

#### **4.7.6 Annapolis Sewer Service Area No. 6**

##### **4.7.6.1 General Description (See Figure 4-13)**

The Annapolis sewer service area includes the City of Annapolis and the surrounding area. It is generally bounded by the Severn River, the Chesapeake Bay, South River and Route 50. The southern boundary extends beyond the South River to include the Woodland Beach and Sylvan Shores drainage areas. The northwestern boundary extends north of Route 50 to include the Bacon Ridge Branch Watershed. The boundaries are shown on Master Plan Maps S-6 through S-9. The service area encompasses 18,336 acres, of which 4,542 acres fall within the City of Annapolis. The Annapolis area is heavily oriented to water-related recreation and commercial ventures. Other than the City itself, other urbanized areas include the Parole Growth Management Area and the MD Route 2 corridor in Edgewater. There are approximately 1,580 acres of vacant land within the County portion of the service area that are programmed for public sewer service. According to the County's General Development Plan (GDP) and the adopted Edgewater/Mayo and Crownsville Small Area Plans, a majority of the land in the County portion of the SSA (excluding City of Annapolis) is designated for low density residential use, with smaller portions planned for low-medium residential and rural uses. Two areas within the service area are designated as Commercial Revitalization Areas. These are the Parole Town Center and the Mayo Road commercial corridor. The Parole Growth Management Area is planned for a mix of retail and office uses, regional commercial services, higher density residential uses, and multimodal transportation facilities. The City of Annapolis is primarily developed. However, redevelopment of property and several annexations from the County have occurred in recent years. Future development will be primarily from infill of single family homes and redevelopment of commercial properties. West Street (MD450) has been targeted as a revitalization corridor. There are seven privately owned systems located within the Annapolis SSA. These systems are listed in Table 4- 4 (located at the back of this chapter) and depicted on the adopted Master Plan Maps.

4-53

## **Table 4 - 17**

### **Annapolis Sewer Service Area # 6**

#### **10.0 MGD Treatment Capacity**

##### I. Existing Capacity

- A. Capacity of Annapolis WRF 10.000
- B. Existing Average Daily Flow (24 Month Average) 8.010
- C. Remaining Capacity 1.990

##### II. Allocated Capacity

- D. Anne Arundel County Capacity Reserved by Allocation 0.445
- E. Annapolis City Capacity Reserved by Allocation 0.068
- F. Remaining Capacity for Allocation (F=C-D-E) 1.477

##### III. Projected Vacant Land Capacity (see Note 1)

- G. Vacant Land Development Potential 0.780
- H. Remaining Capacity (H=F-G) 0.697

##### IV. Redevelopment and Point Flow Sites:

Parole 0.604

Dreams Landing and Ridgley Ave. Medical Ctr. 0.13

Edgewater Commercial 0.431

Infill of Existing Lots of Record 0.400

Remainder of existing development within Planned Service Areas 0.179

City of Annapolis 1.000

Sub-Total: 2.744

TOTAL DEMAND -2.047

##### V. Capacity Expansion Required 2.050 MGD (**See note 2**)

Notes: **1.** Based on current zoning of vacant developable land and buildable lots within the Existing and Planned Service Categories minus the capacity reserved by allocation.

**2.** Previous plans included the estimated flows of 600,000 gallons from David Taylor. This area has been removed from the Annapolis SSA and will be treated at the existing facility at the Naval Station.

4-54

A consent order has been issued by the Maryland Department of the Environment (MDE) against the

Weems Creek Medical Center for posing public health and environmental problems due to a failing

septic system. A private single use sewer line and pumping station are proposed to resolve this problem.

**The Dreams Landing community located along the Severn River, is presently served by a private**

**wastewater collection and treatment system. In response to a petition, the County has initiated a**

**Capital Project to investigate construction of gravity sewers, a pump station and a force main to**

**collect and transport wastewater from this area into the Annapolis WRF collection system. The**

**community petitioned the County for sewer service in order to abandon their existing private facility.**

**Capital Project S-7922 was approved in the County's FY99 CIP.**

#### **4.7.6.2 Projected Population Growth and Flows**

Population within the service area is projected to increase to approximately 83,000 residents by the year 2025. Planned growth in the area will occur mostly in the Parole and Edgewater areas. Parole is designated to receive commercial and mixed use development in the future. Edgewater will realize the buildout of the South River Colony planned development, development on part of the Lee property, and in the area of Pike Ridge Road.

The allowable and unused capacity for the Annapolis Service Area is listed in Table 4-17.

#### **4.7.6.3 Water Reclamation Facility**

Sewage from the service area is collected and conveyed to the Annapolis Water Reclamation Facility (WRF) located off Edgewood Road in the City of Annapolis. This facility utilizes an activated sludge process providing nitrification/de-nitrification. Since the BNR upgrade completed in 2001, the facility has been able to meet its permit requirements with an average effluent TN of 6.9 mg/L and an average effluent TP of 0.54 mg/L. To meet the effluent TN Alimit@ goal of 3.0 mg/L at the expanded capacity of 13 MGD, significant capital improvements are required. There is sufficient space on site to increase the total capacity of the facility to as much as 17.5 MGD if necessary. By Agreement, the treatment facility is jointly owned by the City of Annapolis and Anne Arundel County. However, Anne Arundel County is responsible for operation and maintenance of the plant.

The treatment facility has a rated capacity of 10.0 MGD. As of December 2001 an average daily flow of 7.9 MGD is received at the plant. Approximately 5.2 MGD is received from the City of Annapolis and 2.7 MGD from the County. Both jurisdictions have their own collections systems and incoming connections to the facility, which are metered.

The effluent from the facility is discharged to the Severn River. The plant contains a 10 million gallon emergency storage basin on-site.

The 1970 agreement also included that an expansion to as much as 20 MGD would be required by the year 2000 to meet the projected flow estimates. Although that earlier projection was not reached by the year 2000, the 1998 flow projections summarized in Table 4-17 clearly indicate that a capacity

expansion of at least 2.1 MGD is needed to serve planned growth. A new agreement has been

4-55

executed to address capacity requirements for each jurisdiction. Under this agreement, the proposed

flow split at the Annapolis WRF will be 6.3 MGD for Anne Arundel County and 6.7 MGD for the

City of Annapolis. An application has been submitted to the State of Maryland to increase the rated

capacity of the Annapolis WRF to 13 MGD.

#### **4.7.6.3.1 Strategic Plan for Infrastructure Expansion**

Anne Arundel County has begun work on a Comprehensive Sewer Strategic Plan that consists of a

two-phase approach for planning future modifications and expansion of the County's existing

wastewater collection and treatment system.

The first phase of the study started in June 2002. The County's wastewater treatment plants are being

evaluated on a number of criteria including the States anticipated effluent total nitrogen discharge

goals and other future discharge permit requirements, capacity of the receiving water body, and

constraints imposed by the location of each facility. Based on this information the maximum possible

expansion of the treatment plants will be determined.

The second phase of the study will evaluate how to expand or modify the existing wastewater

conveyance system to route flow toward treatment plants with the most available capacity to

accommodate to growth in a cost effective manner.

This project is designed to project ultimate build-out in the sewer service area using existing zoning

and land use, to define existing and future pump station drainage areas, and prepare a strategic

infrastructure plan to be implemented to meet these future flows. Included in this planning effort is

sizing of gravity interceptors, pump stations, and force mains necessary to convey these flows to the

Annapolis WRF. The results of this project will be foundation of the Master Plan for this Service

Area and will be utilized as a guideline for directing development constructed infrastructure and

planning of capital projects.

#### **4.7.6.4 Pumping Station, Collection, and Conveyance Systems**

The inventory of the City of Annapolis owned and operated pump stations is included in Table 4-18

and a schematic of the relationship between pump stations and the connecting infrastructure (pressure and gravity) is provided in Figure 4-14. The City owned and operated collection system within the SSA consists of a network of gravity collectors and force mains and includes 22 sewer pumping stations. The system serves approximately 98% of the City. Flows from the United States Naval

Academy pass through the City collection system before reaching the Annapolis WRF. A list of County pump stations is also included in Table 4-18 and a schematic of the relationship

between pump stations and the connecting infrastructure (pressure and gravity) is provided in Figure

4-15. The inventory of this infrastructure within the SSA includes the following:

\_\_\_ 59 sewer pump stations

\_\_\_ 124 miles of gravity mains ranging from 4 to 24 inches in diameter

\_\_\_ 6 miles of pressure collectors (grinder pump systems) ranging from 1.5 to 3 inches in diameter

4-56

\_\_\_ 39 miles of force mains ranging in size from 4 to 30 inches in diameter

\_\_\_ Approximately 10,705 connections

The integral backbone of the County's portion of the Annapolis service area conveyance system is a

30-inch diameter manifold force main that conveys sewage from the Parole sewer pump station to the

Annapolis WRF. Manifold force mains add complexity to the system as head conditions are affected

by the discharge rates of the other connected pump stations.

The highest elevation point on this force main is located on Forest Drive between Martha Court and

Thorn Drive. Hunt Meadows SPS (owned by City of Annapolis) discharges its flow upstream of this

high point. A large area of developable land lies along Forest Drive. Although the Master Plan

indicates planned service for the majority of these properties between Bywater Road and Hillsmere

Drive, this

area is currently not served. Development in this area would require comprehensive planning to

designate drainage areas that could be served by pump stations designed and constructed to discharge

against the head conditions of Parole and Hunt Meadows pump stations. The remaining drainage

areas discharging on the gravity side of the 30-inch diameter force main would therefore not require

as extensive planning.

4-57

**Table 4-18**

**Annapolis Sewer Service Area**

**Inventory of Pump Stations**

**STATION NAME OWNER ADDRESS/LOCATION MASTER OPERATING A.A. COUNTY**

**Design**

**PLAN MAP STATION ID Capacity**

**MAP 200/40 NUMBER (MGD)**

Admiral Drive City of Annapolis Admiral Drive S-7 N/A N/A 0.500  
Annapolis Roads Apts. City of Annapolis Lake Heron Drive S-7 N/A N/A 0.040  
Awald Road City of Annapolis Awald Road S-9 N/A N/A 0.090  
Baywoods City of Annapolis Private S-9 N/A N/A 0.050  
Bay Front Drive City of Annapolis Bay Front Drive S-9 N/A N/A 0.060  
Belmont City of Annapolis Edgewood Road S-9 N/A N/A 2.200  
Boucher Avenue City of Annapolis Boucher Avenue S-9 N/A N/A 0.050  
Bristol Drive City of Annapolis Bristol Drive S-7 N/A N/A 0.125  
Bywater Estates City of Annapolis Bywater Road S-9 N/A N/A 0.150  
Fairfax Road (Parole) City of Annapolis Fairfax Road S-7 N/A N/A 0.110  
Hanover Street City of Annapolis Hanover Street S-7 N/A N/A 0.040  
Hunt Meadows City of Annapolis Harness Court S-9 N/A N/A 0.220  
Newtown City of Annapolis Newtown Road S-9 N/A N/A 0.160  
Porter Road City of Annapolis Porter Road S-7 N/A N/A 0.050  
President Point #1 City of Annapolis President Point Drive S-7 N/A N/A 0.040  
President Point #2 City of Annapolis President Point Drive S-7 N/A N/A 0.040  
Second Street City of Annapolis Second Street S-7 N/A N/A 5.000  
Smith Avenue City of Annapolis Smith Avenue S-7 N/A N/A 0.600  
Sumner Road City of Annapolis Sumner Road S-7 N/A N/A 0.110  
Truxtun Park City of Annapolis Truxtun Park Road S-9 N/A N/A 0.200  
Wardour City of Annapolis Wardour Drive S-7 N/A N/A 0.040  
West Annapolis City of Annapolis Shiley Street S-7 N/A N/A 0.050  
Whiton Court City of Annapolis Whiton Court S-9 N/A N/A 0.080  
Anchorage I County 518 Dale Drive S-9 U23A2 700120 0.450  
Anchorage II County 1152 Mainsail S-9 U22B2 700121 0.115  
Annapolis Landing (Tu County 3129 Stonehenge Dr. S-9 O23A4 700176 0.560  
Annapolis Roads County 1050 Bay Ridge Rd S-9 U22B3 700215 0.312  
Arundel on the Bay I County 1323 Magnolia Ave. S-9 V25A4 700132 0.787  
Arundel on the Bay II County 3500 Rockway Ave. S-9 V24C2 700130 0.165  
Arundel on the Bay III County 3311 Shore Cr. S-9 V24D2 700131 0.165  
Arundel on the Bay IV County 1319 Fishing Ck. Rd. S-9 V24C4 700129 0.165  
Arundel on the Bay V County 1256 Washington Dr. S-9 V24D3&4 700128 1.410  
Arundel on the Bay VI County 3337 Thomas Point Rd S-9 U24A1 700127 1.950  
Bay Ridge I County 28 Bay Drive S-9 V23B1 700055 1.275  
Bay Ridge II County 226 West Lake Dr. S-9 V22C2 700053 0.120  
Bay Ridge V County 69 Bay Dr. S-9 V23A2 700052 0.435  
Bay Ridge VI County 2 Bay Dr. S-9 V23B3 700056 0.512  
Bay Ridge VII County 148 West Lake Dr. S-9 V23A3 700054 0.191  
Bay Ridge VIII County 42 East Lake Cr. S-9 V22B2 700164 0.375  
Bay Ridge IX County 16 River Dr. S-9 W23D4 700165 0.413  
Bay View County 1836 Shore Dr. S-9 Q24A4 700092 1.725  
Bently Road County 1018 Shore Dr. S-9 Q23B2 700046 1.170  
Berkshire County 3094 Stratford Ct. S-9 O22B2 700151 0.126  
Broadcreek (DPW & L County 1 Truman Parkway S-7 P20A3 700226 0.063  
Cape St. John I County 298 Cape St John Rd S-9 P21B3 700136 0.864

4-58

**Table 4-18**

**Annapolis Sewer Service Area**

**Inventory of Pump Stations**

**STATION NAME OWNER ADDRESS/LOCATION MASTER OPERATING A.A.COUNTY Design**

**PLAN MAP STATION ID Capacity**

**MAP 200/40 NUMBER (MGD)**

Cape St. John II County 3001 Friends Rd. S-9 P22A4 700137 0.150  
Cape St. John III County 3033 Friends Rd. S-9 P22A3 700138 0.150  
Cape St. John IV County 2909 Poplar Trail S-9 P22A4 700139 0.240  
Cape St. John V County 2998 Dogwood trail S-9 P22A1 700140 0.150  
Cape St. John VI County 210 Cape St. John Rd. S-9 Q22D4 700141 0.159  
Cape St. John VII County 123 Islandview Dr. S-9 Q22D4 700142 0.160  
Chesapeake Harbor I (East) County 2111 Quarry Village Ct S-9 U22A1 700200 0.347  
Chesapeake Harbor II (West) County Beach Village Ct S-9 U21B2 700222 0.347  
General's Hwy (Sam's Club) County 2110 General Hwy S-7 Q19B2 700086 1.850  
Heritage Harbor I County 98 Mastline Dr. S-6 O20C4 700081 1.310  
Heritage Harbor II County 600 Coover Road S-7 O20B1 700080 1.680  
Highland Beach 1 County 1463 Chesapeake Ave. S-9 V24D1 700210 0.420  
Highland Beach 2 (Washington Ave.) County 1166 Bayhighland Dr. S-9 V23D3 700209 0.150  
Hillsmere I County 507 Beach Drive S-9 U23C4 700045 1.000  
Hillsmere II County 624 Greenspring Dr. S-9 T24A4 700157 0.240  
Hillsmere III County 131 E. Bayview Dr. S-9 U24D4 700158 0.450  
Hillsmere IV County 131 W. Bayview Dr. S-9 T24D2 700159 0.393  
Hillsmere V County 625 Deyman Dr. S-9 T24D1 700160 0.260  
Hillsmere VI County 614 Harbor Dr. S-9 T24A4 700161 1.058  
Hillsmere VII County 131 Kuethe Dr. S-9 U23C3 700083 0.490  
Holly Drive (South) County 1331 Holly Dr. S-9 Q23D1 700091 0.108  
Hoot Owl (Riva III) County 513 Hootowl Rd. S-9 O22B1 700082 1.000  
Jennifer Rd (Admiral Dr.) County 110 Jennifer Road S-7 R19B1 700258 2.150  
Krapish (Riva II) County 248 Riva Rd. S-9 P22D3 700076 0.285  
Loretta Heights County 36 Defence Street S-7 R20D4 700093 0.375  
Parole County 2446 Solomons Island Rd S-7 R20C4 700212 9.800  
Riva 2 (Truman Pkwy) County 161 Truman Parkway S-7 Q20D3 700089 1.600  
Riva Woods County 2733 Lury Ave S-9 P21A2 700172 0.425  
Riverview (Riva I) County 3087 Riverview Rd. S-9 P22C4 700078 0.105  
South River Colony County Monarch Dr. S-9 Q25D4 700294 0.130  
Sylvan Shores County 210 Poplar Road S-9 O22A3 700233 0.960  
Thomas Point I County 1536 Gordan Cove Dr. S-9 U25A1 700133 0.400  
Webster Place County 532 Shore Dr. S-9 Q23B1 700077 1.350  
Woodland Beach County 34 Mayo Rd. S-9 P23A2 700235 3.168  
Londontown Publik House Private Private No Plans S-9 R23D4 700272 Not Available

4-61

**4.7.6.5 Required Capital Improvements** (see Table 4-8 located in the back of this chapter)

With the ongoing development of South River Colony and the implementation of the Parole Town

Center Growth Management Plan an expansion of the plant is within the planning horizon. DPW has

initiated a Capital Improvement Project S-7924 to expand the plant from 10.0 MGD to 13.0 MGD.

The project is expected to be bid in fiscal year 2003. The expansion will be planned to meet the

demands anticipated from development projects within both the County and the City of Annapolis and

potential for addition of the United States Naval Station.

The Forest Drive Force Main was recently rehabilitated under Capital Improvement Project X-7388.

This concrete force main was severely deteriorated by hydrogen sulfide gas and had collapsed in several locations. This emergency project has repaired the pipeline and has restored system integrity.

The Woodland Beach Pump Station and force main capacity is being upgraded to meet current and

future peak capacity demands of the drainage area. An incremental approach has been used to upgrade

Woodland Beach Pump Station. Larger impellers were initially installed on the pumps, which

increased the capacity from 2.52 MGD to 3.17 MGD. Under capital project no. S-7884, the pump

station will be further upgraded from a peak capacity of 3.17 MGD to 4.2 MGD. These capital

facility upgrades are depicted on the Master Plan Map S-9. Structural limitations of the Route 2

South River Bridge will require a new force main be designed to go under the South River.

The owners of the Dreams Landing private collection and treatment system have submitted a petition

for County takeover. Design and construction of a pump station and force main to transfer sewage

from the community to the Annapolis WRF and abandonment of the existing private treatment plant

is planned and will be pursued under Project No. S-7922.

The Jennifer Road pump station will require upgrade to meet future development requirements.

Planned additions to the Anne Arundel Medical Center, as well as several subdivision projects have

precipitated the need for the pump station upgrade. The details of the upgrade requirements are being

evaluated as well as the developer responsibilities beyond the existing system expansion charges in

effect. Due to limitations at the Jennifer Road pump station, several options being considered are:

\$ Constructing a new pumping station in the vicinity of Jennifer Road SPS

\$ Diverting some future flows to the Generals Highway SPS

The Sylvan Shores pump station has been identified as requiring upgrades to meet sub-drainage flow

requirements in the future. A study is underway to determine capacity required.