(Adopted on April 14, 2005 by the OWASA Board of Directors)

Goal and Objectives of OWASA's Long-Term Water Conservation and Demand Management Program

Water Conservation Goal:

To develop, fund, and implement a cost-effective water conservation and demand management program that will meet our community's long-term water supply needs (through 2050) by making the highest and best use of our local water resources and eliminating the need for costly new water supply sources and facilities.

Objectives and Targets

1. **Water Supply Sources:** To assure that annual average day raw water demand does not exceed the reliable capacity of OWASA's existing and planned supply sources (Cane Creek Reservoir, University Lake, and the Stone Quarry Reservoir), where "reliable capacity" is the estimated yield of the system under extended periods of low streamflow conditions, such as those that recur approximately once every 30 years, or under more extreme conditions, such as those of the 2001-2002 "drought of record."

   To achieve this objective, annual average day raw water demands should not exceed the target limits shown in Table 1.

2. **Treatment, Storage, and Distribution Facilities:** To manage peak day treated water demands in ways that will allow the deferral of major capital projects, such as expansion of the Jones Ferry Road Water Treatment Plant and associated finished water pumping and storage facilities.

   To achieve this objective, OWASA's annual peaking factor (the ratio of peak day demand to annual average demand) should not exceed 1.45, and peak day treated water demands should not exceed the target limits shown in Table 2.

Table 1. Raw Water Demands: Projected and Target Levels			
YEAR	***CURRENT PROJECTION*** [A] *Average Day Raw Water Demand (mgd)*	***TARGET LIMITS*** *Average Day Raw Water Demand (mgd)*	
		For 30-Year Drought Event	***For Drought of Record (2002)***
2010	*9.4*	*9.4*	*9.4*
2015	*10.6*	*10.6*	*10.6*
2020	*11.9*	*11.9*	*11.7*
2025	*13.2*	*13.2*	*11.7*
2030	*14.4*	*13.2*	*11.7*
2035	*15.4*	*19.3*	*16.8*
2040	*16.4*	*19.3*	*16.8*
2045	*17.4*	*19.3*	*16.8*
2050	*18.4*	*19.3*	*16.8*

Shading indicates higher risk of water supply shortfall if severe drought conditions occur at these times

Table 2. Peak Day Treated Water Demands: Projected and Target Levels		
YEAR	***CURRENT PROJECTION*** [B] *Peak Day Treated Water Demand (mgd) PF=1.55*	***TARGET LIMITS*** *Peak Day Treated Water Demand (mgd) PF=1.45*
2010	*14.5*	*13.6*
2015	*16.5*	*15.4*
2020	*18.5*	*17.3*
2025	*20.5*	*19.1*
2030	*22.3*	*20.8*
2035	*23.8*	*22.3*
2040	*25.4*	*23.7*
2045	*26.9*	*25.2*
2050	*28.5*	*26.6*

Shading indicates the need to expand OWASA's water treatment plant beyond its present capacity of 20 mgd.

3. **Cost-Effectiveness and Customer Acceptance:** To promote and implement conservation measures that are cost-effective and acceptable to both OWASA and its customers, with special consideration given to economic, environmental, and social costs and benefits.

   - *Cost-effective for OWASA means that a conservation measure will achieve a desired increment of demand reduction for less cost than an equivalent expansion of the water supply system.*

- *Cost-effective for customers means that a conservation measure will have a payback period of approximately five years or less. Such calculations will consider total capital and maintenance costs, as well as water, sewer, and energy cost savings.*

- *Acceptable to OWASA's customers means that a conservation measure will sustain the level of service and "quality of life" which OWASA's customers expect. Conservation measures will be promoted primarily through public information, economic incentives, and conservation-based rates.*

4. **Fiscal Impacts to OWASA**: To implement the long-term conservation and demand management program in a timely manner that provides cost benefits to OWASA's customers and minimizes the near-term revenue and cash flow effects caused by reductions in customer demand. This objective will be attained by:

- *Proactively assessing* the likely demand, revenue, operating costs, and cash flow effects of a proposed conservation initiative such that short-term revenue impacts and financial uncertainties will be minimized.

- *Assigning high priority to supply-side alternatives* that have little or no effect on water sales, such as water treatment plant process water recycling, distribution system leak detection, and water main replacement projects.

- *Assigning high priority to conservation measures that increase revenues and cash flow*, such as meter testing and new conservation-oriented rate structures.

- *Phasing in conservation initiatives* in order to smooth out any anticipated revenue reductions.

- *Explaining to customers* the estimated effects of conservation initiatives on OWASA's revenues and rates, as well as the future benefits associated with conservation.

Key Technical Assumptions

OWASA's water conservation and demand management program is based on the following primary technical assumptions. As noted above, the overall goals, objectives, and implementation plan will be periodically evaluated and adjusted to reflect new and updated information related to these and other assumptions.

1. "Current Projection" water demands will be provided in annually updated demand projection reports. These will reflect reductions expected from the gradual "natural" replacement of older less efficient plumbing fixtures and technologies, as well as current estimates of wastewater reuse demands and other conservation options.

2. Upon completion of improvements currently underway at the Stone Quarry pumping station, the estimated 30-year safe yield of OWASA's existing supply system will be about 13.2 mgd, or 11.7 mgd under drought of record (2002) conditions. These estimates will be revisited periodically as different model assumptions are analyzed and new information becomes available.

3. The 30-year safe yield of the system after the expanded Stone Quarry Reservoir becomes operational (assumed to be in 2035) will be about 19.3 mgd, or 16.8 mgd under drought of record conditions. As noted above, these estimates will be revisited periodically.

4. The water plant process water recycle system is assumed to be in operation on a permanent basis, which reduces raw water demands by about 8 percent. This will equate to approximately 1.4 mgd by 2050.

5. The water reclamation and reuse system that will initially serve UNC's main campus is assumed to begin operating in 2007, which will achieve an annual average day water savings of 0.6 mgd, which will increase to 0.9 mgd by 2025. Corresponding peak day savings for the facilities served by the reclaimed water system will begin at about 1.7 mgd and reach 2.7 mgd by 2025. These demand levels reflect water reuse system Scenario 1B (service to the University's four chiller plants on the south side of the main campus). Future expansion of the water reuse system may result in substantial increases in the average day and peak day reclaimed water demands shown above.

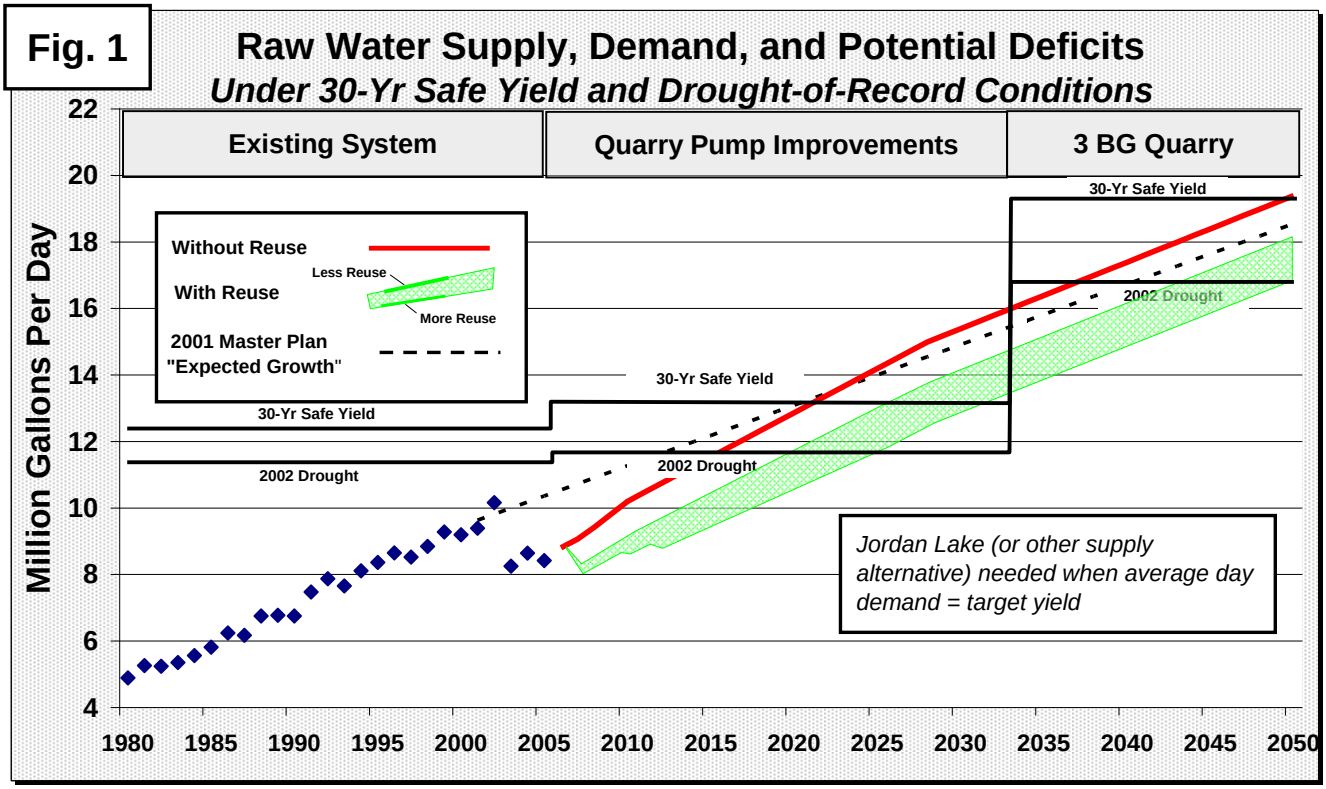
6. The Current Projections do not include any water reuse at Carolina North, but such provisions may be incorporated in the future.

7. Jordan Lake is assumed to be the primary alternative for expanding the community's water supply capacity. The cost of developing Jordan Lake as a future 5 mgd water supply source is estimated to be nearly $31 million (2004 dollars). The levelized net present cost of the Jordan Lake water supply alternative is estimated to be $1.84 per 1,000 gallons, based on a 25-year evaluation period and an annual discount rate of 5 percent. Conservation measures that can be implemented for a net present cost below $1.84 per 1,000 gallons should be considered as potentially cost-effective alternatives to water supply capacity expansion.

As noted above, these assumptions will be periodically reviewed and adjusted as new information becomes available.

Fig. 1

Raw Water Supply, Demand, and Potential Deficits
Under 30-Yr Safe Yield and Drought-of-Record Conditions



Note: **The "Less Reuse" line includes approximately 0.9 mgd of currently programmed demand for four existing chilled water plants on the UNC Campus. The "More Reuse" line includes approximately 1.0 mgd of additional demand for other facilities and uses (Cogeneration Plant, new Northeast Chilled Water Plant, new Manning Drive Steam Plant, existing UNC Hospitals chilled water plant, and irrigation of certain athletic fields), but plans and commitments for these are less certain at the present time.**

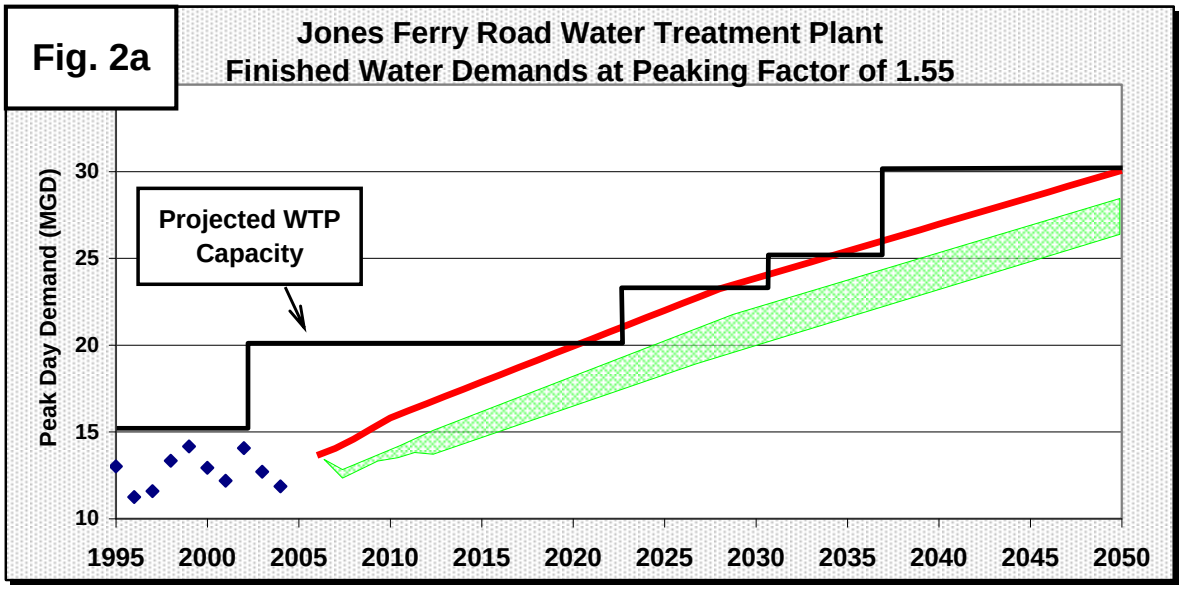
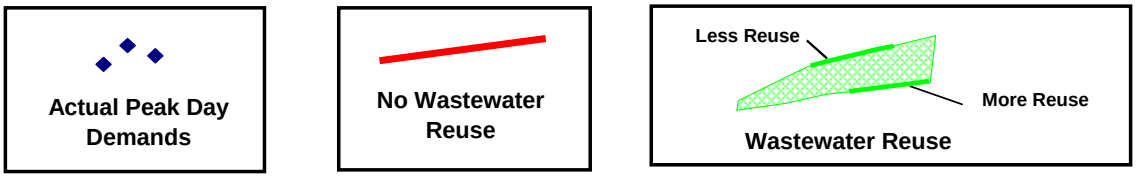


Fig. 2a
Jones Ferry Road Water Treatment Plant
Finished Water Demands at Peaking Factor of 1.55
Peak Day Demand (MGD)
30
25
20
15
10
Projected WTP Capacity
1995
2000
2005
2010
2015
2020
2025
2030
2035
2040
2045
2050


Actual Peak Day Demands
No Wastewater Reuse
Less Reuse
More Reuse
Wastewater Reuse

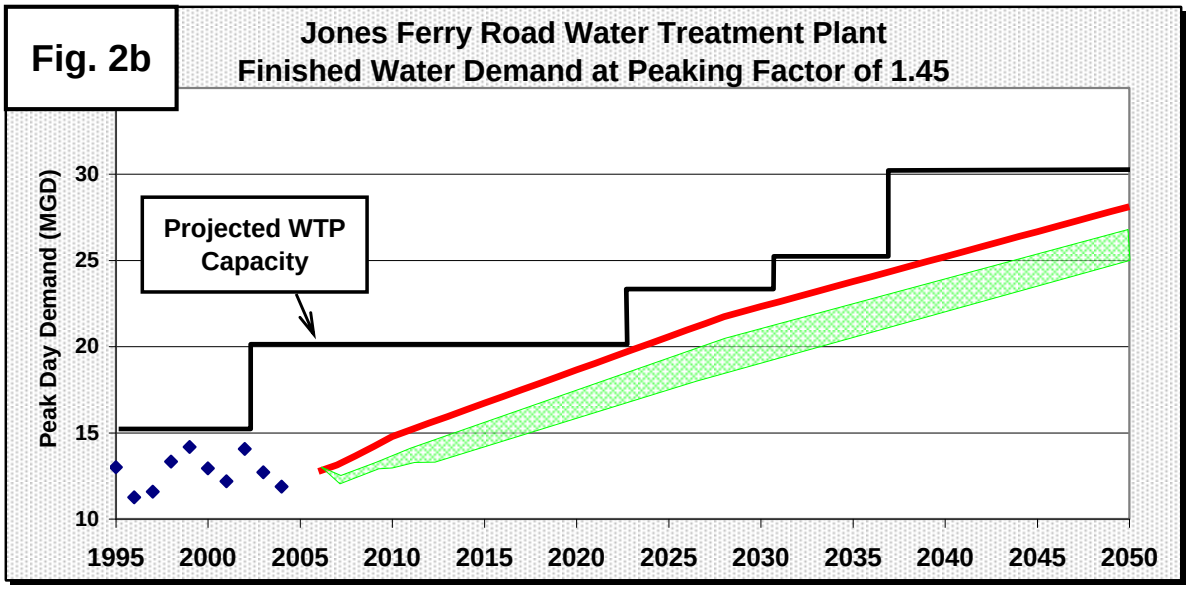


Fig. 2b
Jones Ferry Road Water Treatment Plant
Finished Water Demand at Peaking Factor of 1.45
Peak Day Demand (MGD)
30
25
20
15
10
Projected WTP Capacity
1995
2000
2005
2010
2015
2020
2025
2030
2035
2040
2045
2050