



CITY OF COLLEGE STATION

# Water Conservation Plan

## May 2014

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**Public Water Supply Identification Number: 0210002**

**Brazos County**

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## **SECTION 1. INTRODUCTION**

In accordance with the requirements of the Texas Commission on Environmental Quality (TCEQ), the City of College Station (the City) has updated its water conservation plan for adoption as a City resolution. The resolution of the City Council adopting the Water Conservation Plan shall authorize the City to implement, enforce, and administer the program.

## **SECTION 2. UTILITY PROFILE**

### ***Population and customer data***

The City of College Station Water Services Department manages a water distribution service area covering 54 square miles and a water service population of over 85,000 residents. This population amount does not include approximately 10,000 students living on campus at Texas A&M University (TAMU) that are served by Texas A&M's water utility, nor approximately 5,000 residents within College Station City limits that are served by Wellborn Special Utility District. The City provides drinking water to its customers through a network of over 400 miles of transmission and distribution mains that provide service to nearly 40,000 water connections.

### ***Water Production and Delivery System***

The City utilizes ground water for its public water supply and since 1980 College Station has developed its own water production facilities. The City has nine groundwater wells, eight of which withdraw groundwater from the Carrizo-Wilcox Aquifer, and one in the Sparta Aquifer. The City's wellfield is located northwest of Bryan in the vicinity of Sandy Point Road near Old San Antonio Road. Cooling towers located at the Sandy Point Pump Station cool the raw water from 118° F down to approximately 85°. The water is then pumped through two parallel water transmission lines to the Dowling Road Pump Station in College Station. Here the water is treated to meet Safe Drinking Water Act standards before being pumped to storage and distribution facilities. The City's water distribution system includes over 400 miles of water lines, two ground storage reservoirs and two elevated storage tanks, providing a total storage capacity of 13 million gallons.

### ***Wastewater Collection and Treatment System***

Raw wastewater in College Station travels through a network of over 320 miles of wastewater collection lines to one of three wastewater treatment plants: Carter's Creek Wastewater Treatment Plant, Lick Creek Wastewater Treatment Plant, and Carter Lake Wastewater Treatment Plant. These three wastewater treatment plants and numerous lift stations serve a population of over 85,000 people, with an average daily discharge of 6 to 7 million gallons per day (MGD) and maximum daily wastewater treatment capacity of 11.5 MGD.

### ***Water use data***

Table 1 below summarizes key water use statistics for 2009 – 2013. Average per person usage is given in gallons per capita per day (gpcd). Average and peak daily water demand are given in million gallons per day (MGD). . The peak day to average day ratio varies between 1.7 and 2.1, meaning that peak day demand is nearly twice the average demand.

The peak demand for the City is 24.998 MGD, reached in 2011. During high demand periods when large volumes of water are being pumped from the aquifer, the production capacity of the wells is reduced

due to declining water levels of the aquifer. The City’s water production and pumping system capacity is currently 29 MGD.

**Table 1. Municipal Water Demand 2009 – 2013**

Year	2009	2010	2011	2012	2013
Peak GPCD <sup>1</sup>	245	239	283	232	246
Annual Average GPCD <sup>2</sup>	146	148	178	150	153
Peak Day (MGD)	24.7	21.8	25.0	22.1	26.2
Average Day (MGD)	11.8	11.7	14.6	12.2	12.1
Peaking Factor	2.1	1.85	1.71	1.82	2.17

1. Peak GPCD = (Total Gallons Used in Peak Month ÷ Permanent Population) ÷ Days in Month

2. Annual Average GPCD = (Total Gallons in System ÷ Permanent Population) ÷ 365

### SECTION 3. WATER CONSERVATION GOALS

The purpose of this water conservation plan is to reduce long-term demand on limited water resources by encouraging more efficient water use practices in College Station. Its primary goals are to reduce peak seasonal water demand and reduce the peaking factor on the water production and delivery system. Peaking factor is defined as the ratio between peak daily water use and average daily water use. A peaking factor of 1.5 or more shows potential for significant water conservation savings, particularly in seasonal water use.

#### *Quantified Five (5) and Ten (10) Year Water Conservation Targets and Goals*

*Goal 1: Reduce peak daily water demand*

*Goal 2: Reduce peaking factor to 1.7 or below*

TCEQ rules require the City build capacity to meet escalating peak daily demands, which, as discussed in Section 1, can be up to twice the average demand. Thus, reducing those peak demands will enable the City to defer new capital expenditures for production facilities, and better use of available water resources.

The City aims to reduce peak demand through two methods: programs targeted at reducing peak per capita demand, and programs aimed at reducing the peaking factor. Table 2 outlines projected targets for reducing per capita demand and peaking factor. The Texas Water Conservation Advisory Council and Texas Water Development Board recommend that municipalities set goals of reducing per capita consumption by 1% per year.

**Table 2. Municipal per capita water use goals**

Year	2018	2023
Peak GPCD	236	225
Annual Average GPCD	147	140
Peaking Factor	1.8	1.7

*Goal 3: Maintain Water Loss at or Below 5% of Produced Water*

The goal of the City’s water loss control program is to maintain Non-Revenue Water (defined as unbilled authorized plus unbilled unauthorized usage) water at or below 5% of water produced, on an annual basis. In order to meet this goal, the City has several programs in place, including routine water audits, a program of leak detection and repair, and a meter testing and replacement program. These are described in the following section.

**Table 3: Water Loss Goals**

	Historic 5yr Average	5-yr Goal (2018)	10-yr Goal (2023)
Water Loss (GPCD) <sup>1</sup>	9	8	8
Water Loss (Percentage) <sup>2</sup>	6%	5%	5%

1.  $Water\ Loss\ GPCD = (Total\ Water\ Loss \div Permanent\ Population) \div 365$

2.  $Water\ Loss\ Percentage = (Total\ Water\ Loss \div Total\ Gallons\ in\ System) \times 100$

***Time frame for achieving conservation goals***

The three goals outlined above are designed to be achieved within five to ten years of the date of adoption of this Plan. The City will periodically evaluate the plan in accordance with State and Federal regulations to determine the extent, if any, that the plan needs modification.

**SECTION 4. UNIVERSAL METERING, METER TESTING, AND REPLACEMENT**

The ability to meter all water distribution and consumption uses allows the City to closely monitor actual water use, water losses, and prevent unauthorized use. All service connections in the City are metered. All production wells, pumping stations, interconnections, irrigation, swimming pools, parks, and municipal structures operated by the City are metered.

Master meters at water production pump stations are calibrated and tested annually in accordance with American Water Works Association (AWWA) standards to provide a minimum accuracy of plus or minus five percent (5%).

The City will continue to provide a preventive maintenance program for its water meters, wherein regular scheduled testing, repairs, and replacement are performed in accordance with American Water Works Association (AWWA) standards. After approximately seven years of usage, mechanical wear on traditional water meters causes them to under-report water usage due to parts rotating slower, resulting in lost revenue. In recent years the City has begun replacing old-style mechanical water meters with digital water meters having no moving parts, a twenty-year warranty, and capability to be retrofitted to Automated Metering Infrastructure (AMI). This results in much more accurate meter readings and the ability to provide customers with detailed water usage data on request.

**SECTION 5. WATER LOSS CONTROL MEASURES**

The Water Services Department generates a monthly water loss report that compares metered production with billed metered consumption, as well as unbilled authorized consumption. This report provides an effective tracking system of water loss. The City also completes a detailed water system audit following Texas Water Development Board (TWDB) guidelines at least once each year. The water

system audit determines the volume of actual water loss, the identification of water loss sources, the status and condition of primary water meters, an analysis of water line breaks, an evaluation of underground leakage potential, and provides recommendations for meter replacement.

**Table 4. Five-Year Summary of Water Loss<sup>1</sup>**

	2009	2010	2011	2012	2013
System Input <sup>2</sup>	4,289,137,000	4,305,911,000	5,320,089,000	4,440,799,000	4,647,972,000
Billed Authorized Consumption	3,861,358,000	3,941,350,000	4,964,117,000	4,113,426,000	4,252,645,000
Non-Revenue Authorized Consumption	108,491,000	166,713,900	88,668,000	88,005,000	63,894,000
Water Loss <sup>3</sup>	319,288,000	197,847,100	267,304,000	239,368,000	331,433,000
Water Loss (% of System Input) <sup>4</sup>	7%	5%	5%	5%	7%

1. Figures in table are in gallons
2. System Input = [Self-Supplied + Water Imported] – Water Exported
3. Water Loss = [System Input] – [Billed Authorized Consumption – Non-Revenue Authorized Consumption]
4. Water Loss % = Water Loss ÷ System Input

## **SECTION 6. LEAK DETECTION AND REPAIR**

The City administers a leak detection and repair program for its water distribution system. This program features a work order prioritization system for leaks needing repair and an inventory of equipment and materials needed to promptly repair all detected or reported leaks. The City’s annual rehabilitation program to upgrade its water distribution system also addresses high volume leaks. The City also conducts an annual distribution system rehabilitation program that replaces the high water loss sections of the distribution system. This program is based on findings of monthly water loss reports and the leak detection program.

## **SECTION 7. PUBLIC INFORMATION AND EDUCATION**

The City’s public education program typically makes at least 3,000 direct customer contacts each year through presentations, booths at community fairs, and plant tours. This figure does not include indirect contacts through utility bill inserts, newspaper and radio ads, and similar programs. The City promotes water conservation issues by informing the public in the following ways:

- Offering water conservation audits to all water customers
- Providing water conservation information to all customers upon request
- Coordinating educational presentations, lectures, and demonstrations for schools, civic groups, and the general public
- Publishing water conservation information on a regular basis in the City’s utility bill insert or other written form

- Participating in community environmental education activities with the City of Bryan, Brazos Valley Groundwater Conservation District, Brazos County Master Gardeners, and other local organizations to promote water conservation education
- Supporting annual events and demonstrations relating to water conservation and environmental issues that affect water supply and quality
- Promoting the latest innovations in water conservation through partnerships with Texas Water Development Board’s Water IQ program and EPA’s Water Sense program.

## **SECTION 8. NON-PROMOTIONAL WATER RATE STRUCTURE**

The City utilizes an inclining water rate structure to encourage customers to reduce both peak and overall water usage, while fairly allocating cost of service to each customer class. Under an inclining rate structure, the rate per thousand gallons increases as the amount of water used increases. The City implemented this inclining water rate structure in Fiscal Year 2008. The rate structure in place as of the date of this Plan charges monthly service charges based on meter size, plus a uniform rate per thousand (1000) gallons up to 10,000 gallons for single-family residential water customers. After 10,000 gallons, the rate per thousand increases slightly per thousand gallons for each separate usage block up to 26,000 gallons, as detailed in Table 4 below (City Ordinance No. 2010-3287).

Currently, commercial rate structure charges monthly service charges based on meter size, plus a varying volumetric rate usage rate per thousand (1000) gallons for domestic or irrigation usage. (City Ordinance No. 2010-3287). City Staff is currently researching the option of altering the commercial rate structure in order to meet conservation goals.

**Table 5. FY 2014 Water Rates**

Customer Class	Monthly Usage (gallons)	Rate per 1,000 Gallons
Single-Family Residential	0 - 10,000	\$2.26
	11,000 - 15,000	\$2.94
	16,000 - 20,000	\$3.61
	21,000 - 25,000	\$4.28
	26,000- above	\$4.96
	Meter Fee	\$10.19
Commercial - Domestic	Domestic (inside) usage	\$2.49
Commercial - Irrigation	Irrigation (outside) usage	\$2.68
	Meter Fee	Varies by meter size

This rate structure shall be reviewed on a regular basis to ensure that the rates adequately recover the cost of service and meet the goals of this water conservation plan.

## **SECTION 9. WHOLESALE WATER SUPPLY CONTRACTS**

The City will, as part of contracts for sale of water to any other entity re-selling water, require that entity to adopt applicable provisions of the City's water conservation and drought contingency plan or have a

plan in effect previously adopted and meeting the basic requirements of 30 TAC §288. These provisions will be through contractual agreement prior to the sale of any water to the water re-seller.

## **SECTION 10. ADDITIONAL WATER CONSERVATION STRATEGIES TO ACHIEVE WATER CONSERVATION GOALS**

This section provides information on recommended Best Management Practices developed by the Water Conservation Advisory Council and adopted by the City as a means of achieving specified water conservation goals.

### ***Conservation Coordinator***

This function is fulfilled through the Water Resource Coordinator position. A Conservation Coordinator is an individual designated to be responsible for preparation and implementation of the utility's water conservation and drought contingency plans, preparation and submittal of annual conservation status reports, promotion of water conservation programs, and other duties necessary to carry out implementation of the utility's conservation program.

### ***Landscape Irrigation Conservation and Incentives***

The City provides information to residential and non-residential customers regarding the methods and benefits of water conserving landscaping practices and devices, through public education to homeowners, business owners, landscape architects and designers, and irrigation professionals. The use of Xeriscape™ and "Water Wise" landscaping techniques, including drought tolerant plants and grasses is encouraged for landscaping new homes and commercial areas.

The City has a commercial landscape ordinance that requires certain point values based on the size and type of development. Additional point credits are given to commercial landscapes that employ water-efficient irrigation systems such as drip irrigation systems when possible or other water conserving irrigation systems that utilize efficient sprinklers.

The City's landscape irrigation ordinance was updated in 2008 to comply with state law requiring that landscape irrigation systems are designed, installed, and operated in a water conserving manner. This change was made effective with Ordinance #3155, adopted December 16, 2008. Under this ordinance, a permit and an irrigation plan drawn to scale are required for all irrigation systems. The irrigation plan must be drawn up by a licensed irrigator, and include location & type of sensors, backflow prevention devices, and water emission devices (sprinklers), irrigation controller(s), and valves. A rain shutoff sensor is required, and all emission devices must be installed according to manufacturer's specifications for spacing and pressure. The effect of this ordinance is that new irrigation systems in College Station are designed and installed to operate much more efficiently than older systems, and procedures are in place to prevent water waste.

The City also works with area landscape supply businesses and nurseries to encourage them to sell locally adapted, drought tolerant plants and grasses along with efficient irrigation systems, and to promote use of these materials through demonstrations and advertisements.

The City is also partnering with the Brazos Valley Groundwater Conservation District (BVGCD) and Texas A&M Agri-Life to implement innovative methods to promote landscape water conservation. Through a system of a weather station and rain gauges located throughout the City, customers will be able to

access specific weather information from a website that will provide specific landscape watering recommendations based on weather conditions for their area. The system will also weekly subscription-based email updates through which watering recommendations and water conservation tips will be sent directly to customers who sign up for the service. Weather-based landscape watering recommendations have shown great success with water conservation in other parts of the state and it is believed this new and innovative program will result in significant savings for College Station as well.

### ***Residential Landscape Irrigation Evaluation***

Summertime average water use in College Station is typically twice as high as annual average water use. That increase is primarily due to outdoor irrigation. Irrigation water is easily wasted due to overwatering, leaks and broken or misaligned sprinklers.

The City of College Station Water Services Department has partnered with Texas A&M Agri-Life Research for several years to study the effectiveness of residential water conservation methods. Each year residential water customers with above average seasonal water use receive a letter containing water budgets comparing their estimated outdoor water use against an estimated landscape need, as well as comparing their household water use with neighborhood average household water use. Customers with above-average seasonal water use are encouraged to sign up for a free landscape irrigation evaluation. In 2012 and 2013, approximately 5,000 customers were contacted through this program.

In 2010 the City began offering landscape irrigation evaluations to residential customers with automatic in-ground irrigation systems to educate customers about proper irrigation and eliminate wasteful irrigation practices. While this service is available to all water customers, the program is targeted to water customers with above-average seasonal water use and customers with high bill complaints. The program is advertised through utility bill inserts as well as direct letters to high water use customers.

To date nearly 400 irrigation evaluations have been completed. The procedure is for the customer to contact the City and schedule the evaluation. A Licensed Irrigator contracted with the City conducts the evaluation, which includes a system checkup, an efficiency check, a recommended irrigation schedule, and a written report of all problems observed. The City has also provided homeowner associations of high water use neighborhoods with articles regarding the program for publication in newsletters, and given presentations regarding program specifics, such as procedures and goals.

### ***Plumbing Code and Plumbing Fixture Retrofit Program***

The City has adopted the International Plumbing Code, which requires water saving, Ultra Low Flow (ULF) fixtures to be installed in new construction and in the replacement of plumbing in existing structures. The City educates residents, plumbers, and contractors on the benefits of retrofitting existing facilities with water saving devices through its public education program.

In 2010 the City began offering rebates toward the replacement of high-flow toilets with qualifying WaterSense toilets in residential and commercial structures built prior to 1994. This program is available to residential and commercial customers, for new construction as well as retrofits. To date 695 commercial and multi-family toilets have been replaced, along with 107 single-family residential toilets, for an estimated savings of 4.6 million gallons.

### ***Rainwater Harvesting***

Rainwater harvesting is an effective method of reducing potable water usage while maintaining healthy landscapes and avoiding problems due to excessive run-off. Rainwater harvesting is the practice of

collecting and storing rainwater close to its source and using it for nearby needs. This can be done through a rain barrel, cistern (larger container), or a rain garden.

In 2010 the City began providing customers with education on the proper installation and use of rainwater harvesting systems, along with a modest rebate for rainwater collection barrels. To date rebates have been issued for over 100 barrels. The City plans to modify the existing rainwater rebate program from a set rebate per barrel to a rebate per gallon of water storage. This will incentivize the purchase and installation of larger rainwater collection systems.

### ***Water Reuse***

The City has received authorization from the TCEQ to reuse its treated wastewater effluent as Type I reuse water, the highest quality of reuse water. This authorization is available for direct reuse projects as well as indirect reuse through its Bed and Banks permit. The goal for the City's water reuse program is to reduce peak demand on the potable (drinking) water system by switching non-potable uses of water, such as athletic field irrigation, to reuse water. In 2006 the City completed a feasibility study of providing reuse water for irrigation at City-owned parks and facilities.

In 2012 the City completed the first phase of this plan by extending reclaimed water infrastructure to the City's Veterans Park and Athletic Complex. When this system is fully implemented, it will provide nearly 1 million gallons per day of reclaimed water to the parks, reducing demand on the potable water system. Plans are in development to develop a Water Reuse Implementation Plan that will focus on expanding the water reuse program to include large volume commercial customers, such as shopping centers and business parks.

### ***Prohibition on Wasting Water***

The City's Drought Contingency Plan was amended in 2009 and reauthorized in 2014 to include the following prohibitions on water waste, which apply year-round:

- Operating automatic in-ground or hose-end sprinkler systems between the hours of 10:00 a.m. and 6:00 P.M.
- Allowing water to run off a property or allowing water to pond in the street or parking lot.
- Operating an irrigation system with sprinkler heads that are broken or out of adjustment.
- Failure to repair a controllable leak(s) within a reasonable period after having been given notice directing the repair of such leak(s).
- Operating fountains or ponds without a recirculation device

## **SECTION 11. METHOD FOR TRACKING EFFECTIVENESS OF WATER CONSERVATION PLAN**

In order to track the effectiveness of the Water Conservation Plan, the City compiles and submits an annual report on its Water Conservation Plan to TCEQ, which includes the following performance metrics:

- Summary of public information issued in the previous year
- Report on meter testing program
- Summary of water loss control program
- Peak water demand and overall water consumption
- Per capita water usage for the previous calendar year.
- Evaluation of status of plan and progress toward meeting stated goals

## **SECTION 12. MEANS OF IMPLEMENTATION AND ENFORCEMENT**

The City Manager or his/her designee will act as Administrator of this Water Conservation Plan. The Administrator shall oversee execution and implementation of all elements of this Plan and is responsible for overseeing adequate record-keeping for program documentation.

As a means of implementing and enforcing this Plan, all Plan elements discussed in this document were adopted by City Council Resolution (see Appendix A).

## **SECTION 13. COORDINATION**

This Water Conservation Plan shall work in accordance with the related City of College Station Ordinance, Drought Contingency and Water Emergency Plan, first adopted in January 2000 and as it may be revised or amended from time to time.

The City of College Station will provide a copy of this Water Conservation Plan to the Brazos Region (Region G) Water Planning Group, as designated by the TWDB. See Appendix B.

The City of College Station will provide a copy of this Plan to the Brazos Valley Groundwater Conservation District. See Appendix C.

**APPENDIX A: Resolution of the College Station City Council adopting  
Water Conservation Plan**

**APPENDIX B: Transmittal Letter to Brazos Region G Regional Water Planning Group**

**APPENDIX C: Transmittal Letter to Brazos Valley Groundwater  
Conservation District**