Sanitary Sewers

PROGRAM DESCRIPTION

Fairfax County provides sewer service to its citizens through a system of nearly 3,350 miles of sewer lines, 65 pumping stations, 54 metering stations and one treatment plant owned and operated by the County. Additional treatment capacity is provided by contractual agreements with the District of Columbia Water and Sewer Authority, Alexandria Sanitation Authority (ASA), Arlington County and the Upper Occoquan Sewerage Authority (UOSA).

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 limitation, 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: current system revenues, the sale of revenue bonds and grant funding. The County has generally used current 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 future programs will fall heavily on the County due to scarcity of federal grant funds. While the County is pursuing grant funding options, the County has conservatively assumed that no state or federal grant funding will be available 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 fees and sewer service charges, respectively. New customers to the System are charged a one time availability fee 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 fees 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 fees 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 (formerly the Loudoun County Sanitation Authority (LCSA)), 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, 2008, the County is responsible for $258.8 million in debt to support the expansion and upgrade of the UOSA treatment plant.

Looking to the future, a balance must be struck between the following three major issues facing the integrated sewerage system: (1) the necessity of maintaining high levels of water quality (including meeting more stringent nutrient limits); (2) keeping pace with County growth, and (3) achieving these two goals in terms of both financial and other 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.

In order to meet the anticipated needs for sanitary sewage service in sheds that contribute to the NCPCP, as well as meet new water quality standards for nitrogen control, the program to expand the plant to 67 MGD was initiated in 1992. Construction began in 1997 and was completed in 2005. However, additional facilities will be needed to enhance the removal of nitrogen to current limits of technology. The Noman M. Cole, Jr. Pollution Control Plant is capable of handling anticipated flows from its contributory sheds through 2030.

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. By 2005, flows from Cameron Run, Belle Haven and Falls Church should approach 23 MGD which will leave Fairfax County with unused capacity of several years beyond that time. 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 to current limits of technology. The County's existing capacity at the ASA 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 and Sewer Authority (DCWASA) 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. The County's existing capacity at the Blue Plains plant is now 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 expanded and upgraded to 30 MGD of advanced secondary capacity. Over the next five years, the Plant will be upgraded again to comply with the water quality standards for nitrogen removal, and expanded to 40 MGD, which should be completed by the end of 2010. 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 Sewage Treatment Authority

The southwestern part of Fairfax County is served by a regional plant owned and operated by the Upper Occoquan Sewage 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.

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 western part of Fairfax County is currently served by Blue Plains and Noman Cole Pollution Control Plants. To provide sufficient capacity for the western service area of Fairfax County, the County is considering the purchase of 1.0 MGD of capacity from the Loudoun Water by 2010 and may need up to an additional 2.0 MGD by 2025. Because lower growth resulting in reduced wastewater generation in the Blue Plains pump-over may occur, the County is only committing to 1.0 MGD of capacity. 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.

CURRENT PROJECT DESCRIPTIONS

1. **Noman M. Cole, Jr. Pollution Control Plant Construction** (Mt. Vernon): $384,062,000 to expand the plant capacity to 67 MGD and continue the rehabilitation and replacement of the plant's assets (10-year capital cost $228,279,000 for FY 2010 through FY 2019). This capacity will meet the future demands until 2030 for the Accotink, Pohick and Long Branch drainage basins and the City of Fairfax, the Town of Vienna and Fort Belvoir. Projects proposed to improve the plant's assets include the following: prepare and update Master Plan; repair and replace pumps, motors, mixers, chemical feed systems, valves and other plant equipment; renovate and upgrade roads, floors, walls, tank sidewalls and bottoms and other grounds-, building- and structure-related facilities; replace or rehabilitate tertiary clarifiers used to remove phosphorous; replace or install additional back-up electrical generators; construct additional odor control facilities; construct site improvements to direct stormwater runoff to wastewater treatment facilities; install bio-filter devices to supplement odor control systems; rehabilitate incinerator hearths; complete replacement of plate and frame dewatering units with centrifuges; pave pond no. 1; and replace elevator in Solids Processing building.

2. **Noman M. Cole, Jr. Pollution Control Plant LOT Upgrade** (Mt. Vernon): $131,628,000 to upgrade the plant to meet the limit of technology (LOT) or state-of-the-art (SOA) requirements for nitrogen removal associated with the Chesapeake Bay Program (10-year capital cost $109,400,000 for FY 2010 through FY 2019). Proposed project will include construction of new chemical storage and feed facilities to add methanol for improved nitrogen removal, denitrification filters or equivalent technology, such as moving bed biofilm reactors; construction of additional equalization tanks; replacement of the existing bar screens; conversion of the gravity thickeners to fermentors; modifications to the activated sludge tanks; and rehabilitation of the monomedia filters.

3. **Alexandria Wastewater Treatment Plant Improvements**. $369,512,000 for the County's share of improvements at the Alexandria wastewater treatment plant. 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 (10-year capital cost $140,140,000 for FY 2010 through FY 2019). The land for equalization tanks was purchased in December 2008.

4. **Blue Plains Wastewater Treatment Plant, DCWASA.** $340,139,000 for the County's share of upgrading the 370 MGD of capacity at the Blue Plains treatment plant (10-year capital cost $215,323,000 for FY 2010 through FY 2019). This upgrade includes major plant renovations, specifically including the chemical addition and sludge disposal systems

5. **Arlington Wastewater Treatment Plant Upgrade to 40 MGD**. $76,623,000 for the County's share of the plant upgrade costs (10-year capital cost $42,000,000 for FY 2010 through FY 2019). This project is the result of a new Interjurisdictional Sewer Service Agreement which requires funding from participating jurisdictions, on the basis of their share of sewerage capacity and to meet the one part per million ammonia-nitrogen discharge standard.

6. **Loudoun Water – Wastewater Treatment Plant**. $21,500,000 for the purchase of 1.0 MGD at Loudoun Water's new wastewater treatment plant.

7. **Sanitary Sewer Replacement, Rehabilitation and Upgrade Program**. $112,850,000 for the continual replacement, rehabilitation and upgrade of sewer lines (FY 2010 through FY 2019).

8. **Sewer Metering Projects**. $500,000 to install and rehabilitate sewer meters (FY 2010 through FY 2019). 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 (EPA).

9. **Pumping Station Improvements**. $36,350,000 for the continual replacement, rehabilitation and upgrade of the System's 65 pumping stations (FY 2010 through FY 2019). These improvements do not increase capacity of the stations and are related to addressing system upkeep or improving the stations to address service issues, such as odor control.

PROJECT COST SUMMARIES
SANITARY SEWERS
($000's)

Project Title/ Project Number	Source of Funds	Anticipated to be Expended Thru FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	Total FY2010-FY2014	Total FY2015-FY2019	Total Project Estimate
1. Noman M. Cole, Jr. Pollution Control Plant Construction / N00322, X00910, X00911	SR	***155,779***	***15,599***	23,857	15,670	12,370	19,389	86,885	141,398	384,062
2. Noman M. Cole, Jr. Pollution Control Plant LOT Upgrade / N00322	SR, B	***22,228***	***20,015***	29,075	23,930	12,600	6,537	92,157	17,243	131,628
3. Alexandria Wastewater Treatment Plant Improvements / I00904, 100906	SR, B	***229,372***	***23,729***	14,322	29,176	30,760	26,153	124,140	16,000	369,512
4. Blue Plains Wastewater Treatment Plant, DCWASA / G00901, G00902	SR, B	***124,816***	***11,800***	17,100	22,450	23,640	22,000	96,990	118,333	340,139
5. Arlington Wastewater Treatment Plant Upgrade to 40 MGD / G00903, G00904	SR, B	***34,623***	***9,000***	8,000	7,000	5,000	4,000	33,000	9,000	76,623
6. Loudoun County Wastewater Treatment Plant / J00901	SR, B	***0***	***21,500***					21,500		21,500
7. Sanitary Sewer Replacement, Rehabilitation and Upgrade Program / X00905, X00906, L00117, 100905	SR	***C***	***10,850***	16,000	16,000	12,000	11,000	65,850	47,000	112,850
8. Sewer Metering Projects / X00445	SR	***C***	***50***	50	50	50	50	250	250	500
9. Pumping Station Improvements / 100351	SR	***C***	***4,350***	12,000	3,000	3,000	2,500	24,850	11,500	36,350
TOTAL		$566,818	$116,893	$120,404	$117,276	$99,420	$91,629	$545,622	$360,724	$1,473,164

Key: Stage of Development

- Feasibility Study or Design
- Land Acquisition
- Construction

Notes:
Numbers in bold italics represent funded amounts.
A "C" in the Authorized or Expended Column denotes a Continuing project.

Key: Source of Funds

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

Sanitary Sewers
Project Locations

1,2 Norman M. Cole Jr. Pollution Control Plant
3 Alexandria Wastewater Treatment Plant Improvements
4 Blue Plains Wastewater Treatment Plant DCWASA
5 Arlington Wastewater Treatment Plant Upgrade
6 Loudoun County Wastewater Treatment Plant

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.