Appendix K
City of Waco
Water Conservation and
Drought Contingency Plan

CHAPTER 1

INTRODUCTION

The City of Waco 2005 Water Conservation and Drought Contingency Plan is designed to assist in reducing summertime peak demand and improve overall efficiency over the long-term. The City of Waco (City) operates a municipal water supply system with more than 39,000 retail customers serving a population in excess of 116,000. Wholesale customers serve an additional population of more than 29,000. The service area covers more than 100 square miles and seven pressure planes.

One of the focuses of the plan is reduction of outdoor water use as a means to reduce summertime peak consumption. In 2003 the City launched its "Beat the Peak" program designed to educate residential, commercial, industrial and wholesale customers about the importance of reducing summertime water use. The City continues to support the program through public education and has taken leadership in conservation efforts by retrofitting all City Parks irrigation systems with automatic controllers and upgrading irrigation equipment.

The long-term focus of the Plan is to "Conserve for Our Future" by stretching existing and planned expansions to the water systems by reducing per capita water consumption. Long-term conservation programs include conservation pricing, residential and industrial, commercial, and institutional water surveys designed to help customers reduce per capita water use by 15 percent over the next several decades. Increased usage of reuse water and aquifer storage and recovery will also help manage the demand profile and use water more efficiently.

The service area of the City of Waco is located within the Brazos G Regional Planning area and the City of Waco has provided a copy of this Water Conservation and Drought Contingency Plan to the Region Planning Group (RPG). This Plan is consistent with Waco's role as a leader in water supply planning in the RPG, and meets the standards for water conservation planning in TAC Chapter 288. We have coordinated with the RPG through the following measures:

1. A City of Waco staff member sits on the planning group,
2. The City of Waco presented information on regional water needs in McLennan County at RPG meeting on the October 20, 2004. (Agenda Item 7.5)
3. City of Waco staff members (in addition to City's RPG Representative) attend Planning Group meetings,
4. City of Waco staff has made formal comments (at meetings and in writing) at various times regarding issues with population and water demand projections and with selection of water management strategies,
5. The City of Waco has held numerous meetings with the RPG consultant to address issues related to Waco and the McLennan County area.

CHAPTER 2

Demand Profile, Targets and Goals

A. Demand Profile

Overall water demand in the year 2004 was 10.4 billion gallons. Residential customers and commercial customers were the two highest demand sectors followed by industrial retail customers (See Figure 1). Including wholesale customers as part of the annual demand profile shows that wholesale customers represented 9.8 percent of demand. Dedicated irrigation accounts represented 8.3 percent of overall consumption followed by city accounts at 0.7 percent of total consumption.

Figure 1

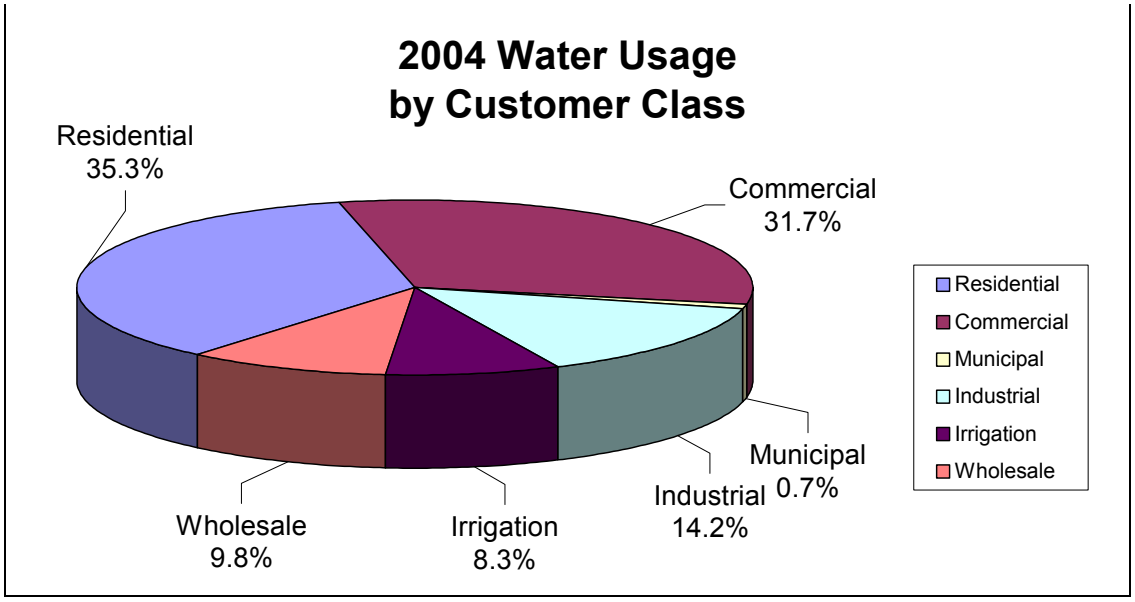
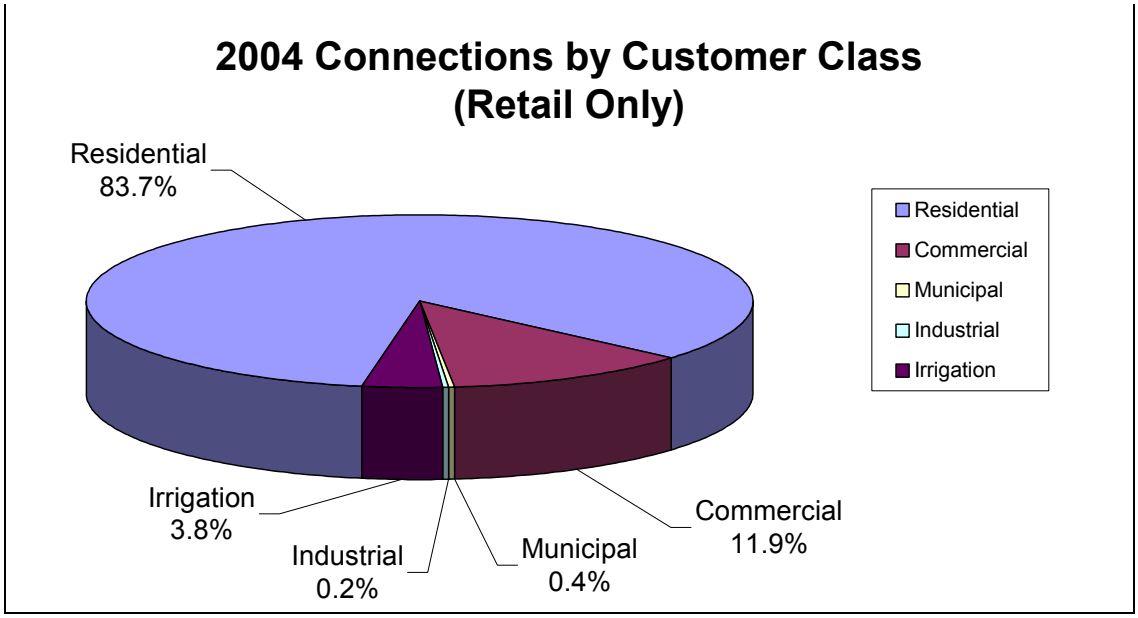


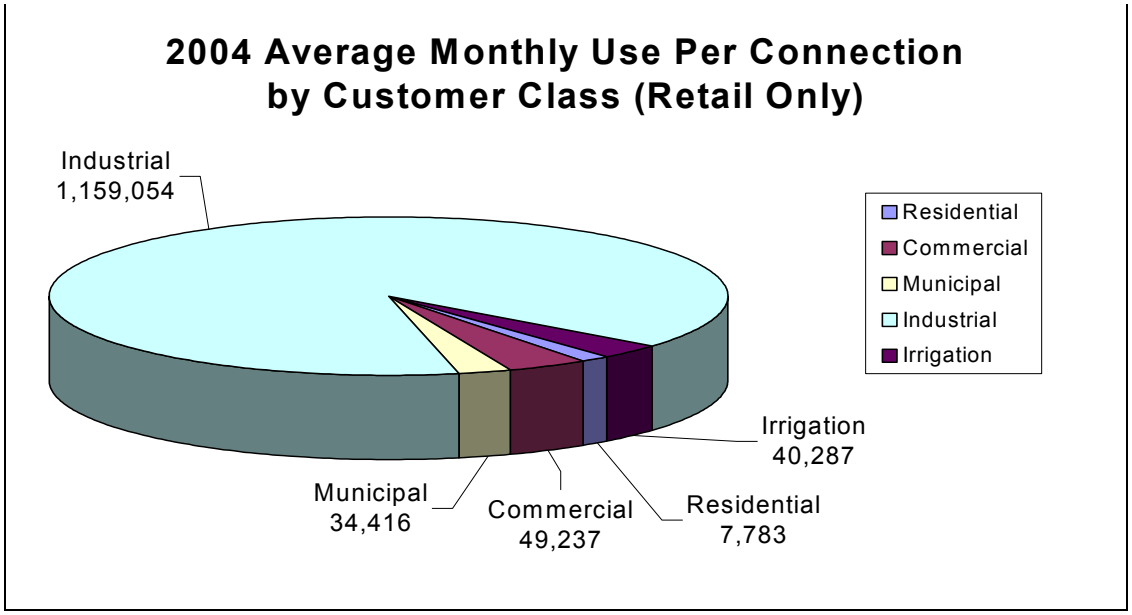
Figure 2 shows the breakdown of retail customers by connection. The chart indicates that residential accounts represent the largest type of account at 83.7 percent of all retail connections. Commercial customers account for the next largest number of customers at 11.9 percent of all accounts. Irrigation accounts represent 3.8 percent of all connections while municipal and industrial accounts were less than one percent each. Wholesale customers represent far less than one percent, and do not appear in this chart.

Figure 2



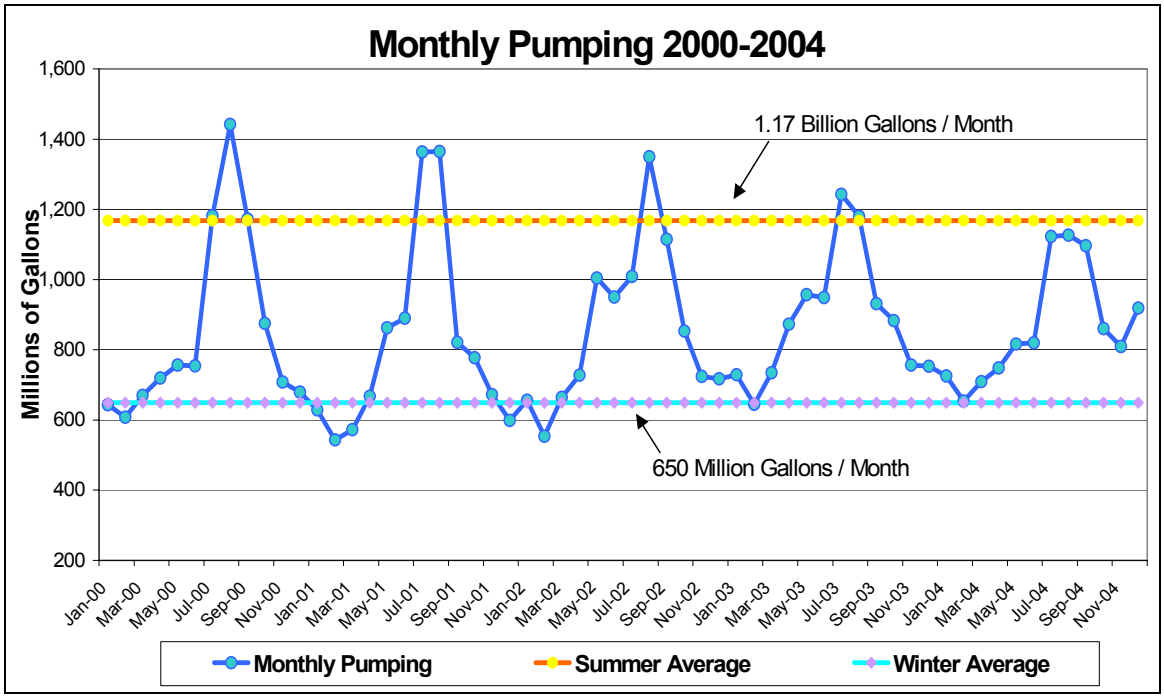
Examining average monthly demand by account gives a different picture. Figure 3 indicates that industrial accounts are the largest average monthly customers of all retail customers. This suggests that industrial customers, followed by commercial, and irrigation accounts can provide the largest water savings per completed water survey, or water conservation measure implemented. The City of Waco showed an unaccounted for water rate of 21.8 percent in 2004, and an average of 16.0 percent over the past four years.

Figure 3



Waco's demand profile shows the summertime peaks typical of Texas cities. The summertime months averaged 1.17 billion gallons per month over the past five years. Over a similar time period the wintertime average was approximately 650 million gallons per month (See Figure 4). Single-family residential customers make up the largest share of summertime pumping followed by commercial retail and wholesale customers. When looked at as a function of the ratio of wintertime average to summertime peak, wholesale customers, irrigation customers, municipal accounts and residential customers cluster at or above 2.0 times the winter average. Industrial and commercial customers have peaking ratio of approximately 1.2 times winter average.

Figure 4



B. Targets and Goals

The City of Waco Water Conservation and Drought Contingency Plan is focused on two efficiency goals. The first and most immediate goal is to reduce summertime peak pumping. The second goal is to reduce overall per capita consumption over the next several decades by 15 percent.

The immediate near term goal is designed to assist the City with challenges to distribution system capacity. Rapid growth in two areas of town, along with the addition of wholesale customers in recent years, has led to higher daily summertime peaks in water use. This has affected water system pressure levels, and thus makes more likely mandatory restrictions on water use. The City goal is to avoid mandatory restrictions by implementing a voluntary conservation program. In order to meet this goal maximum daily consumption needs to be below 66 MGD system wide. Proportional demand for

pressure planes 2 and 4 must be maintained below this level as well. Should either the proportional demand or the overall demand exceed these levels; mandatory restrictions will need to be enforced.

Long-term water supply and demand projections for Region G indicate that the City of Waco demand and supply will be approximately equivalent in 50 years. The City of Waco has a long history of progressive water resource planning. In keeping with that tradition, and ensuring that future generations will have adequate water supplies, the City will promote water conservation as an alternative water supply. Conserving existing supplies is less expensive and has less environmental impact than attempting to build new reservoirs. In order to reduce per capita demand over the next several decades, the city has embarked on a water conservation program designed to educate citizens on the benefits of efficiency, and provide incentives for reduced water use through changes in behavior and installation of water saving equipment.

Table 1 shows recent per capita consumption and the goal of one percent reduction per year until achieving the goal of 140 total gpcd recommended by the State Water Conservation Implementation Task Force. The projected reductions are shown at 5 and 10 year increments as required by HB 2660. If continued indefinitely, the one percent per year reduction will lead Waco to a total gpcd of 140 in 2058, when residential consumption will be 55 gpcd. These targets and goals will be updated whenever the Water Conservation and Drought Contingency Plan is revised.

Table 1
Water Consumption Targets and Goals (GPCD)

Year	2004	2009	2014	2058
Total GPCD	241	229	218	140
Residential GPCD[1]	94	89	85	55
NonIndustrial GPCD[2]	214	204	194	125

[1] The City of Waco's current billing system does not distinguish between multi-family customers with more than 5 units, and other types of commercial customers. Thus only single-family consumption and 2004 population estimated from 2000 census data for single family homes are used in the residential gpcd calculation.

[2] The City of Waco also tracks non-industrial gpcd, since industrial users play such a significant role in overall water usage in the city, and many of the conservation programs are targeted to outdoors discretionary use, which does not impact industrial water consumption.

In addition to traditional water conservation methods focused on changes in customer consumption patterns, the utility plans to promote demand management techniques that provide the most efficient use of our water resources. Demand management programs that are anticipated to be investigated in the next planning time frame include reuse, aquifer storage and recovery, and conjunctive use of surface and groundwater resources.

Current efforts in reducing water losses focus on a percentage of unaccounted for water, or the difference between billed water consumption and total water production. The City's goal is to keep the water loss rate below ten percent. In 2004, the City's water loss

was 21 percent. This represents an increase over recent years. The next step in meeting the City's efficiency goal will be to complete a system audit to determine the cause of the increase, and potential steps to reduce water losses.

Wholesale Customers
In addition to serving retail customers, the City of Waco has five wholesale customers that serve retail customers of their own, including the cities of Lacy Lakeview, West, Woodway, Hewitt and Bellmead. In each of their wholesale contracts, the City of Waco requires the entity to have and maintain a conservation and drought contingency plan, and encourages them to adopt a plan at least as aggressive as the City of Waco's. Each of these wholesale customers is a Municipal Water User Group (WUG) in the Region G Planning area. The Region G Planning Group has placed a high priority on water conservation, and in the current planning process is projecting a decrease in per capita demand of 21 gpcd by 2020 for all entities with a defined water need. The regional planning group will finalize this plan in the summer of 2005, and should the current draft be adopted, the projected target goals for wholesale WUGs served by the City of Waco, will be approximately a 6 gpcd reduction by 2009 and a 13 gpcd reduction by 2014.

D. Utility Survey Data

A detailed summary of the City's water and wastewater system is included in Appendix. A.

CHAPTER 3
WATER CONSERVATION AND DEMAND MANAGEMENT MEASURES

A. Plan Elements

Conservation is achieved through a variety of measures affecting behavior of end-users and the installation of more efficient equipment. To implement these measures in a cost effective and focused manner they have been organized into a number of conservation programs. This chapter summarizes the various programs that the City will pursue. Following the program descriptions is a section on implementation schedules for each program area. The conservation measures are organized into the following eight program areas:

- Water Accountability Program
- Conservation Pricing
- Public Education and Information Programs
- Large Landscape Conservation Programs And Incentives
- Conservation Program for Industrial, Commercial, and Institutional Accounts
- Water Survey Programs For Single-Family And Multi-Family Residential Customers
- Reuse Water
- Alternative Water Supplies
- Ordinances and Wholesale Customer Agreements

B. Water Accountability Program

City of Waco requires meters for all new connections and bills by volume of use. The City collects and tabulates metered water usage data on Commercial, Industrial, Residential (Single-Family, Multi-Family, and Duplex), Municipal and Wholesale accounts. Further, the City collects data on dedicated irrigation meters for all the above-mentioned classes. The City also measures and collects data on firefighting, construction, and main flushing water uses for water quality.

The City of Waco will identify disincentives or barriers to retrofitting mixed-use commercial accounts with dedicated landscape meters, and will conduct a feasibility study to assess the merits of a program to provide incentives to switch mixed-use accounts to dedicated landscape meters.

B.1 Meter Maintenance

The City maintains meters to ensure that accurate readings (meters registering at an accuracy of no less than ninety-five percent (95%) or no higher than one hundred five percent (105%) expressed as a percentage of the full scale of the meter and performing to American Water Works Association water metering standards) are being recorded. This ensures fair and equitable billing and reduces unaccounted for water. The most common size meter in the City is 5/8", which are replaced at 1 million gallons of usage or 8 years, whichever is sooner.

B.2 System Audit And Leak Detection And Repair

The City of Waco water utility shall annually complete a prescreening system audit to determine the need for a full-scale system audit. The prescreening system audit shall be calculated as follows:

- Determine metered sales;
- Determine other system verifiable uses;
- Determine total supply into the system;
- Divide metered sales plus other verifiable uses by total supply into the system. If this quantity is less than 0.9, a full-scale system audit is indicated.

When indicated, the water utility shall complete a water audit of the distribution system using methodology consistent with that described in AWWA's "Water Audit and Leak Detection Guidebook." The City of Waco shall advise customers whenever it appears possible that leaks exist on the customer's side of the meter; perform distribution system leak detection when warranted and cost-effective; and repair leaks when found. This approach is designed to keep lost water levels below 10 percent on an ongoing basis. The City of Waco's conservation program will update these goals as new water loss methodologies are introduced in the next several years.

C. Conservation Pricing

Conservation pricing provides incentives to customers to reduce average and/or peak use. Waco's conservation rate is an increasing block rate, which increases as the quantity used increases, and is detailed in Appendix A of this plan. Prices per thousand gallons increase at specific "tiers" in consumption. Each tier of the rate structure is designed to send a price signal to consumers as their discretionary consumption of water increases. Dedicated irrigation meters have a separate water rate. The rate increases more rapidly than non-irrigation accounts, thus sending an earlier price signal to outdoor water users.

Waco's rates are designed to recover the cost of providing service; and billing for water service is based on metered water use. The City of Waco supplies water and sewer service. Waco currently has a lifeline rate for low income and low water using customers. The initial 2,000 gallons of consumption are included with the monthly service fee. Both

a seasonal rate and an additional high-water use tier shall be evaluated in an effort to reduce summertime peak usage.

D. Public Education and Information Program

The City of Waco's Public Education and Information Program promotes water conservation and water conservation related benefits. The Program includes providing speakers to employees, community groups and the media; using paid and public service advertising; offering public information to promote water conservation practices; and coordinating with other government agencies, industry groups, public interest groups, and the media.

The program also includes a school education program to promote water conservation and water conservation related benefits. Opportunities for learning are designed with Texas state educational goals in mind. Eventual curriculum material shall be available which relates water conservation themes to local water issues, and to all grade levels.

The themes for Waco's conservation education and information program are to:

- **Beat the Peak**
- **Conserve for the Future**

Beat the Peak focuses on summertime water use reductions, while Conserve for the Future promotes wise stewardship of our most precious resource, water.

D.1 Education And Informational Themes

The City of Waco faces conservation challenges on two fronts. In the near term, summertime peaking is the greatest challenge to the City of Waco's ability to distribute water. System expansion will assist with this over the next several years. This near-term conservation effort will be pursued under the theme "Beat The Peak."

The second conservation challenge for the City of Waco is the long-term effort to reduce per capita demand in order to ensure that the city's water supply stretches for the longest period possible. The city is blessed with a water resource that is the result of farsighted planning by City founding fathers. Enabling this resource to stretch far into the future is the most cost-effective means of ensuring the longevity of our supply. It is also the most cost-effective water supply project available, as all alternative supplies will be more expensive than the existing Lake water. The theme for the long-term conservation education effort is "Conserve For Our Future."

It is worth noting the water conservation education goes hand in hand with watershed protection, water quality, and water supply. Numerous opportunities are expected to merge education efforts focused on water conservation with those focused on stormwater, wetlands, water treatment, and other topics. The utility staff will look for opportunities to expand education and distribute information on these interdisciplinary themes.

D.2 Beat The Peak

The Beat The Peak campaign is composed of several elements. The first element is to educate customers about the water supply situation, the challenges to distribution capacity, and the ongoing plans and efforts to upgrade the distribution system. The second element is to educate people about the relationship of summertime water demand to overall demand on the system. Summertime peaks require greater than average capacity in order to deliver water at the time that most people have turned on the faucet or their irrigation system. It is specifically those types of water use that fluctuate seasonally, such as running irrigation systems, which provide the greatest challenge to our water utility. The third element will be to educate customers, especially those with large landscapes, or large summertime irrigation, about the possibilities for reducing their demands, and thus reducing both their bill and distress on the city's water capacity.

All public information and education efforts in the Beat The Peak campaign will start from educating the customers about the capacity issue, and summertime demand. Focused efforts targeted to specific audiences, including professional irrigators, large landscape managers, and residential customers, will stress the water savings potential from specific measures such as:

- Reducing irrigation hours and days;
- Maintaining irrigation systems at their optimum;
- Installing rain sensors;
- Planting low water use landscape materials; and
- Irrigating only when there are signs of plant stress.

Changes in both behavior and equipment can contribute to summertime water savings.
By targeting education efforts to specific high-water use audiences the message about water reductions will heard by the customers who can most help us beat the summertime peak.

D.3 Conserve For Our Future

As a regional water supplier for the Brazos River region, the City of Waco has a responsibility to provide water supply for retail and wholesale customers for the next 60 years. As part of state water planning Region G the City of Waco is projected to have sufficient supply for its needs for the next 50 years. However at that time the water supply and anticipated demand are expected to be equal. Prudent supply planning will include conservation as an integrated part of water resource planning. Water conservation is the least expensive means of expanding our supply over the next 50 years. A successful water conservation program will ensure that at the end of the next five decades Waco can continue to look forward to adequate supplies of freshwater in the future. By conserving now, the water needs of our community, the region, and the environment on which we depend can be protected.

Conserve For Our Future will contain elements of general water supply education, alternative water supply development, and specific measures that residential, commercial, and industrial customers can adopt to reduce their demand. Where possible, to increase the efficiency of our efforts, short-term beat the peak efforts will be integrated with the longer conserve for our future education efforts.

In addition to specific measures that can be adopted to conserve water in the home, in businesses, and in public facilities, an education effort will be promoted to help customers understand the long-term benefits of measures like:

- Rainwater harvesting
- Add an additional rate tier for residential customers on high end users
- Composting
- Conservation awards
- Xeriscape (low-water use) landscaping

D.4 Education and Information Activities

Waco's "Beat The Peak" program will focus on outdoor water use activities. Educational activities will be targeted to several different audiences: professional irrigators, large landscape managers, and residential customers. Educational messages will be delivered in a number of different ways. We anticipate delivering written materials, multimedia releases, special events, and educational forums.

The City of Waco's water utility will produce written materials in the form of

- Brochures
- Newsletter articles
- Media releases
- Public service announcements.

These will be distributed to the customers, the local media, and to nonprofit local organizations such as neighborhood associations, and civic improvement organizations that they may educate their members as well.

The water utility will ensure that multimedia materials are also available. This will be done through use of the utility's web site, broadcast over the city public access channel, in cooperation with local media outlets for the release of information for both television and radio audiences.
Specific efforts will include:

- Interactive screens on the city's web site
- Interviews with city experts in irrigation and plant water demand on the local access channel
- Interviews with city water utility management on the local access channel and with local television stations
- Press conferences to promote the beat the peak campaign, and key educational moments during the hot summer

- Press events, such as giveaways or educational/fund events focused on reducing water use
- Booths at public events sponsored by neighborhood associations, civic organizations, not-for-profit education groups, and other city departments.

The water utility will sponsor special conservation events and activities. Included in these will be promotional events, awards for conservation efforts, and competitions designed to stimulate creative water conservation activities. The utility will explore the potential for cosponsoring a low water use (xeriscape) demonstration garden.

Specific events may include:

- The water conservation day in Waco with music, booths, and activities for children and adults
- Water conservation awards for businesses which show innovative water conservation activities and excellent efficiency in water use
- Water saver landscape awards for local landscapes which use native and adapted materials to reduce outdoor water use
- Water conservation poster contests for grade school or junior high students.

Educational events are an essential component of any water conservation program. To be effective these events must be targeted to specific audiences and have a message which imparts both information and the reasons for change in behavior. Several different kinds of educational forums will be necessary in order to reach those who are most able to assist the city and reducing its peak summertime water use. Target audiences include professional landscapers, large landscape and golf course managers, residents who own automated sprinklers, and athletic field managers. There are number of potential allies in an educational effort of this kind: City parks and water department landscape professionals, local irrigation supply companies, TAES, TCEQ, neighborhood associations, nonprofit groups like Keep Waco Beautiful, and TAMU's turf management program.

Some of the educational events that will be co-sponsored include:

- Workshops for irrigators and irrigation installation companies. These workshops to be jointly offered by city parks, local irrigation companies, TAES, and water utility conservation program.
- Workshops and presentations at local neighborhood associations targeted for homeowners and residents with automated irrigation systems. These workshops to be co-sponsored by TAES, TCEQ, the water utility conservation program, and local neighborhood associations.
- Workshops on locally adapted low water use landscapes. These workshops to be targeted to a number of different audiences such as homeowners are residents, large landscape managers, and local landscape professionals. The workshops to be co-sponsored by Master Gardeners, Native Plant Society, TAES, TAMU, and the water utility.

The City shall promote a School Education Program to encourage water conservation and water conservation related benefits. Programs shall include working with school districts and private schools in the water utility service area to provide instructional assistance, educational materials, and classroom presentations that identify urban, agricultural, and environmental issues and conditions in the Brazos River region and local watershed. Education materials shall meet the state education framework requirements.

E. Large Landscape Conservation Programs And Incentives

Irrigated landscape represents a large opportunity for conservation savings for the City. The large landscape conservation program will consist of several measures, including retrofit of city irrigation facilities, education of irrigation professionals, and surveys of existing customer systems to improve efficiency.

E.1 Municipal Facilities

The City has installed automatic irrigation controllers at all Parks facilities. Landscapes will be maintained with water conservation in mind, both for the water savings, and to provide an example of good landscape management. The City will consider native or adaptive species water efficient landscaping at water agency facilities.

E.2 Customers

The City will provide non-residential customers with support and incentives to improve their landscape water use efficiency. This support shall include, but not be limited to, the following:

The utility will develop a strategy targeting and marketing large landscape water use surveys to commercial/industrial/institutional (ICI) accounts with dedicated irrigation and mixed-use meters. Each year, directly contact via letter or telephone not less than 10% of ICI accounts and offer water use surveys. (Note: ICI surveys that include both indoor and outdoor components will be credited in both categories.) The City will offer the following measures when cost-effective:

- Landscape water use analysis/surveys
- Voluntary water use budgets
- Installation of dedicated landscape meters
- Rain Sensors
- Training in landscape maintenance, irrigation system maintenance, and irrigation system design.
- Financial incentives to improve irrigation system efficiency such as loans, rebates, and grants for the purchase and/or installation of water efficient irrigation systems.
- Follow-up water use analyses/surveys consisting of a letter, phone call, or site visit where appropriate

Survey elements will include: measurement of landscape area; measurement of total irrigable area; irrigation system check, and distribution uniformity analysis; review or develop irrigation schedules, as appropriate; provision of a customer survey report and information packet. The city will track survey offers, acceptance, findings, devices installed, savings potential, and survey cost.

E.3 New or Change of Service Accounts

The City will provide information on native or climate-adapted landscape design, efficient irrigation equipment/management to new customers and change-of-service customer accounts.

E.4 Water Budgets

The City will evaluate the potential for offering water budgets for all dedicated irrigation accounts. Should this program be pursued, the City will assign water use budgets equal to no more than 100% of reference evapotranspiration (ETo) per square foot of landscape area in accordance with the average monthly ETo for the City of Waco.

Should the water budget be instituted, the City will provide notices each billing cycle to accounts with water use budgets showing the relationship between the budget and actual consumption in accordance with the schedule. The City may choose not to notify customers whose use is less than their water use budget.

The City will also evaluate the potential to provide customer notices prior to the start of the irrigation season alerting them to check their irrigation systems and make repairs as necessary. Provide customer notices at the end of the irrigation season advising them to adjust their irrigation system timers and irrigation schedules.

F. Water Survey Programs For Residential Customers Single-Family And Multi-Family Residential

Water surveys are a principal means of educating customers about the direct effects of behavior and equipment on water use. By collecting information on water flow rates, and leakage inside and outside, the consumer is informed about immediate actions that can be taken to reduce water consumption. Implementation shall consist of at least the following actions, performed by either utility staff or by third party contractors:

- Develop and implement a strategy targeting and marketing water use surveys to single-family residential and multi-family residential customers.
- Directly contact via letter or telephone not less than 10% of single-family residential customers and 10% of multi-family residential customers each year.
- Surveys shall include indoor and outdoor components, and at minimum shall have the following elements:

Indoor

i) Check for leaks, including toilets, faucets, and meter check

ii) Check showerhead flow rates, aerator flow rates, and recommend replacement, as necessary

iii) Check toilet flow rates and recommend installation of displacement device or direct customer to ULFT replacement program, as necessary; recommend replacement of leaking toilet flapper, as necessary

Outdoor

iv) Check irrigation system and timers

v) Review or develop customer irrigation schedule

vi) Measure currently landscaped area

vii) Measure total irrigable area

- Provide customer with evaluation results and water saving recommendations; leave information packet with customer.
- Track surveys offered, surveys completed, survey results, and survey costs.

G. Water Use Survey and Customer Incentives Program for Industrial Commercial, and Institutional Accounts

The City of Waco is able to identify and rank Industrial, Commercial, and Institutional (ICI) customers according to use. The ranking will be used to target and implement an ICI water-use survey and customer incentives program described below. The long-term objective of the ICI program is to reduce water use by industrial, commercial, and institutional accounts by an amount equal to 3% of baseline use of ICI accounts in the City's service area each ten year period for the next 50 years. Baseline use is defined as the use by commercial, industrial, and institutional accounts in 2000.

The Water utility will develop a customer targeting and marketing strategy to provide water use surveys and customer incentives to commercial, industrial, and institutional accounts. The City will directly contact (via letter, telephone, or personal visit) and offer water use surveys and customer incentives to at least 10% of commercial, industrial, and institutional accounts on a repeating basis. Water use surveys will include a site visit, an evaluation of all water-using apparatus and processes, and a customer report identifying recommended efficiency measures, their expected payback, and available agency incentives. Within one year of a completed survey, utility staff will follow-up via phone or site visit with customer regarding facility water use and water saving improvements. This will be coordinated with the Landscape Water Use Survey Program.

H. Reuse Water

Use of treated municipal effluent as regulated by TCEQ under Chapter 210 of the TAC will be considered an alternative source of water, and with less restriction during Emergency Water Shortages. For Water Conservation and Drought Contingency Plan purposes the Reuse water should be clearly related to a decrease in reliance on the City's potable water distribution system. Implementation shall consist of at least the following actions:

- Identify and rank commercial, industrial, and institutional customers according to amount, type and peaking pattern of use.
- Encourage industrial, commercial, and institutional customers who are most likely to benefit to utilize treated effluent to replace potable water use in circumstances appropriate for non-potable water. Such uses could include golf course and landscape irrigation, cooling, and process water.

The City will implement programs in conjunction with the WMARSS owner cities to provide as much treated effluent to approved non-potable uses as is available to the City on an annual firm-yield basis. The potential for package treatment plants near end users with large demands for Reuse water will be examined when feasible.

I. Alternative Water Sources

One means of reducing peak pumping pressure on the City's distribution system is to shift use from potable water to alternative supplies where that is feasible and applicable. Although long-term pumping of the Trinity Aquifer has lowered the potentiometric head in the area of the City, there are productive wells that can be utilized during times of high demand. Likewise for end users near the River, utilization of raw water may reduce the demand for potable water, especially during peak demand periods.

Future demand management programs are envisioned to include Aquifer Storage and Recovery (ASR), to pump treated water into the depleted areas of the Trinity Aquifer during low demand periods, and retrieve the water during times of high demand. ASR is currently being investigated by the water utility. All applicable water quality regulations will be enforced in the use of alternative supplies.

Some of the steps to be taken in developing alternative supplies include:

- Cataloging groundwater wells that are in close proximity to end-users or treatment facilities to augment potable supply.
- Contacting potential wholesale and retail customers who could use alternative water resources instead of potable water
- Listing potential wholesale and retail customers with wells who have excess capacity, and could share water resources with the City
- Completing studies of ASR and pursuing it as an alternative demand management strategy.

J. Ordinance And Wholesale Contract Review

As part of the 2005 Water Conservation Planning Process, contracts with wholesale customers have been reviewed to determine conformance with the water conservation goals of the Plan. The City of Waco Landscaping ordinance, Sec 28-218 will be reviewed. Irrigation system design and installation requirements, such as rain sensors, will be evaluated.

Meetings have been held with wholesale customers most likely to be affected by summertime peaking issues. Communication will be maintained with wholesale customers to ensure that the City's retail and wholesale customers are being treated in an equitable fashion, and for optimum implementation of the Plan. The City will offer wholesale customers the opportunity to cosponsor conservation education and information activities.

L. Implementation

The City of Waco's water utility management is committed to implementing a successful Water Conservation and Drought Contingency Plan that will meet with City goals, and conform to Regional and statewide water plans and applicable regulations and statutes. To ensure that success the water utility has formed a conservation team with management and representatives from the customer service, billing, operations, water resources, public relations and accounting expertise within the utility. The City of Waco water utility management shall reconfirm or update the conservation team membership as needed, but no less than once every five years.

Each of the conservation programs that have been outlined in this plan has an implementation schedule and objectives for successful implementation. The initial schedules and objectives are listed below. As the Plan is implemented and adjusted from year-to-year, these may be modified. Annual reporting measures will serve as indicators of the success of the programs.

L.1 Water Accountability Program

1. The Water Accountability Program was first implemented by City of Waco water utility in 1988.
2. The City of Waco water utility management shall reconfirm or update the Water Accountability Program annually as needed.
3. The City of Waco maintains an active distribution system-auditing program.
4. The City of Waco shall repair identified leaks whenever cost-effective.

L.2 Conservation Pricing

1. City of Waco City Council first passed the City's inverted block rate in 2000.
2. The City of Waco water utility management shall update the conservation pricing as needed through recommendation to and passage by City Council.

L.3 Education and Public Information

1. The Conservation Public Information Program was first implemented by City of Waco water utility in February 2003.
2. These programs are planned to be ongoing, as part of regular customer service and water conservation activities in future years.
3. The City of Waco water utility management shall reconfirm or update the conservation education and implementation plan annually as needed.

L.4 Large Landscape

1. Implementation commenced with retrofits of City facilities in December 2002.
2. Not less than 10% of ICI accounts with dedicated irrigation meters will be contacted and offered landscape water use surveys each year.
3. Irrigation water use surveys completed for not less than 15% of ICI accounts with either mixed-use or dedicated irrigation meters by 2015.
4. Develop ETo-based water use budgets for all accounts with dedicated irrigation meters by December 2004.
5. Develop and implement a customer incentive program by the December 2006.

L.5 Residential

1. Implementation will begin during the Summer 2005.
2. The utility will develop and implement a strategy targeting and marketing water use surveys to single-family residential and multi-family residential customers by Spring 2006.
3. Not less than 15% of single-family residential accounts are to receive water use surveys within 10 years of the implementation date.
4. Not less than 15% of multi-family residential units to receive water use surveys within 10 years of the implementation date.

L.6 Industrial/Commercial/Institutional

1. Water utility management in Spring 2003 initiated the City of Waco's ICI Conservation program.
2. ICI Water Use Survey and Customer Incentives Program: 10% of commercial, industrial, and institutional customers to receive a water use survey within 10 years.

3. ICI Conservation Performance Targets: Reduce water use by commercial, industrial, and institutional customers by an amount equal to 3% of the use of baseline commercial, industrial, and institutional water use within 10 years of the date implementation is to commence, and each ten year period thereafter.

L.7 Reuse

1. Implementation shall commence no later than summer 2005.
2. As the City of Waco grows, more treated effluent will be produced. Reuse water supplies will be evaluated annually to determine the potential as an alternative water source.
3. To the extent that treated effluent is available for reuse, replace the use of potable water on golf courses, in large cooling plants and other industrial or landscape processes identified by the water utility.

CHAPTER 3

EMERGENCY WATER MANAGEMENT PLAN

A. Plan Elements

Emergencies such as drought or other uncontrollable circumstances can disrupt the normal availability of the City's water supply. Even though the City may have an adequate water supply, the supply could become contaminated, or a disaster could destroy the supply.

This chapter summarizes the City's Emergency Water Management Plan. Emergency contingency planning is not the same as management/conservation planning. While water management involves implementing permanent water use efficiencies, an emergency contingency plan establishes temporary methods or techniques designed to be used only as long as the emergency exists.

The City's Emergency Water Management Plan includes the following elements:

- Trigger conditions signaling the start of an emergency period;
- Emergency contingency measures;
- Education and information;
- Initiation procedures;
- Termination notification actions; and
- Implementation.

The Plan was adopted by Ordinance No. 2005-___ and will be codified in Chapter 26 of the Code of Ordinances. A copy is attached as an appendix to this 2005 Water Conservation and Drought Contingency Plan.

B. Procedure – Implementation

By May 1 of each year, the City will forecast water supply and potential water demands for May 1 through September 30 of that year. At this point, citizens are encouraged to practice good water management techniques inside and outside the home, including such practices as cutting back on lawn sprinkler times and developing landscapes that require less water. The City may seek voluntary reductions from water use by citizens.

When, in the opinion of the City Manager, an emergency exists for the immediate preservation of the public safety, the City manager may implement the requirements of a

drought or emergency contingency stage (stages 1, 2, or 3 mandatory restrictions) for a period not to exceed sixty (60) days. Thereafter, the City Council may extend the stage for up to ninety (90) days. Criminal penalties do not apply during the time of voluntary conservation.

C. Procedure – Notification

When trigger conditions and potential emergency contingency measures appear to be necessary, the public will be notified about water management restrictions through the news media and the City's TV access channel. If a trigger condition is reached, the public will be kept informed of the status of the drought condition through all available news media.

D. Plan Applicability

The Emergency Water Management Plan applies to all persons and premises receiving retail water from the City of Waco's Water System. Wholesale customers are also subject to the plan as per their contracts with the city. Specific Restrictions based upon trigger levels and types of water use are detailed in the codified ordinance.

E. Enforcement

The City Manager shall have the authority to designate the enforcement authority for the Emergency Water Management Plan. The City may serve a person or user in violation of this emergency Water Management Plan with a written notice stating the nature of the violation and giving a time limit for compliance. This notice may be in the form of a door hanger. The City may also issue a citation returnable to the Waco Municipal Court for a violation. Penalties may include a monetary fine and disconnection from water service.

F. Emergency Criteria

Emergency criteria triggering the implementation of various stages of the Emergency Water Management Plan include, but are not limited to, the following:

A) General or geographical emergency;

B) Water system failures/emergencies (i.e., pressure zone deficiencies, chemical spills, broken water mains, power outages, electrical failures, failures of storage tanks or other equipment, treatment plant breakdown, and water contamination);

C) An inability to recover approximately ninety (90) percent of water stored in all

Storage facilities within a twenty-four hour period;

D) A catastrophic decrease in the Lake reservoir level and/or delivery capabilities resulting in an inability, presently or in the immediate future, to recover resources sufficient to provide services necessary for the public health and welfare.

G. Targets and Goals

The goal of the emergency management measures set forth in the City of Waco's emergency water management plan are to reach the following overall reductions in water use targets. These targets will be measured as a percentage reduction in projected monthly demand, using 2000 as a baseline year.

Stage 1, Level 1	10 percent reduction;
Stage 1, Level 2	20 percent reduction;
Stage 2, Level 1	30 percent reduction; and
Stage 2, Level 2	40 percent reduction.