Wastewater Management

Program Description

Fairfax County provides sewer service to its residents and businesses through a system of approximately 3,300 miles of sewer lines, 70 pumping stations, 57 metering stations, and one treatment plant owned and operated by the County. Additional treatment plant capacity is provided by contractual agreements with the District of Columbia Water (DC Water), Alexandria Renew Enterprises (AlexRenew), Arlington County, Upper Occoquan Service Authority (UOSA), Loudoun Water, Prince William County Service Authority, and Colchester Utilities.

Link to the Comprehensive Plan

Fairfax County's Comprehensive Plan, Public Facilities Element includes the countywide objectives 1-7, which apply to all facility types and the Wastewater Management objectives 34-35 as shown below:

- Provide public sewer in accord with the approved sewer service area and the Statement of Policy Regarding Sewage Disposal.
- Maintain a system of conveyance and treatment facilities that is responsive and compatible with the development and environmental goals of the county, and provide necessary renovations and improvements that will permit the entire system to function at a high level of efficiency.

Source: Fairfax County Comprehensive Plan, 2017 Edition; Policy Plan - Public Facilities, Amended through 5-7-2024

Program Initiatives

The current capital program generally supports the following County initiatives:

- Providing sufficient treatment plant capacity to ensure that projected residential and nonresidential growth can be accommodated over the planning period.
- Improving the effluent quality of County-owned and treatment by contract wastewater treatment facilities to comply with increasingly stringent discharge limitations, such as those mandated by the Chesapeake Bay Program.
- Ensuring a sufficient capital re-investment rate for the rehabilitation and replacement of existing County assets to ensure cost effective long-term operations and provision of adequate service levels.

Financing of the capital program for the sanitary sewer system has historically been derived from three sources: system revenues, the sale of revenue bonds, and grant funding. The County has generally used system revenues on a “pay as you go” basis to fund most capital improvements. This has been true for “recurring” capital projects, such as capital replacement and rehabilitation projects, extension and improvement (E&I) projects, and general system improvements. For major capital initiatives, such as system expansion and regulatory compliance projects, the County has funded the projects using sewer revenue bonds, payable solely from revenues of the Integrated Sewer System and hence not general obligations of Fairfax County. The County actively manages its outstanding debt, refinancing to take advantage of lower interest rates, or retiring debt to manage its debt coverage. While federal and state grants were extensively utilized to fund the construction programs of the 1970's and 1980’s, the financial burden of current programs fall heavily on the County due to scarcity of federal and state grant funds. The County has received limited state grant funding to help offset the cost of compliance with the Chesapeake Bay Program.

Approximately 95 percent of the System's revenues are derived from charges to new and existing customers through availability charges, base charges, and sewer service charges. New customers to the System are charged a one-time availability charge per new connection for access to the System. Existing customers pay sewer service charges, which are based upon the actual water consumption during the winter quarter, and base charges, which are assessed quarterly and provide for a more equitable rate structure by recovering a portion of the program's costs. Availability charges, base charges and sewer service charges are established by the Fairfax County Board of Supervisors. Since 1979, the Board has used the five-year financial projection of system expenses, revenues, and available cash balances to determine the appropriate level of availability charges and sewer service charges. The available cash balance reflects the projected sources and uses of funds by new and existing customers. The system allocates operating revenues and expenses, debt service and capital outlay between existing users and new users of the System. The remaining 5 percent of system revenues are derived primarily from sale of service to wholesale users such as Arlington County, Loudoun Water, the Cities of Fairfax and Falls Church, the Towns of Herndon and Vienna, and Ft. Belvoir.

The FY 2026 approved increases to both the Sewer Service Charge and Base Charge will change the annual average customer bill from $762.76 in FY 2025 to $807.60, a cost increase of $44.84 per year or 5.9 percent. The Sewer Service Charge will increase from $8.81 to $9.33 per 1,000 gallons of water consumed, based on Fairfax County's residential winter quarter average consumption of 16,000 gallons. The Base Charge will increase from $49.73 per quarter to $52.62 per quarter.

The County has issued sewer revenue bonds to provide funds for expanding treatment facility capacity at both County-owned and County-contracted facilities. Most recently, the County issued revenue bond debt for the following treatment plant expansions and upgrades:

- In April 2024, $125 million was issued in revenue bond debt to provide funds for additions, extensions and improvements to the Fairfax County's sewage collection, and treatment systems including the County's Noman M. Cole, Jr. Water Recycling Facility (NCWRF), paying capital improvement costs allocable to the County at other regional treatment facilities that provide service to the County and, if necessary, purchasing additional capacity.

In addition to this County-issued debt, as of June 30, 2024, the County is responsible for $209 million in debt to support the expansion and upgrade of the UOSA treatment plant. A regional facility, UOSA issues its own bonds that are used to finance the expansion and upgrade projects. The participating members of UOSA, (Fairfax County, Prince William County Service Authority, City of Manassas, and Manassas Park) are responsible for the debt service on the UOSA bonds based on capacity owned at the facility.

Looking to the future, a balance must be found between the following three major issues facing the integrated sewer system: (1) the necessity of maintaining high levels of water quality (including meeting more stringent nutrient limits), (2) maintaining capacity to accommodate growth within the County, and (3) achieving these two goals within financial resources. To a similar end, consideration must be given to inspecting, repairing, and maintaining the system at acceptable service levels. In most instances, annual expenditures for system upkeep will enable the County to avoid costly, major rehabilitation in the future.

Summary of Treatment Capacity Status and Sufficiency

Fairfax County's current treatment capacity is projected to be sufficient through 2045. The following summarizes the status of the County's treatment capacity.

Alexandria Renew Enterprises (AlexRenew)

The Cameron Run and Belle Haven watersheds and a portion of the City of Falls Church are served by the Alexandria treatment plant. The Alexandria plant is owned and operated by AlexRenew. Fairfax County is allotted 32.4 MGD of total capacity of 54 MGD. By activating the Braddock Road and Keene Mill Road pumping stations, the County has the capability to divert flow from the Accotink watershed (currently served by the Noman M. Cole Jr. Water Recycling Facility) to AlexRenew. These diversions will increase the County's wastewater management alternatives in the entire eastern portion of the County by off-loading flows from the NCWRF and Blue Plains Treatment Plant to the AlexRenew plant. As with other treatment plants in the area, additional facilities have been constructed at AlexRenew to enhance the removal of nitrogen using "State of the Art" technology. AlexRenew will be constructing new facilities to process wet weather flows during heavy storms to avoid sanitary sewer overflows. Fairfax County will be responsible for its pro rata share of these costs.

Arlington County Pollution Control Plant

The Arlington County pollution control plant serves the portion of Fairfax County within the Four Mile Run watershed. The plant has been upgraded to comply with the water quality standards for nitrogen removal and expanded to 40 MGD. The Arlington plant currently receives approximately 2.0 MGD of flow from Fairfax County. The County's contractual capacity is 3.0 MGD.

DC Blue Plains

With a current capacity of 370 MGD, the District of Columbia Water (DC Water) treatment plant at Blue Plains is the largest plant in the area. In addition to the District of Columbia, it treats flows from Maryland, Virginia, and several federal installations. Wastewater flows originating in the Sugarland Run, Horsepen Creek, Difficult Run, Scotts Run, Dead Run, Turkey Run, and Pimmit Run watersheds are treated at Blue Plains. Fairfax County is presently allocated 31 MGD at the plant. Blue Plains has gone through a major renovation of the chemical addition, nitrogen removal, and sludge disposal systems over the past several years. The County's flows to Blue Plains will be continually monitored to see if any additional capacity will be required at Blue Plains or from Loudoun Water; or if the diverting of flow from the Blue Plains service area with the Difficult Run Pump Station to the NCWRF service area will be sufficient to stay within the County's allocation of 31 MGD.

Noman M. Cole, Jr. Water Recycling Facility

The Noman M. Cole, Jr. Water Recycling Facility (NCWRF) serves the Accotink, Pohick, Long Branch, Little Hunting Creek, and Dogue Creek drainage basins. In addition to flows originating within the County, the plant also treats sewage from the City of Fairfax, Fort Belvoir, and part of the Town of Vienna. The NCWRF was put online in 1970 with an initial design capacity of 18 million gallons daily (MGD), which was subsequently increased to a rating of 36 MGD of advanced treatment in 1978, 54 MGD in 1995, and again increased to a rating of 67 MGD in 2005. The Chesapeake Bay water quality program requires reductions in the number of nutrient pollutants discharged from wastewater treatment facilities. In December 2004, the state notified the County that the renewal of the County's Virginia Pollutant Discharge Elimination System (VPDES) permit includes a requirement that nutrient removal be performed using "State of the Art" technology and meet a waste load allocation (cap) for the nitrogen and phosphorus nutrients. A phased approach was used to renovate and upgrade current plant facilities to accommodate these more stringent nutrient discharge requirements.

Upper Occoquan Service Authority

The southwestern part of Fairfax County is served by a regional plant owned and operated by the Upper Occoquan Service Authority (UOSA). This plant became operational in 1978 and replaced five small treatment plants in Fairfax County (Greenbriar, Big Rocky Run, Flatlick Run, Upper Cub Run, and Middle Cub Run) and six in Prince William County. This plant was originally certified to operate at 15 MGD. Fairfax County's initial 30.83 percent share of the plant was increased to 36.33 percent in 1978 with the purchase of additional capacity from Manassas Park. When the plant expanded to 54 MGD, the County's share increased to 51.1 percent. However, the County has sold some of its capacity to other UOSA users and decreased its share to 40.9 percent. The following summarizes the County's capacity in the plant:

- Original plant capacity of 15 MGD- County capacity of 5.45 MGD.
- Plant capacity expansion to 27 MGD- County capacity of 9.915 MGD.
- Additional plant capacity expansion to 54 MGD- County capacity of 27.6 MGD.
- The County sold 3.0 MGD of capacity to other UOSA users in January 2008, which reduced County capacity to 24.6 MGD.
- The County sold 2.0 MGD of capacity to other UOSA users in January 2010, which reduced County capacity to 22.6 MGD.
- The County sold 0.5 MGD of capacity to other UOSA users in January 2019, which reduced County capacity to 22.1 MGD.

Even with the sale of County capacity, the UOSA Plant is capable of handling anticipated flows from its contributory sheds through 2045.

Loudoun Water

The northwestern part of Fairfax County is currently served by Blue Plains and NCWRF. To provide sufficient capacity for the anticipated growth in this area, the County purchased 1.0 MGD of capacity from the Loudoun Water in March of 2011. The flows in Blue Plains will be continually monitored to see if any additional capacity will be required from Loudoun Water in the planning period. Currently, the County is not utilizing its capacity at Loudoun Water. However, the use of this capacity is anticipated in the future as the County's flows approach its allocation at Blue Plains.

Equity Initiatives

Equity Review and Initiatives

The Wastewater Collection system and the Noman M. Cole, Jr. Water Recycling Facility are critical facilities for Fairfax County and treat half of the wastewater generated by County residents. Success is realized through the measurable improvement in the quality of life for communities across the County through enhanced and improved treatment capacity and technologies resulting in more reliable performance, reduced outages and repeated costly needs for maintenance and repairs.

Wastewater projects are county-wide and affect all demographics and geographic areas. Equity will be advanced through timely and cost-effective completion of the renewal and repair of aging wastewater infrastructure particularly in older and less affluent localities within the County.

Current Project Descriptions

1. **Alexandria Wastewater Treatment Plant Upgrades (Countywide):** This is a continuing project that supports the County's estimated share of improvements at the Alexandria Treatment Plant. Fairfax County's share is estimated to be $342,744,000 through FY 2035. This project includes the replacement and rehabilitation of existing treatment process facilities and facilities to handle wet weather flows in order to avoid sanitary sewer overflows.

2. **Arlington Wastewater Treatment Plant Upgrades (Countywide):** This is a continuing project that supports the County's estimated share of the Arlington Wastewater Treatment Plant upgrade costs. Fairfax County's share is estimated to be $17,108,000 through FY 2035. Funding will provide for Fairfax's portion for non-expansion capital improvements, technology enhancements, clarifier upgrades, a Bio-solids Master Plan, and the relining of a large diameter sewer line for the Four Mile Run interceptor which runs from Fairfax County to the Arlington plant.

3. **DC Blue Plains Wastewater Treatment Plant Upgrades (Countywide):** This is a continuing project that supports the County's estimated share of upgrading the 370 MGD of capacity at the Blue Plains treatment plant. Fairfax County's share is estimated to be $221,898,000 through FY 2035. This upgrade includes major plant renovations, including the chemical addition, flow control tunnels, and sludge disposal systems to meet the enhanced total nitrogen standards.

4. **Extension and Improvements Projects (Countywide):** This is a continuing project to support the extension of sanitary sewer to homes with failing septic systems located within the approved sewer service area. Failing septic systems can be a health hazard and to mitigate this hazard, the County extends sanitary sewer to these homes. Approximately $1,000,000 is anticipated to be required through FY 2035.

5. **Gravity Sewer Capacity Improvements (Countywide):** This is a continuing project to support increasing the size of existing sewer lines and installing new sewer lines to serve development within the County. This is a proactive program to manage the strain placed on the current sewer system due to additional load as areas develop and redevelop. An amount of $378,224,000 is estimated to be required through FY 2035.

6. **Gravity Sewer Conditional Improvements (Countywide):** This is a continuing project to support the replacement, rehabilitation, and investment in sewer lines. A continued increased effort to address large diameter sewer lines continues to prevent future pipe failures. An amount of $271,279,000 is estimated to be required through FY 2035.

7. **Integrated Sewer Metering (Countywide):** These meters support billing for actual flows, help identify excessive Inflow and Infiltration and provide data required for billing other jurisdictions. An amount of $4,150,000 is estimated to be required to install and rehabilitate sewer meters through FY 2035.

8. **Noman M. Cole, Jr. Water Recycling Facility Rehabilitation and Replacement (Mount Vernon District):** This is a continuing project supporting the rehabilitation of the Noman M. Cole, Jr. Water Recycling Facility. An amount of $879,499,000 is estimated to be required to continue the rehabilitation and replacement of the plant's assets through FY 2035. Projects proposed to improve the plant's assets include the following: replacement of and improvements to the existing biosolid facilities; replacement and upgrades to the facility's electrical system including the motor control centers and electrical distribution centers; rehabilitation and upgrades to disinfection facilities; HVAC upgrades to the laboratory and administration buildings; rehabilitation and replacement of miscellaneous pumps, gates, and valves; rehabilitation of the

various facilities; facility pilots, improvements, and additions to improve processes and facilities aimed at improving environmental compliance optimization and reliability, facility safety and security, operations and maintenance costs, and sustainability of the facility; facility stormwater improvements; and other rehabilitation and replacement projects related to the maintenance of the wastewater treatment facility assets.

9. **Pumping Station Rehabilitation (Countywide):** This is a continuing project to support the replacement, rehabilitation, and upgrade of the System's pumping stations. An amount of $290,667,000 is estimated to be required through FY 2035. These improvements do not increase capacity at the stations but are related to addressing system upkeep or improving the stations to address service issues such as odor control.

10. **Stormwater/Wastewater Facility Share (Countywide**): This project supports the Wastewater share of costs associated with the Stormwater/Wastewater Facility. This facility will provide consolidated functions and operations and maximize efficiencies between the Stormwater and Wastewater Divisions.

11. **Upper Occoquan Service Authority Treatment Plant Upgrades (Countywide):** This is a continuing project to support the County's share of plant upgrades associated with the Upper Occoquan Service Authority (UOSA). An amount of $149,974,000 is estimated to be required through FY 2035. Fund 69040, Sewer Bond Subordinate Debt Service, provides debt service funding for the UOSA Bond Series. The UOSA Bond Series is based on the County's portion of the UOSA plant's expansion and upgrades. Upgrades include plant renovations, specifically the nutrient cap project, filter press replacement, and re-carbonation clarifier improvements.

12. **Wastewater Colchester Contribution (Mount Vernon District):** This is a continuing project that supports an annual contribution to the Colchester Wastewater Treatment Facility for wastewater treatment services in the Harborview community. The sewer treatment plant serving the Harborview residents is a private operator. The plant bills Fairfax County and in turn, the County bills each resident using County sewer rates. Funding was previously budgeted in Agency 87, Unclassified Administrative Expenses – Public Works Programs; however, in order to provide more transparency and the carryforward of balances at year-end, funding has been budgeted in a capital project within Fund 30010, General Construction and Contributions. Funding of $579,508 has been included in FY 2026 for this contribution.

13. **Wastewater Developers Reimbursement Program (Countywide):** This program, approved by the Board of Supervisors in December 2022, provides funding for the reimbursement to developers for a portion of the cost to enlarge sewer pipes when required by the Department of Public Work and the Environmental Services. An amount of $112,500,000 is estimated to be required through FY 2035.

14. **WPMD Outside Agency Coordination (Countywide):** This program provides funding for sanitary sewer relocations that are included as part of existing outside Agency (VDOT, VPRA, FCDOT, FFX Water, etc.) construction projects and required by to be coordinated by the Wastewater Planning and Monitoring Division. An amount of $36,020,000 is estimated to be required through FY 2035.

Project Cost Summaries
Wastewater Management
($000's)

	Project Title Project Number	Source of Funds	Budgeted or Expended Through FY 2025	FY 2026	FY 2027	FY 2028	FY 2029	FY 2030	Total FY 2026 - FY 2030	Total FY 2031 - FY 2035	Total
1	Alexandria WWTP Upgrades	B, SR	*C*	***$43,496***	$53,776	$41,376	$18,248	$15,680	$172,576	$170,168	$342,744
	WW-000013										
2	Arlington WWTP Upgrades	B, SR	*C*	***$4,214***	$4,687	$3,890	$1,603	$172	$14,566	$2,542	$17,108
	WW-000012										
3	DC Blue Plains WWTP Upgrades	B, SR	*C*	***$20,689***	$21,631	$30,838	$31,373	$20,906	$125,437	$96,461	$221,898
	WW-000011										
4	Extension and Improvement Projects	SR	*C*						$0	$1,000	$1,000
	WW-000006										
5	Gravity Sewer Capacity Improvements	B, SR	*C*	***$24,415***	$44,085	$45,400	$55,745	$60,875	$230,520	$147,704	$378,224
	WW-000032, WW-000034										
6	Gravity Sewer Conditional Improvements	SR	*C*	***$20,000***	$23,558	$23,247	$35,772	$40,102	$142,679	$128,600	$271,279
	WW-000024, WW-000028										
7	Integrated Sewer Metering	SR	*C*		$2,500	$1,650			$4,150		$4,150
	WW-000005										
8	Noman M. Cole, Jr., Water Recycling Facility Rehabilitation and Replacement	B, SR	*C*	***$52,209***	$55,458	$78,819	$121,259	$112,694	$420,439	$459,060	$879,499
	WW-000009, WW-000016, WW-000017										
9	Pumping Station Rehabilitation	SR	*C*	***$23,980***	$30,070	$31,354	$38,322	$41,222	$164,948	$125,719	$290,667
	WW-000001, WW-000007, WW-000008										
10	Stormwater/Wastewater Facility Share	SR	***$5,632***						$0		$5,632
	WW-000030										
11	Upper Occoquan Service Authority Treatment Plant Upgrades	SR, X	*C*	***$22,688***	$22,356	$22,348	$22,353	$10,185	$99,930	$50,044	$149,974
	Fund 69040										
12	Wastewater Colchester Contribution	G	*C*	***$580***	$580	$580	$580	$580	$2,900	$2,900	$5,800
	2G25-126-000										
13	Wastewater Developers Reimbursement Program	SR	*C*	***$11,250***	$11,250	$11,250	$11,250	$11,250	$56,250	$56,250	$112,500
	2G25-132-000										
14	WPMD Outside Agency Coordination	SR	*C*	***$16,020***	$4,000	$2,000	$2,000	$2,000	$26,020	$10,000	$36,020
	WW-000035										
	Total		***$5,632***	**$239,541**	**$273,951**	**$292,752**	**$338,505**	**$315,666**	**$1,460,415**	**$1,250,448**	**$2,716,495**

Notes: Numbers in bold italics represent funded amounts. A "C" in the 'Budgeted or Expended' column denotes a continuing project.

Key: Source of Funds

B	Bonds
F	Federal
G	General Fund
SR	Sewer Revenue
S	State
U	Undetermined
X	Other