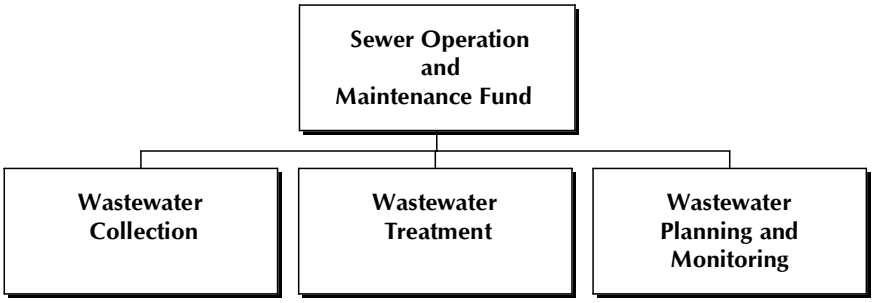
Fund 401
Sewer Operation and Maintenance



Mission

To safely collect and treat wastewater in compliance with all regulatory requirements using state-of-the-art technology in the most cost-effective manner in order to improve the environment and enhance the quality of life in Fairfax County.

Focus

The Wastewater Management Program includes wastewater collection and conveyance, wastewater treatment, and planning and monitoring program areas. The primary functions are to strategically plan, efficiently operate and effectively maintain the wastewater system in the best interest of the County and its customers. Funding for sewer operations and maintenance are financed by a transfer from Fund 400, Sewer Revenue which is used to credit all system revenues collected, including availability fees and sewer service charges associated with the program.

The functions of the Wastewater Management Program are carried out by three divisions under the supervision of the Director of the Department of Public Works and Environmental Services (DPWES), as follows:

1. *Wastewater Collection Division (WCD)*: Operates and maintains the sewers, force mains, pumping stations, and metering stations.

2. *Wastewater Treatment Division (WTD)*: Operates and maintains the County's advanced wastewater treatment plant, the Noman M. Cole, Jr. Pollution Control Plant (NCPCP).

3. *Wastewater Planning and Monitoring Division (WPMD)*: Operates the County's laboratory facility, administers the Industrial Pretreatment Program for the County, performs engineering planning and analysis, provides financial management, and manages service agreements with nearby jurisdictions.

This program operates and maintains nearly 3,330 miles of sewer, 65 pump stations and 54 flow-metering stations. Treatment of wastewater generated is provided primarily through five regional wastewater collection and treatment plants. The regional treatment approach takes advantage of economies of scale in wastewater treatment and ensures the economical and efficient operation and management of the program.

Fund 401
Sewer Operation and Maintenance

One of the five regional plants is the County's owned and operated Noman M. Cole, Jr. Pollution Control Plant (NCPCP), which is currently permitted to treat 67 million gallons per day (mgd) of flow. Other regional facilities include the District of Columbia Water and Sewer Authority's Blue Plains Treatment Plant with 31 mgd capacity; Alexandria Sanitation Authority's Treatment Plant with 32.4 mgd capacity; Upper Occoquan Sewage Authority's Treatment Plant with 27.6 mgd capacity; and Arlington County's Treatment Plant with 3 mgd capacity. Fairfax County utilizes all of these facilities to accommodate a total capacity of 161 mgd.

In FY 2008, the County is projected to provide for the treatment of 111.15 million gallons of wastewater per day. Approximately 40 percent of this flow is treated at the NCPCP. The flow is distributed between the NCPCP and the interjurisdictional facilities as detailed in the following table. The table also includes the capacity utilization percentage and the available (unused) capacity for each plant.

Treatment Plant	Capacity (MGD)	FY 2008 Projected Daily Average (MGD)	Capacity Utilization (%)	Available Capacity (MGD)
DCWASA Blue Plains	31.0	28.93	93%	2.07
Noman M. Cole, Jr.	67.0	44.37	66.2%	22.63
Alexandria Sanitation Authority	32.4	22.80	70.4%	9.6
Arlington County	3.0	2.30	76.7%	.70
Upper Occoquan Sewage Authority	27.6	12.75	46.2%	14.85
Total	**161.0**	**111.15**	**69%**	**49.85**

To ensure that the Wastewater Management Program remains competitive and provides a high performance operation including improvements to the technical and managerial capacities that will continue to enhance service quality, customer service and financial planning, Wastewater Management closely monitors the following areas:

	FY 2006 (Actual)	FY 2007 (Actual)	FY 2008 (Projection)
Sewer Service Charge, $/1,000 gallons	$3.28	$3.50	$3.74
Treatment Plant Costs, $/MGD	$1,137	$1,137	$1,300
Sewer System Overflows, Number/1,000 Miles of Sewer	13	14	20
Odor Complaints per year	21	16	40

Fund 401
Sewer Operation and Maintenance

The County allocates expenses, interest income, bond proceeds, debt service payments, capital improvement project costs and funding, and operating transfers between existing and new users of the system. In accordance with the County's "Growth Pays for Growth Policy", both existing and new customers must pay for their share of the system's total annual revenue requirements.

The Wastewater Management Program (WWM) is funded by revenues generated by the customers of the sanitary sewer system and recorded in Fund 400, Sewer Revenue. Sewer service charges support system operation and maintenance costs, debt service payments, and capital projects that is attributable to supporting and improving wastewater treatment services for existing customers. Availability fees support a proportional share of system costs and capital projects attributable to growth of the system required to support new customers. Existing customers are defined as those who have paid an availability fee for access to the system and receive wastewater treatment services. New customers are those who have not paid the availability fee. Upon payment of the availability fee and connection to the system, a new customer becomes an existing customer.

The agency has identified a number of trends that influence the operation and maintenance of the sanitary sewer system. The major trends over the next two to five years include the following:

THINKING STRATEGICALLY

Strategic issues for the department include:

- Providing superior wastewater services to achieve a pure and natural state of air and water;
- Improving customer service, customer strategy and satisfaction by providing more comprehensive employee training;
- Expanding the Health and Safety Program through the improvement of the Emergency Planning and Response areas to ensure a safe work environment;
- Evaluating the program's financial management strategies to ensure proper cash management and debt capacity; and
- Utilizing automated technologies to enhance the existing computer systems to increase infrastructure rehabilitation projects in the most effective manner.

Chesapeake Bay Water Quality Program Requirements - The new 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 will include a requirement that nutrient removal be performed at the "Limits of Technology." Current technology allows for discharge limits of less than 3.0 milligrams per liter of nitrogen and 0.1 milligrams per liter for phosphorus. The County has the capability to meet the current nitrogen removal standard of 8.0 milligrams per liter. A phased approach is recommended to renovate and upgrade current plant facilities to accommodate new more stringent nutrient discharge requirements. The Sewer Service Charge rate will increase from $3.50 to $3.74 per 1,000 gallons of water consumption in FY 2008. This equates to a 6.75 percent increase in rates and will result in an anticipated increase in the annual cost to the typical household of $18.24. The higher increase in Sewer Service Charges is a direct result of the Chesapeake Bay federally mandated requirements which will result in the renovation and rehabilitation of existing treatment facilities. Funding of $150 million was recommended through the sale of bonds and was anticipated to occur in FY 2007 to meet new state regulatory requirements in (WWM). However, based on the timing of revised project schedules and alternate

shorter-term financing options, a bond sale is no longer anticipated. Rather, it is anticipated that projects will be financed on an as needed basis using a line of credit to allow for flexibility in the timing of planned projects.

Capacity, Maintenance, Operation, and Management (CMOM) - The United States Environmental Protection Agency (USEPA) has been planning for several years to promulgate sanitary sewer overflow (SSO) regulations, which would require municipalities to develop and implement a CMOM program to eliminate any sewer overflows and backups from the wastewater collection systems. The proposed SSO rule and the CMOM program would significantly affect program costs.

Integration of Information Technology - The Geographic Information System (GIS), the Supervisory Control and Data Acquisition (SCADA) System and the Infrastructure Computerized Maintenance Management System (ICMMS) will eventually require integration for optimal use. Computing and information technology are an integral part of every aspect of the Wastewater Management Program operations. Today's high customer expectations and increasing reliance on consistent 24-hour services, lead to an increasing dependence on and expectation for stable and reliable integrated information technologies that infuse the business process. Presently, the GIS, the SCADA system, the ICMMS system and other critical business systems operate independently and do not share information. Future customer service needs will require a full enterprise integration of the critical information technology systems to reduce total cost of ownership, increase availability of critical business data in the right format, and improve the quality and delivery of services to sewer customers.

Capital Improvements - Reinvestment in the sewer system infrastructure ensures optimum operation of all wastewater facilities. This initiative, closely related to CMOM endeavors, emphasizes capital improvements to wastewater collection and treatment facilities to meet requirements of the future sanitary sewer overflow regulations by the USEPA. The program continues to take a proactive stance toward infrastructure rehabilitation; however, CMOM regulations could greatly affect operations.

Asset Management Program - As a result of evaluating the program's financial management strategies, an Asset Management Program was developed. The first phase aligned the program's capital asset policies and procedures with the County's fixed asset policies and developed a process in which to evaluate the program's infrastructure. The second phase developed criteria to identify the program's critical assets. After the criteria was tested and accepted it was applied to all program assets. Phase three will be the condition assessment of all assets beginning with the most critical assets.

Fund 401
Sewer Operation and Maintenance

Budget and Staff Resources

Agency Summary		
Category	**FY 2007 Actual**	**FY 2008 Adopted Budget Plan**
Authorized Positions/Staff Years		
Regular	326/ 325.5	326/ 325.5
Expenditures:		
Personnel Services	$20,646,288	$26,761,386
Operating Expenses	53,061,948	57,927,447
Capital Equipment	528,675	450,500
Subtotal	**$74,236,911**	**$85,139,333**
Less:		
Recovered Costs	($624,334)	($628,409)
Total Expenditures	**$73,612,577**	**$84,510,924**

Note: All expenditures in sewer operations and maintenance are supported by a Transfer In from the Sewer Revenue Fund.

SUMMARY OF ALL AGENCY LOBS (FY 2008 Adopted Budget Data)

Number	*LOB Title*	*Net LOB Cost*	*Number of Positions*	*LOB SYE*
401-01	Wastewater Collection	$14,140,911	142	142.0
401-02	Wastewater Treatment	$23,331,024	141	141.0
401-03	Wastewater Planning and Monitoring	$47,038,989	43	42.5
TOTAL		**$84,510,924**	**326**	**325.5**

LOBS SUMMARY

401-01: Wastewater Collection

Fund/Agency: 401	Sewer Operation and Maintenance
LOB #: 401-01	**Wastewater Collection**
Personnel Services	$10,384,623
Operating Expenses	$3,893,203
Recovered Costs	($471,915)
Capital Equipment	$335,000
Total LOB Cost:	$14,140,911
Federal Revenue	$0
State Revenue	$0
User Fee Revenue	$0
Other Revenue	$0
Total Revenue:	$0
Net LOB Cost:[1]	$14,140,911
Positions/SYE involved in the delivery of this LOB	142 / 142.0

[1]Net cost is supported by revenue to the fund as well as fund balance.

▶ LOB Summary

Wastewater Collection is responsible for the operation, maintenance, repair, and rehabilitation of the County's wastewater collection and conveyance system consisting of approximately 3,330 miles of sanitary sewers and force mains, 65 pumping stations and 54 metering stations. Fairfax County has on of the nation's largest sanitary sewer systems serving 234 square miles. The WCD has a proactive sewer system maintenance program that facilitates a safe and effective wastewater collection system. Each year, over 800 miles of sewer lines are inspected and about 400 miles of sewer lines are cleaned to ensure maximum flow carrying capacity and reduce sewer backups and overflows. Over the last five years, WCD has rehabilitated 120 miles of sewer lines to protect the environment and residents of Fairfax County.

WCD initiatives include:

- Utilization of trenchless technologies for sewer rehabilitation. These technologies provide significant cost savings over traditional open cut repairs with the additional benefits of reduced disruption to citizens, the surrounding environment, and traffic.

- In-house Inflow & Infiltration (I/I) and flow monitoring programs to enable the Wastewater Management Program to identify problem areas. The I/I program has continued to focus on locating problem areas in the system's older sewer service areas, which are then addressed in the comprehensive sewer rehabilitation program. The flow monitoring program provides valuable data to determine problem areas and for billing requirements for interjurisdictional flows. These data are utilized by the Wastewater Planning and Monitoring Division to track

the accuracy of the flow projections and to aid in determining treatment plant expansion needs.

- Greater efforts in sewer inspection and cleaning activities. These activities result in decreasing numbers of overflows and backups in the system.

► Method of Service Provision

Wastewater Collection uses a combination of County employees and contractors to perform the duties of the various aspects of operating, maintaining, and rehabilitating the sanitary sewer system. The normal hours of operation is Monday – Friday 8:00 a.m. – 4:30 p.m., however emergency crews are available 24 hours a day, seven days a week, including holidays.

► Mandate Information

This LOB is federally or state mandated. The percentage of this LOB resources utilized to satisfy this mandate is 100. See the January 2007 Mandate Study, reference page 65 for the specific state code and a brief description.

401-02: Wastewater Treatment

Fund/Agency: 401	*Sewer Operation and Maintenance*
LOB #: 401-02	*Wastewater Treatment*
Personnel Services	$12,196,531
Operating Expenses	$11,064,493
Recovered Costs	$0
Capital Equipment	$70,000
Total LOB Cost:	$23,331,024
Federal Revenue	$0
State Revenue	$0
User Fee Revenue	$0
Other Revenue	$0
Total Revenue:	$0
Net LOB Cost:[1]	$23,331,024
Positions/SYE involved in the delivery of this LOB	141 / 141.0

[1]Net cost is supported by revenue to the fund as well as fund balance.

Fund 401
Sewer Operation and Maintenance

▶ LOB Summary

The Wastewater Treatment Division (WTD) is responsible for operating and maintaining the County's wastewater treatment facility, the Noman M. Cole, Jr. Pollution Control Plant (NCPCP). In FY 2005, the NCPCP expanded capacity from 54 mgd to 67 mgd. This expansion includes improvements for odor control and nitrogen removal to meet requirements of the Chesapeake Bay agreement. The WTD continues to produce a quality effluent to meet regulatory and permit requirements.

WTD initiatives include:

- Plant expansion and upgrades. Expansion of the main plant to 67 mgd began on January 12, 1998 and a certificate to operate the new improvements was obtained in July 2005. The improvements included work on the existing preliminary and primary treatment systems; upgrade and expansion of the activated sludge system and secondary clarifiers; addition of a tertiary clarifier; and ancillary improvements related to the primary, secondary, and advanced wastewater treatment systems, including odor control systems. These improvements provide a biological nutrient removal (BNR) process to meet the plant's new Virginia Pollutant Discharge Elimination System (VPDES) permit limits for ammonia nitrogen.

- Odor Control Measures. As part of the Main Plant Improvements, covers were installed on primary tanks, and air withdrawn from the tanks is treated in a new two-stage wet chemical scrubbing system. These components were brought on-line in July 2002. In addition, a three-stage wet chemical scrubber has been installed on the sludge storage tanks, a grit hopper enclosure is complete, and ventilation improvements were made to several existing buildings with carbon adsorption systems. These improvements went on-line in FY 2005. The new centrifuges also have an odor control scrubber. Since construction, one of the chemical scrubbers has been modified to improve hydrogen sulfide removal from 99 to 99.9. A vent has also been eliminated on the Accotink trunk sewer near the plant.

- Environmental Management System (EMS). Environmental Enterprise (E2) status was achieved in March 2004; Exemplary Environmental Enterprise (E3) status was achieved in July 2007 as part of the County-wide EMS initiative. Work towards Extraordinary Environmental Enterprise (E4) status is in progress. In addition, a pollution prevention program has also been implemented through a cross-functional Wastewater Management Program team.

- Replacement of membrane filter presses with centrifuges. The project was bid in FY 2004 and the facilities came online during FY 2006 and FY 2007.

WTD awards include:

- **NACWA Platinum Peak Performance Award** – The System's Noman M. Cole, Jr. Pollution Control Plant received the Platinum 9 Peak Performance Award from National Association of Clean Water Agencies (NACWA), recognizing the facility's accomplishments in protecting water quality in the County. This distinction was given to only 76 of the approximately 16,500 municipal wastewater treatment plants across the nation. The award recognizes plants that meet 100 of federal standards for preventing pollution for more than

five consecutive years. The plant has protected the water quality of the County streams and watersheds, as well as the Chesapeake Bay. Last year, the plant was honored for the 20th consecutive time for its efforts to protect the Bay.

- **Businesses for the Bay Environmental Excellence Award** – For the second year in a row, Fairfax County's Wastewater Management Program received a Business for the Bay Environmental Excellence Award for the Outstanding Achievement for Nutrient Reduction by Local Government. The Noman M. Cole, Jr. Pollution Control Plant's nutrient reduction program achieved an average total phosphorus concentration of 0.08 mg/l in contrast to a permit requirement of 0.18 mg/l. Therefore, the total phosphorous loading to Pohick Creek, a tributary to the Chesapeake Bay, was 15,382 pounds less than required permit levels. The average total nitrogen discharge concentration was 4.5 mg/L, nearly half the voluntary target of 8.0 mg/L.

▶ Method of Service Provision

The NCPCP is operated 24 hours a day, 365 days a year.

▶ Mandate Information

This LOB is federally or state mandated. The percentage of this LOB resources utilized to satisfy this mandate is 100. See the January 2007 Mandate Study, reference page 65 for the specific state code and a brief description.

401-03: Wastewater Planning and Monitoring

Fund/Agency: 401	*Sewer Operation and Maintenance*
LOB #: 401-03	*Wastewater Planning and Monitoring*
Personnel Services	$4,180,232
Operating Expenses	$42,969,751
Recovered Costs	($156,494)
Capital Equipment	$45,500
Total LOB Cost:	$47,038,989
Federal Revenue	$0
State Revenue	$0
User Fee Revenue	$0
Other Revenue	$0
Total Revenue:	$0
Net LOB Cost:[1]	$47,038,989
Positions/SYE involved in the delivery of this LOB	43 / 42.5

[1]Net cost is supported by revenue to the fund as well as fund balance.

Fund 401
Sewer Operation and Maintenance

▶ LOB Summary

The Wastewater Planning and Monitoring Division (WPMD) is responsible for the agency's fiscal planning, engineering planning and wastewater monitoring. The WPMD continues to effectively monitor the long-term planning needs for the Wastewater Management Program in terms of infrastructure upgrades, maintenance and expansions. The WPMD ensures that all financial requirements are fulfilled by maintaining a rate structure to adequately recover all operating and maintenance costs, capital improvements and debt service obligations. The WPMD also plans for system capacity, both in the conveyance system and treatment facilities, by initiating expansion and improvement projects to keep pace with increased wastewater flows. The WPMD safeguards the environment by ensuring compliance with water quality standards and prevention of toxic discharges into the collection system.

WPMD is currently monitoring the new Chesapeake Bay water quality program requirements which require 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 will include a requirement that nutrient removal be performed at the "Limits of Technology." Current technology allows for discharge limits of less than 3.0 milligrams per liter of nitrogen and 0.1 milligrams per liter for phosphorus. The County has the capability to meet the voluntary nitrogen standard of 8.0 milligrams per liter. A phased approach has been recommended to renovate and upgrade current plant facilities to accommodate new more stringent nutrient discharge requirements. The Sewer Service Charge rate will increase from $3.50 to $3.74 per 1,000 gallons of water consumption in FY 2008. This equates to a 6.75 percent increase in rates and will result in an anticipated increase in the annual cost to the typical household of $18.24. The higher increase in Sewer Service Charges is a direct result of the Chesapeake Bay federally mandated requirements which will result in the renovation and rehabilitation of existing treatment facilities. Due to the significant level of requirements, the FY 2007 budget reflected an anticipated bond sale in FY 2007 in the amount of $150 million to provide maximum flexibility to meet new state regulatory requirements at Wastewater Management facilities. However, based on revised project schedule timelines, a bond sale is no longer anticipated. Rather, projects will be financed on an as-needed basis with shorter-term financing options in FY 2008.

The system supplements the capacity of its own collections and treatment facilities through "Treatment by Contract" agreements with the District of Columbia Water and Sewer Authority (DCWASA), the Alexandria Sanitation Authority (ASA), the Upper Occoquan Sewage Authority (UOSA) and Arlington County. As stated in the individual agreements, the County pays its share of operating, capital and/or debt costs of each entity's system based on actual wastewater flows and allocated capacity, respectively.

WPMD initiatives include:

- Water Environment Federation Teach (WEFTEACH) Sewer Science Program. This program was implemented in Fairfax County High Schools. All 25 High Schools had a science teacher trained at WEFTEC 2005 in Washington, D.C. County staff coordinates the program and provides the approved workbooks and laboratory modules as well as serves as mentors to assist the teachers in the classroom for up to a 5-day period per class. This program is a partnership with Fairfax County Schools and is expected to increase awareness

and understanding of wastewater's function in the community, and may even lead to student and community improvements to the environment.

- Initiate the training of engineers on the new hydraulic modeling software (InfoSewer™). Apply the model to areas in the County where anticipated development may require adjustments to the existing sanitary sewer facilities. Contingent on the success of Fairfax County's ArcIMS program, create a web application to provide on-line public access to as-built sewer information from the GIS sewer database.

WPMD awards include:

- **GFOA Certificate of Achievement for Excellence in Financial Reporting** – For the fourth consecutive year, the Government Finance Officers Association of the United States and Canada (GFOA) awarded a Certificate of Achievement for Excellence in Financial Reporting to the System for its Comprehensive Annual Financial Report (CAFR) for the fiscal year ended June 30, 2006. In order to be awarded a Certificate of Achievement, a government entity must publish an easily readable and efficiently organized comprehensive annual financial report. This report must satisfy both generally accepted accounting principles and applicable financial reporting requirements.

A Certificate of Achievement is valid for a period of one year only. The Wastewater Management Program believes that their current CAFR continues to meet Certificate of Achievement Program's requirements, and are submitting it to the GFOA to determine eligibility for another certificate. The Certificate of Achievement is a prestigious national award recognizing conformance with the highest standards of state and local government financial reports.

► Method of Service Provision

Normal business hours are 8:00 a.m. - 4:30 p.m. Monday – Friday.

► Mandate Information

This LOB is federally or state mandated. The percentage of this LOB's resources utilized to satisfy this mandate is 90 (for Treatment by Contract expenses). See the January 2007 Mandate Study, reference page 65 for specific state code and a brief description.

AGENCY PERFORMANCE MEASURES

Objectives

- To comply with Title V air permit and state water quality permit requirements 100 percent of the time in order to contribute to a pure and natural state of air and water in Fairfax County.

- To maintain sewer infrastructure effectively in order to experience no more than 25 sewer back-ups, which is less than the 5-year rolling annual average of 34.

Fund 401
Sewer Operation and Maintenance

- To ensure efficient wastewater collection and treatment services by providing service to customers at rates that are the lowest in the area.
- To provide excellent financial and asset management by ensuring a debt coverage ratio of 1.20 or greater.

Indicator	Prior Year Actuals		Current Estimate	Future Estimate	LOB Reference Number
	FY 2006 Actual	FY 2007 Estimate/Actual	FY 2008	FY 2009	
Output:					
Total average daily wastewater flow treated (million gallons)	102.4	110.5 / 107.2	110.0	112.0	401-02
Emergency repair work orders processed (1)	99	2,100 / 197	200	200	401-01
Service trouble calls received	1,404	1,500 / 1,236	1,500	1,500	401-03
Operating Reserve maintained (millions)	$18.8	$19.5 / $19.0	$19.3	$19.6	401-03
Efficiency:					
Percent of treatment capacity available for growth	36%	33% / 33%	33%	35%	401-02
Emergency repairs, as a percent of total work orders	0.5%	0.5% / 0.8%	1.0%	1.0%	401-01
Sewer Service Billing Rate, $/1,000 gallons	$3.28	$3.50 / $3.50	$3.74	$4.10	401-03
Service Quality:					
Sanitary sewer overflows (SSOs) per year (FY 2005, 5-yr. avg. = 20)	13	20 / 14	20	20	401-02
Percent of customers responded to within 24 hours	100%	100% / 100%	100%	100%	401-03
Percentage of sewage back-ups responded to within 2 hours	100%	100% / 100%	100%	100%	401-01
Odor complaints per year (FY 2005, 5-yr. avg. = 45)	21	40 / 16	40	40	401-03
Percent Capital Improvement Program funded	100%	100% / 100%	100%	100%	401-03
Outcome:					
Compliance with Title V air permit and State water quality permit	100%	100% / 100%	100%	100%	401-02
Blockages causing sewer back-ups per year (FY 2005, 5-yr. avg. = 34)	7	25 / 12	25	25	401-01
Average household sewer bill compared to other providers in the area	Lowest	Lowest / Lowest	Lowest	Lowest	401-03
Debt Coverage Ratio: (Revenue - Operating Cost/Debt)	1.90	1.30 / 1.70	1.30	1.20	401-03

(1) The agency redefined the definition of emergency repairs to include only true emergency work and no longer includes unscheduled work orders in this performance measurement.