

Water Supply

PROGRAM DESCRIPTION

Residents of Fairfax County receive public water service from one of three water agencies: Fairfax Water, 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 Fairfax Water, respectively. In terms of meeting water supply needs, the towns are dependent on these two water agencies. Using recent estimated averages, Fairfax Water serves 79 percent of Fairfax County residents, Falls Church serves 13 percent, the City of Fairfax serves one percent and the remaining seven percent of the residents receive water from their own individual, private 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 to Fox Mill Water Main, Fox Mill to Vale Road Water Main and the Waples Mill to Vale Road Water Main.
- ✓ Renovate and expand the McLean Pump Station.

Source: 2007 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 Fairfax Water which requires Board approval of all capital projects undertaken by Fairfax Water. Fairfax Water 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 broader picture to the citizens of Fairfax County, the independent program for Falls Church is also presented. Inclusion in this document represents neither concurrence nor approval by Fairfax County of the individual projects proposed by Falls Church. It is presented for information purposes only. Additional information can be found in Fairfax Water's 2008 ten year Capital Improvement Program, which is available directly from Fairfax Water.

Fairfax Water

The principal sources of water for Fairfax Water are the Occoquan Reservoir and the Potomac River. Supplementary sources of water include interconnections with the Cities of Fairfax and Falls Church, Town of Vienna, Loudoun County and Arlington County. The Occoquan Reservoir is impounded by a gravity-type concrete dam across the Occoquan River, a few miles upstream of its confluence with the Potomac River. The dam was constructed 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 Reservoir supply has a safe yield of about 75 million gallons per day (MGD).

Treatment of water from the Occoquan Reservoir is provided by the 120 MGD Griffith Water Treatment Plant in Lorton, placed in service in 2006. This facility applies various chemicals for coagulation, the control of taste and odors, fluoridation and disinfection. The Griffith Treatment Plant replaced the Lorton and Occoquan Treatment Plants.



Picture of the Occoquan Reservoir, one of Fairfax County's two principal sources of water.

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. Construction of the next increment of capacity began in 2005. When completed, this will increase the capacity of the Corbalis plant to 225 MGD.

Nineteen booster pumping stations are located within the distribution system to provide adequate pressure throughout Fairfax Water's service area. A total of 45 million gallons (MG) of distribution system storage is provided at eight locations throughout Fairfax County; an additional 39 MG of treatment plant clearwell storage is also available between the Corbalis and Griffith facilities. There are approximately 3,200 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.

Development of Fairfax Water's supply, treatment, transmission and distribution facilities is conducted in accordance with a ten year Capital Improvement Program. Highlights of the current program include:

- **Capacity Development at the Corbalis Water Treatment Plant:** Construction of the next 75 MGD increment of the Corbalis Plant is scheduled for completion in 2008 and will provide additional production capacity needed to satisfy projected demand for water within Fairfax Water's service area.
- **Construction of various Transmission Mains:** Transmission mains include: Corbalis to Fox Mill Water Main, Fox Mill to Vale Road Water Main, Waples Mill to Vale Road Water Main and the Hunter Mill Road Water Main.
- **System Reliability Improvements:** Construction of back-up power generation facilities and additional system storage to mitigate plant and pumping station failures due to interruptions in commercially supplied power.
- **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.
- **Source Water Protection Activities:** Fairfax Water continues to advocate for source water protection through support of the Occoquan Watershed Monitoring Program, Occoquan Nonpoint Source Program, the Potomac River Basin Drinking Water Source Protection Partnership, 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 10 storage facilities with a total capacity of approximately 14.2 MGD. The overall system consists of approximately 495 miles of pipe ranging from 4 inches to 42 inches.

CURRENT PROJECT DESCRIPTIONS

FAIRFAX WATER

1. **General and Administrative.** \$122,330,000 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.** \$16,166,000 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 Fairfax Water inspection of water mains installed by land development contractors.
3. **Extraordinary Maintenance and Repairs.** \$125,290,000 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.** \$126,984,000 for improvement and betterment of existing supply, treatment, transmission, distribution and general plant facilities associated with a specific project.
5. **General Studies and Programs.** \$13,229,000 for general studies, programs, engineering and research pertaining to water quality, water supply and system development.
6. **Treatment Facilities.** \$188,000,000 for design and construction of the Griffith Treatment Facility, which came on line in 2006. Remaining expenditures reflect costs associated with decommissioning the formerly used Lorton and River Station treatment plants.
7. **Transmission Facilities.** \$19,240,000 for the design and construction of a transmission SCADA system and various pumping station modifications throughout Fairfax County.
8. **General Plant Facilities.** \$46,840,000 for annual expenses attributed to administration, overhead and bond financing for projects funded by current bond issue, future bond issue or funds on hand.
9. **Potomac Stage III Treatment Facilities.** \$198,400,000 for the design and construction of the next production capacity increment at the Corbalis Water Treatment Plant.
10. **Potomac Stage III Transmission Facilities.** \$66,849,000 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 to Fox Mill Water Main, Fox Mill to Vale Road Water Main, Waples Mill to Vale Road Water Main and the Hunter Mill Road Water Main.
11. **Potomac Stage III General Plant Facilities.** \$41,856,000 for annual expenses 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

12. **Dolley Madison to McLean Pumping Station Water Main.** \$1,300,000 to construct a 30-inch water main in Dolley Madison from Old Dominion Drive to the McLean Pumping Station to meet future projected demands.
13. **Seven Corners System Improvements.** \$2,375,000 over ten years for a new storage tank in the Seven Corners area.
14. **Water Main Replacement Program.** \$9,000,000 over five years as part of a systematic approach to water main replacement throughout the City's water system, which is based on several factors, including main break history, impact to customers and traffic impacts. Each year this list is reevaluated and priority replacement projects are selected for construction.
15. **McLean Pump Station.** \$675,000 to rehabilitate and upgrade the existing facility.
16. **Kirby Road Water Main (Chain Bridge – Chesterbrook).** \$12,300,000 to construct a 36-inch water main from the Chain Bridge Pumping Station to the Chesterbrook Pumping Station. This main is part of an overall project that will provide increased water volume to the Dunn Loring and Tysons Corner areas.
17. **Kirby Road Water Main (Chesterbrook – Westmoreland).** \$6,800,000 to construct 36-inch water mains from the Chesterbrook Pumping Station to Westmoreland Street, and in Haycock Road from Great Falls Street to Highland Avenue. These mains are part of an overall project that will provide increased water volume to the Dunn Loring and Tysons Corner areas.
18. **Pumping Station Control Center.** \$200,000 to relocate the operations control center to a new location at a property owned by the City.
19. **Washington Aqueduct Residuals Disposal.** \$11,450,000 as the City's share of a project to eliminate discharge of water treatment residuals to the Potomac River.

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

Project Title/ Project Number	Source of Funds	Authorized to be Expended Thru FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	Total FY2009-FY2013	Total FY2014-FY2018	Total Project Estimate
Fairfax Water										
1. General and Administrative	SR	C	9,880	10,540	9,340	12,600	15,240	57,600	64,730	122,330
2. Subdivision and Other Development Projects	SR	C	1,591	1,639	1,688	1,739	1,791	8,448	7,718	16,166
3. Extraordinary Maintenance and Repairs	SR	C	17,166	14,192	13,582	12,853	12,412	70,205	55,085	125,290
4. Additions, Extensions, and Betterments	SR	C	42,526	41,061	8,743	6,004	5,664	103,998	22,986	126,984
5. General Studies and Programs	SR	C	8,313	1,760	379	400	423	11,275	1,954	13,229
6. Treatment Facilities	SR	187,537	463					463		188,000
7. Transmission Facilities	SR	11,560	2,665	1,465	2,485			6,615	1,065	19,240
8. General Plant Facilities	SR	44,560	430	250	880			1,560	720	46,840
9. Potomac Stage III Treatment Facilities	SR	190,751	7,207	442				7,649		198,400
10. Potomac Stage III Transmission Facilities	SR	20,458	14,250	16,650	10,900	3,841		45,641	750	66,849
11. Potomac Stage III General Plant Facilities	SR	28,906	2,930	2,950	4,420	2,140		12,440	510	41,856
Subtotal		483,772	107,421	90,949	52,417	39,577	35,530	325,894	155,518	965,184
Falls Church Department of Public Utilities										
12. Dolley Madison to McLean P.S. Water Main	RB	C				200	1,100	1,300		1,300
13. Seven Corners System Improvements	RB	1,300	375	700				1,075		2,375
14. Water Main Replacement Program	RB	C	1,000	2,000	2,000	2,000	2,000	9,000		9,000
15. McLean Pump Station	RB	75	600					600		675
16. Kirby Road Water Main (Chain Bridge - Chesterbrook)	RB	C		700	3,000	4,300	4,300	12,300		12,300
17. Kirby Road Water Main (Chesterbrook - Westmoreland)	RB	C				800	2,000	2,800	4,000	6,800
18. Pumping Station Control Center	SR	50	150					150		200
19. Washington Aqueduct Residuals Disposal	SR	11,050	400					400		11,450
Subtotal		12,475	2,525	3,400	5,000	7,300	9,400	27,625	4,000	44,100
GRAND TOTAL		\$496,247	\$109,946	\$94,349	\$57,417	\$46,877	\$44,930	\$353,519	\$159,518	\$1,009,284

Notes:
Numbers in **bold italics** represent funded amounts.
A "C" in the 'Authorized to be 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