

**CITY OF BANDERA**  
**WATER CONSERVATION PLAN**

Adopted by the Bandera City Council on  
April 19, 2018

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# **Water Conservation Plan for The City of Bandera**

**April 2018**

## **1. INTRODUCTION AND OBJECTIVES**

Water supply has always been a key issue in the development of Texas. Additional supplies to meet increased demand will be difficult and expensive to develop. It is important that the City of Bandera make efficient use of its water supplies. The City procures its water from the lower Trinity aquifer.

Recognizing the need for efficient use of existing water supplies, the Texas Commission on Environmental Quality (TCEQ) has required water conservation plans from public municipal water suppliers and has developed guidelines and requirements governing the development of these water conservation plans. These TCEQ guidelines and requirements are included in Appendix B. The objectives of this water conservation plan are as follows:

- Reduce seasonal peak demands.
- Reduce the loss and waste of water.
- Improve the efficient use of water.
- Maintain quality of life.

The City of Bandera draws its water from the lower Trinity Aquifer. The three well sites are:

Dallas Street Well  
Indian Waters  
Mulberry

Water is treated with chlorine at each of the well sites. Each well site has ground storage with the Dallas St. well also having an elevated storage tank. An additional elevated storage tank is located in the city's business district. The city has divided its water system into two pressure planes -Dallas and Mulberry. The pressure planes are connected by PRVs which are not functioning. Plans are in place to unify the pressure planes as quickly as possible. The Dallas well site feeds the Dallas Pressure Plane. The Mulberry and Indian Waters wells, along with the downtown elevated storage tank, supply the Mulberry Pressure Plane.

## **2. TEXAS COMMISSION ON ENVIRONMENTAL QUALITY RULES**

The TCEQ rules governing development of water conservation plans for public water suppliers are contained in Title 30, Part 1, Chapter 288, Subchapter A, Rule 288.2 of the Texas Administrative Code, which is included in Appendix B. For the purpose of these rules, a water conservation plan is defined as "a strategy or combination of strategies for reducing the volume of water withdrawn from a water supply source, for reducing the loss or waste of water, for maintaining or improving the efficiency in the use of water, for increasing the recycling and reuse of water, and for preventing the pollution of water." The elements in the TCEQ water conservation rules covered in this conservation plan are listed below.

### Minimum Conservation Plan Requirements

The minimum requirements in the Texas Administrative Code for Water Conservation Plans are covered in this report as follows:

<b>TCEQ Rule</b>	<b>Location in Plan</b>	<b>Description</b>
288.2(a)(1)(A)	Section 4.1	Utility Profile
288.2(a)(1)(C)	Section 3	Specification of Goals
288.2(a)(1)(D)	Section 4.2	Accurate Metering
288.2(a)(1)(E)	Section 4.3	Universal Metering
288.2(a)(1)(F)	Section 4.4	Determination and Control of Unaccounted for Water
288.2 (a)(1)(G)	Section 4.5	Public Education and Information Program
288.2(a)(1)(H)	Section 4.6	Non-Promotional Water Rate Structure
288.2(a)(1)(I)	Section 4.7	Reservoir System Operation Plan
288.2(a)(1)(J)	Section 4.8	Means of Implementation and Enforcement
288.2(a)(1)(K)	Section 4.9	Coordination with Regional Water Planning Group
288.2(a)(2)(A)	Section 4.10	Leak Detection, Repair, and Water Loss Accounting
288.2(a)(2)(B)	Section 4.11	Record Management System

### Additional Conservation Strategies

TCEQ rules also list optional conservation strategies, which may be adopted.

<b>TCEQ Rule</b>	<b>Location in Plan</b>	<b>Description</b>
288.2(a)(3)(B)	Section 5.1	Ordinances, Plumbing Codes or Rules on Water-Conserving Fixtures
288.2(a)(3)(F)	Section 5.2	Considerations for Landscape Water Management Regulations

### 3. SPECIFICATION OF WATER CONSERVATION GOALS

Rule 288.2(a)(1)(C) requires the adoption of specific water conservation goals for a water conservation plan. The City has developed 5-year and 10-year goals for the reduction of per capita municipal use, as expressed in the water utility profile (Appendix C). The TCEQ defines municipal use in gallons per capita per day as “the total average daily amount of water diverted or pumped for treatment for potable use by a public water supply system. The calculation is made by dividing the water diverted or pumped for treatment for potable use by the population served.” In this definition, the “water diverted or pumped” refers to the total volume of water metered at the City’s three wells and includes the City’s water loss.

These reduction goals, expressed in gallons per capita per day (gpcd), are based on the average total gpcd for the City for the last five years (2013-2017) which is 112.1 gpcd.

	Historic 5-year Average	Baseline	5-year Goal for 2023	10-year Goal for 2028
Total GPCD	112	112	108.25	104.5
Residential GPCD	45	45	43.5	41.9
Water Loss (GPCD)	16.6	16.6	16.0	15.4
Water Loss (Percentage)	15.2%	15.2%	14.7	14.1%

### 4. MINIMUM CONSERVATION PLAN REQUIREMENTS

#### 4.1 Water Utility Profile

The completed profile is included in Appendix C, which includes data on existing and projected service populations, number of connections, historical metered water sales and water production, and general utility system information.

#### 4.2 Accurate Metering of Treated Water Delivery from the District

The City’s three wells supply all of the water used by the City. The well meters are calibrated annually.

#### 4.3 Universal Metering, Meter Testing and Repair, and Periodic Meter Replacement

The City currently requires metering of all connections. Defective meters are replaced as needed. Abnormal consumption is flagged by the billing system algorithm, whether consumption is unusually high or low.

#### **4.4 Determination and Control of Unaccounted for Water**

Water loss is the difference between the amount of water supplied by the wells and the amount of water delivered (sold) to customers plus authorized but unmetered uses such as fire fighting, releases for flushing of lines, and uses associated with new construction. Water loss can include several categories:

- Inaccuracies in customer meters.
- Unmetered uses such as firefighting.
- Losses due to water main breaks and leaks in the water distribution system.
- Losses due to illegal connections and theft.
- Other.

The city's water loss for the last five years is reported in the Utility Profile in Appendix C. This water loss percentage has averaged around 15% over the last 5 years.

Other actions the city is taking to reduce loss include the following:

- The Public Works Department is seeking funding to replace the current meters with electronic meters. The amount of funding will determine how quickly this change out will take place.
- A program is being considered to test 5% of the meters every year and replace meters every 10 years.
- The fire department will continue to meter how much water they take and will select hydrants that are scheduled to be flushed or exercised.
- City employees and the public works department work together to identify possible leaks in the distribution system. Leaks are fixed as quickly as possible.

#### **4.5 Continuing Public Education and Information Campaign**

The continuing public education and information campaign on water conservation will be expanded to include the following elements:

- Insert water conservation information with water bills. Inserts will include material developed by City staff and material obtained from the Texas Water Development Board (TWDB), the TCEQ, and other sources.
- Encourage local media coverage of water conservation issues and the importance of water conservation.
- Make water conservation brochures, and other water conservation materials available to the public at City Hall.
- Make information on water conservation available on its website and include a link to the Texas AgriLife Extension Native and Adapted Landscape Plants, An Earthwise Guide to Central Texas.

#### **4.6 Water Rate Structure**

The City presently charges residents who live within the city limits, and have a standard 3/4" connection, a monthly service charge of \$19.69 per water meter.

In an effort to promote water conservation the City charges more per gallon for those customers who consume larger volumes of water. Water used is charged at a rate of \$4.26 per 1000 gallons for the first 5,000 gallons. Residents who use over 5,000 gallons are charged \$5.91 per 1000 gallons. These rates continue to increase until the rate of \$7.88 per 1000 gallons is charged to consumers who use over 25,000 gallons.

#### **4.7 City's Reservoir System Operation Plan**

The City pumps and treats groundwater and does not have surface water supplies for which to implement a reservoir system operation plan.

#### **4.8 Implementation and Enforcement**

Appendix D contains an ordinance adopted by the City Council regarding this water conservation plan. The ordinance designates responsible officials to implement and enforce the water conservation plan.

#### **4.9 Coordination with Region J Water Planning Group**

The Chair of the Region J Water Planning Group will be provided a copy of this water conservation plan.

#### **4.10 Leak Detection, Repair, and Water Loss Accounting**

The City currently maintains a leak detection program designed to reduce the loss of water due to leaks and water main breaks. Most leaks are discovered by the visual observation from both members of the public and meter readers. City maintenance crews regularly check and service transmission and storage facilities to ensure that any leaks or main breaks in these areas are quickly contained and repaired. The City has sufficient crews to repair discovered leaks within 24 hours.

#### **4.11 Record Management System**

As required by TAC Title 30, Part 1, Chapter 288, Subchapter A, Rule 288.2(a)(2)(B), the City's current record management system allows for the separation of water sales and uses into residential and commercial

The City identifies high residential water users through database management and notifies the resident if a leak is suspected. The customer is advised to check faucets. Dye is freely distributed to customers to check their toilets for a possible leak. The customer is also advised to check all outdoor plumbing and sprinkler systems.

## **5. OTHER WATER CONSERVATION MEASURES**

### **5.1 Ordinances, Plumbing Codes, or Rules on Water-Conserving Fixtures**

The State of Texas has required water-conserving fixtures in new construction and renovations since 1992. The state standards call for flows of no more than 2.5 gallons per minute (gpm) for faucets, 3.0 gpm for showerheads, and 1.6 gallons per flush for toilets. Similar standards are now required nationally under federal law. These state and federal standards assure that all new construction and renovations will use water-conserving fixtures.

### **5.2 Landscape Water Management Regulations**

The City has adopted the following landscape water management regulations intended to minimize waste in landscape irrigation:

- 
- The City has adopted a drought management plan that restricts watering during times of drought. Restrictions are broken into 6 stages. As the severity of the drought increases the Mayor has the authority to increasingly restrict the use and timing of outdoor and nonessential use of water.

### **5.3 Review of the Water Conservation Plan**

The City will continue to review and develop recognized Best Management Practices (BMPs) that are suitable for its customer water use profile over the duration of this plan. This developmental process will include an annual evaluation of BMPs and recommend which measures should be increased, maintained, or eliminated. The entire water conservation plan will be revised and resubmitted to the TCEQ by January 31, 2023.

## **APPENDIX A**

### **LIST OF REFERENCES**

- (1) Title 30 of the Texas Administrative Code, Part 1, Chapter 288, last updated February 25, 2017.
- (2) City of Bandera Code of Ordinances, Ordinance 203, adopted 6/8/2000, Article 13.08 Drought Contingency Plan.

## APPENDIX B

### TEXAS COMMISSION ON ENVIRONMENTAL QUALITY RULES ON MUNICIPAL WATER CONSERVATION PLANS

Texas Commission on Environmental Quality  
Chapter 288 - Water Conservation Plans,  
Drought Contingency Plans, Guidelines and Requirements

#### SUBCHAPTER A: WATER CONSERVATION PLANS

##### §§288.1

Effective October 7, 2004

#### §288.1. Definitions.

The following words and terms, when used in this chapter, shall have the following meanings, unless the context clearly indicates otherwise.

(1) **Agricultural or Agriculture** - Any of the following activities:

(A) cultivating the soil to produce crops for human food, animal feed, or planting seed or for the production of fibers;

(B) the practice of floriculture, viticulture, silviculture, and horticulture, including the cultivation of plants in containers or non-soil media by a nursery grower;

(C) raising, feeding, or keeping animals for breeding purposes or for the production of food or fiber, leather, pelts, or other tangible products having a commercial value;

(D) raising or keeping equine animals;

(E) wildlife management; and

(F) planting cover crops, including cover crops cultivated for transplantation, or leaving land idle for the purpose of participating in any governmental program or normal crop or livestock rotation procedure.

(2) **Agricultural use** - Any use or activity involving agriculture, including irrigation.

(3) **Conservation** - Those practices, techniques, and technologies that reduce the consumption of water, reduce the loss or waste of water, improve the efficiency in the use of water, or increase the recycling and reuse of water so that a water supply is made available for future or alternative uses.

(4) **Drought contingency plan** - A strategy or combination of strategies for temporary supply and demand management responses to temporary and potentially recurring water supply shortages and other water supply emergencies. A drought contingency plan may be a separate document identified as such or may be contained within another water management document(s).

(5) **Industrial use** - The use of water in processes designed to convert materials of a lower order of value into forms having greater usability and commercial value, commercial fish production, and the development of power by means other than hydroelectric, but does not include agricultural use.

(6) **Irrigation** - The agricultural use of water for the irrigation of crops, trees, and pastureland, including, but not limited to, golf courses and parks which do not receive water through a municipal distribution system.

(7) **Irrigation water use efficiency** - The percentage of that amount of irrigation water which is beneficially used by agriculture crops or other vegetation relative to the amount of water diverted from the source(s) of supply. Beneficial uses of water for irrigation purposes include, but are not limited to, evapotranspiration needs for vegetative maintenance and growth, salinity management, and leaching requirements associated with irrigation.

(8) **Mining use** - The use of water for mining processes including hydraulic use, drilling, washing sand and gravel, and oil field repressuring.

(9) **Municipal per capita water use** - The sum total of water diverted into a water supply system for residential, commercial, and public and institutional uses divided by actual population served.

(10) **Municipal use** - The use of potable water within or outside a municipality and its environs whether supplied by a person, privately owned utility, political subdivision, or other entity as well as the use of sewage effluent for certain purposes, including the use of treated water for domestic purposes, fighting fires, sprinkling streets, flushing sewers and drains, watering parks and parkways, and recreational purposes, including public and private swimming pools, the use of potable water in industrial and commercial enterprises supplied by a municipal distribution system without special construction to meet its demands, and for the watering of lawns and family gardens.

(11) **Municipal use in gallons per capita per day** - The total average daily amount of water diverted or pumped for treatment for potable use by a public water supply system. The calculation is made by dividing the water diverted or pumped for treatment for potable use by population served. Indirect reuse volumes shall be credited against total diversion volumes for the purpose of calculating gallons per capita per day for targets and goals.

(12) **Nursery grower** - A person engaged in the practice of floriculture, viticulture, silviculture, and horticulture, including the cultivation of plants in containers or nonsoil media, who grows more than 50% of the products that the person either sells or leases, regardless of the variety sold, leased, or grown. For the purpose of this definition, grow means the actual cultivation or propagation of the product beyond the mere holding or maintaining of the item prior to sale or

lease, and typically includes activities associated with the production or multiplying of stock such as the development of new plants from cuttings, grafts, plugs, or seedlings.

(13) **Pollution** - The alteration of the physical, thermal, chemical, or biological quality of, or the contamination of, any water in the state that renders the water harmful, detrimental, or injurious to humans, animal life, vegetation, or property, or to the public health, safety, or welfare, or impairs the usefulness or the public enjoyment of the water for any lawful or reasonable purpose.

(14) **Public water supplier** - An individual or entity that supplies water to the public for human consumption.

(15) **Regional water planning group** - A group established by the Texas Water Development Board to prepare a regional water plan under Texas Water Code, §16.053.

(16) **Retail public water supplier** - An individual or entity that for compensation supplies water to the public for human consumption. The term does not include an individual or entity that supplies water to itself or its employees or tenants when that water is not resold to or used by others.

(17) **Reuse** - The authorized use for one or more beneficial purposes of use of water that remains unconsumed after the water is used for the original purpose of use and before that water is either disposed of or discharged or otherwise allowed to flow into a watercourse, lake, or other body of state-owned water.

(18) **Water conservation plan** - A strategy or combination of strategies for reducing the volume of water withdrawn from a water supply source, for reducing the loss or waste of water, for maintaining or improving the efficiency in the use of water, for increasing the recycling and reuse of water, and for preventing the pollution of water. A water conservation plan may be a separate document identified as such or may be contained within another water management document(s).

(19) **Wholesale public water supplier** - An individual or entity that for compensation supplies water to another for resale to the public for human consumption. The term does not include an individual or entity that supplies water to itself or its employees or tenants as an incident of that employee service or tenancy when that water is not resold to or used by others, or an individual or entity that conveys water to another individual or entity, but does not own the right to the water which is conveyed, whether or not for a delivery fee.

Adopted September 15, 2004

Effective October 7, 2004

**SUBCHAPTER A: WATER CONSERVATION PLANS**

**§§288.2**

**Effective October 7, 2004**

**§288.2. Water Conservation Plans for Municipal Uses by Public Water Suppliers.**

(a) A water conservation plan for municipal water use by public water suppliers must provide information in response to the following. If the plan does not provide information for each requirement, the public water supplier shall include in the plan an explanation of why the requirement is not applicable.

(1) Minimum requirements. All water conservation plans for municipal uses by public drinking water suppliers must include the following elements:

(A) a utility profile including, but not limited to, information regarding population and customer data, water use data, water supply system data, and wastewater system data;

(B) until May 1, 2005, specification of conservation goals including, but not limited to, municipal per capita water use goals, the basis for the development of such goals, and a time frame for achieving the specified goals;

(C) beginning May 1, 2005, specific, quantified five-year and ten-year targets for water savings to include goals for water loss programs and goals for municipal use, in gallons per capita per day. The goals established by a public water supplier under this subparagraph are not enforceable;

(D) metering device(s), within an accuracy of plus or minus 5.0% in order to measure and account for the amount of water diverted from the source of supply;

(E) a program for universal metering of both customer and public uses of water, for meter testing and repair, and for periodic meter replacement;

(F) measures to determine and control unaccounted-for uses of water (for example, periodic visual inspections along distribution lines; annual or monthly audit of the water system to determine illegal connections; abandoned services; etc.);

(G) a program of continuing public education and information regarding water conservation;

(H) a water rate structure which is not "promotional," i.e., a rate structure which is cost-based and which does not encourage the excessive use of water;

(I) a reservoir systems operations plan, if applicable, providing for the coordinated operation of reservoirs owned by the applicant within a common watershed or river basin in order to optimize available water supplies; and

(J) a means of implementation and enforcement which shall be evidenced by:

(i) a copy of the ordinance, resolution, or tariff indicating official adoption of the water conservation plan by the water supplier; and

(ii) a description of the authority by which the water supplier will implement and enforce the conservation plan; and

(K) documentation of coordination with the regional water planning groups for the service area of the public water supplier in order to ensure consistency with the appropriate approved regional water plans.

(2) Additional content requirements. Water conservation plans for municipal uses by public drinking water suppliers serving a current population of 5,000 or more and/or a projected population of 5,000 or more within the next ten years subsequent to the effective date of the plan must include the following elements:

(A) a program of leak detection, repair, and water loss accounting for the water transmission, delivery, and distribution system in order to control unaccounted-for uses of water;

(B) a record management system to record water pumped, water deliveries, water sales, and water losses which allows for the desegregation of water sales and uses into the following user classes:

(i) residential;

(ii) commercial;

(iii) public and institutional; and

(iv) industrial;

(C) a requirement in every wholesale water supply contract entered into or renewed after official adoption of the plan (by either ordinance, resolution, or tariff), and including any contract extension, that each successive wholesale customer develop and implement a water conservation plan or water conservation measures using the applicable elements in this chapter. If the customer intends to resell the water, the contract between the initial supplier and customer must provide that the contract for the resale of the water must have water conservation requirements so that each successive customer in the resale of the water will be required to implement water conservation measures in accordance with the provisions of this chapter.

(3) Additional conservation strategies. Any combination of the following strategies shall be selected by the water supplier, in addition to the minimum requirements in paragraphs (1) and (2) of this subsection, if they are necessary to achieve the stated water conservation goals of the plan. The commission may require that any of the following strategies be implemented by the water supplier if the commission determines that the strategy is necessary to achieve the goals of the water conservation plan:

(A) conservation-oriented water rates and water rate structures such as uniform or increasing block rate schedules, and/or seasonal rates, but not flat rate or decreasing block rates;

(B) adoption of ordinances, plumbing codes, and/or rules requiring water-conserving plumbing fixtures to be installed in new structures and existing structures undergoing substantial modification or addition;

(C) a program for the replacement or retrofit of water-conserving plumbing fixtures in existing structures;

(D) reuse and/or recycling of wastewater and/or graywater;

(E) a program for pressure control and/or reduction in the distribution system and/or for customer connections;

(F) a program and/or ordinance(s) for landscape water management;

(G) a method for monitoring the effectiveness and efficiency of the water conservation plan; and

(H) any other water conservation practice, method, or technique which the water supplier shows to be appropriate for achieving the stated goal or goals of the water conservation plan.

(b) A water conservation plan prepared in accordance with 31 TAC §363.15 (relating to Required Water Conservation Plan) of the Texas Water Development Board and substantially meeting the requirements of this section and other applicable commission rules may be submitted to meet application requirements in accordance with a memorandum of understanding between the commission and the Texas Water Development Board.

(c) Beginning May 1, 2005, a public water supplier for municipal use shall review and update its water conservation plan, as appropriate, based on an assessment of previous five-year and ten-year targets and any other new or updated information. The public water supplier for municipal use shall review and update the next revision of its water conservation plan not later than May 1, 2009, and every five years after that date to coincide with the regional water-planning group.

Adopted September 15, 2004

Effective October 7, 2004

**APPENDIX C**  
**WATER UTILITY PROFILE**

**UTILITY PROFILE FOR  
RETAIL WATER SUPPLIER**

**CONTACT INFORMATION**

**Name of Utility:** City of Bandera

**Public Water Supply Identification Number (PWS ID):** 0100012

**Certificate of Convenience and Necessity (CCN) Number:** 13190

**Surface Water Right ID Number:** N/A

**Wastewater ID Number:** 20121

**Completed By:** John Hegemier

**Title:** Public Works Foreman

**Address:** P.O. Box 896

**City:** Bandera

**Zip Code:** 78003

**Email:** PublicWorksForeman@CityofBandera.org **Telephone Number:** 830-328-1681

**Date:** March 12, 2018

**Regional Water Planning Group:** J

**Groundwater Conservation District:** Bandera County River Authority & Groundwater District

Check all that apply:

- Received financial assistance of \$500,000 or more from TWDB
- Have 3,300 or more retail connections
- Have a surface water right with TCEQ

## Section I: Utility Data

### A. Population and Service Area Data

1. Current service area size in square miles: 2  
(Attach or email a copy of the service area map.)
2. Provide historical service area population for the previous five years, starting with the most current year.

Year	Historical Population Served By Retail Water Service	Historical Population Served By Wholesale Water Service	Historical Population Served By Wastewater Service
2017	1852	0	1482
2016	1815	0	1452
2015	1796	0	1436
2014	1779	0	1423
2013	1761	0	1409

3. Provide the projected service area population for the following decades.

Year	Projected Population Served By Retail Water Service	Projected Population Served By Wholesale Water Service	Projected Population Served By Wastewater Service
2020	1889	0	1496
2030	2065	0	1653
2040	2256	0	1825
2050	2467	0	2016
2060	2725	0	2227

4. Describe the source(s)/method(s) for estimating current and projected populations.

**The Bandera Public Works department provides active water service to 741 residential connections. Based on an average household size of 2.5 people the City currently provides service to 1852 people. Area projections are based on an annual growth rate of 1.0%. Likewise, we projected population served by wastewater to grow at an annual rate of 1.0%.**

**B. System Input**

Provide system input data for the previous five years.

Total System Input = Self-supplied + Imported – Exported

Year	Self-supplied Water in Gallons	Purchased/Imported Water in Gallons	Exported Water in Gallons	Total System Input	Total GPCD
2013	70,541,400	0	0	70,541,400	110
2014	77,655,000	0	0	77,655,000	119
2015	72,993,000	0	0	72,993,000	111
2016	72,954,800	0	0	72,954,800	110
2017	74,307,100	0	0	74,307,100	110
<b>Historic 5year Average</b>	67,485,189	0	0	67,485,189	112

**C. Water Supply System**

The City of Bandera owns and operates the City of Bandera Public Water System. The Bandera Public Water system is a groundwater system comprised of three Lower Trinity wells and a distribution system with 1018 connections.

1. Designed daily capacity of system 1,800,000 **gallons** per day.
2. Storage Capacity:  
Elevated 150,000 **gallons**  
Ground 723,300 **gallons**
3. List all current water supply sources in gallons.

Water Supply Source	Source Type*	Total Gallons
<b>Lower Trinity Aquifer</b>	Groundwater	84,069,668

4. If surface water is a source type, do you recycle backwash to the head of the plant?

N/A

**D. Projected Demands**

1. Estimate the water supply requirements for the next ten years using population trends, historical water use, economic growth, etc.

Year	Population	Water Demands (gallons)
2018	1871	74,674,110
2019	1889	75,674,121
2020	1908	75,408,131
2021	1927	75,775,141
2022	1946	76,142,152
2023	1966	76,509,162
2024	1986	76,876,172
2025	2005	77,243,182
2026	2025	77,610,193
2027	2045	77,977,203

2. Describe sources of data and how projected water demands were determined. Attach additional sheets if necessary.

We used population numbers based on 2.5 people per meter with an annual growth rate of 1.0%. Water consumption likewise was originally calculated to increase at a similar 1.0% growth rate, but then the 10 year result was reduced by 5.0% to account for the water conservation measures we will be implementing. The years between 2018 and 2027 was simply an interpolation between the beginning and end points.

**E. High Volume Customers**

1. List the annual water use, in gallons, for the five highest volume **RETAIL customers**. Select one of the following water use categories to describe the customer; choose Residential, Industrial, Commercial, Institutional, or Agricultural.

Retail Customer	Water Use Category*	Annual Water Use	Treated or Raw
Bandera Rehab	Commercial	5,095,000	Treated
School District	Commercial	3,499,000	Treated
Mac's Laser Wash	Commercial	3,415,000	Treated
Cedar Creek	Commercial	2,872,000	Treated
Bandera Lodge	Commercial	2,397,000	Treated

2. If applicable, list the annual water use for the five highest volume **WHOLESALE customers**. Select one of the following water use categories to describe the customer; choose Municipal, Industrial, Commercial, Institutional, or Agricultural.

Wholesale Customer	Water Use Category*	Annual Water Use	Treated or Raw

\*For definitions on recommended customer categories for classifying customer water use, refer to the online [Guidance and Methodology for Reporting on Water Conservation and Water Use](#).

**F. Utility Data Comment Section**

Provide additional comments about utility data below.

## Section II: System Data

### A. Retail Connections

- List the active retail connections by major water use category.

Water Use Category*	Active Retail Connections			
	Metered	Unmetered	Total Connections	Percent of Total Connections
Residential – Single Family	741		741	76%
Residential – Multi-family (units)				
Industrial				
Commercial	235		235	24%
Institutional				
Agricultural				
<b>TOTAL</b>	976		976	

\*For definitions on recommended customer categories for classifying customer water use, refer to the online [Guidance and Methodology for Reporting on Water Conservation and Water Use](#).

- List the net number of new retail connections by water use category for the previous five years.

Water Use Category*	Net Number of New Retail Connections				
	2017	2016	2015	2014	2013
Residential – Single Family	4	2	3	Not Available	Not Available
Residential – Multifamily (units)				Not Available	Not Available
Industrial				Not Available	Not Available
Commercial	0	1		Not Available	Not Available
Institutional				Not Available	Not Available
Agricultural				Not Available	Not Available
<b>TOTAL</b>	4	3	3		

**B. Accounting Data**

For the previous five years, enter the number of gallons of RETAIL water provided in each major water use category.

Water Use Category*	Total Gallons of Retail Water				
	2017	2016	2015	2014	2013
Residential - Single Family	28,986,000	28,784,000	28,070,000	30,261,000	27,489,000
Residential – Multi-family					
Industrial					
Commercial	32,985,000	34,206,000	34,216,000	35,746,000	32,471,000
Institutional					
Agricultural					
<b>TOTAL</b>	61,971,000	62,990,000	62,286,000	66,007,000	59,960,000

**C. Residential Water Use**

For the previous five years, enter the residential GPCD for single family and multi-family units.

Water Use Category*	Residential GPCD				
	2017	2016	2015	2014	2013
Residential - Single Family	43	43	42	47	42
Residential – Multi-family					

**D. Annual and Seasonal Water Use**

1. For the previous five years, enter the gallons of treated water provided to RETAIL customers.

Month	Total Gallons of Treated Retail Water				
	2017	2016	2015	2014	2013
January	5,495,000	6,453,000	5,310,100	5,653,000	6,002,000
February	5,149,000	5,521,000	4,870,000	12,533,000	3,621,000
March	6,057,000	5,814,000	5,958,000	4,761,000	7,291,400
April	5,316,000	5,621,000	5,634,000	5,033,000	6,712,000
May	6,795,000	5,680,000	5,756,000	6,711,000	5,634,000
June	6,854,000	6,174,000	5,915,000	6,365,000	5,785,000

July	7,253,000	7,961,000	7,136,000	7,679,000	6,314,000
August	6,491,000	6,802,000	7,558,000	7,244,000	6,504,000
September	6,590,000	6,088,000	7,205,000	6,069,000	6,526,000
October	6,155,000	6,027,000	6,110,000	5,611,000	5,484,000
November	5,938,000	5,353,000	5,235,000	5,714,000	5,463,000
December	6,215,000	5,459,000	6,306,000	4,302,000	5,205,000
<b>TOTAL</b>	<b>74,307,000</b>	<b>72,955,000</b>	<b>72,993,100</b>	<b>77,655,000</b>	<b>70,541,000</b>

2. For the previous five years, enter the gallons of raw water provided to RETAIL customers.

Month	Total Gallons of Raw Retail Water				
	2017	2016	2015	2014	2013
January	0	0	0	0	0
February	0	0	0	0	0
March	0	0	0	0	0
April	0	0	0	0	0
May	0	0	0	0	0
June	0	0	0	0	0
July	0	0	0	0	0
August	0	0	0	0	0
September	0	0	0	0	0
October	0	0	0	0	0
November	0	0	0	0	0
December	0	0	0	0	0
<b>TOTAL</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

3. Summary of seasonal and annual water use.

Water Use	Seasonal and Annual Water Use					Average in Gallons
	2017	2016	2015	2014	2013	
Summer Retail (Treated + Raw)	20,598,000	20,937,000	20,609,000	21,288,000	18,603,000	<u>20,407,000</u> 5yr Average
TOTAL Retail (Treated + Raw)	74,307,000	72,955,000	72,993,100	77,655,000	70,541,000	<u>73,690,200</u> 5yr Average

**E. Water Loss**

Provide Water Loss data for the previous five years.

Year	Total Water Loss in Gallons	Water Loss in GPCD	Water Loss as a Percentage
2017	12,336,000	18	17%
2016	9,965,000	15	14%
2015	10,707,000	16	15%
2014	11,648,000	18	15%
2013	10,581,000	16	15%
<b>5-year average</b>	11,047,400	16.6	15.2%

**F. Peak Water Use**

Provide the Average Daily Water Use and Peak Day Water Use for the previous five years.

Year	Average Daily Use (gal)	Peak Day Use (gal)	Ratio (peak/avg)
2017	203,581	357,000	1.75
2016	199,877	383,000	1.92
2015	199,981	392,000	1.96
2014	212,753	Not Available	Not Available
2013	193,263	Not Available	Not Available

**G. Summary of Historic Water Use**

<b>Water Use Category</b>	<b>Historic 5-year Average</b>	<b>Percent of Connections</b>	<b>Percent of Water Use</b>
Residential SF	29,753,800	76%	46%
Residential MF			
Industrial			
Commercial	35,293,200	24%	54%
Institutional			
Agricultural			

**H. System Data Comment Section**

Provide additional comments about system data below.

### Section III: Wastewater System Data

#### A. Wastewater System Data.

The City of Bandera Wastewater System services about 80% of its water customers. The collection system encompasses all of the city residents and some of the water customers outside of the city. There are four lift stations. There is one treatment plant with a racetrack and two clarifiers. The city has 5 drying beds. The treated water is chlorinated before being discharged into the Medina River.

1. Design capacity of wastewater treatment plant(s): 277,000 gallons per day.
2. List the active wastewater connections by major water use category.

Water Use Category*	Active Wastewater Connections			
	Metered	Unmetered	Total Connections	Percent of Total Connections
Municipal	480		480	70%
Industrial				
Commercial	188		188	30%
Institutional				
Agricultural				
<b>TOTAL</b>	668			

3. What percent of water is serviced by the wastewater system? 66 %
4. For the previous five years, enter the number of gallons of wastewater that was treated by the utility.

Month	Total Gallons of Treated Wastewater				
	2017	2016	2015	2014	2013
January	4,046,000	5,002,000	4,664,000	3,948,495	4,985,414
February	4,206,000	3,474,000	3,789,000	3,750,164	3,490,796
March	4,662,000	3,876,000	4,666,000	4,155,883	3,899,157
April	4,363,000	3,964,000	4,670,000	3,663,448	3,936,224
May	4,378,000	5,634,000	8,108,000	4,580,967	3,986,332
June	4,249,000	4,634,000	5,839,000	3,924,499	3,612,565
July	3,892,000	3,379,000	4,345,000	3,619,960	3,441,378
August	4,055,000	4,363,000	3,933,000	3,676,909	3,291,820
September	4,462,000	3,637,000	3,840,000	4,072,880	3,784,310

October	4,401,000	3,354,000	4,505,000	3,743,006	4,111,443
November	4,007,000	3,339,000	4,959,000	4,230,963	4,002,633
December	4,648,000	3,948,000	4,876,000	3,893,705	3,883,731
<b>TOTAL</b>	51,369,000	48,604,000	58,194,000	47,260,879	46,425,803

5. Can treated wastewater be substituted for potable water?

Yes       No

**B. Reuse Data**

1. Provide data on the types of recycling and reuse activities implemented during the current reporting period.

Type of Reuse	Total Annual Volume (in gallons)
On-site irrigation	
Plant wash down	
Chlorination/de-chlorination	
Industrial	
Landscape irrigation (parks, golf courses)	
Agricultural	
Discharge to surface water	
Evaporation pond	
Other	
<b>TOTAL</b>	

**C. Wastewater System Data Comment**

Provide additional comments about wastewater system data below.

**APPENDIX D**

**ADOPTION OF WATER CONSERVATION PLAN**