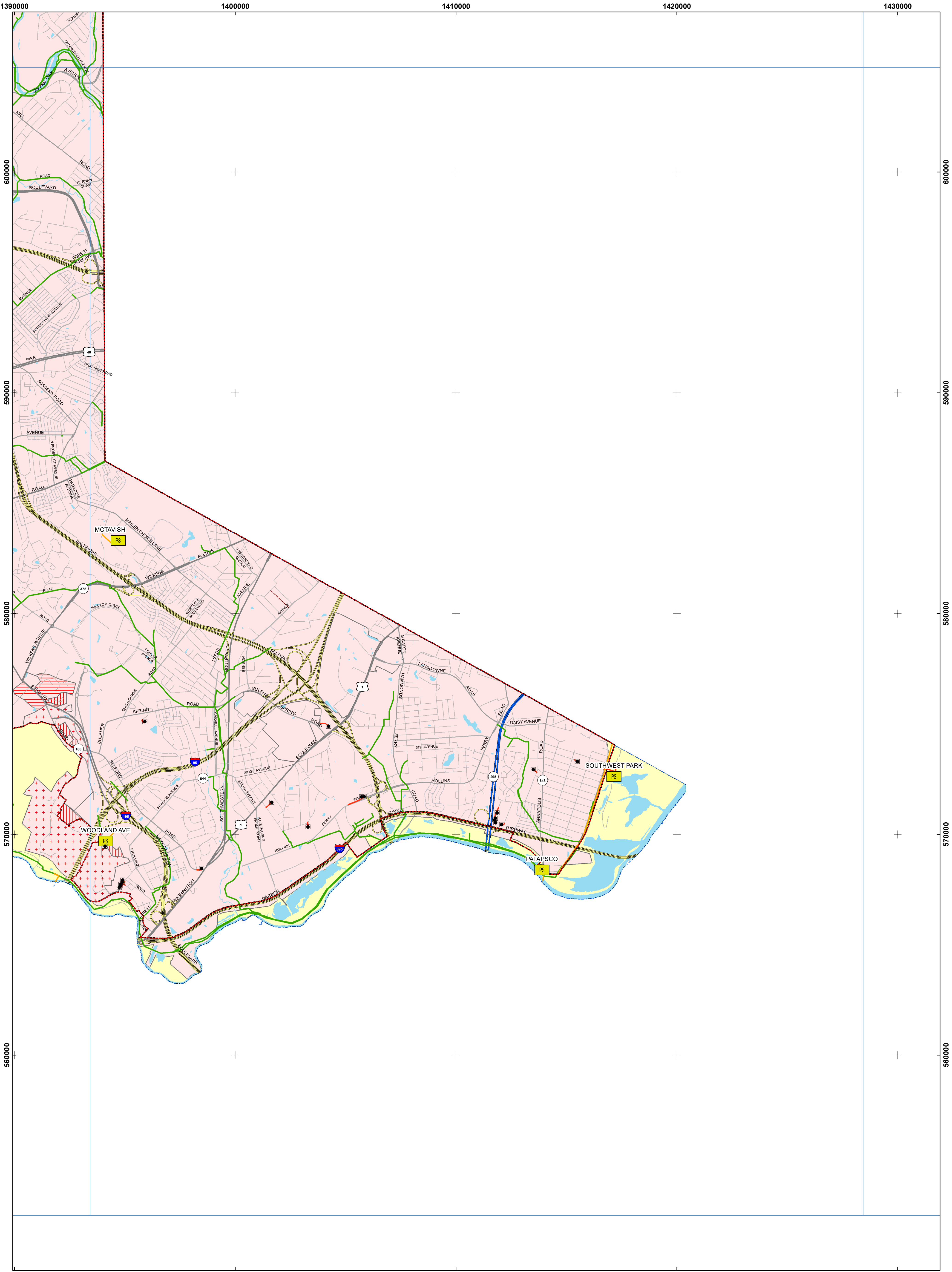


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Feet

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Baltimore County Sewerage Plan



2020 Triennial Review Map S-22B

Maryland State Plane Coordinate System
North American Datum 1983 HARN, U.S. Survey Foot
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Published August 2020

System Facilities

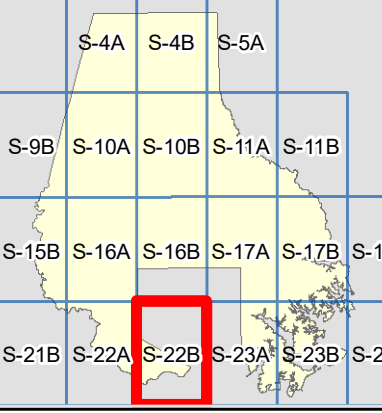
- Grinder Pump
- Pump Station
- Force Mains
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- Low Pressure Mains

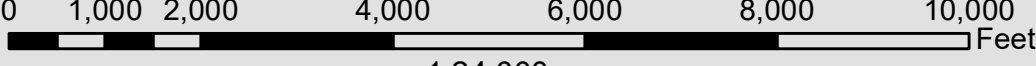

Sewerage Plan Area Designations

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Boundaries

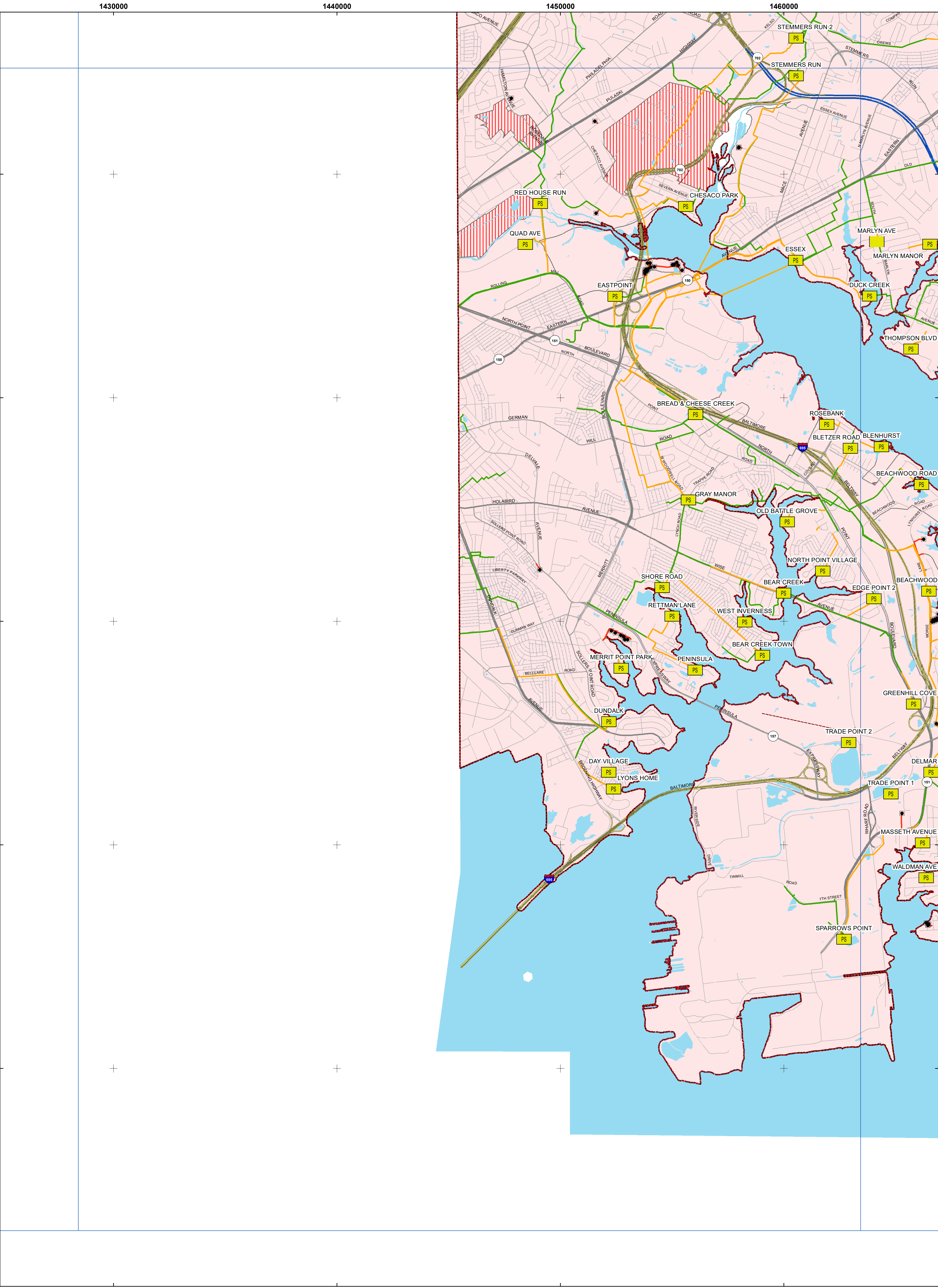
- Triennial Master Plan Grid
- Urban Rural Demarcation Line
- Metropolitan District






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Map 17 of 20



Baltimore County Sewerage Plan



2020 Triennial Review Map S-23A

Maryland State Plane Coordinate System
North American Datum 1983 HARN, U.S. Survey Foot
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Published August 2020

System Facilities

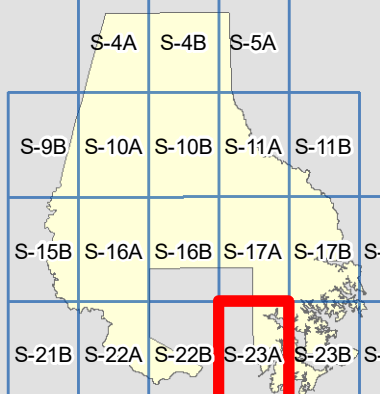
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Sewerage Plan Area Designations

| | | | | |
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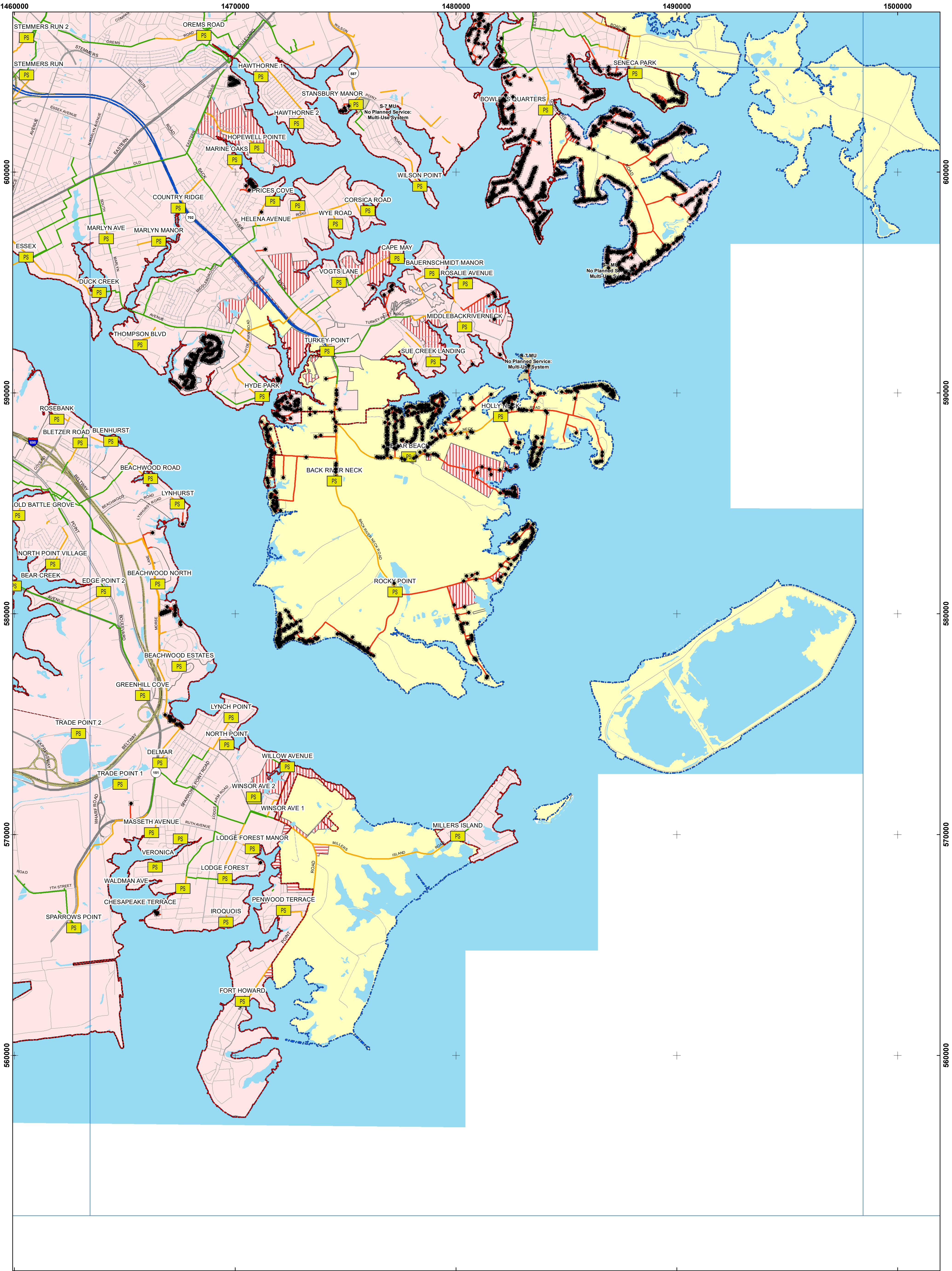
Boundaries

- Triennial Master Plan Grid
- Urban Rural Demarcation Line
- Metropolitan District




0 1,000 2,000 4,000 6,000 8,000 10,000 Feet

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Baltimore County Sewerage Plan



2020 Triennial Review Map S-23B

Maryland State Plane Coordinate System
North American Datum 1983 HARN, U.S. Survey Foot

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Published August 2020

System Facilities

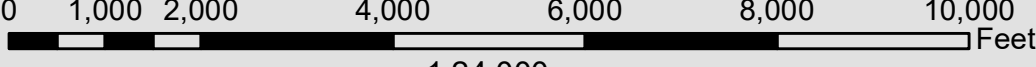

- Grinder Pump
- Pump Station
- Force Mains
- Gravity Mains 12" and Greater
- Low Pressure Mains

Sewerage Plan Area Designations

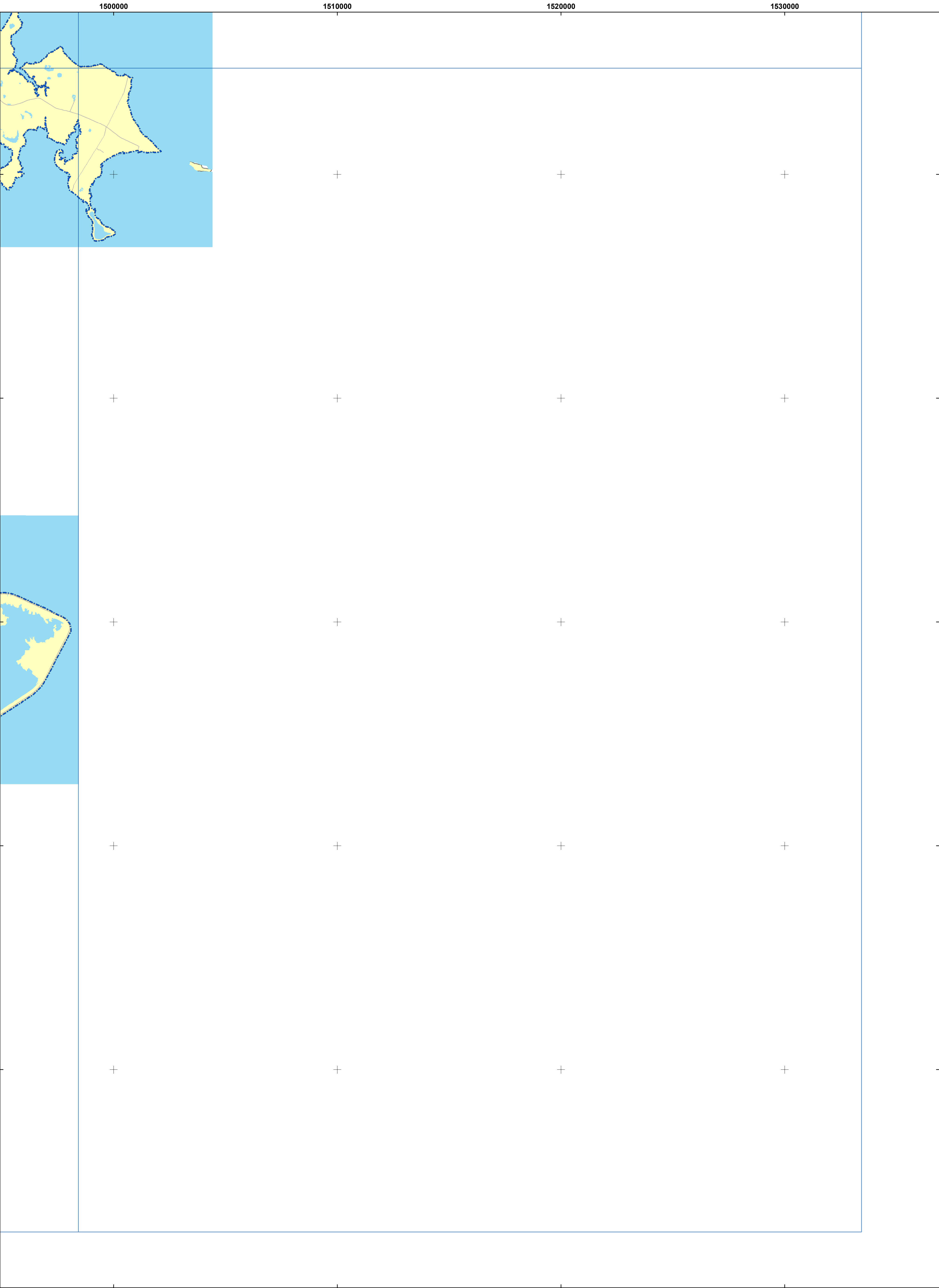
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Boundaries


- Triennial Master Plan Grid
- Urban Rural Demarcation Line
- Metropolitan District



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Baltimore County Sewerage Plan



2020 Triennial Review Map S-24A

Maryland State Plane Coordinate System
North American Datum 1983 HARN, U.S. Survey Foot
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System Facilities

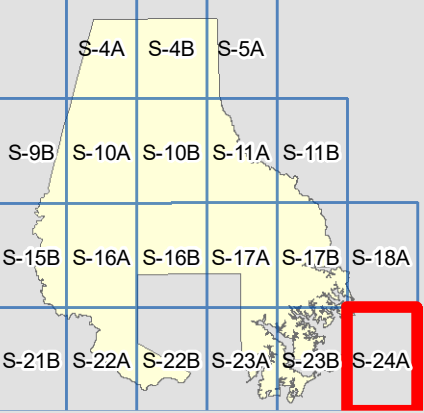
- Grinder Pump
- Pump Station
- Force Mains
- Gravity Mains 12" and Greater
- Low Pressure Mains

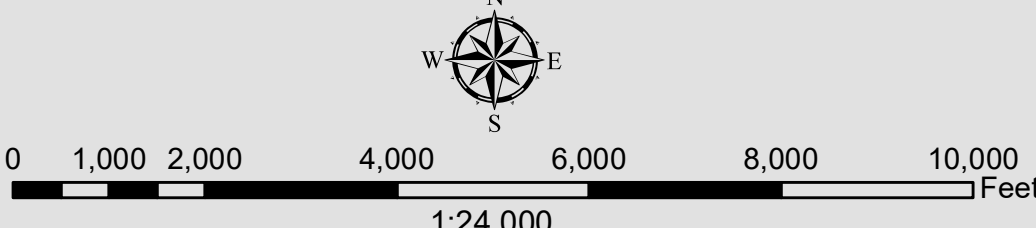
Sewerage Plan Area Designations

- S-1 Existing Service Area
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Boundaries

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- Urban Rural Demarcation Line
- Metropolitan District





0 1,000 2,000 4,000 6,000 8,000 10,000 Feet
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