ORANGE WATER AND SEWER AUTHORITY
Quality Service Since 1977

AGENDA
MEETING OF THE OWASA BOARD OF DIRECTORS
THURSDAY, OCTOBER 26, 2006, 7:00 P.M.
CHAPEL HILL TOWN HALL

In compliance with the "Americans with Disabilities Act," interpreter services are available with five days prior notice. If you need this assistance, please call the Clerk to the Board at 537-4217.

7:00 PM **Administer Oath of Office to Town of Carrboro Appointee William R. Stott, III**

7:05 PM **Announcements**

1. Announcements by the Chair
   - A. Any Board member who knows of a conflict of interest or potential conflict of interest with respect to any item on the agenda tonight is asked to disclose the same at this time.
   - B. The OWASA Board will have a Work Session on Wednesday, November 15, 2006 at 7:00 P.M. to discuss rate design
2. Announcements by Board Members
   - A. The Budget and Financial Planning Committee Meeting on Thursday, November 9, 2006 at 8:30 A.M. in the OWASA Boardroom to discuss rate design (Milton Heath)
3. Announcements by Staff
   - A. OWASA Employee Service Awards (Ed Kerwin)
   - B. Sunday, November 12, 2006 will be the last day of the recreation season at OWASA's lakes (John Greene)
   - C. Association of Metropolitan Water Agencies 2006 Gold Award for Competitiveness Achievement (John Greene)
   - D. Series 2006 Bond Closing (Pat Davis)

7:20 PM **Petitions and Requests**

1. Public
2. Board
3. Staff

REGULAR AGENDA
Discussion and Action

7:25 PM 1. Resolution of Appreciation for D. Douglas Terry (Mac Clarke/Ed Kerwin)

Discussion

7:35 PM 2. Annual Review and Update of Strategic Trends and Master Plan Issues (Ed Holland)

8:00 PM 3. Report on the Piney Mountain Pump Station Replacement Project (Mason Crum)

8:10 PM 4. Annual Performance Measurement Report Fiscal Year 2002-2006 (Ed Kerwin and Staff)

ITEM 1

RESOLUTION OF APPRECIATION FOR D. DOUGLAS TERRY

Whereas, Doug Terry began serving as the Superintendent of the Jones Ferry Road Water Treatment Plant on January 28, 1974, when the University of North Carolina at Chapel Hill owned and operated the public water system for the Chapel Hill-Carrboro community; and

Whereas, Doug Terry has been responsible for the operation of the Jones Ferry Road Water Treatment Plant since the Orange Water and Sewer Authority (OWASA) began serving the community in February, 1977; and

Whereas, Doug Terry's responsibilities included oversight and protection of our raw water supplies, University Lake and the Cane Creek and Stone Quarry Reservoirs; and supervision of lake recreation and involvement in developing and managing an in-house spill response team; and

Whereas, Doug Terry will retire on Friday, October 27, 2006 from his position as OWASA's Manager of Water Supply and Treatment; and

Whereas, Doug Terry's career in the water resource field spans 40 years, including his service for the City of Raleigh as a wastewater treatment plant operator and water treatment laboratory supervisor; and

Whereas, during the entirety of Doug Terry's tenure at the Jones Ferry Road Water Treatment Plant, there were no violations of State or Federal drinking water quality standards; and

Whereas, during Doug Terry's career, OWASA won awards for Best Tasting Water in North Carolina in 1988, 1989 and 2003; and

Whereas, in June, 2005 OWASA's drinking water treatment program received a national award, the "Director's Certificate of Recognition," from the Partnership for Safe Water; and

Whereas, Doug Terry received the North Carolina Waterworks Operator Association's awards for Class A Operator of the Year in 1990, Piedmont Region Operator of the Year in 1995 and State-wide Operator of the Year in 2000; and

Whereas, Doug is well loved by OWASA employees and he is well known for his quick sense of humor;

NOW, THEREFORE, BE IT RESOLVED BY THE DIRECTORS OF ORANGE WATER AND SEWER AUTHORITY:

1. That OWASA Board of Directors does hereby formally recognize, honor and praise D. Douglas Terry for his many achievements with the Orange Water and Sewer Authority and expresses its appreciation for his dedicated and loyal service in providing high quality drinking water to people in the Chapel Hill-Carrboro community.

Adopted this the 26th day of October, 2006.

Michael A. (Mac) Clarke, Chair

ATTEST:

Gordon Merklein
Secretary

ITEM 2

AGENDA ITEM

- **ANNUAL REVIEW AND UPDATE OF STRATEGIC TRENDS AND MASTER PLAN ISSUES**

BACKGROUND

- To provide information and discussion about long-term, trends and utility planning issues.

PURPOSE

- The attached memorandum is this year's update of OWASA's 2001 *Comprehensive Water and Sewer Master P*lan. The purpose of these annual reports is to revisit key Master Plan elements and to note new information, data trends, or policy issues that either change or reinforce original findings and recommendations.

- Staff will present the findings.

ACTION NEEDED

- No action necessary; discussion as desired by the Board.

October 26, 2006

MEMORANDUM

TO: Board of Directors

THROUGH: Ed Kerwin

FROM: Ed Holland

DATE: October 20, 2006

SUBJECT: Annual Review and Update of Strategic Trends and Master Plan Issues

Summary

OWASA water sales and reservoir withdrawals for the past five years have remained below the historically high levels observed in 2001. Reduced consumption is likely due to a combination of weather factors and water conservation efforts by customers across all user categories. Reduced reservoir withdrawals also result from the recycling of water treatment plant process water that began in the fall of 2002. Process water was previously released to an intermittent creek. Water withdrawals from University Lake and Cane Creek are 23 percent less in 2006 than were projected in OWASA's 2001 Master Plan.

Substantial reductions in summer peak demands at the Jones Ferry Road Water Treatment Plant continue to indicate that customers are using less water outdoors (irrigation). We believe this is a response to OWASA's seasonal rate structure and to year-round standards in the Carrboro, Chapel Hill, and Orange County conservation ordinances.

A continuing trend of lower peak flows at the Mason Farm Wastewater Treatment Plant during rainy periods suggests that OWASA's long-term program to systematically identify, repair and replace older sewer lines is successfully reducing the unwanted inflow and infiltration of stormwater into the sewer system.

Lower peak demands at both the water and wastewater treatment plants will delay the need for costly future expansions.

OWASA's projections of future demand are based on the approved comprehensive plans of Carrboro, Chapel Hill, and Orange County and reflect the most up-to-date information available regarding new development proposed for the University's Central Campus and Carolina North. Local rezoning decisions that are consistent with existing comprehensive plans are not expected to affect OWASA's demand projections. Additional development density can be accommodated within the scope of OWASA's current plans if highly efficient water conservation technologies are implemented in new development projects.

We are working with local government staffs to develop collaborative approaches for increasing water use efficiency in our service area.

The existing reservoir/quarry water supply system and its future expansion can meet the ultimate buildout needs of the Carrboro/Chapel Hill/University community. However, if projected demands are not reduced further and/or additional water supply sources are not developed, the community will become more vulnerable to severe drought conditions beginning around 2020 until the Stone Quarry expansion is available for water storage in the early 2030s. The primary goal of OWASA's long-range conservation program and the reclaimed water system project is to reduce water shortage risks without having to rely on additional water from Jordan Lake.

Water quality in OWASA's University Lake and Cane Creek Reservoir remains good, but not pristine, as indicated by periodic blooms of blue-green algae, especially in University Lake. Both reservoirs remain sensitive to nitrogen and phosphorus nutrient inputs from their respective watersheds. Bloom conditions appear to be aggravated by prolonged summer periods of high temperature and low streamflow.

The ongoing $50 million upgrade and expansion of the Mason Farm Wastewater Treatment Plant will be completed in 2007. New and upgraded treatment units have improved the quality of the water released to Morgan Creek, increased plant reliability, reduced odor (more odor elimination measures are planned), and enabled the reuse of treated effluent to meet certain non-drinking water needs. The new filter complex and ultraviolet light (UV) disinfection systems are in service, but the filters are not yet being operated to remove nitrogen from the wastewater. The expansion to 14.5 million gallons per day (mgd) will provide additional capacity to serve new development anticipated by Carrboro, Chapel Hill, and the University.

OWASA's practice of applying liquid biosolids (highly treated wastewater sludge) to agricultural land has become limited by weather conditions, cropping schedules, availability of land, increasing biosolids volume, transportation costs, and other operational factors. Several emerging issues and trends could affect the future viability and capability of this management approach and suggest the need for a more diversified program. A draft Biosolids Master Plan is scheduled for completion in 2007.

Introduction and Background

OWASA completed a *Comprehensive Water and Sewer Master P*lan in 2001, combining previously separate elements of planning and operations information into a single "road map for the future." Overall findings of the *Master Plan Final Report* and related *Technical Memoranda* were highlighted in the December 2001 *Capstone Report*.

Annual review and update reports have been provided to the Board of Directors in memoranda of September 19, 2003, October 22, 2004 (revised), and October 21, 2005. The present memo updates last year's report with more recent data plus additional commentary where appropriate.

These annual updates are intended to revisit key Master Plan elements and note any new information, data trends, or policy issues that either change or reinforce original Master Plan findings or recommendations. The update memos follow the same basic question and answer format as the 2001 *Capstone Report* with a focus on items of the most strategic, rather than simply informational, importance. For example, annual updates emphasize questions such as "How much more water will be needed in the future?" or "What future options do we have?" rather than "How is our water treated?" or "Where does our water come from?" – unless, of course, significant changes have occurred or are proposed for those areas.

Assumptions

What basic assumptions about future growth were used in OWASA's Master Plan?

Several important assumptions and policies underlie all the Master Plan forecasts and projections. If these assumptions and policies should change significantly – either by circumstance or by public intent, substantial modifications to the Master Plan and subsequent update reports will likely be needed. The major assumptions and policies applied in the original 2001 Master Plan are listed below. Any changes or modifications that have been incorporated into the current update are discussed in the appropriate sections of this memo.

1. OWASA's long-term service area, defined by the urban services boundaries of Carrboro, Chapel Hill, and Orange County, will remain unchanged during the 50-year planning period.

2. OWASA will serve only the current service area over the next 50 years. Water demand forecasts do not anticipate any retail or wholesale water or wastewater service outside of this area.

3. The moderate and very linear growth rates experienced during the past 20 to 25 years are expected to continue. Therefore, in the absence of 2050 population and employment projections from Carrboro, Chapel Hill, and Orange County, the demand forecasts in the Master Plan are based on linear extrapolations of historical housing, employment, and development trends.

   Master Plan estimates of future residential water and sewer service demands for non-University growth were based on 2050 housing estimates that actually exceeded Carrboro's and Chapel Hill's buildout projections by more than 20 percent. In other words, Master Plan forecasts for residential water/sewer demands (which comprise 55 percent of OWASA water use) were conservatively based on buildout estimates that were known to be higher than those anticipated by local planners.

4. Due to the limited amount of land available for future growth and development under the existing plans and policies of Carrboro, Chapel Hill, and Orange County, OWASA's service area will likely be built out to currently planned development

densities sometime within the 50-year planning period, but neither the timing nor rate of growth is precisely known. It is important to note that OWASA's demand projections have been based on currently planned development densities within the currently approved urban services boundary.

Raw Water Supply

How will growth affect water and sewer demands?

Based on community trends observed since the mid-1970s, and on information provided by Carrboro, Chapel Hill, Orange County, and the University of North Carolina at Chapel Hill (the University, or UNC), OWASA's 2001 Master Plan anticipated an approximate doubling of water and sewer demands by 2050. Shortly after the Master Plan was completed, the University announced plans for accelerated development between 2002 and 2008 and, ultimately, for more intense central campus buildout than anticipated in the OWASA Master Plan. Those more recent UNC growth plans resulted in revised projections of future water and wastewater service needs that were intermediate between the "expected" and "high growth" projections of the 2001 Master Plan. These adjustments were discussed in the September 19, 2003 update memo and are reflected in current demand projections, which have not changed.

Demands for UNC's Carolina North development were included in OWASA's 2001 Master Plan projections. The preliminary water and sewer demand projections previously developed for Carolina North have not yet been modified, and this current memo reflects the best information currently available. Our projections will be updated as appropriate when the University completes the revised development plan for Carolina North.

Long-term demand projections for non-University customers are not expected to exceed OWASA's Master Plan projections unless major changes occur in the growth plans and policies of Carrboro or Chapel Hill; e.g., through significant changes in local comprehensive plans or long-range urban service boundaries already established by Carrboro, Chapel Hill, and Orange County. The pace and timing of community and University growth may result in short-term departures from projected demand trends, but such departures are not expected to affect long-term estimates of water and sewer system capacity needs. As more detailed growth plans are developed by the local governments and the University, OWASA's projected demand curves will be reviewed and refined. For example, the assumed linear pattern of future growth will likely bend upward in the middle years before leveling off at or below projected buildout levels.

In response to a request by the Chapel Hill Town Council, OWASA prepared a discussion paper entitled *Water and Sewer Capacity Implications of Increased Density in OWASA's Carrboro-Chapel Hill Service Area, February 22, 2006.* Findings were presented to elected officials of Carrboro, Chapel Hill, and Orange County. The report concluded that OWASA can meet the water needs of increased development density

within the currently defined urban services area of Carrboro and Chapel Hill through the greater use of highly efficient water conservation technologies that are available today. The report also noted that the ultimate capacities of OWASA's facilities have been based on projections of future demands that correspond to housing and employment levels that exceed Carrboro's and Chapel Hill's buildout projections by more than 20 percent, thus providing a conservative margin of safety for meeting the capacity needs of future development.

Pursuant to that report, we are now working with local government staffs to evaluate collaborative approaches for increasing water use efficiency in new and existing development within OWASA's service area.

Wastewater treatment capacity may eventually be constrained by nutrient discharge limits imposed through Jordan Lake water quality management rules that the North Carolina Environmental Management Commission will consider in 2007.

Can future water and sewer needs be reduced through more water conservation?

The drought of 2001-2002 revealed both the limits of OWASA's water supply under prolonged drought conditions as well as the potential demand reductions that can be achieved through aggressive conservation efforts. As noted in the following sections, we have observed significant reductions, which we expect to become long-term, in both drinking water and wastewater treatment demands. It is likely that these reflect several important changes that OWASA initiated after the Master Plan was completed and after the drought of 2001-2002. These include:

- √ Seasonal water rates (2002).
- √ New conservation standards and year-round requirements, and new local water conservation ordinances adopted by the local governments (2003).
- √ A comprehensive review of different conservation management practices (2003).
- √ Implementation of a permanent system for recycling process water at the Jones Ferry Road Water Treatment Plant as a raw water conservation measure (2005).
- √ Adoption of specific water conservation goals and objectives (2005).
- √ A wastewater reclamation and water reuse feasibility study with the University; follow-up technical analyses, and a contract with UNC to establish a reclaimed water program that will reduce long-term potable water demands by up to 14 percent beginning in late 2008 or early 2009.

It is likely that the comprehensive water and sewer rate study, which is currently underway, will recommend additional conservation incentives.

The role of an active OWASA conservation program – including the reclaimed water system project – has become a key element of our long term water supply plans and represents a significant strategic change since the Master Plan was completed in 2001. This was formally recognized with the Board of Directors' adoption of a *Goal and*

Objectives for OWASA's Long-Term Water Conservation and Demand Management Program in April 2005. An important focus of the goal is "eliminating the need for costly new water supply sources and facilities." In addition to specific demand targets, the document establishes guidelines for cost-effectiveness, customer satisfaction, and fiscal impacts that will be weighed when new conservation and demand management programs are contemplated. The Board intends to revisit the Water Conservation Goal and Objectives periodically and will revise them as necessary to reflect future conditions and new information that becomes available.

Have raw water demands been consistent with the Master Plan projections?

Projected and actual raw water demands (water pumped from OWASA's reservoirs) from 2000 through 2006 are presented in Figure 1. Most notable has been the overall decrease since 2001. Reduced demands likely reflect customer responses to the seasonal rate structure first implemented in 2002; year-round limits on outdoor water use; and a more general willingness to use water conservatively. University staff have documented specific technical and operational changes that have permanently reduced campus water use.

Additionally, the process water recycling program at OWASA's Jones Ferry Road Water Treatment Plant has permanently reduced raw water demands by an average of 0.63 mgd since its inception in September 2002. Efforts continue to better understand water use patterns among OWASA's different customer categories.

What is "process water recycling?"

The water treatment process requires a certain amount of water for washing filters and removing solids from treatment units. Previously, this process water, which accounted for about six to ten percent of the total water pumped to the Jones Ferry water treatment plant, was further treated and then discharged to a nearby stream. During the 2002 drought, State authorities allowed OWASA to temporarily recycle the treated process water back through the plant, rather than discarding it, thus reducing demands on the Cane Creek and University Lake reservoirs. In February 2005, following a comprehensive study, OWASA received permission to permanently continue this practice. Regulations limit process water recycling to a maximum of 10 percent of total water treated on a daily basis.

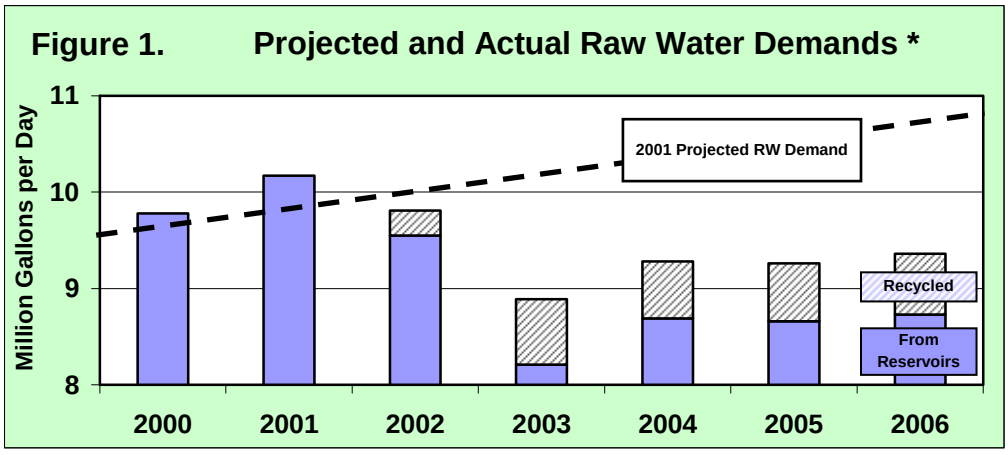
Table 1 and Figure 1 present raw water demand trends since 2000 and the role of process water recycling in reducing overall withdrawals from OWASA's reservoirs. As indicated in Table 1, a combination of treatment plant recycling and reduced customer demands has resulted in ***reservoir withdrawals that are 23 percent less in 2006 than projected in OWASA's original 2001 Master Plan.***

Table 1. Raw Water Demands and Recycled Treatment Plant Process Water

Calendar Year	Projected Demand per Master Plan	Actual Demand	Variance		Recycled WTP Process Water
	(MGD)	(MGD)	(MGD)	(%)	(MGD)
2000	9.68	9.78	0.10	1%	0
2001	9.86	10.16	0.30	3%	0
2002	10.04	9.55	(0.49)	(5%)	0.26 [a]
2003	10.22	8.21	(2.01)	(24%)	0.68
2004	10.40	8.69	(1.71)	(20%)	0.59
2005	10.58	8.66	(1.78)	(20%)	0.60
2006	10.76	8.73 [b]	(2.03) [b]	(23%) [b]	0.63 [b]

(a) Process water recycling did not begin until September 2002. The 12-month average for CY 2002 was 0.26 mgd. The 4-month average while the system was operating (September - December 2002) was 0.78 mgd.

(b) Data available through September 2006 only.



*** All demand data are reported for Jan-Dec calendar years, except 2006, for which data are only available through September.**

How much more raw water will be needed in the future?

The Master Plan projected an ultimate (2050) raw water demand of 18.5 million gallons per day (mgd). The additional main campus University growth noted above represented a potential additional demand of 3.3 mgd not anticipated in the Master Plan, for a total system demand of 21.8 mgd in 2050, which corresponds closely to the Master Plan's

"high growth" scenario. The 2001 Master Plan projections did not, however, incorporate the potential effects of demand reduction efforts, including passive conservation associated with the use of water-saving plumbing fixtures in new construction or the gradual replacement of older inefficient fixtures in existing buildings. The continued recycling of water treatment plant process water and the implementation of non-potable wastewater reclamation on the UNC campus is expected to reduce previously projected 2050 needs to an ultimate raw water demand of 18.1 mgd, which is slightly less than the original Master Plan "expected growth" projection of 18.5 mgd.

OWASA will continue working closely with UNC staff to review past and projected water use by existing and new campus facilities. Any changes in previous demand estimates will be reflected in subsequent projections.

Several new residential/commercial (mixed use) infill projects have been proposed for downtown Carrboro and Chapel Hill at higher development densities than currently allowed under local ordinances. By themselves, these projects would not affect the overall demand for OWASA service. If the local communities decide to rezone larger areas for higher development density, any additional utility service demands could be offset through the use of highly efficient water conservation technologies that are currently available, as discussed in OWASA's February 22, 2006 discussion paper *Water and Sewer Capacity Implications of Increased Density in OWASA's Carrboro-Chapel Hill Service Area.*

What is the OWASA/UNC reclaimed water program?

OWASA and the University collaborated on a major study in 2003 to determine whether high quality reclaimed wastewater from the Mason Farm Wastewater Treatment Plant could be reused to meet some of the major non-potable (non-drinking) water demands on the University's main campus. Based on the *Final Draft Water Reclamation and Reuse Feasibility Study* by Hazen and Sawyer (June, 2004) and follow-up pilot scale research, OWASA and UNC concluded that it was technically, environmentally, and economically feasible for the University to use reclaimed water in cooling tower operations at the University's chilled water facilities. Reclaimed water may also be used for irrigation of turf and landscaped areas, as well as boiler and cooling tower make-up water at the University's steam plants.

In April, 2006 OWASA and UNC signed a contract to develop a reclaimed water system by November 1, 2008. The planned system will include a reclaimed water pump station and storage tank at OWASA's wastewater treatment plant and up to five miles of new reclaimed water lines. The first phase of the system, which will include the new facilities at the wastewater plant, a 24-inch reclaimed water transmission line to the southern part of the campus, and reclaimed water pipes on the main campus. At startup, the initial reclaimed water demand will be between 0.53 and 0.66 mgd, or about five to seven percent of OWASA's total projected demands. In later phases, reclaimed water lines will be extended to serve the northern part of the campus, and by 2028 the demand for

reclaimed water is projected to be at least 1.3 to 1.9 mgd, or about 10 to 14 percent of OWASA's total demand.

As agreed to in the OWASA/UNC contract, the reclaimed water project will be financially self-supporting. The University will fund all necessary capital improvements, and OWASA will recover all related production and overhead costs through reclaimed water rates and fees to be established per the rate study now underway.

Will OWASA have enough water in the future?

The 2001 Capstone Report answered this question with an unqualified "Yes!" As reported in previous updates, the answer is still "Yes," but without the exclamation mark, and perhaps now including an asterisk or footnote to reflect the experience of the drought of 2001-2002 and the results of a more detailed hydrologic model of OWASA's quarry/reservoir system.

Master Plan calculations of water available from OWASA's University Lake/Cane Creek/Quarry Reservoir system were based on estimates of 30-year safe yield; i.e., the amount of water that the system can produce on an average daily basis throughout the year during drought conditions expected to occur about once every 30 years. The drought of 2001-2002, however, represented substantially more severe low streamflow conditions than the 30-year event. The extreme effects on reservoir drawdown and the increasing possibility that the reservoirs might become totally depleted suggested that water supply plans based on 30-year safe yield estimates might not offer as much reliability as the community desires. Subsequent estimates and illustrations of water supply capacity therefore depict OWASA's present and future water system in terms of both the 30-year safe yield and the 2002 drought, which represents the worst case on record for our local reservoir system. An improved hydrologic model of the reservoir/quarry system based on daily, rather than monthly streamflow data, was completed in 2004. The updated model indicated that previously planned improvements to OWASA's raw water pumps and transmission mains would not provide the additional yield reported in the 2001 Master Plan. Implications of those findings were discussed in the September 19, 2003 update memo and have been incorporated into OWASA's Capital Improvements Plan (CIP).

How much water can the existing reservoir/quarry system provide?

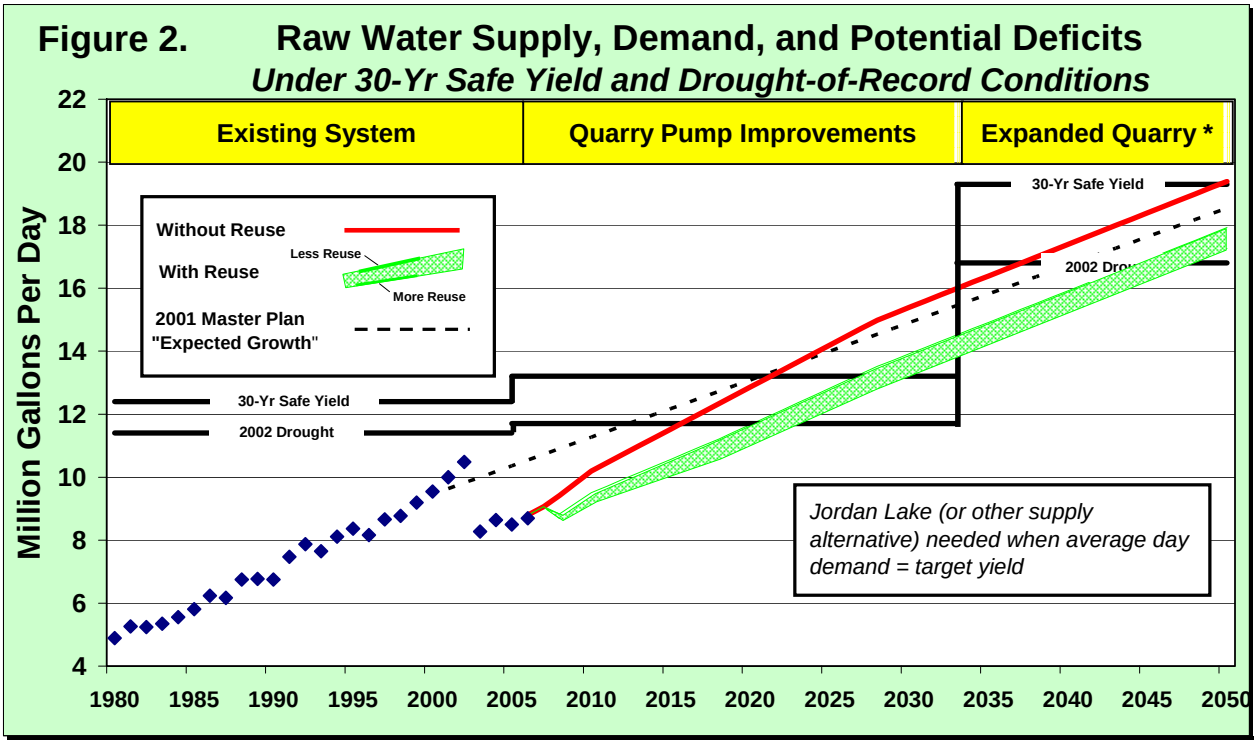
The 2001 Master Plan reported that the existing Cane Creek/University Lake/Quarry Reservoir system could sustain a yield of 11.2 mgd under drought conditions that were estimated to occur once every 30 years. The more recent and detailed hydrologic model indicates that through carefully optimized operation, the system can actually provide 12.4 mgd under estimated 30-year drought conditions, but the existing system would have sustained a yield of only 11.4 mgd during the 2001-2002 drought.

The installation of a new pumping system at the existing Quarry Reservoir, scheduled for completion in 2007, will increase the 30-year and drought-of-record safe yields for the system to 13.2 mgd and 11.7 mgd, respectively.

How long can the existing supply meet projected needs?

The Master Plan reported that the existing system, with improved pumping and transmission capacity, could supply anticipated needs under drought conditions expected to occur once in 30 years until approximately 2030. Revised estimates based on the new reservoir hydrologic model indicate that the Master Plan's "expected" demand could exceed the 30-year safe yield around 2020, or the record drought yield around 2012.

The alternative demand curves in Figure 2 illustrate the significant effect of the OWASA/UNC reclaimed water program on the overall reliability and adequacy of our raw water supply. Both curves assume the continued recycling of process water at the water treatment plant. The reclaimed water system will begin operating late in 2008 or early 2009 and could enable OWASA to reliably meet projected demands through about 2030 under 30-year drought conditions, or 2023 under drought-of-record conditions. Demand projections will continue to be refined as further decisions are made by the University and UNC Hospitals about which facilities will ultimately use reclaimed water.



* Eventual quarry storage volume: 2.4 - 3.0 billion gallons.
Reuse Demands per McKim & Creed Technical Memorandum #3 (9/8/05).

To the extent that future water demands are reduced through permanent water conservation, the reliable capacity of OWASA's existing supplies may be sufficient to meet future needs beyond the above-stated periods.

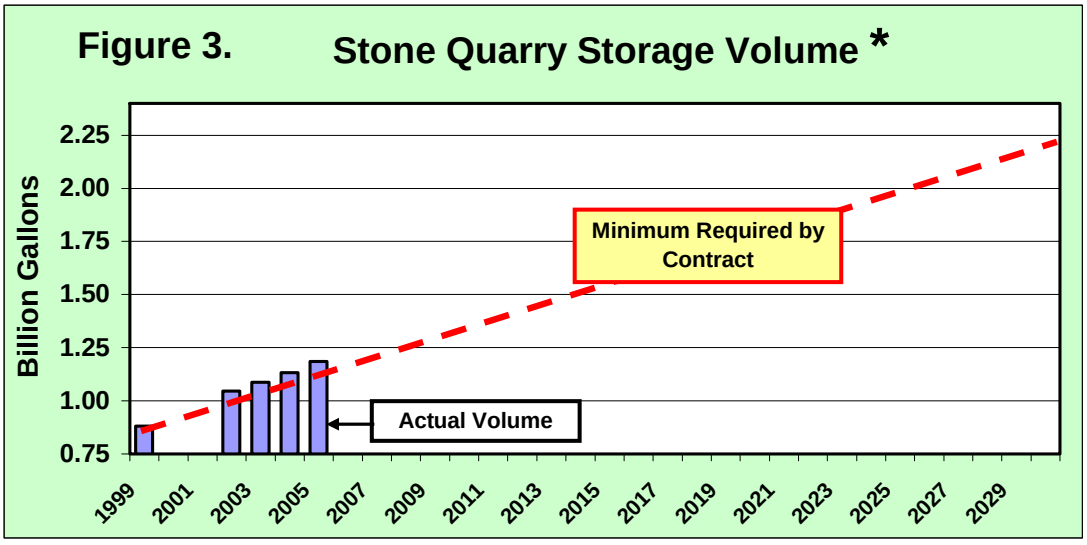
What are OWASA's plans for obtaining additional water in the future?

Expansion of the Stone Quarry Reservoir and the use of OWASA's 5 mgd Jordan Lake water supply storage allocation remain the principal options for additional supply. As noted earlier, more aggressive conservation can represent additional demand side sources, but the cost-benefit and revenue implications of these practices are not yet thoroughly understood and will require the same degree of evaluation as conventional supply side alternatives.

OWASA's use of Jordan Lake would most likely occur through purchases of treated water through the City of Durham, which plans to develop its own Jordan Lake supply within the next 10 years. OWASA staff will continue to discuss water supply collaboration opportunities with management and utility staffs of Durham and other jurisdictions where appropriate.

When will the larger quarry be available?

The *Capstone Report* noted that the expanded Quarry Reservoir will not be available until the early 2030s, after the American Stone Company has completed its mining operations and OWASA has converted the quarry for use as a drinking water reservoir. In order to ensure adequate storage volume by 2030, American Stone's agreement with OWASA includes a commitment to expand the active site by extracting rock at an average rate of at least 487,500 tons per year, which is equivalent to approximately 42



*** Volume of actively mined quarry below 485 MSL elevation. Estimates do not include 0.20 billion gallons available in existing Quarry Reservoir.**

million gallons per year of new storage capacity. As indicated in Figure 3, actual expansion below the critical 485-foot MSL elevation contour has occurred at a rate equivalent to about 50 million gallons of storage capacity per year for the six years ending in December 2005, when total volume of the active quarry was calculated to be adequate to hold 1.19 billion gallons. If it remains constant, the current rate of expansion will produce a final quarry volume (including OWASA's existing Quarry Reservoir) of approximately 2.4 billion gallons when mining ends in 2030.

How would we meet the water supply shortfall that could occur before 2030?

Principal supply side options include collaborative use of Jordan Lake and/or possible purchases of supplemental water from other jurisdictions, most likely Durham. No specific information is available at this time about the potential costs or the contractual terms that might apply to either of these options. However, based on existing arrangements that other parties have in place or have proposed, and based on prior evaluations of the needed infrastructure, it is certain that the cost of obtaining water from Jordan Lake either independently or in partnership with others will be very expensive when compared to our current water supply production and delivery costs.

The continued recycling of water treatment plant process water and implementation in 2008-09 of the reclaimed water system with UNC are key demand side elements of OWASA's long-term water supply plans that will help reduce the risk of water supply shortfalls before the expanded quarry is available in the early 2030s. OWASA will also pursue cost-effective and practical water conservation measures to extend the local supply. As noted earlier, OWASA's primary conservation goal is ***to avoid future shortfalls through cost-effective water conservation and demand management initiatives.*** Other programs and practices in addition to those already in place will be fully evaluated during the next several years.

How clean is OWASA's source water?

Routine water quality monitoring and special projects completed since 2001 confirmed earlier findings cited in the Capstone Report: "OWASA's reservoir water quality is excellent in terms of public health and safety, but is not pristine." Accordingly, the Cane Creek Reservoir intake structure was modified to allow the selective withdrawal of the highest quality lake water. Since 2001, it was also determined that the potential benefits of additional in-lake manipulation of water quality (via mechanical aeration or other techniques) are too uncertain to justify their relatively high capital and operating costs. A complete water quality survey that is conducted every four or five years for the reservoirs and tributaries was last completed in December 2005. Additionally, OWASA continues to participate in the Triangle Area Water Supply Monitoring Program, through which the United States Geological Survey has compiled systematic data from University Lake, Cane Creek, and their principal tributaries since 1988.

OWASA's reservoirs continue to meet all public health-related water quality standards.

The Cane Creek watershed protection recommendations adopted by the OWASA Board of Directors in 1997 included a goal of acquiring ownership or conservation easements on 1,265 acres of additional land. Since then, 1,004 acres have been protected, and the 1,265-acre goal will likely be achieved within the next few years.

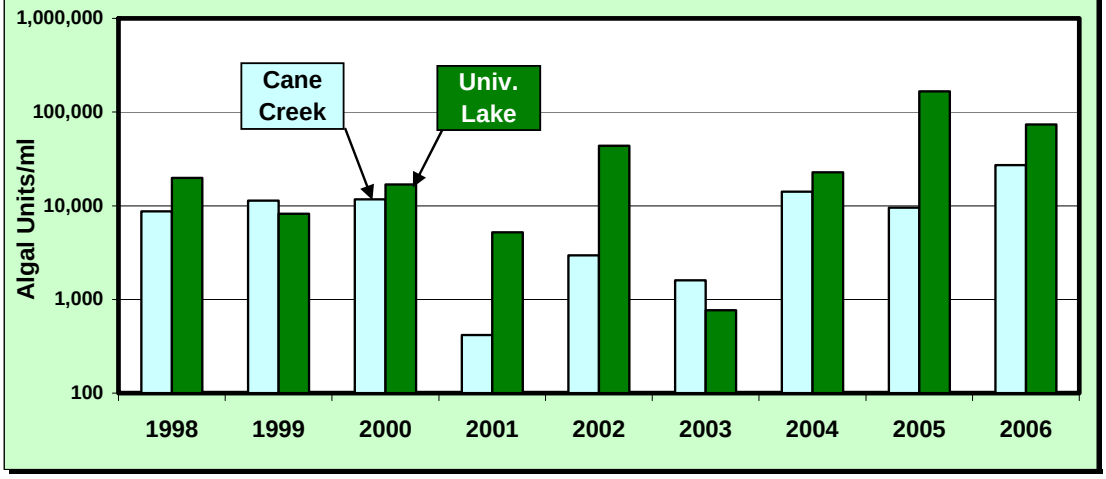
A study of potential water quality benefits of land/easement acquisition in the University Lake watershed was completed in 2003 and determined that it is unlikely that a similar program would significantly improve future water quality in University Lake. However, it was recommended that OWASA consider strategic acquisition of critical riparian buffer lands in the University Lake watershed on a case-by-case basis. Based on that recommendation, OWASA purchased its first tract of land in the University Lake watershed in September 2006 – a 74-acre parcel of pasture and woodlands immediately adjacent to Morgan Creek and University Lake.

The principal water quality issues for Cane Creek and University Lake have been associated with nutrients (nitrogen and phosphorus), which stimulate excessive algal growth. Certain types of algae, especially cyanobacteria ("blue-green algae"), may cause water treatment problems – taste and odor, filter clogging, coagulation problems, and so forth – when they occur in high concentrations or blooms. Many of these same species also produce toxic organic compounds that are harmful to animals and humans under extreme conditions. Figure 4 presents average concentrations of blue-green algae in OWASA's reservoirs from 1998-2006.

No state or federal regulatory limits exist for algae, but water quality experts generally consider concentrations of more than 100,000 units per milliliter to be indicative of

Figure 4. **Blue-Green Algae in OWASA Reservoirs**

Mean Values of 4 Highest Weeks of Each Calendar Year



Each bar represents the arithmetic mean of the four highest concentrations of total cyanobacteria measured in weekly samples collected during each calendar year.

hypereutrophic conditions, or extreme nutrient enrichment. As shown in Figure 4, blue-green densities in University Lake exceeded this benchmark during the summer of 2005 during a prolonged period of hot stagnant whether with little rainfall and low streamflows. OWASA will continue to explore alternative approaches for reducing nutrient loads, especially in the University Lake watershed, and will continue promoting the use of best management practices for nonpoint pollution control in both watersheds.

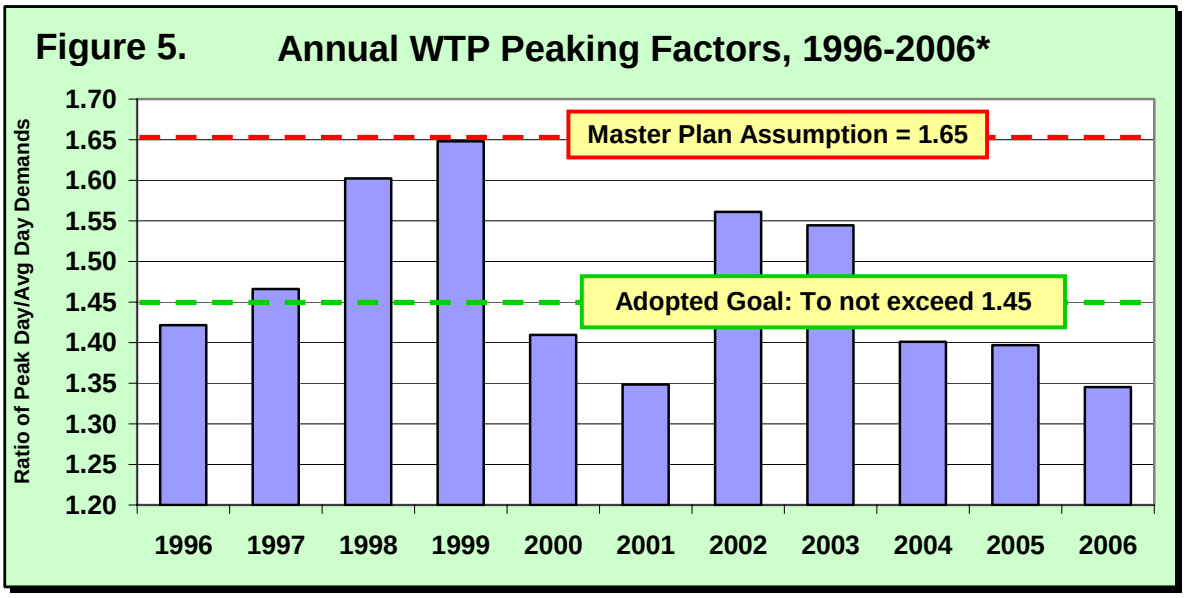
Water Treatment

Does OWASA have enough water treatment capacity?

Yes. Treatment capacity has been increased from 15 to 20 mgd since the Master Plan was completed in 2001. This was accomplished through the addition of two new filters, a new finished water pump, and improvements to the existing clearwell in order to provide the extended disinfectant contact time required for a flow rate of 20 mgd. Additional upgrades and improvements are planned in the coming years, but no further capacity expansions should be needed during the 15-year capital improvement period if the reclaimed water system is implemented as planned.

Why does the treatment plant capacity have to be so much greater if customers use less than 10 million gallons of water each day?

The water plant must be able to accommodate short-term peak demands during periods of high use. The Master Plan recommendations for water plant expansion were based on a peaking ratio of 1.65 (maximum day demand divided by annual average water

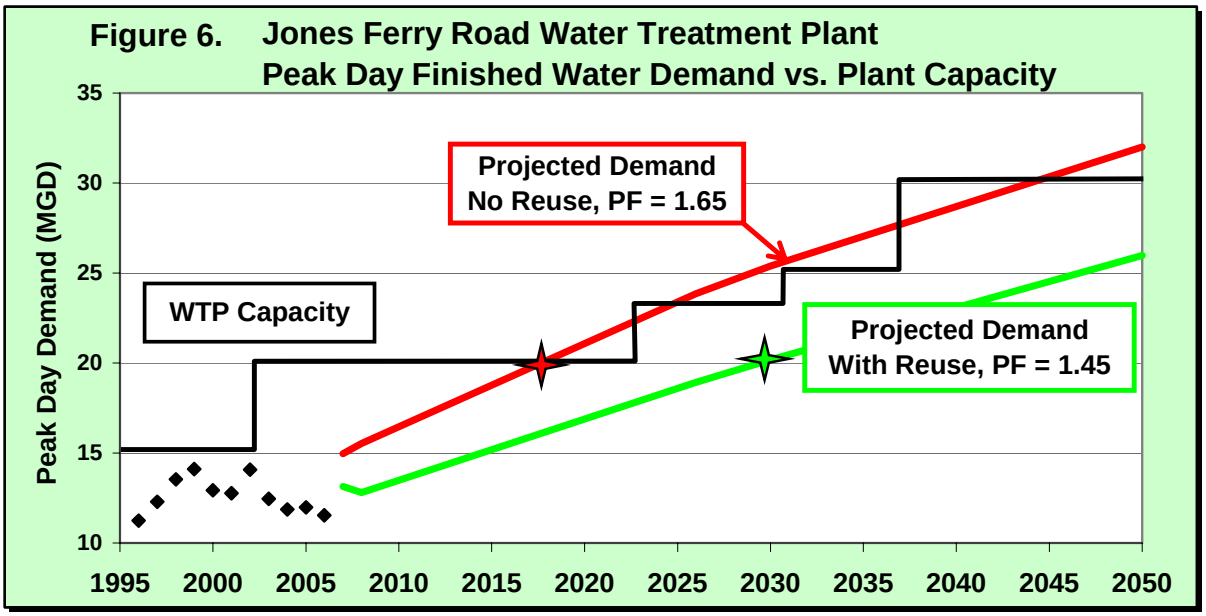


production), which was indicated by the most current information available at the time. Since then, however, peaking ratios have declined substantially as shown in Figure 5. The 11-year average of 1.47 is slightly below the traditional industry norm of 1.50.

Can we avoid or delay treatment plant expansions by practicing more aggressive water conservation and demand management?

Yes. By practicing commonsense conservation – especially for outdoor water use – customers can help limit the summer peak ratios to 1.45 or less, which is one of the specific conservation objectives adopted by the Board of Directors in 2005. Additionally, the OWASA/UNC reclaimed water program will help defer the next water plant capacity expansion by more than 10 years from the Master Plan projection.

The combined effects of reducing summertime peak demands and implementing the OWASA/UNC reclaimed water program are illustrated in Figure 6. Diamonds on the graph indicate actual peak day treated water demands for 1995 through 2006. Future peak day demands are shown for factors of 1.65, as assumed in the original Master Plan, with and without implementation of the OWASA/UNC reclaimed water project ("less reuse" is assumed here). The solid stepped line represents existing and future water treatment plant capacity. The red and green stars indicate the years (2018 and 2030) in which peak demands would reach 20 mgd under these different scenarios.



Additional water savings may be realized through other conservation and demand management practices, such as the replacement of older plumbing fixtures with newer water-saving versions, etc., but the projected demand reduction benefits and utility revenue impacts of their implementation need further study.

How much drinking water treatment capacity will ultimately be needed?

The Master Plan projected the need for 30 mgd of treatment capacity to support anticipated peak day demand at buildout in the OWASA service area, but as noted above, several important assumptions have changed in the past several years: (1) increased estimates of University buildout demand; (2) decreased estimates of University potable water demand due to the reclaimed water program; and (3) potential decreases in peak day treatment needs due to conservation. Ultimate water treatment capacity requirements may be less than 30 mgd, but until future growth and community buildout trends, including the University's Carolina North project, become more clearly defined, and until the actual effects of the reclaimed water project can be measured, the 30 mgd estimate of ultimate treatment capacity remains a valid planning target. The existing site of the Jones Ferry Road Water Treatment Plant is large enough to accommodate future expansion to a 30 mgd facility.

Will the plant be able to meet new drinking water quality standards?

Yes. OWASA meets all federal and state drinking water standards for public health protection and aesthetic quality, and will be able to meet new standards that will go into effect shortly. The new standards that will most directly affect our water treatment system are known as the "Long Term 2 Enhanced Surface Water Treatment Rule" (LT2ESWTR) and the "Stage 2 Disinfectants and Disinfection Byproducts Rule" (Stage 2 DDBR).

LT2ESWTR reduces the risk of exposure to *Cryptosporidium* and other pathogenic microorganisms through strict control of turbidity (cloudiness caused by microscopic particles) in treated drinking water. LT2ESWTR standards require that average turbidity measurements not exceed 0.3 NTUs (nephelometric turbidity units) and that no single measurement exceed 1.0 NTU. During the past year, 99.95 percent of OWASA's measurements were less than 0.3 NTUs, with a highest single turbidity reading of only 0.23 NTU.

Stage 2 DDPR will further reduce the exposure to chemicals produced when drinking water is disinfected with chlorine. The principal classes of disinfection byproducts regulated under this rule are total trihalomethanes (THMs) and five types of haloacetic acids (HAA5). The maximum allowable levels (annual average) of these substances will be 80 ug/L for THMs and 60 ug/L for HAA5. All of OWASA's measurements met these standards during 2005, with THM concentrations of 38.2 ug/L and total HAA concentrations of 31.5 ug/L. Concentrations of disinfection byproducts in OWASA's drinking water have decreased since disinfection with chloramines began in January 2002. This process adds ammonia, which combines with chlorine in the treated water to form compounds called chloramines that provide effective disinfection while producing fewer THMs and HAAs than the former chlorine system. The Jones Ferry Road Water Treatment Plant is expected to continue meeting both the turbidity and disinfection byproducts standards in the future.

OWASA analyzed for lead in tap water samples collected from 30 older homes in July and September, 2005. All results were below the detectable level of 3 parts per billion.

The federal Safe Drinking Water Act (SDWA), as amended in 1996, requires the United States Environmental Protection Agency (EPA) to publish a list of contaminants every five years which, at the time of publication, are not subject to any proposed or promulgated national primary drinking water regulations. Contaminants on the list are known or anticipated to occur in public water systems and may require future regulation. The list currently includes about 10 microbiological contaminants and 50 chemical contaminants. EPA conducts research on occurrence, health effects, analytical methods, treatment technologies, and treatment costs for contaminants on the list. EPA also develops drinking water guidance and health advisories and makes regulatory determinations for priority contaminants on the list. If the EPA adopts additional regulations to address other drinking water contaminants of emerging concern, OWASA may be required to undertake additional water plant improvements. To better meet future needs, we will keep informed of regulatory proposals, health effects and risk assessment studies, and advancements in water treatment technologies.

Drinking Water Storage

How much storage exists, and how much will be needed?

OWASA's five elevated tanks and the underground clearwell at the water treatment plant provide 8.0 million gallons (MG) of finished water storage. The Master Plan recommended the addition of another 1.5 MG clearwell at the water plant in 2005 and a new 1.5 MG elevated storage tank at OWASA's 17-acre property west of Old NC 86 and north of Carrboro in 2008 to meet projected growth in the 740-foot pressure zone in the northern part of the service area. As discussed earlier, the observed reduction in average and peak day demands to levels substantially below the Master Plan projections have allowed these future expansions to be substantially deferred. A recently completed engineering study of the 740-foot pressure zone recommends that the additional elevated storage tank will not be needed until 2020 and that its eventual storage capacity need only be 0.5 MG, rather than 1.5 MG, assuming current land use and population and employment projections. The 1.5 clearwell addition at the water treatment plant has been deferred beyond the 2021 CIP planning period.

Drinking Water Distribution

Does OWASA's distribution system suffer from the "aging infrastructure" problems heard about in other cities?

The 2001 Master Plan noted that OWASA's water and sewer lines are generally in better condition than the infrastructure of larger older cities. Beginning in 2002, the CIP included a series of projects that would increase the rate of water line renewal and rehabilitation from two miles to five miles or more per year. A special study completed in 2003 examined the water line infrastructure in more detail and determined that

OWASA's proposed program actually exceeded the optimum rate of renewal/ rehabilitation. As a result, the renewal/rehabilitation rate was reduced to three miles per year in FY 2004 and to two miles per year in the FY 2006 program. Staff uses a detailed Geographic Information Systems (GIS) based prioritization model, which includes factors for pipe material, age, operating pressure, and other variables, to help identify the most critical water line replacement projects.

Wastewater Collection

Can OWASA's sewer system handle all of the community's wastewater?

The currently adopted CIP includes projects to expand the capacity of major portions of OWASA's largest sewer interceptor lines along Morgan Creek, Bolin Creek, and Meeting of the Waters Creek. These projects were recommended in the Master Plan, which also noted that certain portions of the sewer system are subject to unacceptable volumes of stormwater infiltration and inflow (I/I). These remain the focus of OWASA's sewer and manhole replacement/rehabilitation program.

How much of a problem is I/I?

Decreases in sewer peak flows measured at the Mason Farm Wastewater Treatment Plant in recent years indicate that I/I reduction efforts begun in the early 1990s have been successful. Since completion of the Master Plan, significant opportunities for further cost-effective I/I reduction have been and continue to be specified in greater detail through specially targeted sanitary sewer evaluation studies (SSES) planned and funded through the CIP. Unlike many older urban areas, our community's wastewater collection system is separated from the storm drainage system, thereby minimizing the potential for I/I related sewer overflows. Illicit connections of private storm drains and sewers to the public sewer system are occasionally discovered and removed.

Should OWASA be making greater investments in sewer line repairs and rehabilitation?

As with the drinking water distribution lines, the CIP commits additional resources to sewer line work in the coming years and supports the repair/rehabilitation of approximately four miles of sewer line per year. These projects are determined through basin-by-basin SSES analyses that focus on I/I problems and the structural integrity of the system.

OWASA's plans and provisions for funding and implementing long-term water and sewer system rehabilitation and replacement needs are more proactive, aggressive, and sustainable than many other utilities.

WASTEWATER TREATMENT

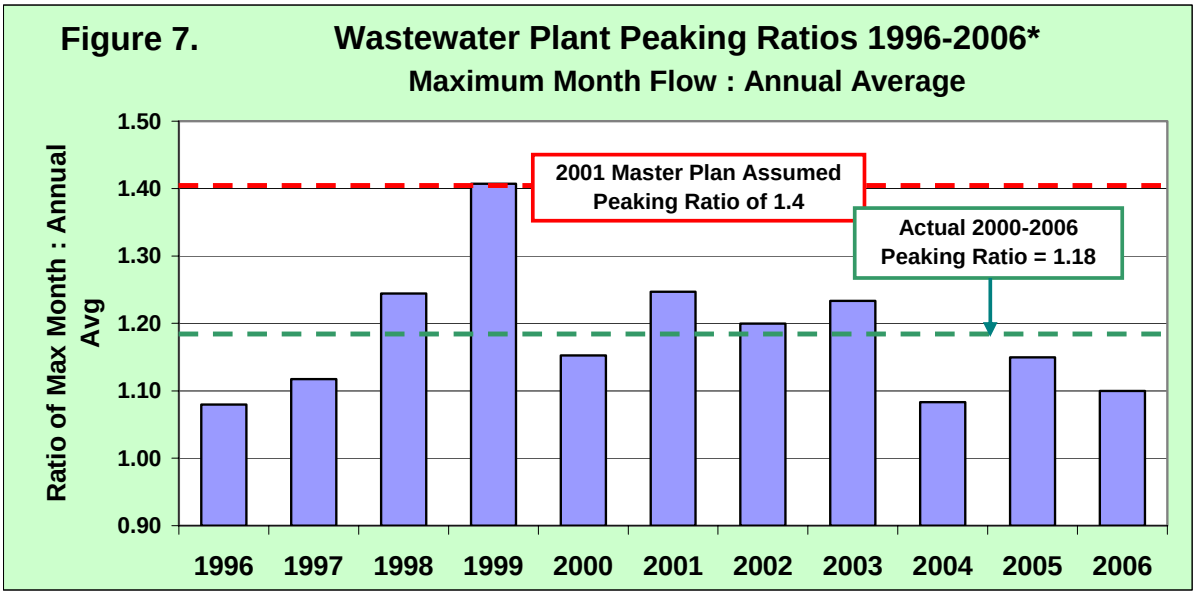
Can water conservation and demand management reduce the future need for wastewater plant capacity?

Water conservation helps reduce or delay the need for increased wastewater treatment capacity by reducing average daily flow rates, but conservation does not reduce the total load of pollutants that must be processed at the plant. The regulatory requirements for wastewater plant capacity are based on maximum monthly flow rates, which are dominated by excess stormwater inflow and infiltration during rainstorms, rather than day-to-day customer water use. Reduced in-home water use will generally have less effect on future capacity needs for wastewater treatment than for drinking water.

Does this mean that correcting more of the I/I problems in the collection system can reduce future expansion needs?

Yes. As noted in the *Capstone Report*, OWASA will pursue this strategy as long as the benefits of deferring the costs of wastewater treatment plant or sewer interceptor capacity expansion justify the costs of I/I reduction. Another important factor is timing. A successful I/I reduction program requires sustained effort and investment over a number of years before results are realized; but the need to expand treatment plant capacity may be more immediate. OWASA's strategy is to maintain an aggressive, cost-effective I/I reduction program with the long-term goal of deferring future wastewater treatment plant and collection system capacity expansions as much as possible and minimizing the potential for sewer overflows. As presented in Figure 7, recent data that show a substantial reduction in maximum month (peak) flows at the Mason Farm Wastewater Plant reflect fewer extreme rainfall events, but also suggest that OWASA's efforts to reduce I/I is succeeding.

Figure 7. Wastewater Plant Peaking Ratios 1996-2006*



*** All demand data are reported for Jan-Dec calendar years, except 2006, for which data are only available through September.**

Will the water reclamation project with the University reduce the need for future wastewater treatment plant capacity?

No. When implemented, the reclaimed water project will reduce demands on OWASA's reservoirs and (drinking) water treatment plant, but not on the wastewater plant. With the reclaimed water project, the University will use highly treated effluent from the wastewater plant instead of potable drinking water for the cooling towers of its chilled water facilities. The total amount of wastewater discharged to the sewer system will be the same as if potable water had been used.

OWASA is currently upgrading and expanding the wastewater plant to a capacity of 14.5 mgd. When will the plant have to be enlarged again?

The ongoing $50 million upgrade and expansion of the Mason Farm Wastewater Treatment Plant will be completed in 2007. New and upgraded treatment units have already improved the quality of the water released to Morgan Creek, increased plant reliability, reduced odor (more odor elimination measures are planned), and enabled the future reuse of treated effluent to meet certain non-drinking water needs. The new filter complex and ultraviolet light (UV) disinfection system are in service, but the filters are not yet being operated to remove nitrogen from the wastewater.

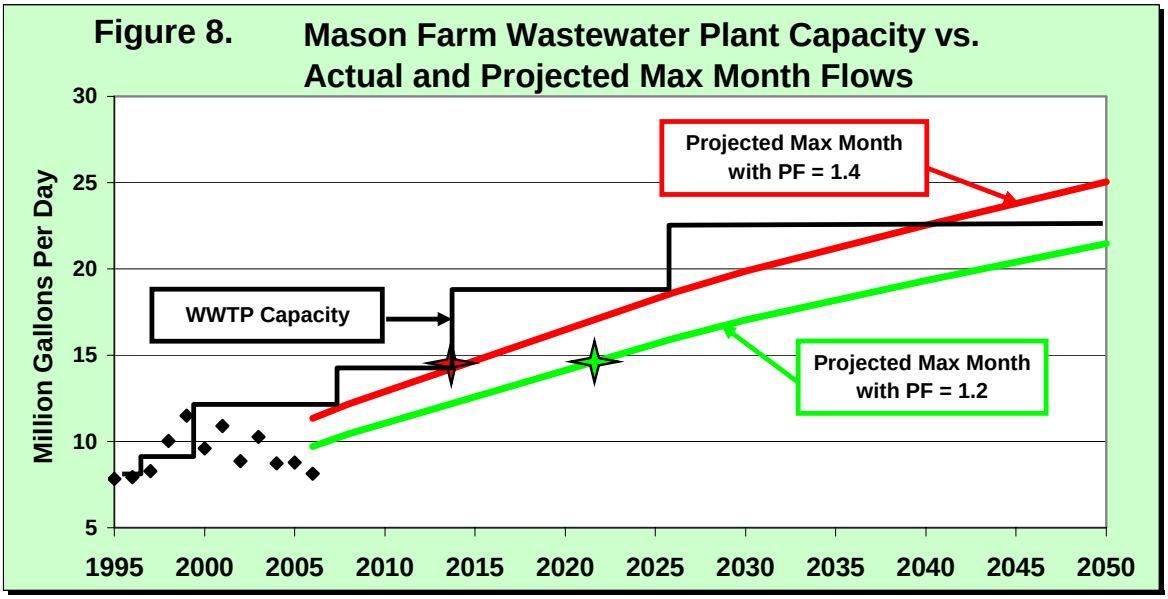
The expansion to 14.5 mgd will provide additional capacity to serve new development anticipated by Carrboro, Chapel Hill, and the University. Based on current projections, this expanded capacity should be adequate to meet the maximum-month flow needs through at least 2014.

How much wastewater treatment capacity is ultimately required?

The Master Plan projected the eventual need for a 22.5 mgd (maximum month) wastewater plant. Revisions to the University's growth plans discussed earlier would increase ultimate wastewater treatment demand by about 3 mgd to about 25.5 mgd under the Master Plan assumptions, which include a conservative monthly peaking factor of 1.4. OWASA staff believes, however, that the data in Figure 7 justify a lower peaking factor, which results in an ultimate need for approximately 23 mgd of wastewater treatment capacity. The effects of different peaking factors on the timing of wastewater plant expansion are indicated by the stars in Figure 8.

A reduction in the peaking factor to 1.2 could defer the need for plant expansion by about seven years. The wastewater plant upgrade and expansion project currently underway has been designed to accommodate the ultimate expansion of the plant on its existing site.

In the future, it may be possible to expand plant capacity by using innovative, advanced treatment technologies, such as by retrofitting some or all of the existing aeration basins with membrane filters. OWASA will continue to evaluate the potential need for, applicability, and benefits and costs of new treatment technologies.



What is known about water quality standards and future discharge limits for the wastewater plant?

Jordan Lake's Upper New Hope Arm is currently under a TMDL (Total Maximum Daily Load) rule-making of the NC Environmental Management Commission. Final rules, which are scheduled for consideration during 2007, will specify allowable annual loads of total nitrogen (TN) and total phosphorus (TP) that may be discharged from OWASA's Mason Farm Wastewater Treatment Plant. OWASA already must meet strict limits on TP discharges and ammonia-nitrogen. The Jordan Lake rules will require even greater levels of removal, which will result in higher operating costs.

The improvement and expansion project now underway has been designed in anticipation of these regulations and will achieve the nutrient reductions that are proposed in the draft rules for plant flows of up to 18.5 mgd. For additional capacity expansions, the proposed TN and TP limits may require more advanced and expensive nutrient removal processes.

Are there any discretionary treatment or reliability issues – not required by regulations – that OWASA should consider for the future?

The 2001 Master Plan identified several discretionary measures which have all been incorporated into the current wastewater treatment plant expansion/upgrade that will be completed in 2007. These include additional electrical generator standby capacity to ensure uninterrupted operation during power outages; filters that will provide higher quality effluent (including advanced nutrient removal) and help meet regulatory requirements for non-potable reuse; ultraviolet disinfection, which is more environmentally friendly than chlorine disinfection; an improved system to capture and use methane from biosolids treatment to run boilers and to power a blower; and improved odor control to resolve neighborhood issues. Additional opportunities will be considered

in the future, such as the use of fuel cell and other alternative energy technologies, and the potential availability of biosolids for use by the general public.

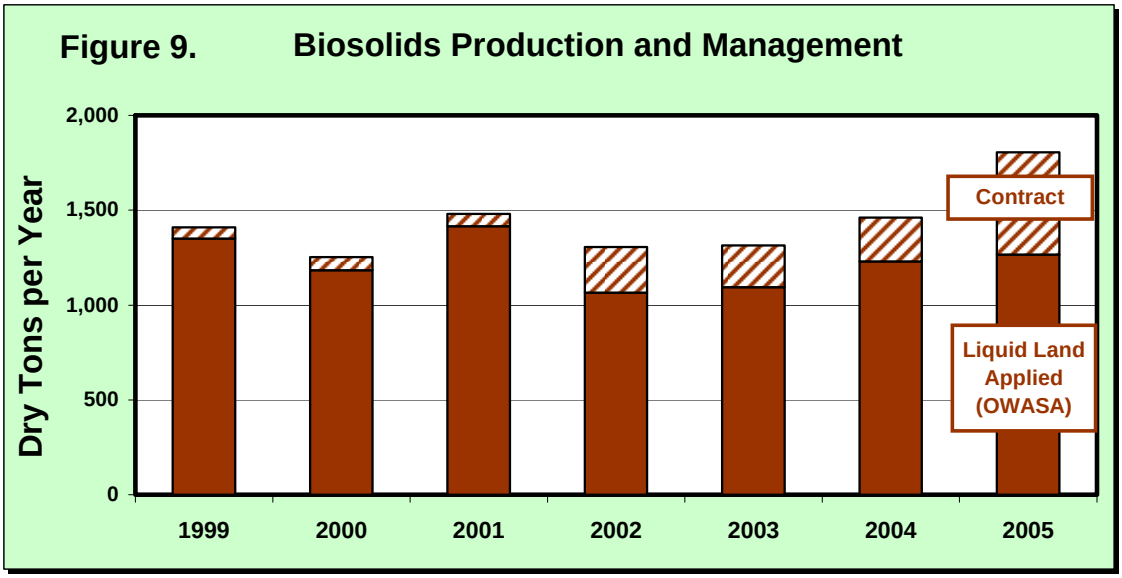
How will we manage the increasing volumes of biosolids generated during the treatment of the community's wastewater?

The 2001 Master Plan included projections of the volume and characteristics of biosolids generated during the wastewater treatment process and an evaluation of certain alternatives for managing and recycling the biosolids. The Master Plan confirmed that our long-standing program of applying liquid biosolids to privately-owned and OWASA-owned farmlands was cost-effective, environmentally sound, and generally acceptable to the public. It identified the need for additional property to ensure that an adequate amount of land remains available for our liquid biosolids recycling program.

More recent and in-depth analyses by OWASA staff, especially the February 3, 2006 discussion paper, *Biosolids Management: Current and Projected Conditions, Issues and Strategies for Ensuring Sustainable Biosolids Management*, have indicated that OWASA's practice of applying liquid biosolids to agricultural land has become limited by weather conditions, cropping schedules, availability of land, increasing biosolids volume, transportation costs, and other operational factors. For the past several years, we have contracted for supplemental third-party services, including incineration, landfilling, and composting, to manage an increasing portion of our biosolids production.

As indicated in Figure 9, OWASA's capacity to land apply liquid biosolids with its own resources appears to be approximately 1,200 dry tons per year.

Figure 9. Biosolids Production and Management



Several external issues and trends, including the possible regulation of phosphorus as a limiting nutrient, could affect the future viability and capability of our management approach and suggest a more diversified program. Staff and Board have recognized the need for a long-term Biosolids Master Plan through which OWASA can meet its goal of sustainability. The future program will likely comprise a mix of several options and may include land application, composting, thermal drying, and/or other methods. The current project to install a biosolids dewatering system will be installed at the Mason Farm Wastewater Plant as a "gateway" technology for the improved flexibility and reliability of OWASA's biosolids program; that is, a necessary next step toward any of several future options. The dewatering facilities are now under design, and expected to be operational in the latter part of 2007. It is likely that the land application of either liquid and/or dewatered biosolids will remain a component of our program until additional methods are available and practical.

A draft Biosolids Master Plan is scheduled for completion in 2007.

Future Master Plan Update Reports

Future Master Plan narrative updates will be prepared annually and will address additional issues as they emerge. Staff will also provide more detailed strategic data updates on demand trends by major customer category, water and wastewater plant production/treatment trends, and other pertinent information.

Edward A. Holland, AICP
Planning Director

ITEM 3

AGENDA ITEM

- REPORT ON THE PINEY MOUNTAIN PUMP STATION REPLACEMENT PROJECT

PURPOSE

- To provide information about completion of the construction project.

BACKGROUND

- After failure of a common septic field that was owned and operated by the Piney Mountain Homeowners Association (HOA), in 1994 the OWASA Board approved an agreement between OWASA and the HOA which allowed OWASA to construct a pump station (with all costs being borne by the HOA) that would collect the flows from the neighborhood and pump the wastewater to a manhole in Durham's wastewater collection system, for eventual treatment at the Durham Wastewater Treatment Plant.

- Because of the unique characteristics of the wastewater entering the pump station (the influent to the pump station had extremely high levels of hydrogen sulfide) the wet well deteriorated at a much faster rate than would normally be expected.

- An evaluation of the pump station was conducted and it was determined that a new wet well would be needed.

- OWASA originally intended to replace the pump station through a contract, but because only one bid was received and the costs were considered prohibitively expensive, a decision was made to have OWASA accomplish the necessary construction work through a combination of in-house forces and subcontractors (for specialized work).

- Work began on the pump station in March 2006 and the project was completed in September of 2006.

ACTION NEEDED

- No action is requested at this time.

October 18, 2006

MEMORANDUM

TO: Board of Directors

THROUGH: Ed Kerwin

FROM: Nick Parker

DATE: October 18, 2006

SUBJECT: Completion of Piney Mountain Pump Station Replacement Project

Purpose

Provide information regarding the recent completion of the Piney Mountain Pump Station Replacement Project.

Background

The Piney Mountain neighborhood consists of 59 lots in the "rural buffer" north of (and outside) the primary OWASA service area.

Before 1994, wastewater from each home was pumped into privately-maintained collector pipes which carried the wastewater to a common nitrification or "septic" field owned by the Homeowners' Association (HOA).

After this septic field failed and Orange County declared the situation to be a public health emergency, in 1994 the OWASA Board approved an agreement between OWASA and the HOA which allowed OWASA to construct a pump station (with all costs being borne by the HOA) that would collect the flows from the neighborhood and pump the wastewater to a manhole in Durham's wastewater collection system, for eventual treatment at the Durham Wastewater Treatment Plant.

The pump station was constructed through a contract and made operational in 1995.

Because of the unique characteristics of the wastewater entering the pump station (the influent to the pump station had extremely high levels of hydrogen sulfide) the wet well deteriorated at a much faster rate than would normally be expected.

In 2003 OWASA hired a consultant to evaluate the condition of the pump station and to make recommendations concerning any repairs that would be needed. The evaluation concluded that an entirely new, larger and more corrosion resistant wet well was required. After discussing available alternatives with representatives of the HOA in the winter of 2005-06, the HOA issued a notice to proceed with the replacement project to OWASA in March 2006.

OWASA originally intended to replace the pump station through a contract, but because only one bid was received and the costs were considered prohibitively expensive ($244K for design and construction), a decision was made to have OWASA accomplish the necessary construction work through a combination of in-house forces and subcontractors (for specialized work). The HOA was provided a cost estimate of $160K (design and construction) to accomplish the work primarily with OWASA forces, and is estimated that the actual costs will be just under that amount.

Work began on the pump station in March 2006 and the project was completed in September of 2006.

Conclusion

As a result of the teamwork and cooperation among the various OWASA departments, private contractors and the HOA, the project was delivered on time and within budget.

_____
Nick Parker
Utilities Engineer

ITEM 4

AGENDA ITEM

- **ANNUAL PERFORMANCE MEASUREMENT REPORT FISCAL YEARS 2002-2006**

PURPOSE

- The Board of Directors and staff have agreed that it would be useful to review and discuss the Performance Measurement Reports to ensure understanding of what is reported and to seek opportunities to further improve this important management tool.

ACTION NEEDED

- Discussion by the Board of Directors and direct staff accordingly.

October 26, 2006

M E M O R A N D U M

TO: Board of Directors

FROM: Ed Kerwin

DATE: October 19, 2006

SUBJECT: Annual Performance Measurement Report Fiscal Years 2002-2006

Attached for your review is our Annual Performance Measurement Report for Fiscal Years (FY) 2002-2006 (through June 30, 2006).

A narrative sheet explaining the goals precedes each department's performance measurement table. The shaded areas of the tables indicate that historical data has not been gathered for the performance measures. Several of the annual departmental goals have been modified to reflect increased production, inflation, changes in scope or additional personnel cost.

Departmental performance results that had noticeable variances from established goals or previous performance are noted below:

Water Supply

- In the fall and early winter, there was an increase in calls from customers about taste and odor in our drinking water. We believe the taste and odor resulted from a combination of the seasonal turnover of water in the lakes, when cold surface water falls to the lake bottom; and the decomposition of algae, which was very noticeable in the summer of 2005. We made treatment process adjustments including greater addition of fine carbon powder to resolve the taste and odor.

- There was a noticeable increase in customer inquires about lead and copper levels in the OWASA water after several news articles were published about testing procedures and levels detected in other municipalities. Similar calls were received on the testing of well water after news articles about arsenic and bacteria concerns in local wells.

Water Distribution

- The total miles of water and sewer mains in the system increased due to better information developed and queried through our Geographic Information System (GIS). The previous number was developed many years ago from scaling paper maps (1" equals 100' scale) and then adjusted each year as additional mains were added or dedicated.

- The reduction in the number of new meters installed is a reflection of a downturn in new construction. This reduction is also reflected in the amount of service availability

fees collected during fiscal year 2006.

- OWASA staff that performs the fire hydrant inspections has been assisting with replacing and installing water services. The fire hydrant inspection program has previously been preformed with the assistance of the Chapel Hill and Carrboro Fire Departments. As of June 2006 the Chapel Hill Fire Department had not resumed their inspections. We have been informed that these inspections should begin again in early fall of 2006.

Wastewater Treatment Plant

- The cost of biosolids increased due to the required need for considerable outside assistance in managing the increased inventory of biosolids which resulted from the plant construction, weather conditions and demand for the product. Two contract operations were used to assist in the reduction of this inventory at a cost in excess of $380,000.

- The cost for chemicals used in the treatment process increased 40-50% after Hurricane Katrina plus companies started to add a fuel surcharge to each delivery. There was also an increased utilization of chemicals to accommodate the current construction activity (i.e. acetic acid).

- The usage of electricity per unit of wastewater treated as well as the cost of electricity per unit of wastewater increased as a result of new process units being brought on line (UV disinfection system, additional aeration channels, etc.).

- An increase in odor complaints was experienced this fiscal year from residents near the Mason Farm WWTP. Staff confirmed the headworks is top priority to meet our odor elimination goal. Further recommendations on odor control improvements will be an outcome of the current odor study.

Maintenance

- The number of work orders reflects an increase because of an emphasis to write a work order for every operation. This provides for better documentation of the work being performed on facilities and equipment and allows for the capture of labor, material and equipment which can be used in evaluating staffing, equipment replacement and life cycle cost.

Purchasing

- The relocation of the majority of inventory items to the new warehouse facility last fiscal year provided the opportunity to inspect the condition of certain parts. There were a number of parts that was considered damaged and were taken out of inventory and scraped. To make sure that an adequate number is maintained in the inventory, these items were replaced. Inventory purchased also increased due to the proposed Automatic Meter Reading (AMR) change out program.

Customer Service

- Billing timeliness remained below our goal due to continued staff vacancies and issues relating to our meter reading function.

Human Resources

- During the year Engineering, BIS, Operations and Maintenance, had vacancies that were difficult to recruit and fill.

Staff continues to review, refine and improve the benchmarks set for the various departments and we look forward to a discussion of the measures with the Board at the October 26, 2006 meeting.

Should you have any questions about the comments provided or the information detailed on the individual department performance measurement reports, please do not hesitate to contact me.

_____

Ed Kerwin
Executive Director

Attachment

ANNUAL PERFORMANCE MEASUREMENT REPORT

Orange Water and Sewer Authority
Chapel Hill – Carrboro, North Carolina

Purpose: to provide performance indicators for all aspects of OWASA's operations and business activities in order to objectively measure the effectiveness of OWASA's ongoing improvements program.

Fiscal Years 2002 – 2006
(Through 06/30/06)

TABLE OF CONTENTS

Symbol represents an Environmental Performance Measurement

Water Supply and Treatment

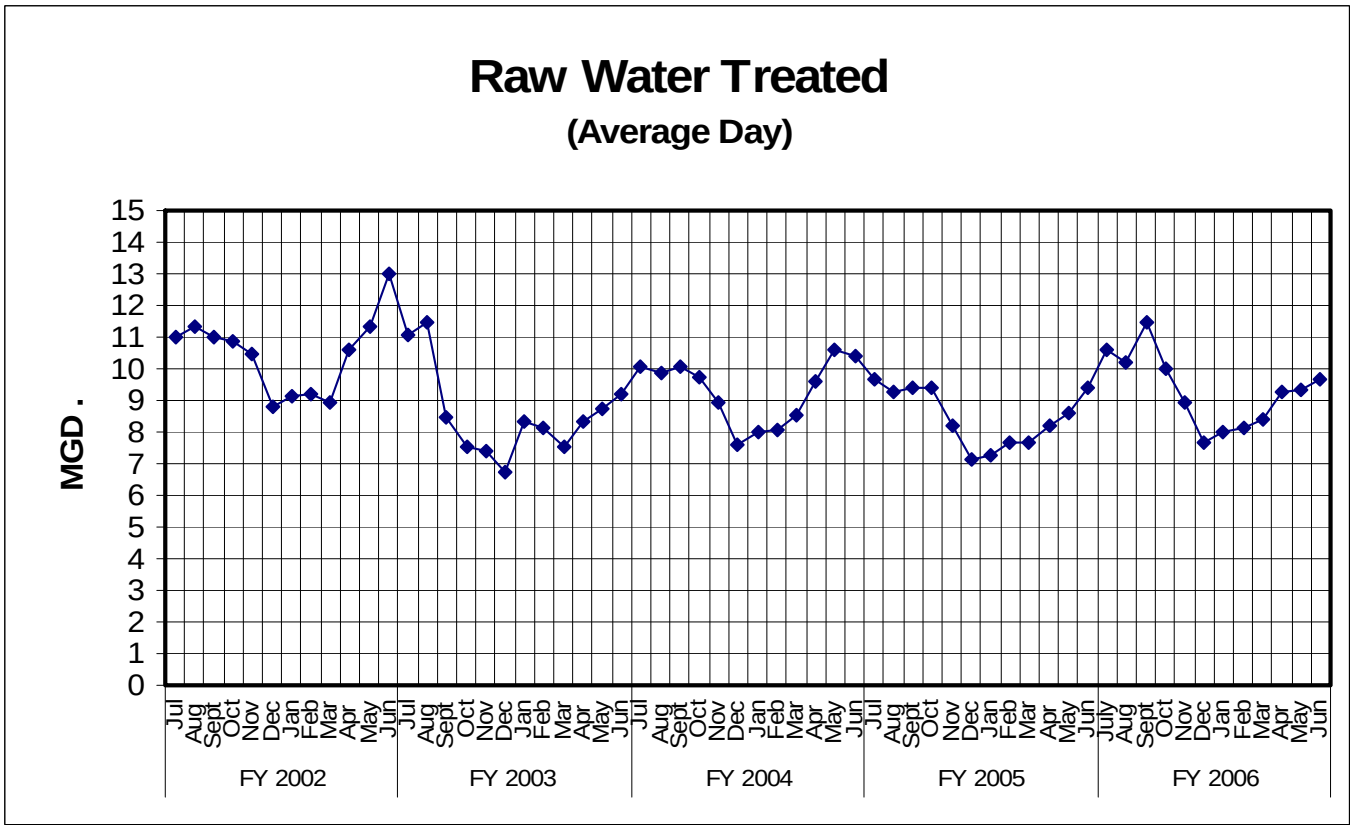
The Water Supply and Treatment function is the responsibility of the Water Supply and Treatment Manager and is responsible for the operation of raw water reservoirs and recreation facilities, the Jones Ferry Road Water Treatment Plant, and the elevated storage tanks within the finished water distribution system.

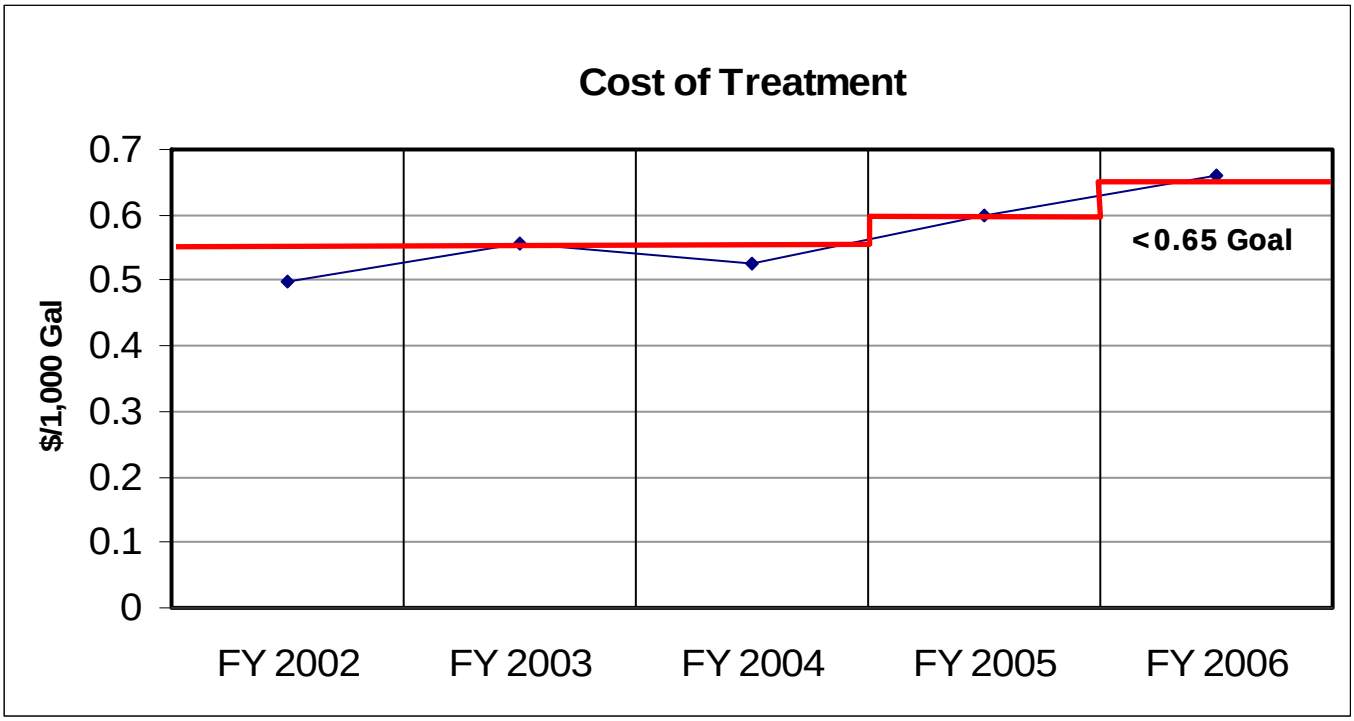
PERFORMANCE MEASURES:

Type	Measurement
Workload	**Million gallons raw water treated**
	Measure of the number of million gallons of raw water treated as determined by influent flow meters at the Jones Ferry Road Water Treatment Plant.
	Total solids removed
	The amount of solids removed from the water treatment process.
	Solids beneficially reused
	The percent of solids there were treated and recycled for beneficial use.
Efficiency	**Costs per thousand gallons treated**
	A measure of the total operational cost under the control of the Water Supply and Treatment Manager to treat one thousand gallons of raw water. This includes costs for the reservoirs and Water Treatment Plant and does not include maintenance and other overhead costs.
	Costs per dry ton solids removed
	A measure of the costs of treating water plant residuals (solids produced in the treatment process such as silt, mud, spent chemicals, etc.) and includes the cost of disposing of the material.
	Chemical costs per thousand gallons water treated
	A measure of the cost of chemicals required to treat one thousand gallons of water.
	Energy costs per thousand gallons treated
	A measure of the total energy costs required to pump and treat one thousand gallons of raw water.
	Kilowatt hours used per thousand gallons treated
	A measure of the total energy units required to pump and treat one thousand gallons of raw water.
Effectiveness	**Number of primary drinking water standards noncompliances**
	A monthly report is filed with the North Carolina Division of Environmental Health regarding the quality of the drinking water. Any noncompliance of secondary drinking water standards would be reported.
	Number of secondary drinking water standards noncompliances
	A monthly report is filed with the North Carolina Division of Environmental Health regarding the quality of the drinking water. Any noncompliances of secondary drinking water standards would be reported.
	NPDES permit noncompliance
	The number of NPDES permit violations for processed water discharged to the Rocky Brook Branch.
	Average finished water turbidity
	A measure of the presence of suspended and colloidal matter in the finished water. The analytical measurement is reported in nephelometric turbidity units (NTU).
	Process water as a percentage of total raw water treated
	The total quantity of water required in the day to day operation (pump seal water, chemical carrier water) and maintenance (cleaning and sludge removal) of the various treatment processes. It is measured as a percentage of the total raw water treated.
	Process water recycled as a percentage of total process water
	The volume of treated process water beneficially reused.
	Number of water quality inquiries
	The number of customer water quality inquiries and complaints received from OWASA customers by the Laboratory Staff. Inquires are divided into four categories including taste and odor, chlorine taste or smell, discolored water and other complaints.
	Number of information requests
	The number of customer inquiries or requests for information about the water treatment process or water chemistry (hardness, alkalinity, pH, fluoride, lead, copper, etc.).
	Per capita water consumption
	A measure of the average water consumption per person in the OWASA service area.
	Number of trees planted within the watershed
	A measure of trees planted within the watershed.

Performance Measures
Water Supply and Treatment

		Units	Total FY 02	Total FY 03	Total FY 04	Total FY 05	Total FY 06	Annual Goal	FY 06 July - Dec	FY 06 Jan - Jun
WORKLOAD	Raw water treated TOTAL	MG	3,822	3,231	3,406	3,303	3,396	N/A	1,803	1,593
	AVERAGE DAY	MGD	10.5	8.9	9.3	9.1	9.3		9.8	8.8
	Total solids removed	DRY TONS	437	551	482	478	579	N/A	325	254
	Solids beneficially reused	%	0	0	79	100	100	N/A	100	100
EFFICIENCY	Cost of treatment	$/1000 GAL.	0.50	0.56	0.53	0.60	0.64	< 0.65	0.66	0.62
	Cost of solids removal	$/DRY TON	329	270	252	278	264	< 325	261	267
	Chemical costs for water treatment	$/1000 GAL.	0.15	0.17	0.16	0.17	0.22	< 0.25	0.25	0.18
	Energy costs for water treatment	TOTAL	**0.11**	**0.14**	**0.14**	**0.15**	**0.14**	**< 0.15**	**0.14**	**0.14**
	Raw water pumping	$/1000 GAL.	0.05	0.05	0.06	0.06	0.06	< 0.06	0.06	0.06
	Water treatment		0.01	0.02	0.02	0.02	0.02	< 0.02	0.02	0.02
	Finished water pumping		0.05	0.07	0.06	0.07	0.06	< 0.07	0.06	0.06
	Energy units per 1,000 gallons	KWH/ 1,000 Gal.	----							
	Raw water pumping		----	0.98	0.95	1.02	1.1	N/A	1.1	1.0
	Finished water pumping			1.10	1.10	1.18	1.1	N/A	1.0	1.2
EFFECTIVENESS	Primary drinking water standards non-compliances	EA.	0	0	0	0	0	0	0	0
	Secondary drinking water standards non-compliances	EA.	0	0	0	0	0	0	0	0
	NPDES permit noncompliance	EA.	0	0	1	0	0	0	0	0
	Average finished water turbidity	NTU	0.09	0.07	0.06	0.06	0.06	< 0.10	0.06	0.06
	Process water as a percentage of total raw water treated	%	0	9.1	9.5	7.5	7.8	< 8.0	7.4	8.1
	Process water recycled as a percentage of total process water	%	0	92	81	83	87	> 90	86	88
	Water quality inquiries:	TOTAL	**110**	**71**	**67**	**122**	**175**		**107**	**68**
	Taste & odor	EA.	57	23	29	31	86	N/A	62	24
	Chlorine	EA.	15	7	6	3	20		5	15
	Discolored	EA.	23	24	10	24	12		8	4
	Other	EA.	15	17	22	64	57		32	25
	Information requests	EA.	38	84	86	94	142	N/A	69	73
	Per capita water consumption	GPD	--	105	121	108	103	N/A	112	95
	Number of trees planted within the watershed	EA.	35,300	3,000	7,900	0	0	N/A	0	0


Raw Water Treated
(Average Day)
MGD .
15
14
13
12
11
10
9
8
7
6
5
4
3
2
1
0
Jul Aug Sept Oct Nov Dec Jan Feb Mar Apr May Jun
FY 2002
FY 2003
FY 2004
FY 2005
FY 2006


Cost of Treatment
$/1,000 Gal
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
< 0.65 Goal
FY 2002
FY 2003
FY 2004
FY 2005
FY 2006

Water Distribution

The Water Distribution function the responsibility of the Distribution and Collections System Manager and is responsible for operating and maintaining the finished water distribution system from the Jones Ferry Road Water Treatment Plant to the meters at the customers' premises except the finished water storage tanks.

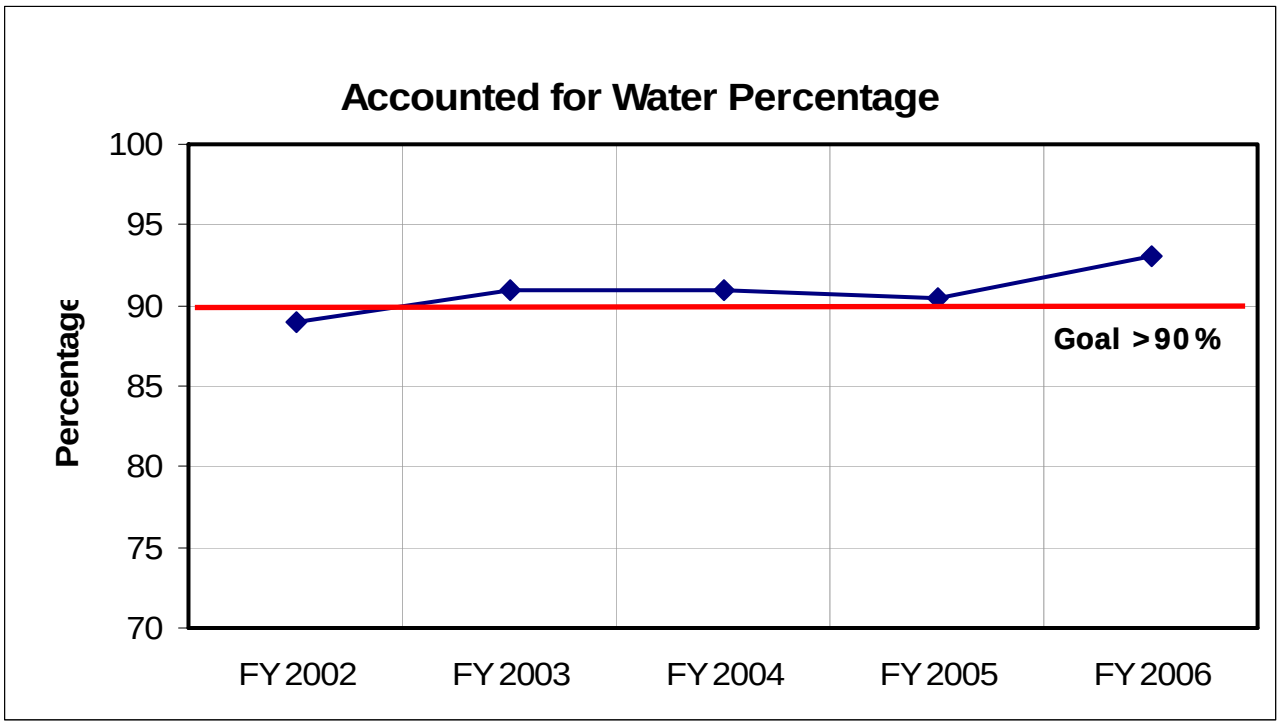
PERFORMANCE MEASURES:

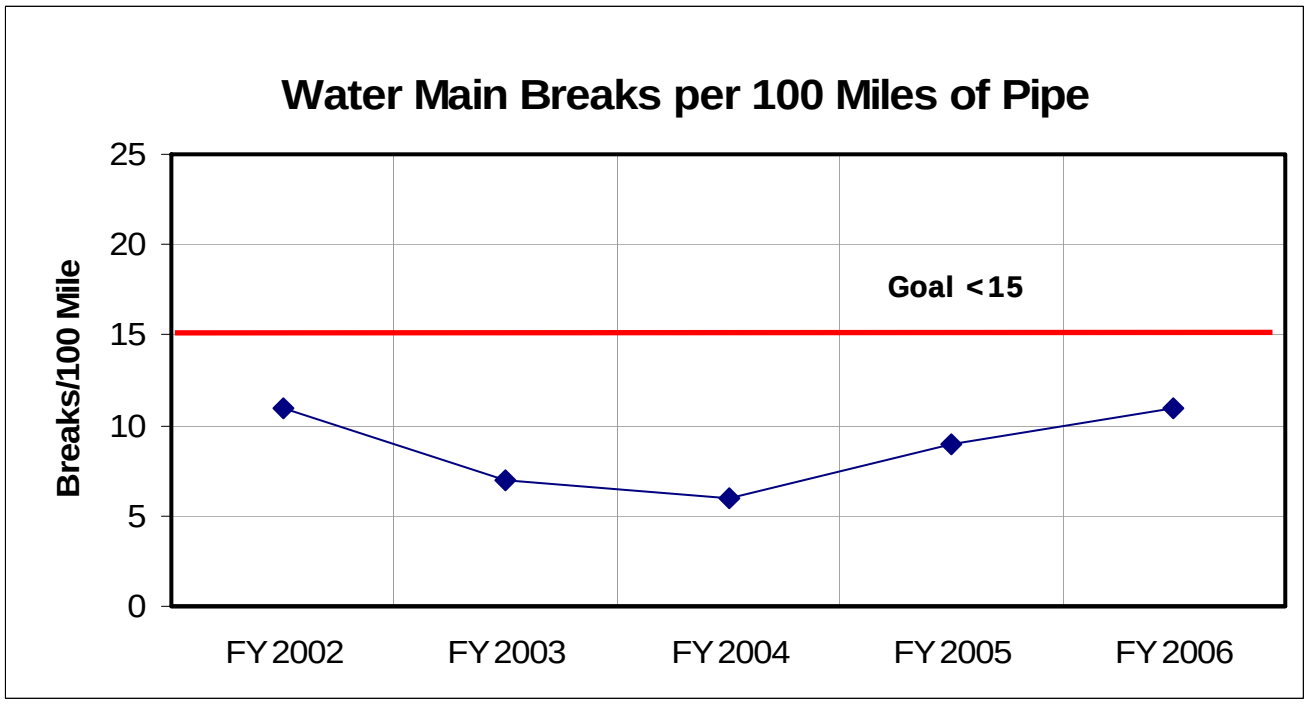
Type	Measurement
Workload	**Length of pipe in system** *Miles of water distribution piping maintained from the Jones Ferry Road Water Treatment Plant to the customers' service lines.*
	Total number of backflow sites permitted *Total number of backflow sites permitted.*
	Feet of pipe replaced in-house *Total footage of water distribution piping replaced by in-house crews as part of the ongoing renewal and replacement program.*
	Meters changed out *The number of meters replaced.*
	New meters set *The number of new service meters installed.*
	Hydrants inspected *The number of fire hydrant inspected.*
	Valves exercised *The number of valves exercised.*
	Service lines replaced *The number of service lines replaced.*
Efficiency	**Costs per mile of pipe maintained** *Measure of the total maintenance costs per mile of pipe under the control of the Distribution and Collection Systems Manager for maintaining the water distribution system, not including overhead or costs funded in other departments.*
	Costs per foot of pipe replaced *Measure of the total replacement costs per foot for replacing water distribution piping by in-house crews.*
	Cost of hydrants inspected *Measure of the total cost of hydrants inspected and maintenance activity divided by the number of hydrants.*
	Cost of service lines replaced *Measure of the total cost of service lines replaced divided by the total number of service lines replaced.*
	Cost of valves exercised *Total cost of valves exercised divided by the number of valves exercised.*
	Percent of backflow sites reinspected within 30 days of due date *The number of backflow sites reinspected within 30 days of due date divided by the total number of backflow maintained.*
Effectiveness	**Accounted for water percentage** *The volume of finished water billed divided by the volume of finished water pumped to the distribution system.*
	Customer Effectiveness rating on rehabilitation projects *Rating from 1 to 5 (5 being highest) by OWASA customers of our manhole rehabilitation program.*
	Main breaks per 100 miles of pipe *The number of main breaks per 100 miles of pipe.*
	Percent of hydrants maintained *The number of hydrants maintained divided by the number of hydrants.*
	Percent of valves exercised *The number of valves exercised divided by the number of valves maintained.*
	Percent of emergency repairs completed within 5 hours *The number of emergency repairs completed within 5 hours divided by the total number of emergency repairs completed.*

Performance Measures
Water Distribution

		Units	Total FY 02	Total FY 03	Total FY 04	Total FY 05	Total FY 06	Annual Goal	FY 06 Jul - Dec	FY 06 Jan – Jun
WORKLOAD	Length of pipe in system	MILES	337	340	343	346	406	N/A	346	406
	Total number of backflow sites permitted	EA.	--	1,387	1,543	1,861	1,917	N/A	1,917	1,917
	Pipe replaced in-house	FT.	10,900	7,128	5,764	7,510	10,821	9,000	5,144	5,677
	Meters changed out	EA.	1,109	506	409	800	86	960	35	51
	New meters set	EA.	519	342	367	402	205	N/A	128	77
	Hydrants inspected	EA.	631	1,426	1,690	422	421	1,910	113	288
	Valves exercised	EA.	1,560	0	105	351	889	1,200	213	678
	Service lines replaced	EA.	115	99	97	109	164	50	34	130
EFFICIENCY	Cost of pipe maintenance	$/MILE	5,364	4,611	4,661	5,014	4,091	<4,700	2,313	1,778
	Cost of pipe replacement	$/FT.	43	55	58	49	47	<65	36	57
	Cost of hydrants maintenance	$/ EA.	34	324	--	104	106	TBD	118	94
	Cost of service lines replaced	$/ EA.	1,264	955	1,334	927	585	TBD	607	562
	Cost of valves exercised	$/ EA.	47	--	76	45	20	TBD	25	78
	Percent of backflow sites reinspected within 30 days of due date	%	100	100	100	100	100	>95	100	100
EFFECTIVENESS	Accounted for water percentage	%	90	91	91	91	95	>90	93	91
	Customer effectiveness rating on rehabilitation projects	1-5 (5 Highest)	4.0	4.4	4.2	4.4	4.4	>4.0	4.3	4.5
	Number of main breaks per 100 miles of pipe	NO./ 100 MILE	11	7	6	9	11	<10	9	2
	Percent of hydrants maintained	%	40	88	99	25	25	100	7	18
	Percent of valves exercised	%	17	0	1	4	11	20	3	8
	Percent of emergency repairs completed within 5 hours	%	96	97	98	98	98	>90	98	98

Water Distribution





Wastewater Collection

The Wastewater Collection function is the responsibility of the Distribution and Collection Systems Manager and is responsible for operating and maintaining the wastewater collection system from the customer's service lateral to the Mason Farm Wastewater Treatment Plant, except the wastewater pumping stations.

PERFORMANCE MEASURES:

Type	Measurement
Workload	**Miles of pipe maintained** *Miles of wastewater collection piping maintained from the customers' service laterals to the Mason Farm Wastewater Treatment Plant.*
	Feet of pipe replaced in-house *Total footage of wastewater collection piping replaced or renovated by in-house crews as part of the ongoing renewal and replacement program.*
	Number of manholes repaired *The number of manholes rehabilitated or repaired.*
	Miles of easement maintained *The miles of sewer easement mowed and kept clean.*
	Miles of pipe televised *The miles of sewer pipe televised.*
	Miles of pipe cleaned *The miles of sewer pipes flushed and cleaned.*
	Number of sewer laterals repaired *The number of sewer laterals repaired.*
	Percent of aerial sewer crossings inspected *The number of aerial sewer crossing inspected divided by the number of aerial crossing maintained.*
	Percent of sewers outside of public right-of-ways inspected *The number of sewers outside of public right-of-ways inspected divided by the public right-of-way maintained.*
	Total number of grease control sites permitted *A measure of the total number of grease control sites permitted.*
Efficiency	**Costs per mile of pipe maintained** *Measure of the total maintenance costs under the control of the Distribution and Collection Systems Manager for maintaining the wastewater collection system, not including overhead or costs funded in other departments.*
	Costs per foot of pipe replaced or renovated in-house *Measure of the replacement or renovation costs per foot for replacing or renovating wastewater collection system piping by in-house crews.*
	Cost of manhole rehabilitation *Total cost of manhole rehabilitation divided by the number of manholes rehabilitated.*
	Cost of sewer easement mowing *Total cost of mowing divided by the total number of miles of easement mowed.*
	Cost of sewer line cleaning *Total cost of sewer line cleaning divided by the number of miles of sewer pipes cleaned.*
	Cost of sewer laterals repaired *Total cost of sewer laterals repaired.*
Effectiveness	**Number of sewer blockages per 100 miles of pipe maintained** *Total number of sewer blockages per 100 miles of sewer pipe.*
	Number of blockages due to roots *Number of sewer pipe blockages due to roots.*
	Number of blockages due to grease *The number of sewer pipe blockages due to grease.*

Effectiveness continued:

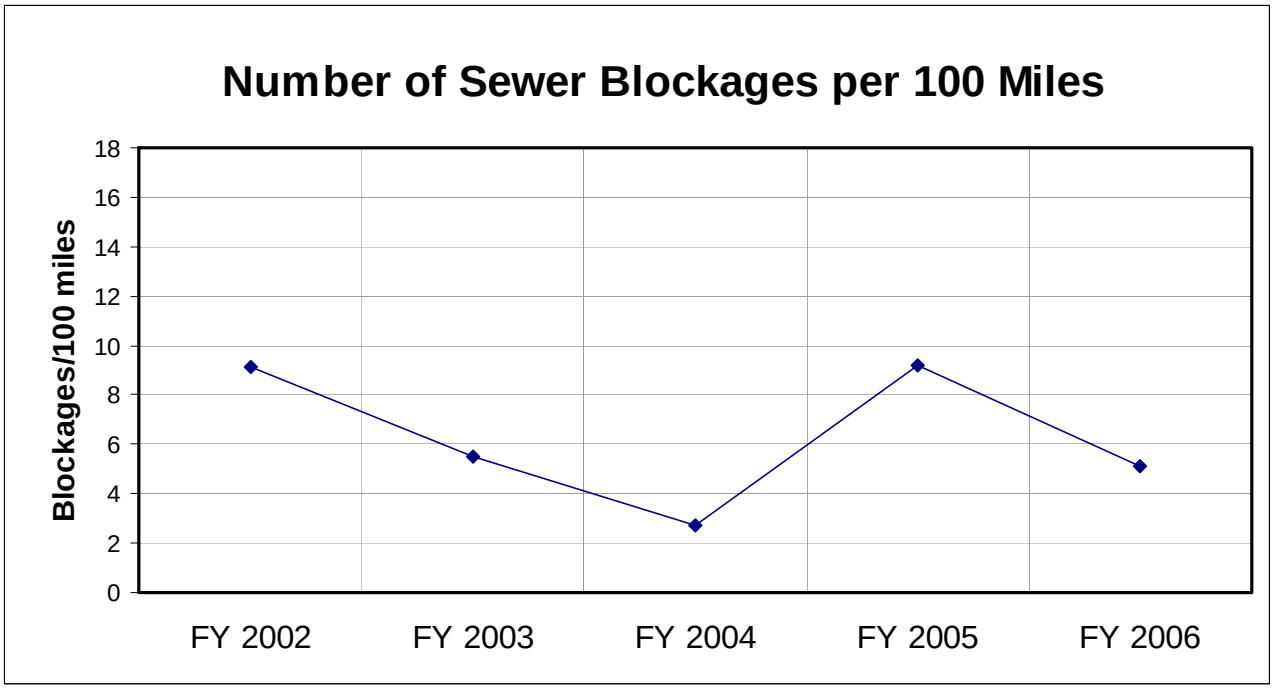
- **Sewer overflow per million gallons treated**
  The total gallons of wastewater overflows divided by that total volume (MG) of wastewater treated.

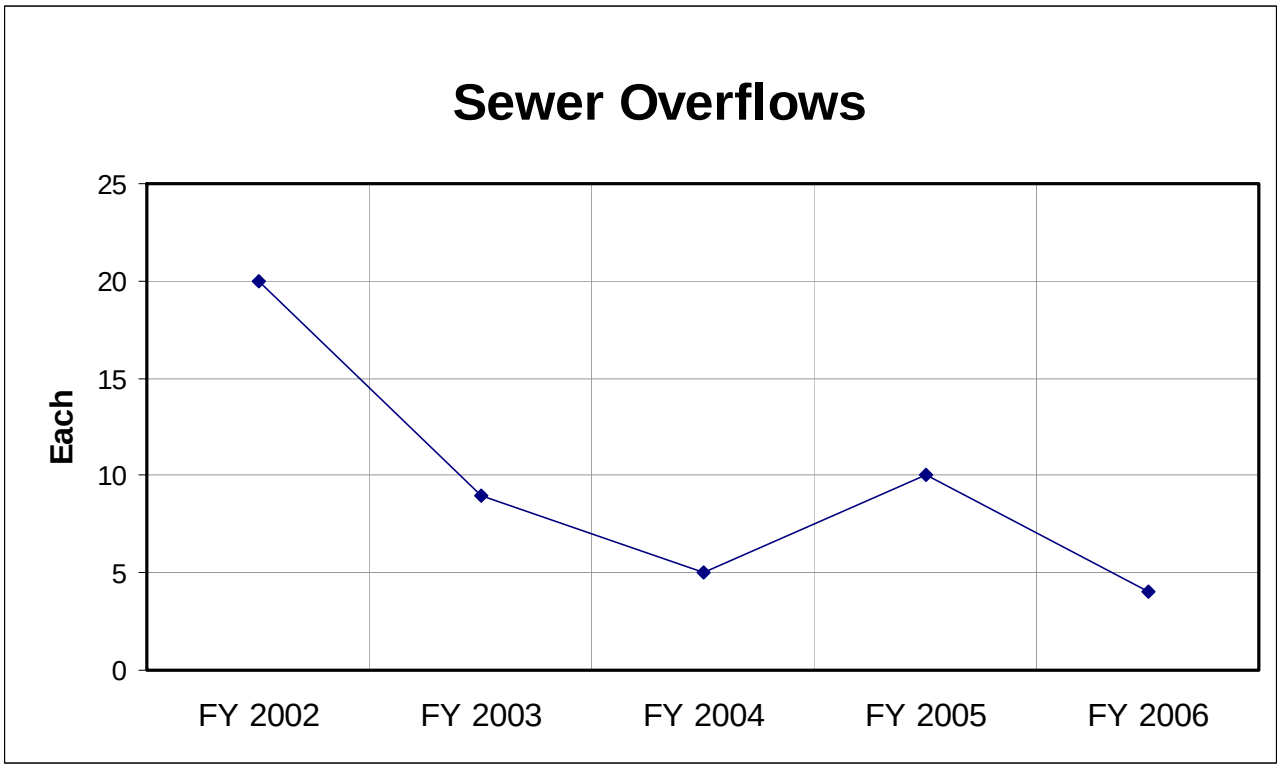
- **Sewer overflows**
  Number of reportable wastewater overflows that occur in the OWASA wastewater collection and treatment system.

Performance Measures
Wastewater Collection

		Units	Total FY 02	Total FY 03	Total FY 04	Total FY 05	Total FY 06	Annual Goal	FY 06 Jul - Dec	FY 06 Jan - Jun
WORKLOAD	Pipe maintained	MILES	285	288	294	296	312	N/A	296	312
	Pipe replaced or renovated in-house	FT.	700	0	150	0	0	N/A	0	0
	Manholes rehabilitated	EA.	320	83	159	215	109	100	79	30
	Sewer easement mowed	MILES	105	57	92	100	141	140	102	39
	Sewer line video inspected	MILES	11	28	13	17	12	14	7	5
	Sewer line cleaned	MILES	63	119	138	182	173	150	81	92
	Number of sewer laterals repaired	EA.	9	6	4	6	6	<10	3	3
	Percent of aerial sewer crossings inspected	%	200	200	300	200	100	200	100	0
	Percent of sewer outside of public right-of-ways inspected	%	94	132	78	97	99	100	75	24
	Total number of grease control sites permitted	EA.		148	179	241	275	N/A	242	275
EFFICIENCY	Cost for pipe maintenance	$/ MILE	3,774	3,467	3,494	4,017	3,415	<4,000	1,823	1,592
	Costs for pipe replaced or renovated in-house	$/FT.	15	0	58	--	--	< 60	--	--
	Cost of manhole rehabilitation	$/EA.	112	338	220	166	394	TBD	348	440
	Cost of sewer easement mowing	$/MILE	--	--	--	701	469	TBD	515	422
	Cost of sewer line cleaning	$/MILE	624	656	385	627	597	TBD	571	602
	Cost of sewer laterals repaired	$/EA.	2,933	2,660	2,071	1,705	2,182	<3,000	3,150	1,214
EFFECTIVENESS	Number of sewer blockages per 100 miles of sewer pipe	NO./ 100 MILE	9.1	5.5	2.7	9.2	5.1	TBD	5.1	0
	Number of blockages due to roots	EA.	14	10	13	4	4	<10	4	0
	Number of blockages due to grease	EA.	7	5	9	5	2	TBD	2	0
	Sewer overflow per million gallons treated	GAL/MG	9.37	10.15	5.32	27.26	0.29	0	0.29	0
	Sewer overflows	EA.	20	9	5	10	2	0	2	0

Wastewater Collection





Wastewater Treatment

The Wastewater Treatment function is the responsibility of the Wastewater Treatment & Biosolids Recycling Manager and is responsible for operation of the pretreatment and odor control program, the Mason Farm Wastewater Treatment Plant, and the biosolids-recycling program.

PERFORMANCE MEASURES:

Type	Measurement
Workload	**Million gallons treated** *Measurement of the number of million gallons treated at the Mason Farm Wastewater Treatment Plant as determined by the influent flow meters .Also expressed in million gallons per day.*
	Million Gallons of biosolids produced *Measurement of the number of gallons of biosolids produced.*
	Percent of biosolids treated and beneficially reused *Percent of biosolids that were recycled as part of the agricultural nutrients recycling program (beneficial use) rather than incineration or land filled.*
	Million gallons of septage treated *Measurement of the number of million gallons of septage treated at the Mason Farm Wastewater Treatment Plant.*
Efficiency	**Costs per thousand gallons treated** *A measure of the total operational cost to treat one thousand gallons of wastewater. This includes operational cost for the Mason Farm Wastewater Treatment Plant and does not include maintenance and other overhead costs.*
	Costs per dry ton biosolids recycled *These costs are associated with the treatment and recycling of wastewater plant biosolids and include the costs of applying the biosolids on local agricultural lands.*
	Chemical costs per thousand gallons treated *A measure of the cost of chemicals required to treat one thousand gallons of wastewater.*
	Energy costs per thousand gallons treated *A measure of the total energy costs required to treat one thousand gallons of wastewater.*
	Kilowatt hours used per thousand gallons treated *A measure of the total energy required to treat one thousand gallons of wastewater.*
	Odor control costs per thousand gallons treated *A measure of the chemical costs per thousand gallons of wastewater treated for odor control purposes. The bulk of the treatment takes place in the collection system.*
Effectiveness	**Number NPDES permit noncompliances** *The numbers of NPDES permit noncompliances as reported by the Mason Farm Wastewater Treatment Plant on the monthly report to the North Carolina Division of Water Quality.*
	Number of wastewater overflows *The number of reportable wastewater overflows which occur at the Mason Farm Wastewater Treatment Plant.*
	Number of odor inquiries *The number of odor inquiries received regarding the operation of the wastewater pumping stations and the Mason Farm Wastewater Treatment Plant.*
	Treatment Process Effectiveness *The average effluent total suspended solids, carbonaceous biological oxygen demand, ammonia nitrogen, and total phosphorus compared to the NPDES permit limit.*
	Days of biosolids storage available *The number of days available biosolids storage, when due to weather, recycling is not possible.*
	Ratio of peak day flow vs. annual average. *The ratio of the peak day flow for the quarter vs. the running annual average.*
	Reclaimed water *The volume of reclaimed effluent from the wastewater treatment plant beneficially reused.*
	Methane gas utilization *A measure of methane gas beneficially reused at the wastewater treatment plant.*

Performance Measures
Wastewater Treatment

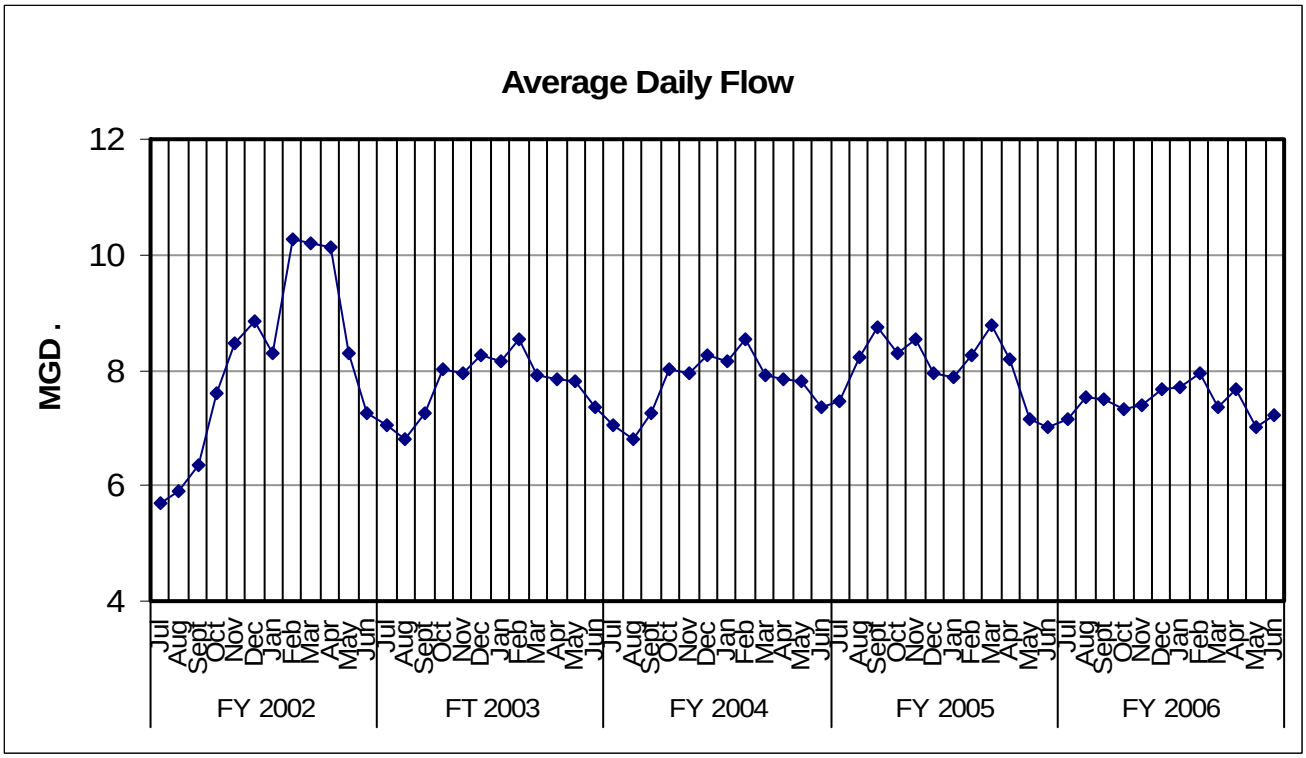
		Units	Total FY 02	Total FY 03	Total FY 04	Total FY 05	Total FY 06	Annual Goal	FY 06 Jul-Dec	FY 06 Jan-Jun
WORKLOAD	Wastewater treated TOTAL	MG	2,922	2,694	2,831	2,983	2,721		1,367	1,354
	AVERAGE DAY	MGD	8.0	7.4	7.7	8.2	7.4	N/A	7.4	7.5
	PEAK DAY	MGD		13.1	12.0	15.5	11.8		11.8	9.9
	Biosolids produced	MG	12.43	12.99	13.71	15.66	13.84	N/A	7.84	6.00
	Biosolids recycled	%		75	93	92	100	N/A	100	100
	Septage received	MG	1.17	1.20	1.16	1.04	1.00	N/A	0.52	0.48
EFFICIENCY	Cost of wastewater treated	$/1000 GAL	0.65	0.67	0.69	0.70	1.12	< 0.72	1.05	1.19
	Cost of biosolids recycling	$/DRY TON	130	230	160	150	438	< 150	438	0
	Chemical costs for wastewater treatment	$/1000	0.14	0.14	0.09	0.10	0.24	< 0.15	0.22	0.26
	Energy costs per thousand gallons treated	$/1000	0.15	0.15	0.16	0.17	0.20	< 0.15	0.18	0.21
	Energy units per 1000 gallons	KWH/ 1,000	3.55	3.54	3.75	3.73	4.31	N/A	4.01	4.61
	Odor control costs for wastewater treatment	$/1000	0.05	0.08	0.06	0.05	0.06	< 0.06	0.06	0.06
EFFECTIVENESS	NPDES permit noncompliances	EA.	3	8*	1	1	1	0	0	1
	Wastewater overflows at plant	EA.	0	0	0	0	0	0	0	0
	Odor inquiries	EA.	54	16	30	20	65	0	17	48
	Treatment Process Effectiveness									
	Total suspended solids	mg/l	5	6	6	7	5	< 30	5	5
	CBOD	mg/l	3.6	4.2	2.8	3.3	2.0	< 4.0 (8.0)	2.1	1.9
	NH3-N	mg/l	0.4	1.1	0.5	0.6	0.3	< 2.0 (4.0)	0.3	0.3
	Total Phos	mg/l	0.5	0.5	0.5	0.5	0.6	< 0.6	0.5	0.6
	(NPDES Permit Limits)							PERMITTED SUMMER LIMITS (WINTER LIMITS)		
	Available biosolids storage	DAYS	20	11	15	25	28	21	28	27
	Ratio of peak day flow to running annual average	%	1.52	3.04	1.55	1.90	1.59	TBD	1.59	1.32
	Reclaimed water	TBD								
	Methane gas utilization	TBD								

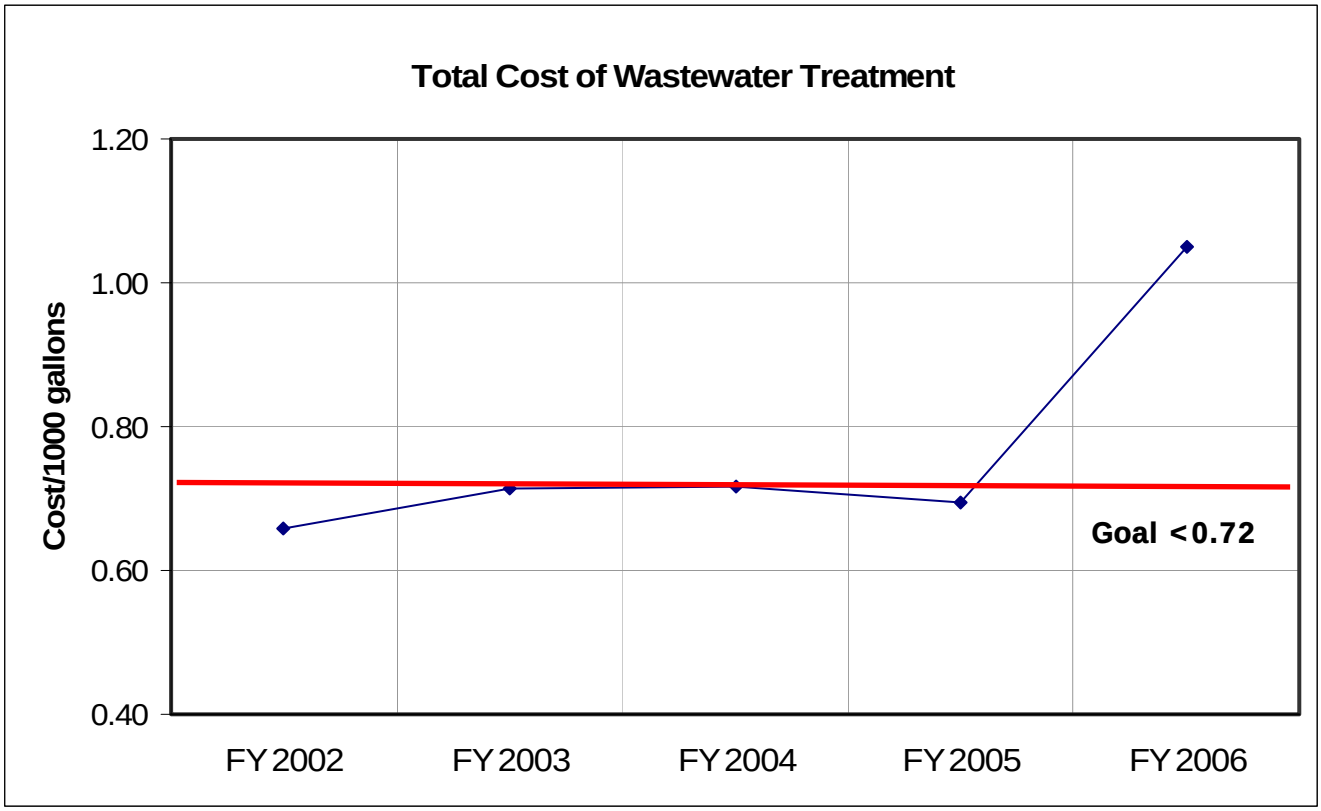
* 75 chlorine residual violations were rescinded by the Division of Water Quality

DAYS	20	11	15	25
%	1.52	3.04	1.55	1.90
TBD				
TBD				

* 75 chlorine residual violations were rescinded by the Division of Water Quality

Wastewater Treatment





Laboratory

The Laboratory function is the responsibility of the Laboratory Manager and is responsible for analytical data and support for the water and wastewater operations.

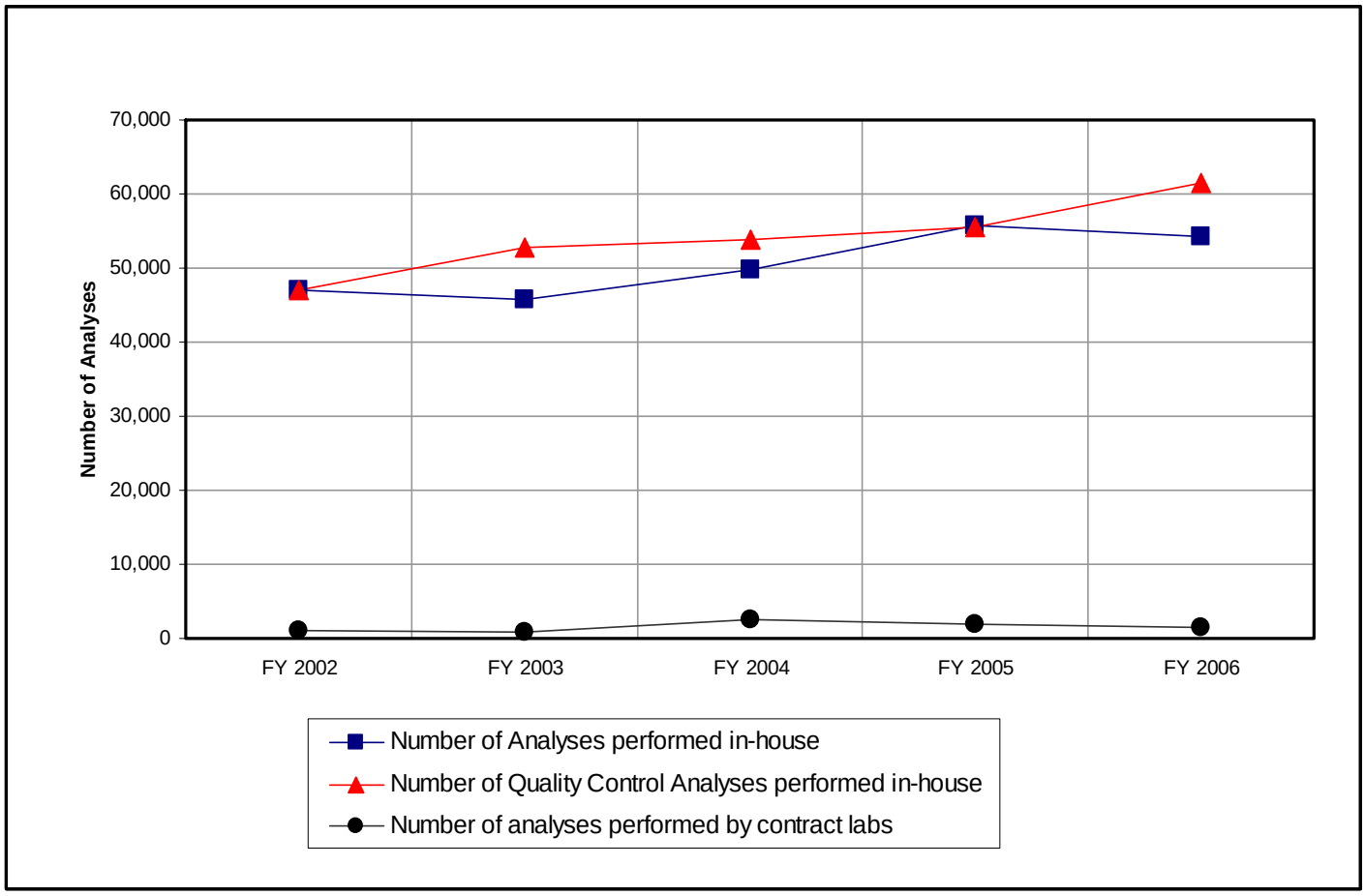
PERFORMANCE MEASURES:

Type	Measurement
Workload	**Number of analysis** *Measurement of the number of analyses performed for the water and wastewater operations.* **Number of quality control analysis** *Measurement of the number of laboratory quality control analyses performed.* **Number of contract samples** *Measure of the number of analyses performed by contract labs for water and wastewater operations.*
Effectiveness	**Percentages of quality control analysis within 95% confidence limits** *The percentage of quality control analyses performed that fall within the acceptable confidence limits.* **Percentage of analysis invalidated due to in-house error** *Indicates effectiveness of the staff.* **Percent of State Required Water Laboratory Quality Assurance/Quality (QA/QC) Control Analysis Passed on Initial Test** *The percent of State required water laboratory QA/QC passed on initial test.* **Percent of Wastewater Laboratory Proficiency parameters passed on initial test,** *The number of Proficiency parameters passed by the Wastewater laboratory during their initial studies divided by the total number of Proficiency parameters performed during their initial studies.*

Performance Measures
Laboratory

		Units	Total FY 02	Total FY 03	Total FY 04	Total FY 05	Total FY 06	Annual Goal	FY 06 Jul - Dec	FY 06 Jan – Jun
WORKLOAD	Number of analyses performed in-house	EA.	47,076	45,657	49,805	55,688	54,337	N/A	27,417	26,920
	Number of quality control analyses performed in house	EA.	47,023	52,842	53,829	55,544	61,594	N/A	29,693	31,901
	Number of analyses performed by contract laboratories	NO.	1,150	862	2,658	1,908	1,541	N/A	1,116	425
EFFECTIVENESS	Percentage of quality control analyses within 95% confidence limits	%	99	98	99	99	99	>95	98	99
	Percent of analyses invalidated due to in-house error	%	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	Percent of State required Water Laboratory Proficiency Parameters passed	%		100	100	100	100	100	100	100
	Percent of State required Wastewater Laboratory Proficiency Parameters passed	%		100	100	100	100	100	100	NA

Laboratory


70,000
60,000
50,000
40,000
30,000
20,000
10,000
0
Number of Analyses
FY 2002
FY 2003
FY 2004
FY 2005
FY 2006
Number of Analyses performed in-house
Number of Quality Control Analyses performed in-house
Number of analyses performed by contract labs

Maintenance

The maintenance function is the responsibility of the Plants Maintenance Manager and is responsible for all facility preventive, corrective, and predictive maintenance for the water supply and treatment, water pumping, wastewater pumping, wastewater treatment operations, and vehicle maintenance.

PERFORMANCE MEASURES:

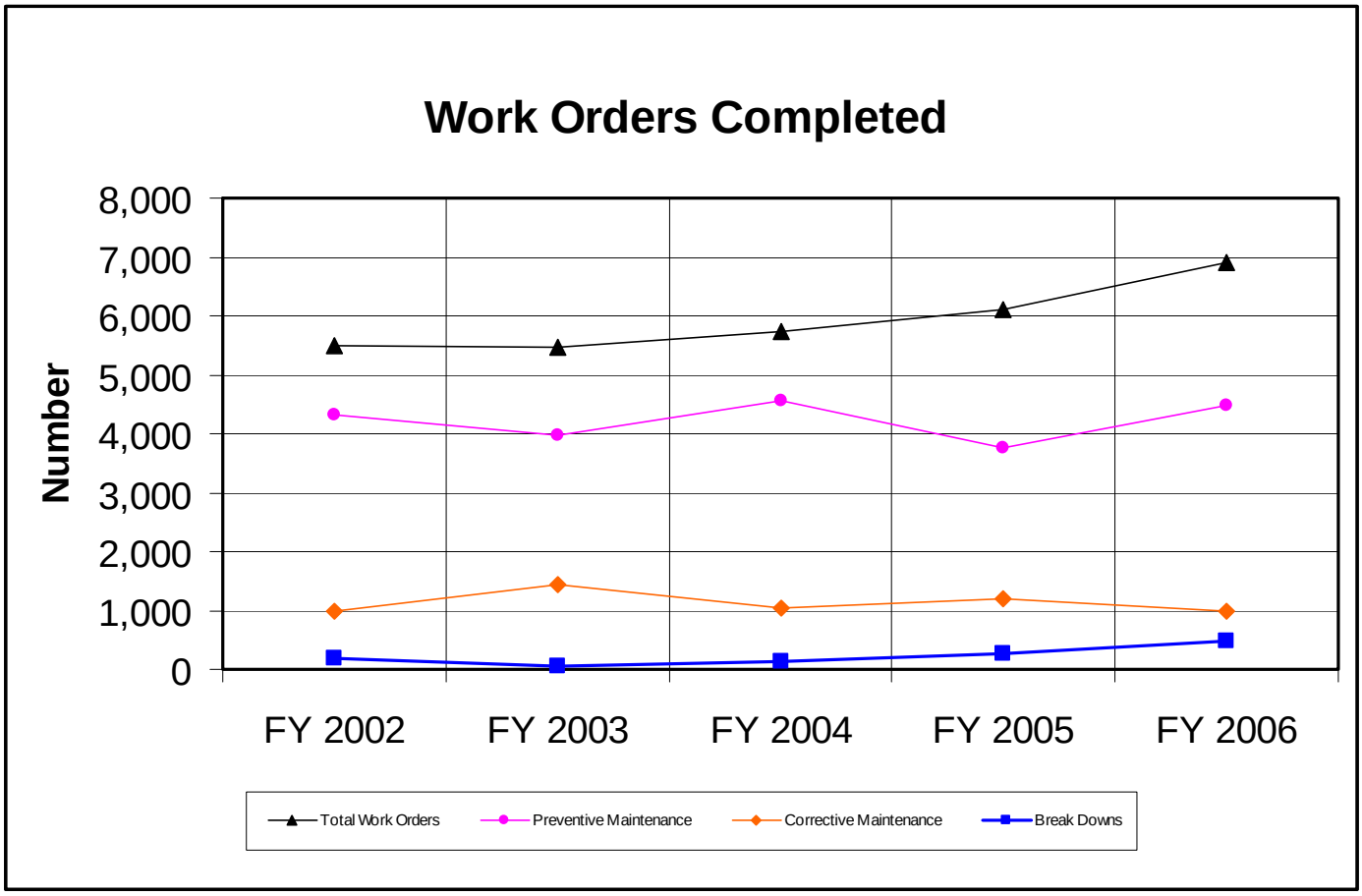
Type	Measurement
Workload	**Work orders completed** *The number of corrective maintenance work orders completed for the water and wastewater plant operations.*
	Number of vehicles maintained *The total number of vehicles maintained by vehicle maintenance shop including off road equipment.*
	Number of equipment units maintained *The total number of equipment units maintained by water and wastewater maintenance.*
	Vehicle work orders completed *The total number of work orders completed by the vehicle maintenance shop.*
Efficiency	**Equipment availability percentage** *Percentage of critical equipment which is available for service. A 100% index for this standard would indicate that every piece of equipment is ready to operate at all times.*
	Ratio of breakdown work orders to total work orders *This measurement is a ratio of the corrective maintenance work orders generated because of equipment failure as a percentage of the total number of work orders completed. This performance standard provides a benchmark as to how much maintenance activity is of the "fix it when it breaks" variety rather than the more desirable preventive and predictive maintenance.*
	Percentages of repeat work orders due to technician error *Percentage of work orders completed which were not performed properly the first time.*
	Number of wastewater pumping station overflows *The number of reportable wastewater overflows that occur at any of the 26 pumping stations because of equipment failure.*
	Fleet reliability *Percent of vehicles available for service. A 100% index for this standard would mean that all vehicles were ready to operate at all time.*
	Work orders completed on schedule *This indicates the Maintenance Department's responsiveness. The number of work orders completed within its schedule.*
	Ratio of hours allocated to preventative maintenance vs. corrective maintenance *Indicates how well the Maintenance Department keeps up with preventative maintenance. The hours spent performing preventive maintenance divided by the hours performing corrective maintenance.*
	Average fuel mileage of the OWASA fleet *A measure of the average miles per gallon of fuel consumption for the OWASA fleet (not including heavy equipment).*
	Alternative fuel vehicles *Number of vehicles within the fleet operating on alternative fuel such as biodiesel, electric, or compressed natural gas.*

Performance Measures
Maintenance

		Units	Total FY 02	Total FY 03	Total FY 04	Total FY 05	Total FY 06	Annual Goal	FY 05 Jul - Dec	FY 05 Jan - Jun
WORKLOAD	Work Orders Completed: Total	.		**5,389**	**5,733**	**6,114**	**6,916**		**3,260**	**3,656**
	Preventive Maintenance			3,814	3,960	3,750	4,467		2,121	2,346
	Corrective Maintenance	EA.	6,037	926	1,021	1,212	985	N/A	492	493
	Breakdown Maintenance			112	125	270	486		228	258
	Other Maintenance			537	627	882	976		419	557
	Number of vehicles maintained	EA.	--	--	76	73	73	N/A	72	73
	Number of equipment units maintained	EA.	2,659	3,000	3,113	3,363	3,461	N/A	3,415	3,461
	Vehicle Work Orders Completed: Total			**1,629**	**1,604**	**1,584**	**1,397**		**719**	**678**
	Preventive Maintenance		1,545	915	805	749	775		418	357
	Corrective Maintenance	EA.		526	580	718	485	N/A	208	277
	Breakdown Maintenance			158	162	65	156		68	88
	Other Maintenance			51	57	52	69		25	44
EFFECTIVENESS	Equipment availability percentage	%	99.8	99.1	99.9	99.9	99.9	>98.0	99.9	99.9
	Percent of breakdown work orders to total work orders Plants Maintenance	%	1.5	2.0	2.2	4.4	7.0	TBD	6.9	7.0
	Vehicle Maintenance					4.1	11.2		9.3	13.0
	Repeat work orders due to technician error Plants Maintenance	%	0.1	0	0	0	0	0	0	0
	Vehicle Maintenance			0	0	0	0	0	0	0
	Wastewater pumping station overflows, equipment-related	EA.	0	0	0	1	0	0	0	0
	Fleet reliability	%	99.7	99.4	99.9	99.9	99.9	>95.0	99.9	99.9
	Work Orders completed on schedule			94	96	98	99		98	99
	Plants Maintenance	%	91	61	80	91	75	>90	75	74
	Vehicle Maintenance			78	88	95	**86**		**86**	**86**
	Overall Maintenance									
	Percent of hours allocated to preventative maintenance vs. corrective maintenance	%	71							
	Plants Maintenance			69	88	75	72	>70	72	72
	Vehicle Maintenance			50	54	49	64	>50	60	69
	Average fuel mileage of the OWASA fleet	TBD								
	Alternative fuel vehicles	EA.	--	31*	31*	31*	31*	N/A	31*	31*

*Includes equipment using biodiesel as fuel.

Maintenance



Public Affairs

Public Affairs are the responsibility of the Public Affairs Administrator and is responsible for providing complete and timely information to the organization's customers and the community at large.

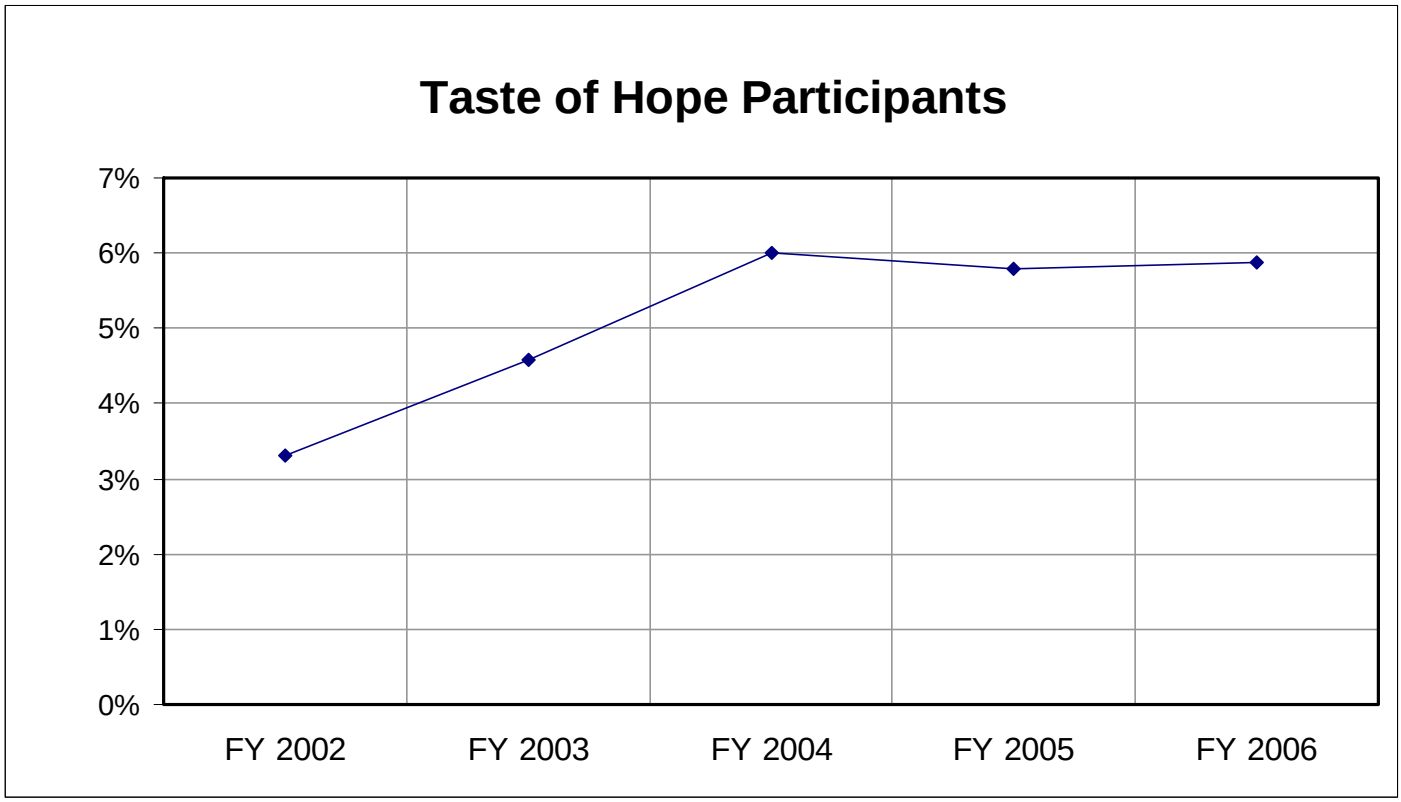
PERFORMANCE MEASURES:

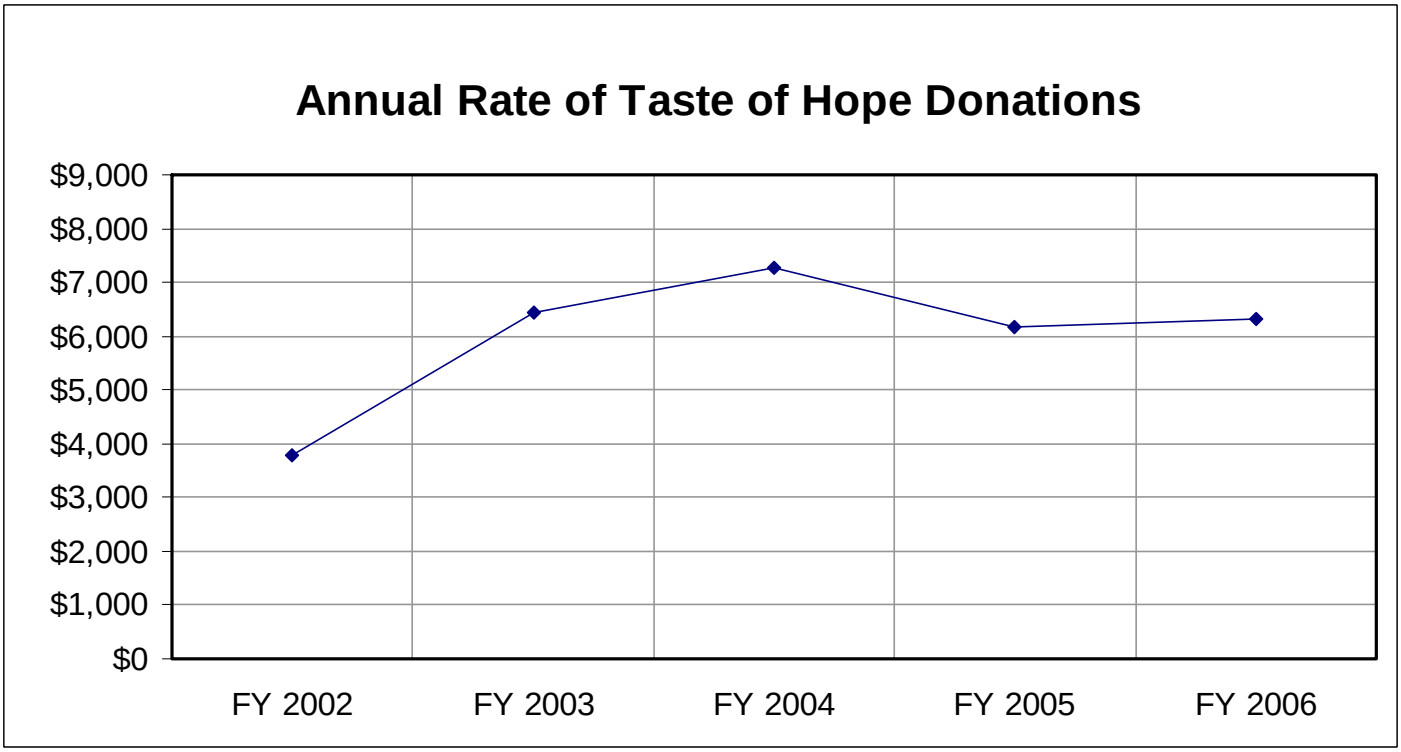
Type	Measurement
Workload	**News releases prepared** *Number of news releases prepared.*
Efficiency	**Percentage of news releases covered by local media** *Percentage of news releases that are covered by the local media from the total number of releases prepared.* **Number of donors participating in the Taste of Hope customer assistance program** *The number of OWASA billed customers who have their monthly bills automatically rounded up to the nearest dollar, with the added amount designated for use in the Taste of Hope Customer Assistance Program administered locally by the Inter-Faith Council for Social Service; some funds are provided to Water Partners International for water projects in developing nations. No OWASA funds other than donations are used to fund the Taste of Hope program or to promote it.* **Percentage of about 18,000 billed customer who are Taste of Hope donors:** *Self explanatory.* **Annual rate of Taste of Hope donations** *Quarterly or annual donation rate calculated from the monthly donation rate in the final month of a given quarter or year. To an extent, donations vary from month to month because the average bill rounding per customer fluctuates with billings and may be somewhat more or less than 50 cents per donor per month.*

Performance Measures
Public Affairs

		Units	Total FY 02	Total FY 03	Total FY 04	Total FY 05	Total FY 06	Annual Goal	FY 06 Jul - Dec	FY 06 Jan – Jun
WORKLOAD	News releases	EA.	37	50	35	34	42	N/A	21	21
EFFECTIVENESS	Percentage of news releases covered by local media	%	85	90	61	77	72	100	57	87
	Number of donors participating in the Taste of Hope Customer Assistance Program	Number at end of year or quarter	644	1,050	1,140	1,036	1,083	NA	1,077	1,083
	Percent of about 18,000 billed customers who are Taste of Hope donors	**%** at end of year or quarter	3.6	5.8	6.3	5.8	5.8	NA	6.0	5.8
	Annual rate of Taste of Hope donations	$(12 * monthly rate)	3,600	6,428	7,266	6,156	6,304	NA	7,535	6,304

Public Affairs





Customer Service

The Customer Service function is the responsibility of the Customer Service Manager and is responsible for meter reading, billing and collection, and customer service activities.

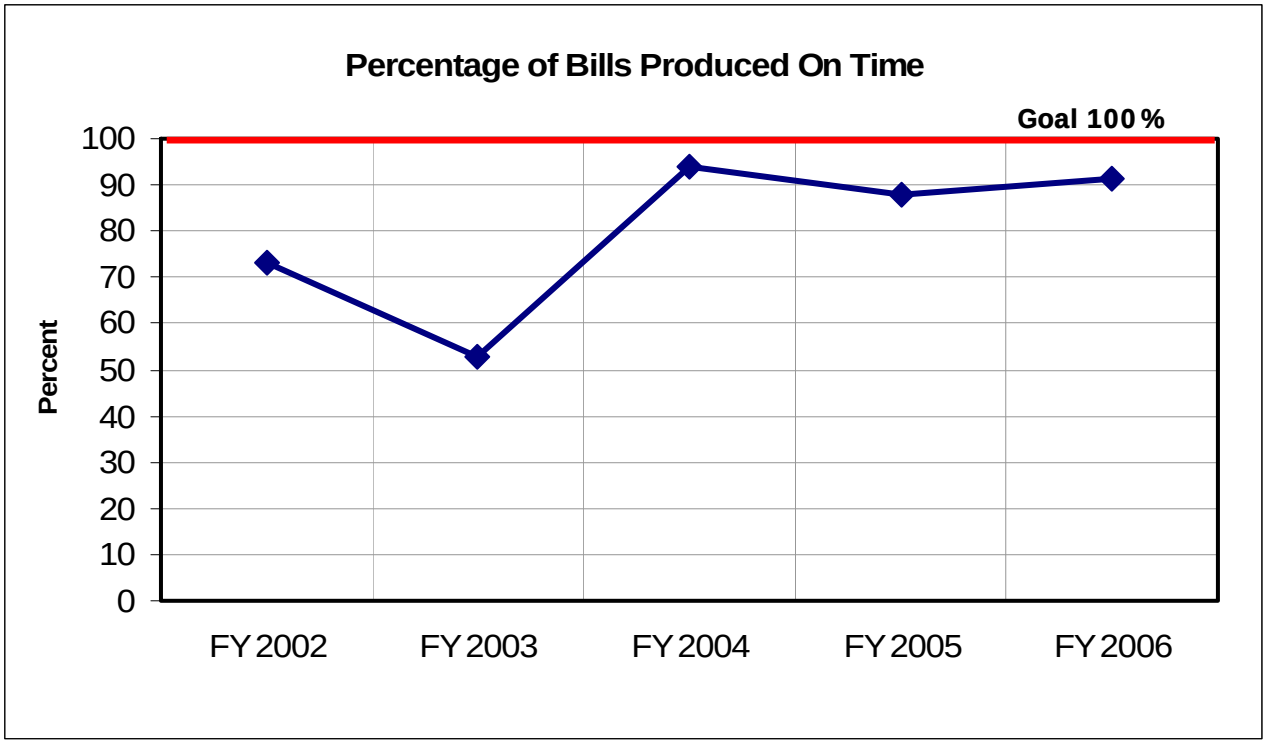
PERFORMANCE MEASURES:

Type	Measurement
Workload	**Meters read** *Total number of meters read.* **Bills mailed** *Total number of bills mailed.*
Effectiveness	**Meter reading accuracy** *Percentage of meters read accurately for which the data is used as the basis for customers' bills. The number of meters read divided by the total number of staff hours.* **Meter reading estimates** *Percentage of meters readings that were estimated rather than read.* **Billing timeliness** *Percentage of total bills which are delivered to post office on scheduled day.*

Performance Measures
Customer Service

		Units	Total FY 02	Total FY 03	Total FY 04	Total FY 05	Total FY 06	Annual Goal	FY 06 Jul - Dec	FY 06 Jan – Jun
WORKLOAD	Meters read	# OF METERS	215,511	230,602	234,146	235,632	237,505	N/A	117,720	119,785
	Bills mailed	# OF BILLS	206,313	211,316	215,793	219,608	223,559	N/A	111,323	112,236
EFFECTIVENESS	Meter reading accuracy	%	99	99	99	99	99	100	99	99
	Meter reading estimates	%	7	11	1	0.8	4.3	<1	8	0.5
	Billing timeliness	%	73	53	94	82	90	100	92	89

Customer Service



Financial Management

The overall Financial Management function is the responsibility of the Finance and Customer Service Director, with support from the Accounting Manager. Together they are responsible for maintaining the fiscal affairs of OWASA including accounts payable, accounts receivable, the general ledger, asset records, cash investment, payroll, budget development, and financial reporting.

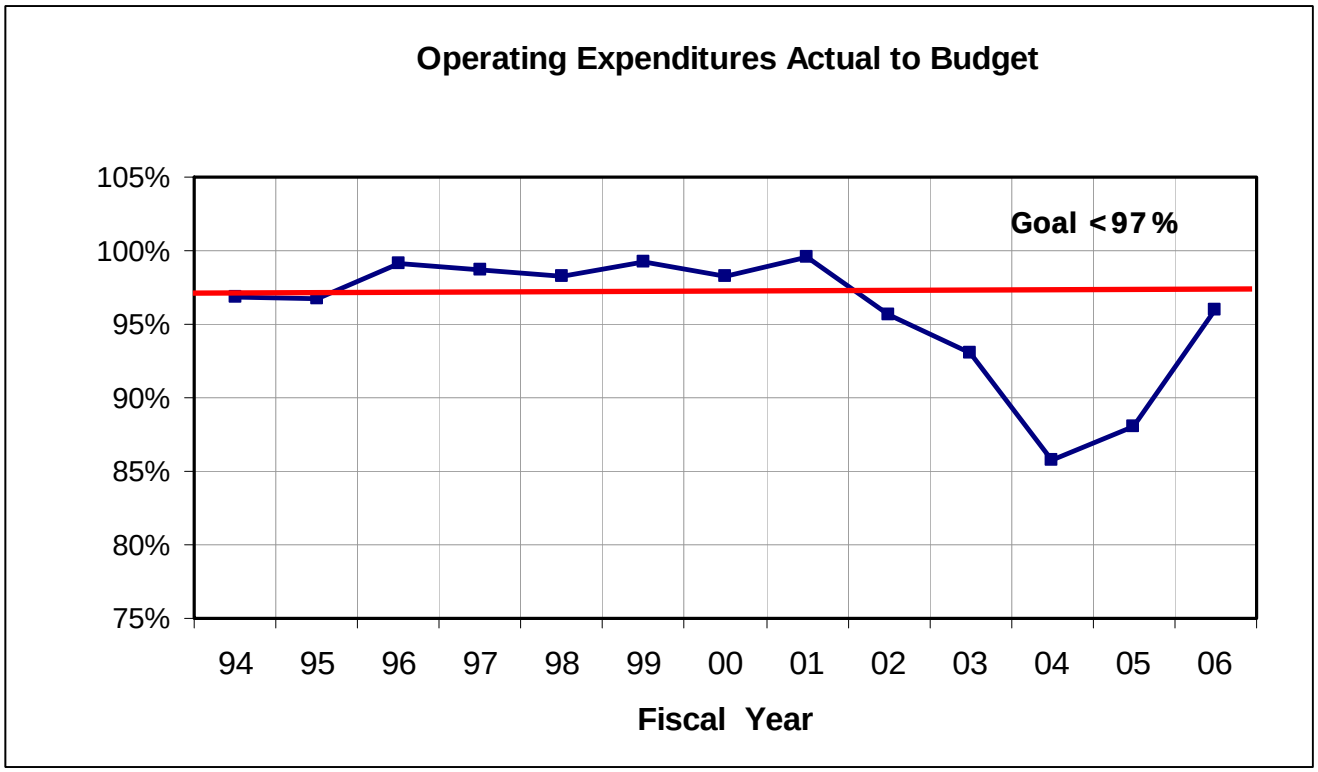
PERFORMANCE MEASURES:

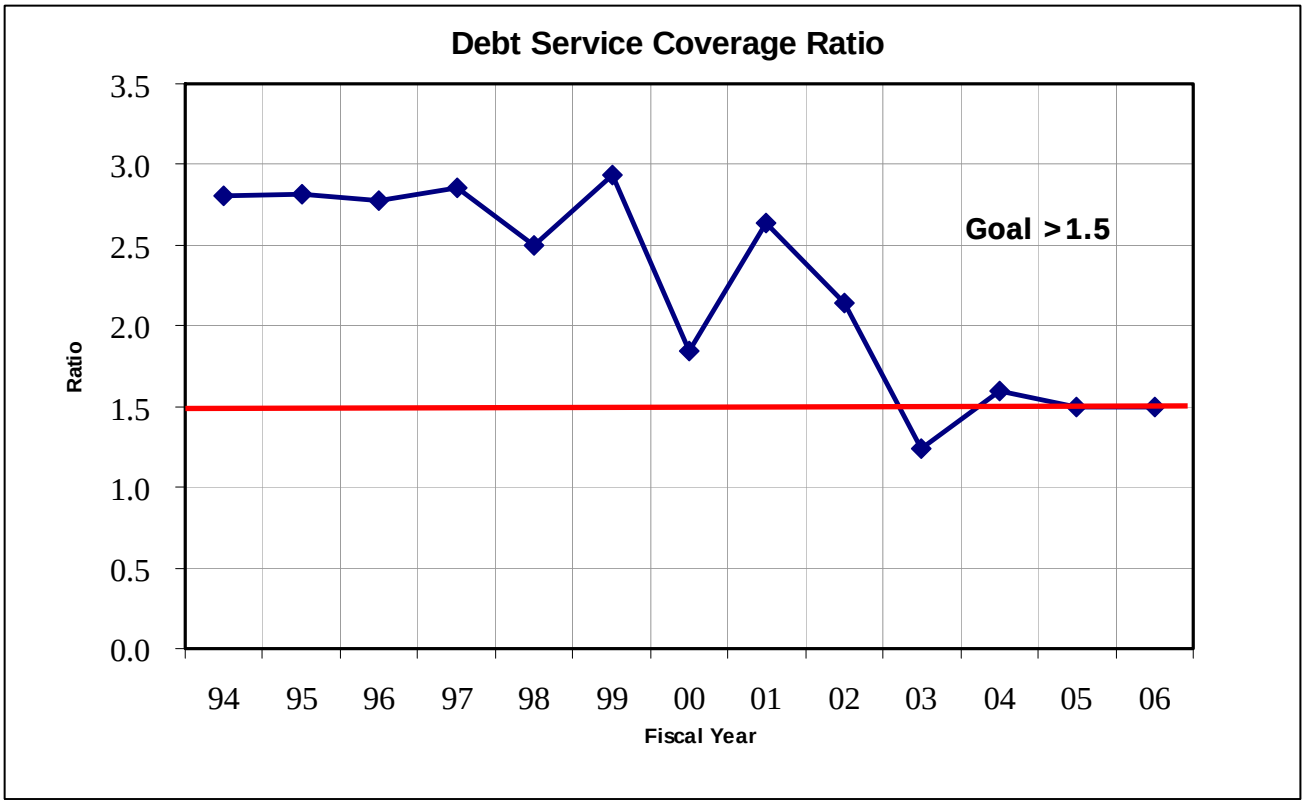
Type	Measurement
Effectiveness	**Payroll accuracy** *Percentage of payroll checks properly calculated and distributed.* **Percentage of revenues uncollectible** *Comparison of bad debts written-off as a percentage of total revenues.* **O&M budget expenses to budget** *Percentage, of actual operating expenses to budgeted expenses.* **Percent of invoices paid within 30 days of receipt by Finance Department "Revenue to Budget"** *Measurement of the Finance Department's responsiveness in processing bills.* **Debt per customer account** *Monetary allocation of the organization's outstanding debt over the customer base.* **Ratio of O&M expenses to total operating revenue** *Comparison of operating outflow to operating inflow. An indicator or the organization's ability to service debt and fund capital improvements from operating revenues.* **Ratio of annual net revenue to annual debt service** *Measures the margin of net revenue, including interest income, over annual debt service requirements.* **Debt service as percent of revenues** *A comparison of annual debt service requirements to gross revenues.*
Efficiency	**Amount of solar energy utilized** *A measure of the amount of solar energy utilized.* **Energy cost Administration Building and Operations Center** *A measure of monthly energy cost (electric and heating fuel) per square foot Administration Building and Operations Center office space and work space.* **Water consumption of Administration Building and Operations Center** *A measure of daily water consumption per employee at OWASA's Administration Building.*

Performance Measures
Financial Management

		Units	Total FY 02	Total FY 03	Total FY 04	Total FY 05	Total FY 06	Annual Goal	FY 06 Jul - Dec	FY 06 Jan - Jun
EFFECTIVENESS	Payroll accuracy	%	99	99	99	99	99	100	99	99
	Percentage of revenues uncollectible	%	0.05	0.20	0.17	0.53	0.28	<0.20	0.17	.44
	O&M budget expenses to budget	%	95	93	86	88	96	<97	97	95
	Revenue to budget	%	102	87	93	97	97	100	103	92
	Percent of invoices paid within 30 days of receipt by Finance Department	%	100	100	99	99	99	>95	99	99
	Debt per customer account	$/ACCT	3,778	3,535	5,292	5,133	5,192	N/A	5,184	5,192
	Ratio of O&M expenses to total operating revenue	%	63	73	64	65	66	<66	61	71
	Ratio of annual net revenue to annual debt service	--	1.5	1.2	1.8	1.5	1.5	>1.5	1.2	1.7
	Debt service as a percent of revenues	%	21	26	24	28	32	<35	27	32
EFFICIENCY	Amount of solar energy utilized	TBD								
	Monthly energy costs: Administration Building Operations Center	$/SF	--	0.20 TBD	0.21 TBD	0.22 0.11	0.24 0.11	TBD	0.24 0.07	0.23 0.14
	Water consumption: Administration Building Operations Center	GAL/ EMP/ DAY	--	6.4 TBD	3.3 TBD	7.5 8.8	7.5 12.7	TBD	8.7 10.1	6.3 15.2

Financial Management





Purchasing

The Purchasing function is the responsibility of the Procurement Manager and is responsible for certain centralized procurement activities, monitors decentralized procurement activities throughout OWASA, inventory management, and coordination of vehicle maintenance.

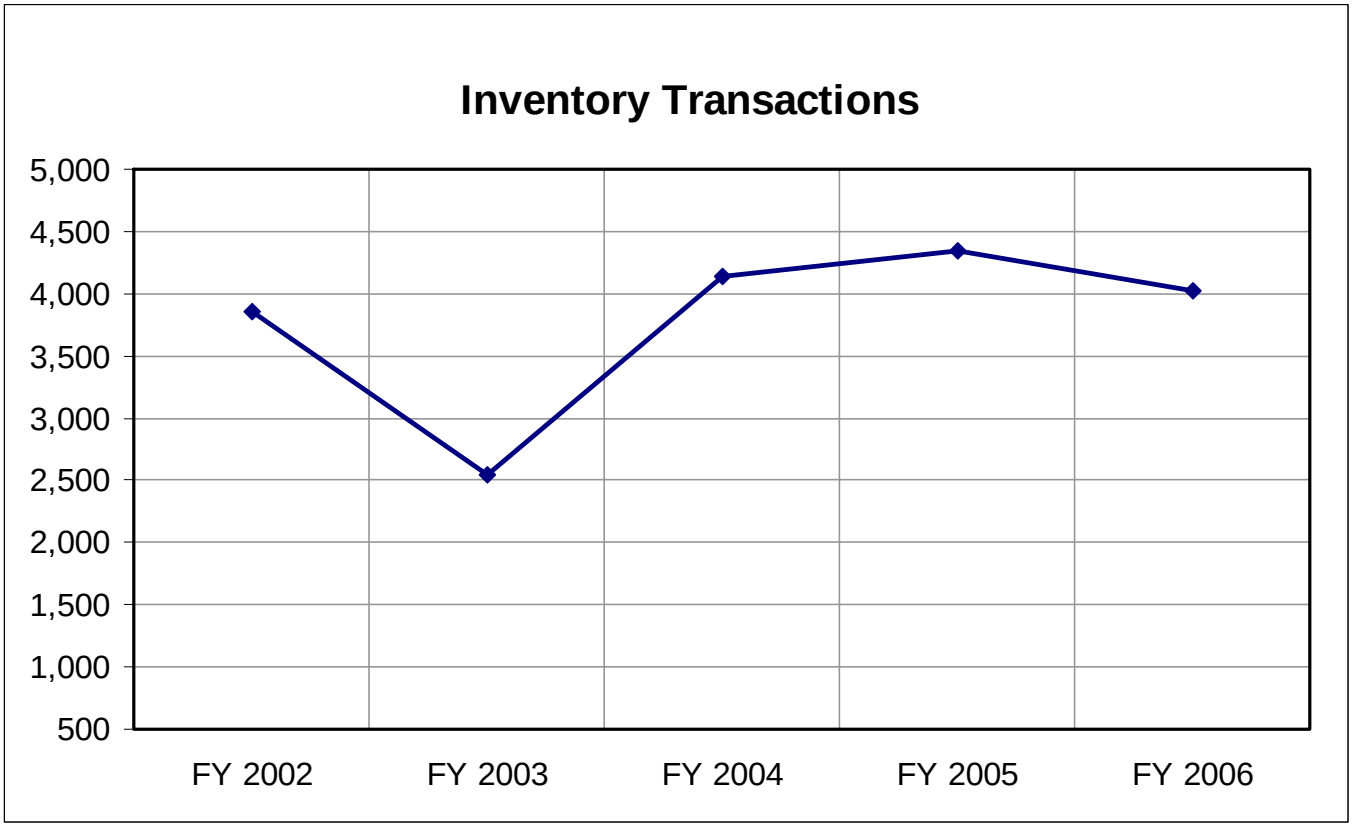
PERFORMANCE MEASURES:

Type	Measurement
Workload	**Inventory transactions** *Total number of transactions (purchases, issues, adjustments) performed on the inventory of repair parts.* **Purchase Orders – Warehouse** *The number of purchase orders issued for stocking the warehouse with supplies and other materials.* **Purchase Orders – Other** *The number of purchase orders issued over $150.00 excluding warehouse items.*
Effectiveness	**Use of recycled materials** *The weight/volume of materials purchased which are made from recycled products.* **Percentage unaccounted for inventory** *The net dollar value of all adjustments (gains and losses combined) made to the inventory balance as a result of a physical count divided by the inventory beginning balance value.*

Performance Measures
Purchasing

		Units	Total FY 03	Total FY 04	Total FY 05	Total FY 06	Annual Goal	FY 06 Jul - Dec	FY 06 Jan - Jun
WORKLOAD	Inventory Transactions	EA.	2,539	4,135	4,347	4,027	N/A	1,492	2,535
	Purchase Orders Warehouse	EA.			224	430	N/A	236	194
	Purchase Orders Other	EA.			619	445	N/A	247	198
EFFECTIVENESS	Use of recycled materials	TBD							
	Percent Unaccounted Inventory	%	7.0	5.3	1.0	1.0	<5	These values are reported in conjunction with the physical count at year end.	

Purchasing


Inventory Transactions
5,000
4,500
4,000
3,500
3,000
2,500
2,000
1,500
1,000
500
FY 2002
FY 2003
FY 2004
FY 2005
FY 2006

Business Information Services

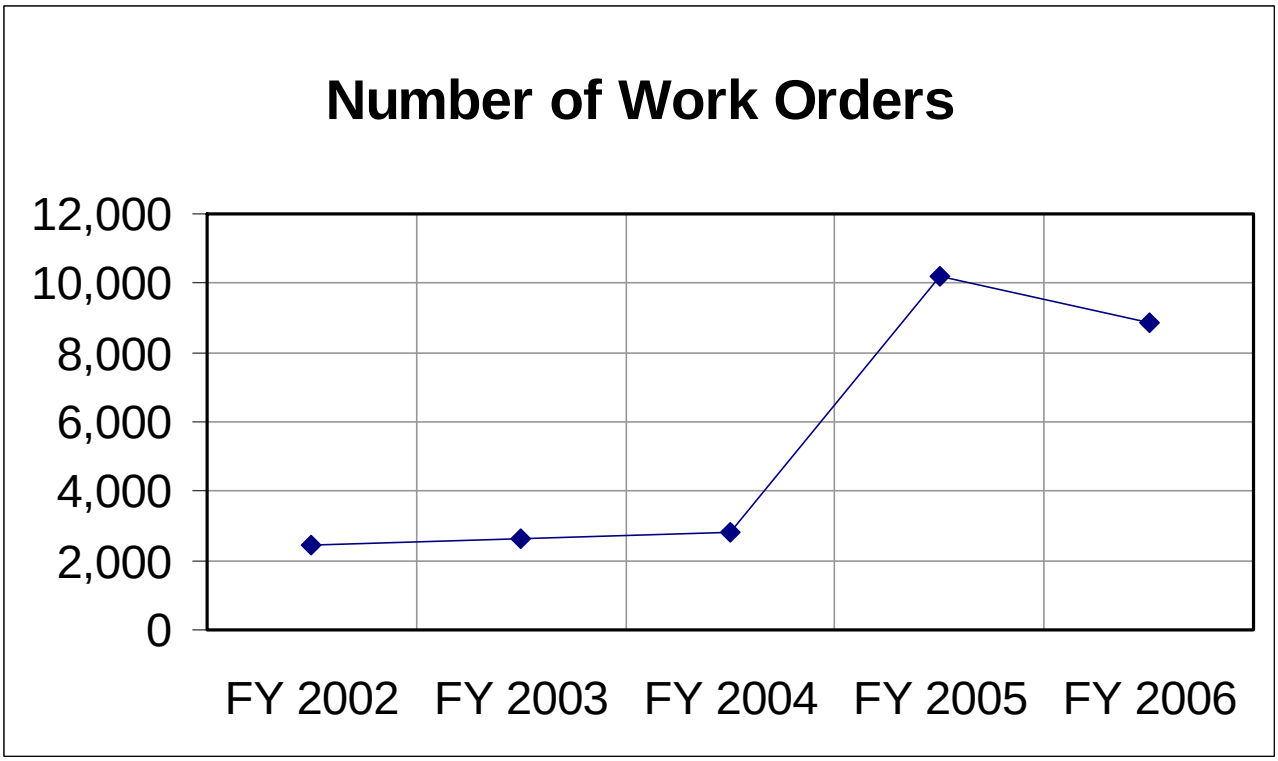
The Business Information Services (BIS) function is the responsibility of the BIS Director and is responsible for developing and maintaining OWASA's computer network, telecommunications, and office business systems.

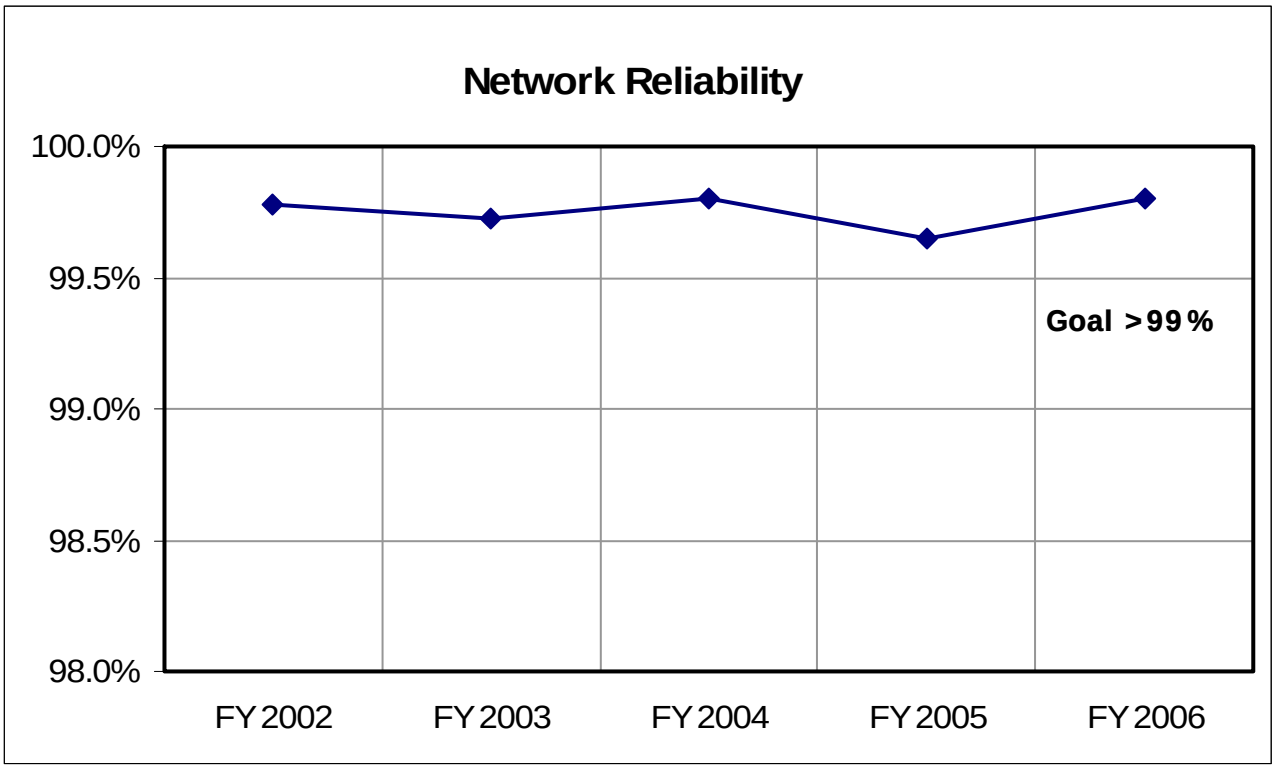
PERFORMANCE MEASURES:

Type	Measurement
Workload	**Workstations maintained** *Total number of individual workstations maintained.* **Number of work orders completed** *Total number of work orders completed.*
Efficiency	**Network reliability** *Calculation of network down days as a percentage of total available network days.* **Workstation reliability** *Calculation of workstation down days as a percentage of total available work station days.* **Percent of priority 1 work orders completed within 24 hours** *The number of priority 1 work orders completed in less than one day divided by the total number of priority 1 work orders.*

Performance Measures
Business Information Systems

		Units	Total FY 02	Total FY 03	Total FY 04	Total FY 05	Total FY 06	Annual Goal	FY 06 Jul - Dec	FY 06 Jan – Jun
WORKLOAD	Workstations maintained	EA.	102	102	107	113	113	N/A	113	113
	Number of work orders completed	EA.	2,425	2,635	2,280	10,216	8,870	TBD	4,526	4,344
EFFECTIVENESS	Network reliability	%	99.8	99.7	99.8	99.8	99.8	>99.0	99.8	99.8
	Workstation reliability	%	99.5	99.6	99.6	99.7	99.6	>99.0	99.6	99.6
	Percent of priority 1 work orders completed within 24 hours	%	98	97	97	96	96	TBD	96	96


Number of Work Orders
12,000
10,000
8,000
6,000
4,000
2,000
0
FY 2002
FY 2003
FY 2004
FY 2005
FY 2006


Network Reliability
100.0%
99.5%
99.0%
98.5%
98.0%
Goal >99%
FY 2002
FY 2003
FY 2004
FY 2005
FY 2006

Human Resources

The Human Resources function is the responsibility of the Human Resources Director and is responsible for developing and maintaining Human Resources policies and procedures throughout OWASA as well as proving for recruitment, affirmative action, employee benefits (including insurance), employee records management, and administrative building custodial and courier services.

PERORMANCE MEASURES:

Type	Measurement
Workload	**Positions filled** *Number of positions filled with permanent employees (an internal hire is a promotion and an external hire is a new employee).* **Positions vacated** *Number of performance full time positions vacated.* **Number of grievance Step II-IV** *Number of formal written Step II-IV) grievances conducted.* **Number of EEOC complaints** *Number of EEOC complaints filled with Orange County.* **Number of HR sponsored events** *Number of events and programs such as training, Employee Appreciation Day, information sessions, and blood drives coordinated, managed, and/or lead by Human Resources.* **Number of training events attended by employees** *Number of training events that OWASA employees report to HR that they have attended during the given period.*
Effectiveness	**Average time to fill vacancies** *Average time to fill vacancies from when the position was vacated until the new employee starts.* **Attrition rate** *The percentage vacancies of the total number of authorized positions including and excluding promotions.* **Percent of new hires successfully completing probationary period** *Percentage of new hires that successfully complete probationary period.* **At fault EEOC complaints** *Number of EEOC complaints for which the organization was found to have responsibility.* **Grievances overturned at Step IV** *Number of grievances heard at the Step IV level by the hearing officer for which the Executive Directors decision was overturned.* **Diversity percentages** *The racial and gender of OWASA employees. Diversity percentages are the name of the category. Racial percentages are the racial breakdowns at OWASA employees in terms of black, white and other. Gender refers to gender breakdowns of OWASA employees - male/female.*

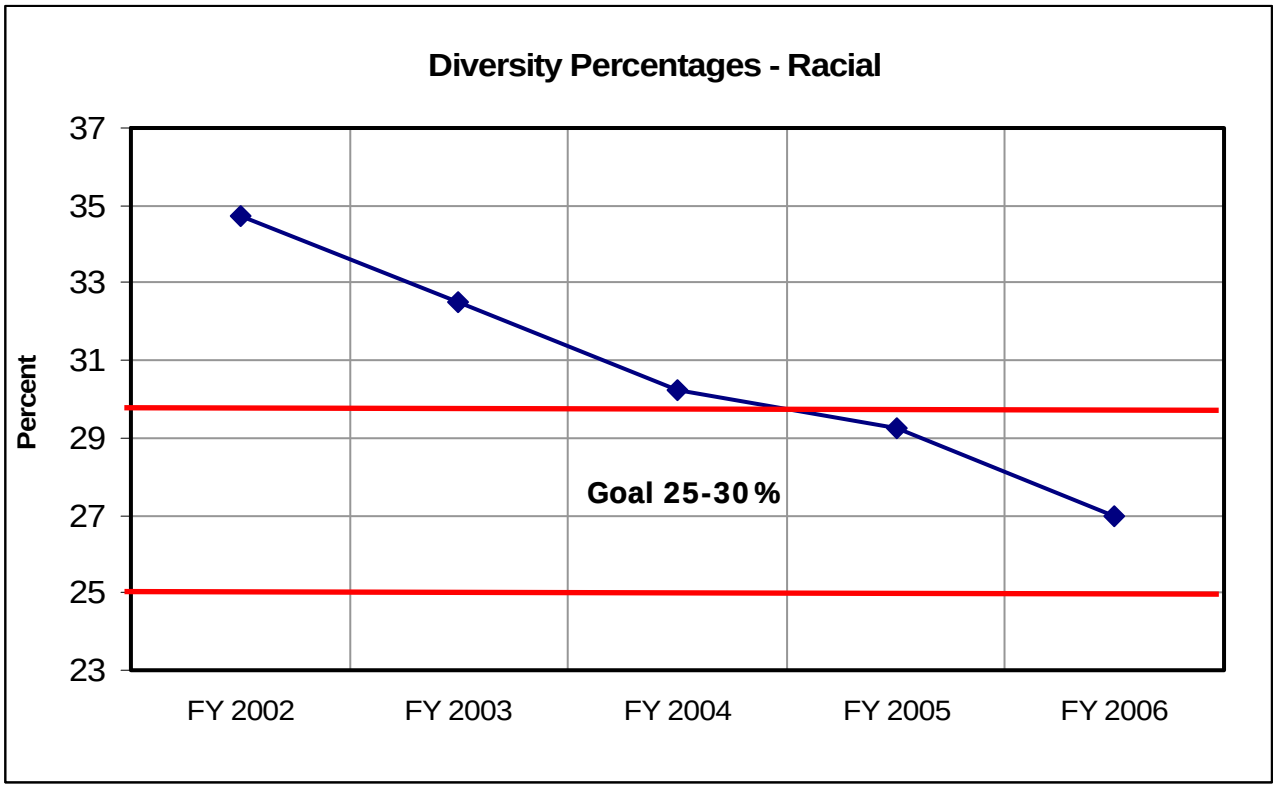
NOTE: THE NUMBER OF HR SPONSORED EVENTS AND NUMBER OF TRAINING EVENTS ATTENDED BY EMPLOYEES WILL VARY ANNUALLY BASED ON THE NEEDS AND INTERESTS OF EMPLOYEES AND THEIR DEPARTMENTS. THERE ARE NO SPECIFIC NUMERIC GOALS IN THESE AREAS.

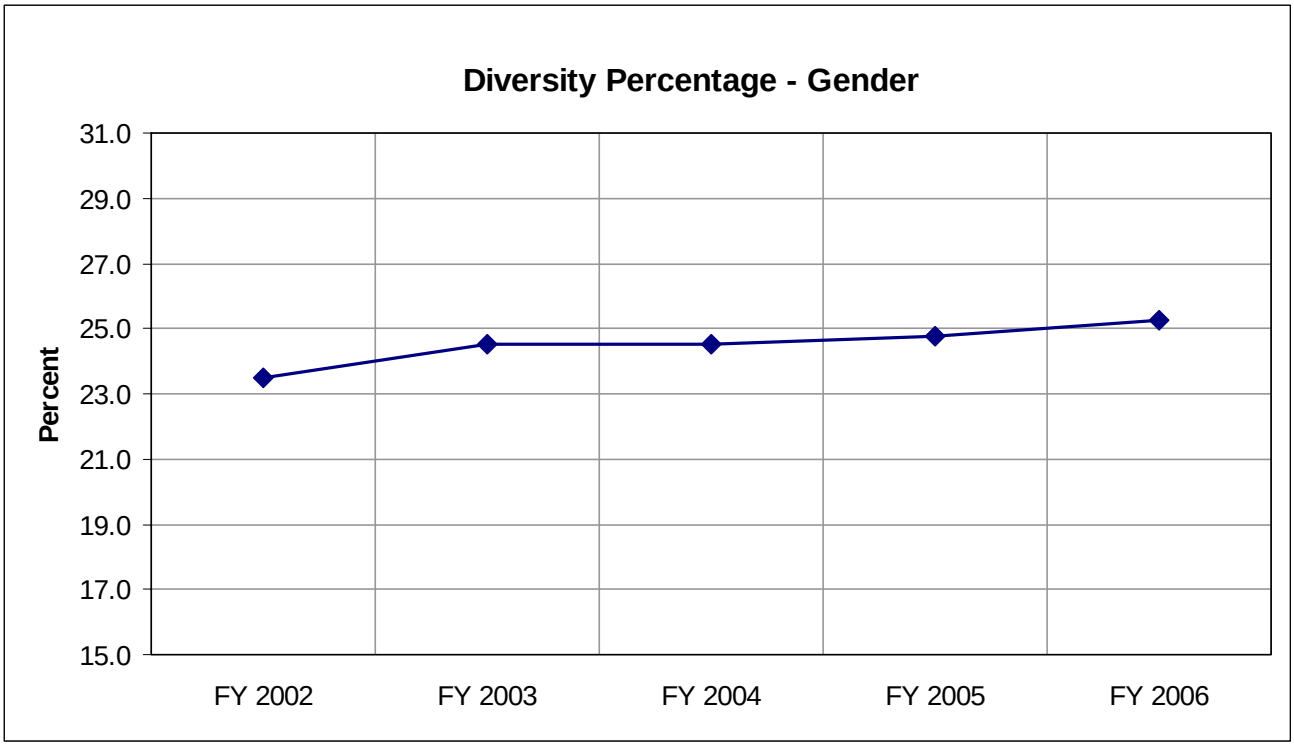
ALTHOUGH THE AVERAGE TIME TO FILL VACANCIES, ATTRITION RATE AND % OF NEW HIRES COMPLETING PROBATION ARE AREAS TRACKED BY HUMAN RESOURCES, THESE ARE AREAS LARGELY CONTROLLED BY THE DEPARTMENTS. HIRING SUPERVISORS OFTEN LEAVE POSITIONS VACANT FOR LONG PERIODS OF TIME FOR VARIOUS DEPARTMENTAL NEEDS SUCH AS RESTRUCTURING AND COST SAVINGS. HUMAN RESOURCES POSTS POSITIONS AS SOON AS THE SUPERVISOR APPROVES THE ACTION. POSITIONS ARE POSTED FOR A LIMITED AMOUNT OF TIME OR UNTIL THE VACANCY IS FILLED BASED ON THE SUPERVISORS NEEDS AND WISHES. HUMAN RESOURCES GENERALLY RECOMMENDS CHANGES OR ENHANCEMENTS IN THE RECRUITMENT PROCESS TO THE HIRING SUPRVISOR IF THERE IS DIFFICULTY IN FILLING A VACANCY. HUMAN RESOURCES FORWARDS APPLICATIONS TO THE HIRING SUPERVISOR AND CHECKS REFERENCES BASED ON THE NEEDS AND REQUIREMENTS OF THE SUPERVISOR.

THE ATTRITION RATE AND % OF HIRES COMPLETING PROBATION ARE ALSO AREAS TRACKED BY HUMAN RESOURCES. HOWEVER, AN EMPLOYEE'S DECISION TO LEAVE OR STAY WITH AN ORGANIZATION IS LARGELY DUE TO HIS/HER DAY-TO-DAY INTERACTIONS WITH SUPERVISORS, CO-WORKERS AND THEIR SATISFACTION WITH THE JOB ITSELF. OTHER FACTORS SUCH AS JOB CHANGES BY A SPOUSE, FAMILY NEEDS, ETC. MAY ALSO IMPACT AN EMPLOYEE'S DECISION TO LEAVE THE ORGANIZATION AND THEREFORE IMPACT THE PERFORMANCE MEASURES.

Performance Measures
Human Resources

		Units	Total FY 02	Total FY 03	Total FY 04	Total FY 05	Total FY 06	Annual Goal	FY 06 Jul - Dec	FY 06 Jan – Jun
WORKLOAD	Positions filled – Internal	EA.	25	16	30	4	14		6	8
	Positions filled – External					11	11		4	7
	Positions filled – ***Total***					**15**	**25**		**10**	**15**
	Positions vacated – Due to Promotions	EA.	17	15	29	19	11		3	8
	Positions vacated – Other						14		5	9
	Positions vacated – ***Total***						**25**		**8**	**17**
	Total number of formal grievances (Step II-IV)	EA.	1	0	2	1	0		0	0
	EEOC complaints	EA.	0	0	1	0	0		0	0
	Number of HR sponsored events	EA.	36	24	26	32	29		17	12
	Number of training events attended by employees	EA.	99	39	34	50	79		43	36
EFFECTIVENESS	Average time to fill vacancies	DAYS	93	69	58	94	116	90	140	193
	Attrition rate:									
	Including Promotions	%	7.4	6.7	10.6	9.7	16.7	<8.0	5.3	5.7
	Excluding Promotions						9.3		3.3	5.9
	Percent of new hires successfully completing probationary period	%	90	78	100	83	88	100	100	75
	At fault EEOC complaints	EA.	0	0	0	0	0	0	0	0
	Grievances overturned at Step IV	EA.	0	0	0	0	0	0	0	0
	Diversity percentages									
	Racial	%	34	35	30	30	28	25-30	27	28
	Gender	%	24	25	25	25	26	--	26	25


Diversity Percentages - Racial
Percent
37
35
33
31
29
27
25
23
Goal 25-30%
FY 2002
FY 2003
FY 2004
FY 2005
FY 2006


Diversity Percentage - Gender
Percent
31.0
29.0
27.0
25.0
23.0
21.0
19.0
17.0
15.0
FY 2002
FY 2003
FY 2004
FY 2005
FY 2006

Safety

The Safety function is the responsibility of the Safety and Training Administrator and is responsible for administering and coordinating of safety programs throughout OWASA.

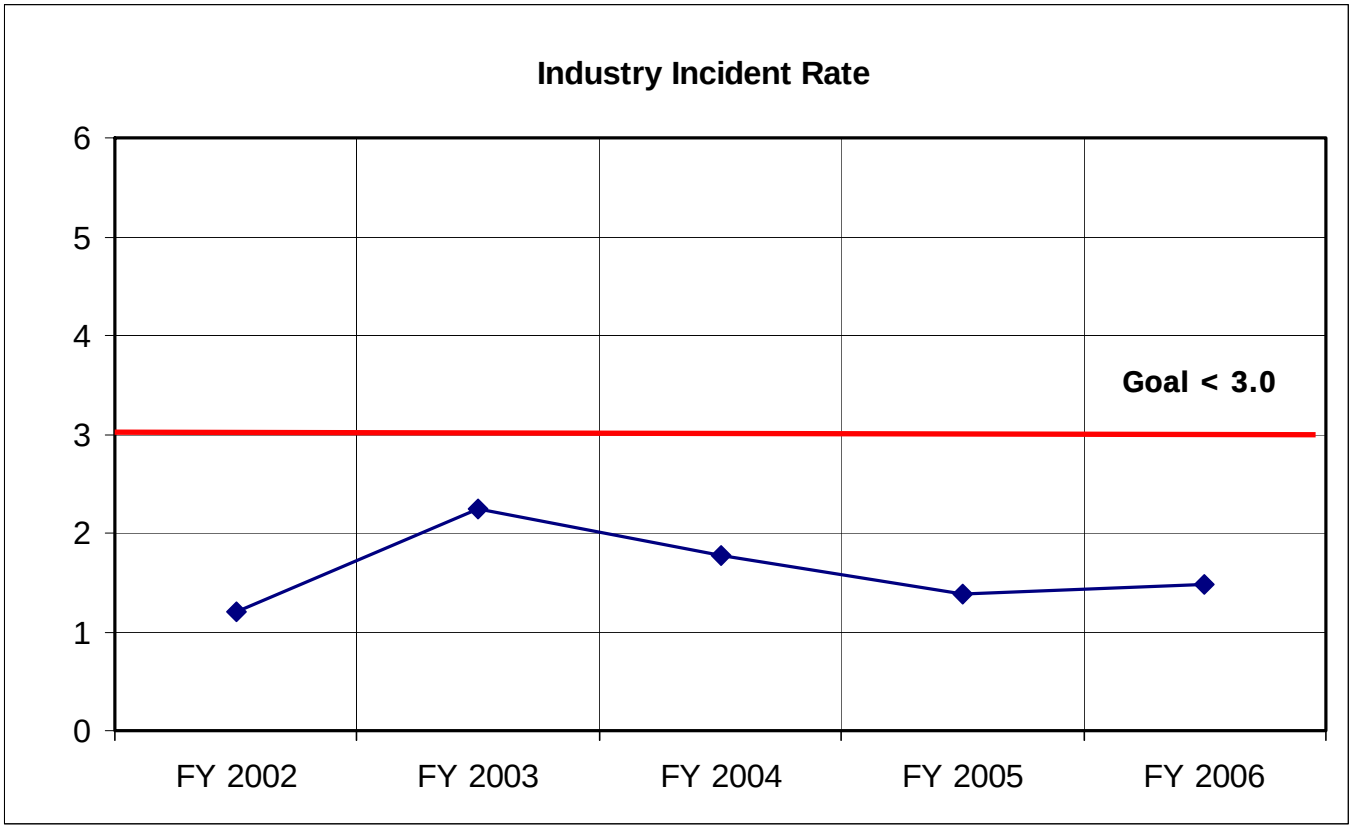
PERFORMANCE MEAUSRES:

Type	Measurement
Workload	**Safety training sessions conducted** *The number of safety training session conducted during the quarter.*
Effectiveness	**Industry incident rate** *The number of injuries, illnesses, or lost workdays related to a common exposure base of 100 full-time workers. This rate allows an industry to make accurate interindustry comparisons. The water industry rate for a public utility is 7.5. OWASA's goal is to perform at or one-half of the Public Sector, Standard Industrial Classification Code 49 incidence rate of 7.5.* **Number of Workers Comp accidents** *The number of Workers Compensation accidents reported quarterly.* **Number of loss time work days** *The number of lost workdays expressed on a quarterly basis and benchmarked each year to establish trends and set goals.* **Number of restricted work days** *The number of restricted work days expressed on a quarterly basis and benchmarked each year to establish the basis for our early return to work program.* **Number of total vehicle accidents** *The number of vehicle accidents reported quarterly.* **Total number of preventable vehicle accidents** *The number of preventable vehicle accidents.* **Number of preventable Workers Comp accidents** *The number of preventable Workers Compensation accidents.*

Performance Measures
Safety

		Units	Total FY 02	Total FY 03	Total FY 04	Total FY 05	Total FY 06	Annual Goal	FY 06 Jul - Dec	FY 06 Jan – Jun
WORKLOAD	Number of safety training sessions conducted	NO.	30	64	86	114	92	TBD	40	52
EFFECTIVENESS	Industry incident rate	%	1.2	2.3	1.8	1.4	1.5	< 3.0	2.7	0.4
	Number of workers comp accidents	NO.	9	13	16	3	8	0	6	2
	Number of loss time work days	NO.	37	69	280	94	0	0	0	0
	Number of restricted work days	NO.	2	34	116	300	0	0	0	0
	Number of vehicle accidents	NO.	21	13	25	17	10	0	4	6
	Number of preventable vehicle accidents	NO.	9	8	20	12	5	0	1	4
	Number of preventable workers comp accidents	NO.	3	10	3	3	6	0	4	2

Safety


Industry Incident Rate
6
5
4
3
2
1
0
Goal < 3.0
FY 2002
FY 2003
FY 2004
FY 2005
FY 2006

Engineering

The Engineering function is the responsibility of the Engineering and Planning Director and is responsible for development and administration of the Comprehensive Master Plan, the Capital Improvement Program, third-party development of systems, design and/or management of rehabilitation and replacement projects; maintenance of infrastructure records/drawings, and engineering assistance throughout the organization.

PERFORMANCE MEASURES:

Type	Measurement
Workload	**Active Capital Projects** *The number of active capital improvement projects.* **Capital projects completed** *The number of capital improvement projects completed.* **Plans reviewed** *The number of third-party plans reviewed and approved.* **Fees calculated** *The number of fee schedules calculated for new service connections.* **Feet pipeline inspected** *The footage of pipeline inspected on third-party development projects.*
Efficiency	**Inspection costs per foot inspected** *Costs per foot of line inspected.* **Plan review cost per foot of line reviewed** *Cost per foot of line reviewed.*
Effectiveness	**Actual capital project expense to budget to date** *Actual capital project expenditures as an annualized percentage of total capital budget.* **Average plan review time** *The average length of time to review plan from date received to of review letter.* **Fee calculation accuracy** *Number of fee calculations properly calculated.*

Performance Measures
Engineering

		Units	Total FY 02	Total FY 03	Total FY 04	Total FY 05	Total FY 06	Annual Goal	FY 06 Jul - Dec	FY 06 Jan – Jun
WORKLOAD	Active capital projects	EA.	35	34	32	39	36	N/A	36	36
	Capital projects completed	EA.	18	13	12	15	8	N/A	4	4
	Third party plans reviewed	EA.	57	58	58	48	59	N/A	29	30
	Connection fees calculated	EA.	894	834	805	780	436	N/A	252	184
	Pipeline inspected	FT.	35,694	47,543	47,022	46,750	53,860	45,000	25,489	28,604
	Capital projects communication plans completed	EA.	7	5	10	10	4	N/A	1	3
EFFICIENCY	Inspection costs	$/FT.	1.91	1.85	1.78	1.80	1.80	< 1.80	1.79	1.81
	Plan review cost	$/FT.	2.03	2.04	1.99	1.98	1.96	< 2.01	1.96	1.96
EFFECTIVENESS	Actual capital project expenditure to budget	%	78	64	73	84*	71	>80	38	33
	Average plan review time	WORK DAYS	11	15	12	12	13	<15	12	13
	Fee calculation errors	NO.	2	0	0	1	0	0	0	0
	Capital projects communication plans effectiveness rating	1 – 5 (5 Highest)	3.6	4.1	4.2	4.3	4.3	>4.0	4.3	4.3

Engineering