Sanitary Sewers

PROGRAM DESCRIPTION

Fairfax County provides sewer service to its residents through a system of nearly 3,390 miles of sewer lines, 65 pumping stations, 54 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 Sanitation Authority (ASA), Arlington County, Upper Occoquan Service Authority (UOSA), and Loudoun Water.

LINK TO THE COMPREHENSIVE PLAN

The Policy Plan for Fairfax County's Comprehensive Plan has established a number of objectives and policies in order to:

- ✓ Emphasize the need to maintain a system of conveyance and treatment facilities that is responsive and compatible with the development and environmental goals of the County.
- ✓ Provide public sewer in accord with the Board of Supervisor's approved sewer service area in support of the County's land use objectives.

Source: 2007 Edition of the Comprehensive Plan, as amended

CURRENT PROGRAM INITIATIVES

The current capital program can generally be categorized in regards to supporting 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 sewerage 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 the majority of capital improvements. This has particularly been true for "recurring" capital projects, such as capital replacement and rehabilitation projects, extension and improvement (E&I) projects and general system improvement projects. For major capital initiatives, such as system expansion and regulatory compliance projects, the County has funded the projects through the use of sewer revenue bonds, payable solely from the 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' and 1980s, 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 90 percent of the System's revenues are derived from charges to new and existing customers through availability charges and sewer service charges, respectively. New customers to the System are charged a one-time availability charge per new connection for access to the System. Existing customer charges are based upon the annualized equivalent of actual water consumption during the winter quarter. Availability 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 10 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.

As previously discussed, the County has issued sewer revenue bonds to provide funds for expanding treatment facility capacity at both County-owned and County-contracted facilities. Specifically, the County issued revenue bond debt for the following treatment plant expansions:

- Noman M. Cole, Jr. Pollution Control Plant (NCPCP) – $104 million in revenue bond debt to support the expansion from 54 million gallons per day (MGD) to 67 MGD.

- Alexandria Sanitation Authority – $90 million in State Revolving Fund/Virginia Resources Authority debt to support the County's share of plant upgrades.

In addition to this County-issued debt, as of June 30, 2011, the County is responsible for $276.1 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) providing 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 has completed the program of plant expansion and upgrading that was begun in the early 1970s. This program was directed at pollution problems in the Potomac River and the Occoquan Reservoir and was comprised of four major elements:

- Creation of a single treatment complex at the Noman M. Cole, Jr. plant to treat flows from the Accotink, Pohick, Dogue and Little Hunting Creek Watersheds and Fort Belvoir;

- Installation of pumping facilities at the old Westgate treatment plant to divert flows from its service area to the Alexandria treatment plant;

- Expansion and upgrading of the District of Columbia Water and Sewer Authority's treatment plant at Blue Plains to 370 MGD; and

- Construction of the UOSA plant and eliminating the discharge from the five small County facilities.

Fairfax County's current treatment capacity is projected to be sufficient through 2030 with the addition of 1.0 MGD of capacity from the Loudoun Water. The following summarizes the status of the County's treatment capacity.

Noman M. Cole, Jr. Pollution Control Plant

The Noman M. Cole, Jr., Pollution Control Plant (NCPCP) serves the Accotink, Pohick, Long Branch, Little Hunting 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 Noman M. Cole, Jr. Plant was put on line 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 amount of nutrient pollutants discharged from wastewater treatment facilities. In December 2004, the state notified the County that the renewal of County's National Pollutant Discharge Elimination System (NPDES) permit includes a requirement that nutrient removal be performed using "State of the Art" technology and meet a waste load allocation (cap) for the nutrients nitrogen and phosphorus. Current technology allows for discharge limits of 3.0 milligrams per liter for nitrogen and 0.1 milligrams per liter for phosphorus. A phased approach has been under way to renovate and upgrade current plant facilities to accommodate these more stringent nutrient discharge requirements. Until the "state of the Art" technology is installed, the County has a nitrogen discharge requirement of 7.0 milligrams per liter. The Noman M. Cole, Jr. Pollution Control Plant is capable of handling anticipated flows from its contributory sheds through 2030.

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 will be undergoing a major renovation of the chemical addition, nitrogen removal and sludge disposal systems over the next several years. 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 would the diverting flow with the Difficult Run Pump Station will be sufficient to stay within the County's allocation or 31 MGD.

Alexandria Sanitation Authority

The Cameron Run and Belle Haven watersheds and the City of Falls Church are served by the Alexandria treatment plant. The Alexandria plant is owned and operated by the Alexandria Sanitation Authority (ASA). Sixty percent of its capacity is contractually allocated to Fairfax County. The ASA plant has been expanded and upgraded to provide 54 MGD of advanced secondary treatment capacity. Fairfax County is allotted 32.4 MGD of capacity which will provide Fairfax County with capacity through 2030. By reactivating the Braddock Road and Keene Mill Road pumping stations, the County has the capability to divert flow from the Accotink watershed to ASA. These diversions will increase the County's wastewater management alternatives in the entire eastern portion of the County by off loading the NCPCP and Blue Plains Treatment Plant to the ASA plant. The ASA plant completed a major rehabilitation project in 2005 to meet water quality standards for nitrogen removal. As with other treatment plants in the area, additional facilities will be needed to enhance the removal of nitrogen using "State of the Art" technology. The County's existing capacity at the ASA plant is capable of handling anticipated flows from its contributory sheds through 2030.

Arlington County Pollution Control Plant

The Arlington County pollution control plant serves that 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. The County's existing capacity at the Arlington plant is capable of handling anticipated flows from its contributory sheds through 2030.

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. 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.

Even with the sale of County capacity, the UOSA Plant is capable of handling anticipated flows from its contributory sheds through 2030.

Loudoun Water

The north western part of Fairfax County is currently served by Blue Plains and Noman Cole Pollution Control Plants. To provide sufficient capacity for this area of Fairfax County, 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. But, the use of this capacity is anticipated in the near future as the County's flows are approaching its allocation at Blue Plains.

CURRENT PROJECT DESCRIPTIONS

1. **Noman M. Cole, Jr. Pollution Control Plant Rehabilitation and Replacement** (Mt. Vernon): $102,984,000 to continue the rehabilitation and replacement of the plant's assets through FY 2017. Projects proposed to improve the plant's assets include the following: rehabilitate tertiary clarifiers used to remove phosphorous; replace three existing and install two additional back-up electrical generators; rehabilitate incinerator hearths; pave pond no. 1; replace motor control centers and electrical distribution center; ash system improvements, rehabilitate sludge storage tanks and rehabilitate primary grit removal facilities.

2. **Noman M. Cole, Jr. Pollution Control Plant LOT Upgrade** (Mt. Vernon): $72,982,000 to upgrade the plant to meet the limit of technology (LOT) or otherwise known as state-of-the-art (SOA) requirements for nitrogen removal associated with the Chesapeake Bay Program through 2017. The project will include construction of new chemical storage and feed facilities to add methanol for improved nitrogen removal; moving bed biofilm reactors; construction of additional equalization tanks; replacement of the existing bar screens; modifications to the activated sludge tanks; and rehabilitation of the filters process.

3. **Alexandria Wastewater Treatment Plant Improvements**. (Countywide) $91,894,000 for the County's share of improvements at the Alexandria wastewater treatment plant through FY 2017. Included is renovation of the carbon absorption system, scum collection system, the dechlorination system and the nitrogen removal system to meet the enhanced total nitrogen standard three parts per million.

4. **Blue Plains Wastewater Treatment Plant, DC Water.** (Countywide) $60,202,000 for the County's share of upgrading the 370 MGD of capacity at the Blue Plains treatment plant through FY 2017. This upgrade includes major plant renovations, specifically including the chemical addition and sludge disposal systems

5. **Arlington Wastewater Treatment Plant Upgrade**. (Countywide) $9,480,000 for the County's share of the plant upgrade costs through FY 2017. This project is the result of the Chesapeake Bay Program requirements to meet the state-of-the-art (SOA) nitrogen removal standard.

6. **Sanitary Sewer Replacement, Rehabilitation and Upgrade Program**. (Countywide) $49,487,000 for the continual replacement, rehabilitation and upgrade of sewer lines through FY 2017.

7. **Pumping Station Improvements**. (Countywide) $39,463,000 for the continual replacement, rehabilitation and upgrade of the System's 65 pumping stations through FY 2017. These improvements do not increase capacity of the stations but are related to addressing system upkeep or improving the stations to address service issues, such as odor control.

8. **Sewer System Capital Renewal** (Countywide) $2,730,000 for the renovation and improvements to the Robert P. McGrath facility which is home to the Sewer collection system maintenance staff and equipment. Improvements include upgraded outdoor lighting, reconfiguring office space, HVAC upgrades, and miscellaneous facility rehabilitation.

9. **Sewer Metering Projects**. (Countywide) $2,455,000 to install and rehabilitate sewer meters. These meters support billing for actual flows, help identify excessive Inflow and Infiltration (I/I) and provide data required by the State Water Control Board and the Environmental Protection Agency.

10. **Extension and Improvements Projects** (Countywide) $3,000,000 annually for the extension of sanitary sewer to homes with failing septic systems that are 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.

PROJECT COST SUMMARIES
SANITARY SEWERS
($000's)

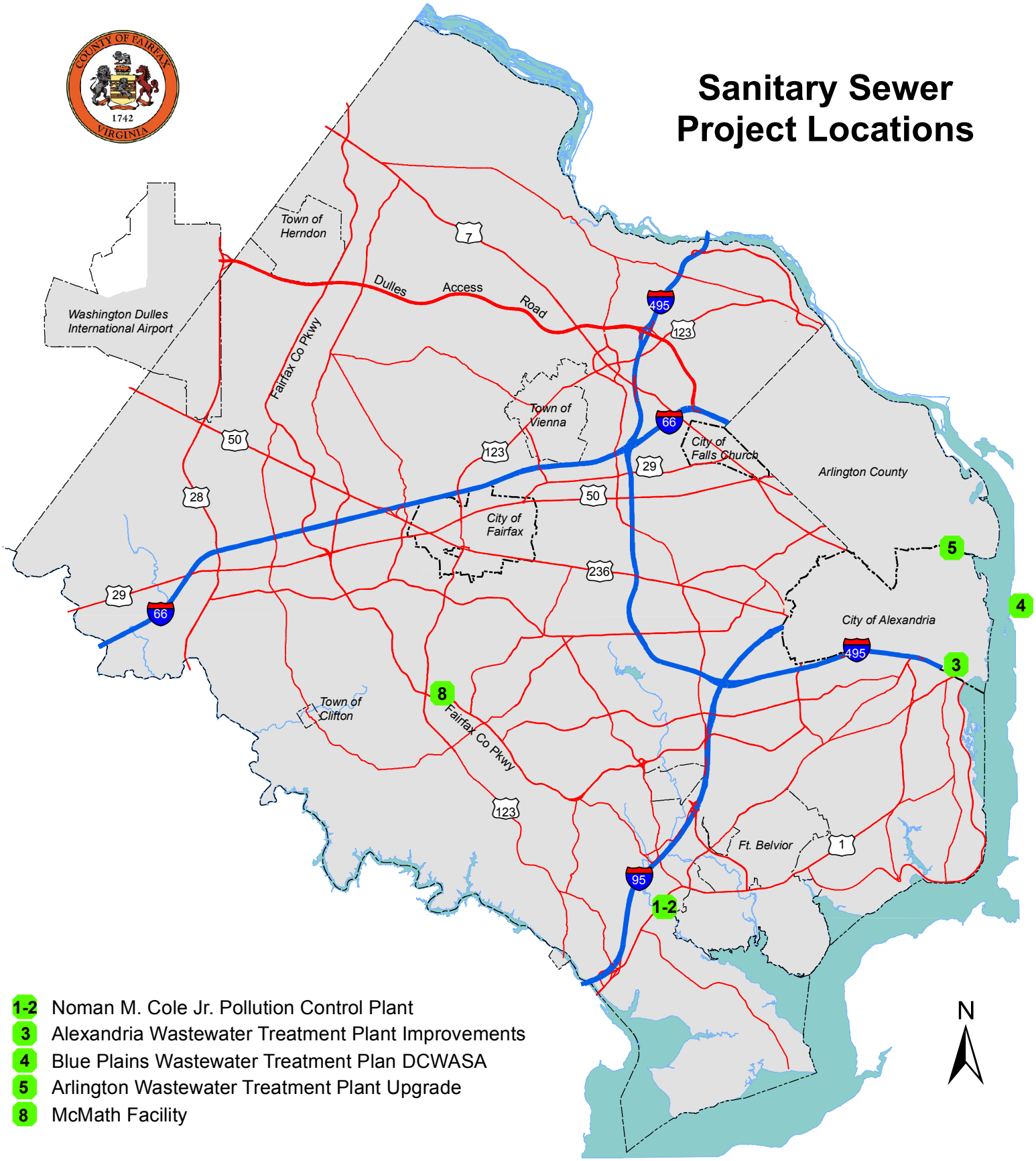
	Project Title/ Project Number	Source of Funds	Budgeted or Expended Through FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	Total FY2013-FY2017	Total FY2018-FY2022	Total Project Estimate
1	Noman M. Cole, Jr. Pollution Control Plant Construction Rehabilitation / X00911, X00912	SR	***48,804***	***13,339***	25,553	19,705	19,329	25,058	102,984	175,117	326,905
2	Noman M. Cole, Jr. Pollution Control Plant LOT Upgrade / N00323, FS0001	SR, B, F, S	***142,839***	***24,796***	12,445	8,387	14,705	12,649	72,982	1,617	217,438
3	Alexandria Wastewater Treatment Plant Improvements /I00906	SR, B	***49,551***	***15,601***	22,471	21,622	20,467	11,733	91,894	58,728	200,173
4	Blue Plains Wastewater Treatment Plant, DCWater / G00901, G00902	SR, B	***82,675***	***19,679***	11,135	8,314	11,981	9,093	60,202	34,576	177,453
5	Arlington Wastewater Treatment Plant Upgrade / G00903, G00904	SR, B	***43,741***	***2,176***	304	2,000	3,000	2,000	9,480	10,000	63,221
6	Sanitary Sewer Replacement, Rehabilitation and Upgrade Program / X00903, L00117	SR	***C***	***15,239***	7,841	8,837	8,969	8,601	49,487	76,372	125,859
7	Pumping Station Improvements / 100353	SR	***C***	***6,911***	7,268	7,718	8,029	9,537	39,463	34,490	73,953
8	Sewer System Capital Renewal / X00442	SR	*C*	***210***	1,050	105	315	105	1,785	945	2,730
9	Sewer Metering Projects / X00445	SR	***2,350***	***105***					105		2,455
10	Extension & Improvement Projects /X00828	SR	*C*	***3,000***	3,000	3,000	3,000	3,000	15,000	15,000	30,000
	TOTAL		$369,960	$101,056	$91,067	$79,688	$89,795	$81,776	$443,382	$406,845	$1,220,187

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

Key: Stage of Development	
	Feasibility Study or Design
	Land Acquisition
	Construction

Key: Source of Funds	
B	Bonds
G	General Fund
S	State
F	Federal
X	Other
U	Undetermined
SR	Sewer Revenues

Sanitary Sewer Project Locations



1-2 Noman M. Cole Jr. Pollution Control Plant
3 Alexandria Wastewater Treatment Plant Improvements
4 Blue Plains Wastewater Treatment Plan DCWASA
5 Arlington Wastewater Treatment Plant Upgrade
8 McMath Facility

Note: Map numbers correspond to project descriptions in the text and cost summary tables. Only CIP projects with selected, fixed sites are shown on the map.