

Appendix 4G
Municipal Water Conservation

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As part of our planning efforts for Region F, water conservation must be considered when developing water management strategies for water user groups with needs. An expected level of conservation is included in the demand projections due to the natural replacement of inefficient plumbing fixtures with low flow fixtures, as mandated under the State Plumbing Code. For Region F, the total municipal water savings associated with plumbing fixtures is approximately 7 percent of the projected demand if no conservation occurred.

Additional conservation savings can potentially be achieved in the region through the implementation of conservation best management practices. The potential savings from water conservation were evaluated for twelve municipal water user groups with potential supply shortages.

To assess appropriate strategies for Region F, we reviewed the conservation strategies identified through the Water Conservation Implementation Task Force. The Task Force identified 21 municipal conservation strategies and 15 strategies for industrial water users. In addition the State has adopted new regulations that require all new clothes washers to be more water efficient by 2007. After review and consideration of these strategies, it is recommended that four conservation strategies be evaluated for municipal water users with needs. These include:

- Public and School Education
- Reduction of Unaccounted for Water through Water Audits
- Water Conservation Pricing
- Federal Clothes Washer Rules

Best Management Practices (BMPs) not selected include rebate programs, accelerated plumbing fixtures replacements, and specific outdoor watering measures. The benefits of outdoor watering strategies were assumed to be accounted under the public and school education BMP. Also, many of the entities in Region F already use restrictions on outdoor watering as a drought management measure. Accelerated fixture replacements do not reduce the ultimate water need, but could delay when the need begins. This is also true for rebate programs that simply accelerate the already assumed conservation savings.

However, the likelihood of implementing rebate programs in rural communities is low and previous studies have shown these programs to be relatively costly per acre-foot of water saved.

Region F recognizes that it has no authority to implement, enforce or regulate water conservation practices. These water conservation practices are intended to be guidelines. Water conservation strategies determined and implemented by the individual water user groups in Region F supersede the recommendations in this plan and the Region F Water Planning Group considers these strategies to meet regulatory requirements for consistency with this plan.

A summary of the assumptions in costs and savings for the selected municipal conservation strategies is presented below. Summaries of water conservation savings and costs of each BMP for each water user group may be found in the attached tables.

Public and School Education

Potential water savings associated with education programs are difficult to assess because the results often overlap with other measures. Literature reviews indicate the savings can range from 1 to 5 percent of the projected demand. For cities that have already implemented an aggressive education program, the additional savings may be on the lower side of this range. In Region F, it is assumed that conservation savings associated with education will be 2.0% the first decade increasing to 4.5% by 2060.

Annual costs were estimated at just over \$1,000 for small rural communities to over \$100,000 for Midland, Odessa and San Angelo. These costs include personnel to develop and oversee the program, public outreach through the news media, public meetings, school education materials, giveaways, and other miscellaneous program specific costs.

Water Conservation Pricing

This BMP can apply to two different conditions: 1) use of rate structures to discourage inefficient and/or excessive water use (e.g., inverted block rates), and 2) natural reduction of use in response to overall rate increases. For this plan, we are assuming that there will be some reduction in water use as new more expensive water is developed. For calculation of potential water savings, a potential water savings of 1.5%

of the projected demand. The costs for this strategy are based on estimated costs of conducting a rate study by the city and implementation of a rate change.

Water System Audit

Under House Bill 3338, all retail public utilities serving 3,300 people or more will be required to conduct water system audits to identify the system water loss. These audits will be required beginning in 2005 and performed every 5 years. The audit itself does not reduce water loss, but can identify potential infrastructure problems contributing to water loss. The TWDB recommends that water system losses should be less than 15 percent of the total water used. The American Water Works Association leak Detection Committee recommends a goal of 10 percent. For the purposes of this plan it was assumed that a water audit would reduce losses to 12 percent of the total water used. If water losses were already less than 12 percent, it was assumed that no additional savings will be realized. Region F recognizes the benefits of water audits as good stewardship for all water systems and recommends that all system conduct water audits.

Costs for this strategy are only those costs associated with the audit itself. Costs range from about \$3,000 for a small system to over \$300,000 for the larger cities. These costs are amortized over 5 years, which is the schedule for water audits.

Federal Clothes Washer Rules

New regulations governing the manufacturing of clothes washers to be energy efficient were passed in 2007. One option to achieve the efficiency mandate is to reduce water volume (less energy would be needed to heat the water). The water savings per washer is estimated at 5.6 gallons per person per day. It was assumed that 90 percent of the single family homes had washing machines and 3 percent of these homes would have water efficient machines as of year 2000. The average life of a washing machine is 13 years, and the natural replacement rate was assumed at 7.7 percent per year.

This strategy was evaluated for each municipal water user group with a need. It was assumed that these new regulations will occur without any cost to the water user group. Estimates of the number of clothes washers was made for each municipal water user group and savings calculated accordingly.