

Water Supply

PROGRAM DESCRIPTION

Residents of Fairfax County receive public water service from one of three water agencies: Fairfax County Water Authority, City of Fairfax Department of Transit and Utilities, and the Falls Church Department of Public Utilities. The Towns of Vienna and Herndon, while operating their own water distribution systems, purchase water from the City of Falls Church and the Fairfax County Water Authority, respectively. In terms of meeting water supply needs, the towns are dependent on these two water agencies. Using recent estimated averages, the Fairfax County Water Authority serves 79 percent of Fairfax County residents, Falls Church serves 13 percent, the City of Fairfax one percent and the remaining 7 percent of the residents receive water from their own individual wells.

LINK TO THE COMPREHENSIVE PLAN

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

- ✓ Provide the facilities to treat, transmit, and distribute a safe and adequate potable water supply.
- ✓ Identify the need for additional water transmission facilities, including the Corbalis-Fox Mill Water Main, Fox Mill-Vale Road Water Main, Waples Mill – Vale Road Water Main and the Stringfellow Road Water Main.

Source: 2003 Edition of the Fairfax County Comprehensive Plan, as amended

CURRENT PROGRAM INITIATIVES

While Fairfax County has neither direct administrative nor budgetary control over water suppliers, the importance of water facilities to County planning is recognized. The Board of Supervisors has entered into an agreement with the Fairfax County Water Authority, which requires Board approval of all capital projects undertaken by the Water Authority. The Fairfax County Water Authority projects included in this CIP represent a program guided by the objectives of the Comprehensive Plan and endorsed by the Board of Supervisors. In the interest of providing a complete picture to the citizens of Fairfax County, the independent Programs for Falls Church and Fairfax City are also presented. Inclusion in this document represents neither concurrence nor approval by Fairfax County of the individual projects proposed by Falls Church or Fairfax City. They are presented for information purposes only. Additional information can be found in the Authority's 2004 ten year Capital Improvement Program, which is available directly from the Fairfax County Water Authority.

Fairfax County Water Authority

The principal sources of water for the Water Authority are the Occoquan River and the Potomac River. Supplementary sources of water include one public well system and interconnections with the Cities of Fairfax and Falls Church, Town of Vienna, Loudoun County, and Arlington County. The Occoquan Reservoir is impounded by two gravity-type concrete dams across the Occoquan River, a few miles upstream of its confluence with the Potomac River. The low-level dam was constructed in 1950 and the high-level dam was constructed about 3,000 feet further upstream in 1957. The drainage area of the

Occoquan River above the dam is approximately 595 square miles. The dam impounds about 8.3 billion gallons of water when filled to the crest of the dam at Elevation 122 feet, mean sea level. The present Occoquan River supply has a safe yield of about 72 million gallons per day (MGD). The Potomac River Source of supply has its raw water intake located near Sugarland Run at Lowes Island in Loudoun County. The Potomac River at the Authority intake is slightly impounded by the Seneca rock weir.

Treatment of water from the Occoquan Reservoir is provided at three interconnected plants which have a combined current capacity of 112 MGD. The Occoquan Treatment Plant, located in Prince William County, was placed in service in 1964. The Lorton Treatment Plants, located in Fairfax County, were placed in service in 1951 and in 1973. These facilities apply various chemicals for coagulation, the control of taste and odors, fluoridation, and disinfection. Construction of the Griffith Treatment Plant began during 2000. The Griffith Treatment Plant will replace the existing Lorton and Occoquan Treatment Plants.

Construction of the intake structure, raw water pumping station and initial phase of the Corbalis Treatment Plant commenced in 1978 and was placed into operation in 1982. A major plant expansion was begun in 1992 and completed in 1995. The Corbalis Treatment Plant is authorized by the Virginia Department of Health to operate at a filtration rate of 150 MGD. Facilities are available for applying various chemicals for coagulation, control of taste and odors, fluoridation, and disinfection. Design of the next increment of capacity began in 2002. When completed, this will increase the capacity of the Corbalis plant to 225 MGD.

Twenty-nine booster pumping stations are located within the distribution system to provide adequate pressure throughout the Authority's service area. A total of 42 million gallons (MG) of distribution system storage is provided at 31 locations throughout Fairfax County. There are approximately 3,110 miles of water main up to 54 inches in diameter in the system. The distribution system is interconnected at 76 locations with 12 other water systems in northern Virginia.

Consistent with the primary goal of the County's Water Supply Program, the Fairfax County Water Authority recently completed construction of the Potomac Off-Shore intake and third raw water conduit supplying the Corbalis Water Treatment Plant and the replacement of various deficient distribution mains. Development of the Fairfax County Water Authority's supply, treatment, transmission, and distribution facilities is conducted in accordance with a ten year Capital Improvement Program. Highlights of the current program include:

- **Construction of the new F. P. Griffith Water Treatment Plant:** When completed in 2004, this facility will utilize state-of-the-art treatment techniques capable of meeting the newly adopted water quality requirements of the Safe Drinking Water Act.
- **Capacity Development at the Corbalis Water Treatment Plant:** Design of the next 75 MGD increment of the Corbalis Plant is underway to provide additional production capacity needed to satisfy projected demand for water within the Authority's service area. Construction is expected to start in late 2004.
- **Creation of a Consolidated Laboratory:** A new laboratory for the analysis of all source and finished water is under construction at Corbalis. Laboratory improvements are necessary to achieve water quality objectives and demonstrate compliance with drinking water regulations.
- **Construction of various Transmission Mains:** Transmission mains include: Corbalis to Fox Mill Water Main (Phase II), Stringfellow Road Water Main, Fox Mill to Vale Road Water Main, and Waples Mill to Vale Road Water Main.
- **Construction of Additional System Storage:** Additional storage at the existing Penderwood and Central Area tank sites to satisfy peak demands and limit customer service disruptions.
- **Implementation of a Supervisory Control and Data Acquisition (SCADA) system:** By providing remote monitoring and control capability, SCADA will promote more efficient system performance during both routine and alternative operations.

- **Watershed Management Activities:** The Authority continues to advocate watershed protection through the following projects and programs: Support of the Occoquan Watershed Monitoring Program and the Occoquan Nonpoint Source Program, Study of critical watershed areas, increased involvement in watershed and water quality issues, and analysis of ongoing activities in the watershed.

Falls Church Department of Public Utilities

Falls Church buys treated water from the U.S. Corps of Engineers via a 36-inch connection to the Dalecarlia Filter Plant located on MacArthur Boulevard in the District of Columbia. The Corps obtains its raw water from the Potomac River at Great Falls. The Falls Church Water System has a current system capacity of 45 MGD. The Falls Church Water System consists of the main pumping station at Chain Bridge and seven booster pumping stations. The system includes 9 storage facilities with a total capacity of approximately 12 MGD. The Tysons Tank has been demolished and a new tank with a capacity of 2.2 MG was constructed in 2003. The overall system consists of approximately 465 miles of pipe ranging from 4 inches to 42 inches.

City of Fairfax Department of Transit and Utilities

Fairfax City owns and maintains two water reservoirs in Loudoun County. They are two miles apart and are located about seven miles northwest of Sterling Park. Goose Creek Reservoir holds about 200 MG. Beaverdam Creek Reservoir impounds about 1.3 billion gallons. Beaverdam Reservoir ensures the City a four-month supply against drought and low flow in Goose Creek. The City's treatment plant is located at Goose Creek; its capacity is 12 MGD. The City has a pumping station located at Goose Creek which delivers water to the transmission and distribution system. Three storage tanks (nine MG total) are maintained in the City to equalize water pressure. The City's water transmission line runs 22 miles from Goose Creek to the City of Fairfax along the abandoned W&OD railroad right-of-way and parallels Hunter Mill Road.

CURRENT PROJECT DESCRIPTIONS

FAIRFAX COUNTY WATER AUTHORITY

1. **General and Administrative.** \$75,480,000 for annual expenses associated with administration and overhead. These expenses include materials and supplies; refund of advances; and costs associated with net revenue funded projects, but not attributed to a single project or program.
2. **Subdivision and Other Development Projects.** \$10,080,000 for annual expenses associated with the review and approval of plans for water main installation associated with land development activities. This project also includes provisions for FCWA inspection of water mains installed by land development contractors.
3. **Extraordinary Maintenance and Repairs.** \$81,901,000 for extraordinary maintenance and major repair of supply, treatment, transmission, distribution and general plant facilities associated with a specific project.
4. **Additions, Extensions, and Betterments.** \$53,747,000 for improvement and betterment of existing supply, treatment, transmission, distribution and general plant facilities associated with a specific project.
5. **General Studies and Programs.** \$19,335,000 for general studies, programs, engineering and research pertaining to water quality, water supply, and system development.
6. **Treatment Facilities.** \$201,056,000 for the future 120 MGD Griffith Water Treatment Plant on the Occoquan Reservoir. Costs also include the construction of a consolidated water analysis laboratory at the Potomac Treatment facilities.
7. **Transmission Facilities.** \$32,817,000 for the design and construction of various transmission facilities throughout Fairfax County. Other projects include various pumping station modifications and the transmission SCADA system.

8. **Distribution Facilities.** \$768,000 for the design and construction of additional distribution facilities to replace inadequate well systems in northern Fairfax County.
9. **General Plant Facilities.** \$7,770,000 for annual expenses attributed to administration, overhead, and bond financing for projects funded by current bond issue, future bond issue, or funds on hand.
10. **Potomac Stage III Treatment Facilities.** \$133,656,000 for the design and construction of the next production capacity increment at the Corbalis Water Treatment Plant.
11. **Potomac Stage III Transmission Facilities.** \$66,114,000 for the design and construction of various transmission facilities primarily associated with development of the Potomac River Water Supply Facilities. Water main projects include the Corbalis-Fox Mill Water Main, Fox Mill-Vale Road Water Main, Waple Mill-Vale Road Water Main, and the Stringfellow Road Water Main. Additional projects include associated storage facilities.
12. **Potomac Stage III General Plant Facilities.** \$38,400,000 for annual expense attributed to administration, overhead, and bond financing associated with development of the Potomac River Water Supply Facilities funded by future bond issue and funds on hand.

FALLS CHURCH DEPARTMENT OF PUBLIC UTILITIES

13. **Powhatan Street Water Main – Arlington County Interconnection.** \$550,000 to extend approximately 2,100 linear feet of 16-inch ductile iron pipe along Powhatan Street to connect the City's existing 12-inch pipe to the Arlington County Water System for back-up water supply in case of emergency (water main breaks, power outage, river crossing bypass, etc.). This project will also improve the fire protection in the Franklin Park area.
14. **Dolley Madison Boulevard Transmission Main.** \$5,000,000 to install 18,300 linear feet of 24-inch transmission main from Chain Bridge Pumping Station to McLean Pumping Station, and 7,400 linear feet of 20-inch transmission main from McLean Pumping Station to Scott's Run Pumping Station along Georgetown Pike and Dolley Madison Boulevard. This main will provide the additional transmission capacity necessary to transfer water from Chain Bridge towards Tysons Corner to meet future projected demands in that area.
15. **Old Dominion Drive Water Main – Arlington County Interconnection.** \$375,000 to install a 1,250 foot extension of 12-inch ductile iron pipe along Old Dominion Drive. It will connect the City's existing 10-inch main to the Arlington County water system for back-up water supply in case of an emergency (water main breaks, power outage, river crossing bypass, etc.). This project will also improve fire protection in the Chesterbrook Shopping Center area.
16. **Fairview Lake Loops.** \$600,000 to install 550 linear feet of 12-inch, 850 linear feet of 8-inch, and 480 linear feet of 6-inch water main to complete the loops in this area. This project will improve service reliability and eliminate dead ends to provide better drinking water quality.
17. **Tysons Corner System Improvements.** \$3,000,000 to improve the water pressure, fire protection, and storage capacity in the Tysons Corner area. The existing 1.6 MG Tysons Tank will be removed and a new 2.2 MG tank will be built at the same location. Scotts Run and George Mason pumping stations will be upgraded. An addition of a 10 MGD underground booster pumping station at the Dunn Loring Tank site will be constructed. This project includes the installation of 4,200 linear feet of 12-inch water main along Gallows Road and two pressure reducing valves to lower the pressure in the Fairfax Circle area, which is now over 100 psi.
18. **Second River Crossing Transmission Main.** \$25,000,000 to install a parallel transmission main between the Washington Aqueduct Treatment Plant and the City's Chain Bridge main pumping station to meet future demands and ensure system reliability.
19. **Seven Corners System Improvements.** \$3,000,000 for a feasibility study to address low pressure and inadequate fire protection issues in the Seven Corners area.

20. **McLean Pumping Station Improvements.** \$2,000,000 to upgrade the McLean Pumping Station from 10 MGD to 13 MGD to meet the future demand of customers.
21. **Falls Church Sewer Rehabilitation.** \$1,600,000 to replace or line with insituform, which is the process for reconstructing aged, damaged and deteriorated sewer lines. This is an on-going project until the entire system is rehabilitated. The comprehensive sewer study will provide recommendations for expanded rehabilitation requirements.
22. **SCADA and Telemetry System Upgrades.** \$500,000 to upgrade the existing obsolete SCADA and Telemetry equipment with up-to-date equipment.

**PROJECT COST SUMMARIES
WATER SUPPLY
(\$000's)**

Project Title/ Project Number	Source of Funds	Anticipated to be Expended Thru FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	Total FY2005-FY2009	Total FY2010-FY2014	Total Project Estimate
Fairfax County Construction										
1. General and Administrative	SR	C	3,080	3,100	3,840	8,820	12,650	31,490	43,990	75,480
2. Subdivision and Other Development Projects	SR	C	940	960	980	1,000	1,020	4,900	5,180	10,080
3. Extraordinary Maintenance and Repairs	SR	C	9,372	8,232	8,907	9,109	8,897	44,517	37,384	81,901
4. Additions, Extensions, and Betterments	SR	C	8,814	7,412	6,021	6,026	6,000	34,273	19,474	53,747
5. General Studies and Programs	SR	C	4,685	1,684	3,908	3,435	1,505	15,217	4,118	19,335
6. Treatment Facilities	SR	191,815	7,110	2,131				9,241		201,056
7. Transmission Facilities	SR	23,805	5,750	1,962	700	600		9,012		32,817
8. Distribution Facilities	SR	130	638					638		768
9. General Plant Facilities	SR	4,950	1,710	700	130	280		2,820		7,770
10. Potomac Stage III Treatment Facilities	SR	16,024	37,000	37,000	37,000	6,632		117,632		133,656
11. Potomac Stage III Transmission Facilities	SR	25,146	9,675	6,450	3,043		50	19,218	21,750	66,114
12. Potomac Stage III General Plant Facilities	SR	2,140	6,250	7,390	7,720	3,090	40	24,490	11,770	38,400
Subtotal		264,010	95,024	77,021	72,249	38,992	30,162	313,448	143,666	721,124
Falls Church Department of Public Utilities										
13. Powhatan Street Water Main - Arlington County Interconnection	SR	0	550					550		550
14. Dolley Madison Boulevard Transmission Main	SR	0		500	2,500	2,000		5,000		5,000
15. Old Dominion Drive Water Main - Arlington County Interconnection	SR	375						0		375
16. Fairview Lake Loops	SR	0		600				600		600
17. Tysons Corner System Improvements	SR	0	3,000					3,000		3,000
18. Second River Crossing Transmission Main	SR	0	2,000		18,000	5,000		25,000		25,000
19. Seven Corners System Improvements	SR	0	1,000	2,000				3,000		3,000
20. McLean Pumping Station Improvements	SR	0	2,000					2,000		2,000
21. Falls Church Sewer Rehabilitation	SR	0	400	400	400	400		1,600		1,600
22. SCADA and Telemetry System Upgrades	SR	100	100	100	100	100		400		500
Subtotal		475	9,050	3,600	21,000	7,500	0	41,150		41,625
GRAND TOTAL		\$264,485	\$104,074	\$80,621	\$93,249	\$46,492	\$30,162	\$354,598	\$143,666	\$762,749

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
X	Other
U	Undetermined
SR	Systems Revenues
RB	Revenue Bonds



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