Brazos River Authority

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Water Conservation Plan

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Table of Contents

Introduction 1

Regulatory Requirements 1

Description of BRA's Service Area 1
Water Supply System Data 1
Reservoir System Operation Plan 3
Specification of Conservation Goals 3
Description of Practices Utilized to Measure and Account for Diversions 5
Monitoring and Record Management Program 5
Metering and Leak Detection and Repair 6
BRA Long Term Contracts by Type of Use 6
Conservation Requirements in BRA Contracts 7
Documentation of Coordination with Regional Water Plans 7
Means for Implementation and Enforcement 7
Review and Update of Water Conservation Plan 8

Part I: Water Conservation Plan for Wholesale Water Providers 9

Population Data 9
Customer Data 10
Water Use Data 11
Wastewater Data 12
Water Conservation Goals for Municipal Users 12

Part II: Water Conservation Plan for Irrigation Users 13

BRA Water Rights Authorized for Irrigation Use 13
Irrigation Contracts 13
Practices Used to Account for Water Deliveries 14
Delivery Efficiency 14
Historical Diversions 15
Water Pricing Policy 17
Water Conservation Goals for Agricultural Irrigation Users 17

Appendices

Appendices and List of Tables are also in separate formatted document.

Appendix A Texas Administrative Code Title 30, Part 1, Chapter 288, Rules 288.4 and 288.5

Appendix B - Resolution Adopting Water Conservation Plan

Appendix C - Projected Population, Demand, and Per Capita Water Use for Major Municipal Customers

Appendix D - Agricultural Water Pricing Policy

List of Tables

Table 1 Population Projections for the Brazos River Basin and the San Jacinto-Brazos and Brazos-Colorado Coastal Basins 10

Table 2 Brazos River Authority Long-Term Contracts for 5,000 Acre-Feet per Year or More 10

Table 3 BRA Water Rights.....13

Table 4 BRA Irrigation and Agricultural Irrigation Contracts.....13

Table 5 Estimated Channel Loss Factors.....15

List of Figures

Figure 1 Brazos River Authority Water Supply Facilities 2

Figure 2 Current Long Term Commitments 7

Figure 3 Brazos River Basin Location Map.....9

Figure 4: Permitted Diversion Rights and Total Annual Water Use 11

Figure 5: Permitted Diversions Rights and Irrigation Water Use.....16

Figure 6: Permitted Diversions Rights and Total Water Use by Type 17

Introduction

As a wholesale and agricultural irrigation water supplier, the Brazos River Authority (BRA) is required to adopt a Water Conservation Plan in conformance with the rules governing Water Conservation Plans for Wholesale Water Providers and Water Conservation Plans for Agricultural Use. These rules are set forth by the Texas Administrative Code, Title 30, Chapter 288, Subchapter A, Rule 288.5 and 288.4, respectively. Copies of the rules are contained in Appendix A.

This Water Conservation Plan, dated April 29, 2019, supersedes the Water Conservation Plan dated April 28, 2014. Water conservation planning helps the BRA effectively convey to its customers the benefits of water conservation. Water conservation can:

- Delay expensive capital investments to upgrade or expand existing water facilities.
- Delay the need for new or expanded wastewater treatment facilities.
- Conserve energy as less water needs to be treated, pumped and distributed to the consumers.
- Reduce stream diversions, thereby enhancing water quality, environmental and recreational functions.
- Improve water levels in reservoirs.

Regulatory Requirements

Description of BRA's Service Area

The BRA's service area consists of the Brazos River Basin in Texas (Figure 1). The Brazos River Basin in Texas covers approximately 42,000 square miles and includes all or part of 70 counties. The main stem of the Brazos River begins in eastern Stonewall County, Texas and extends to the Gulf of Mexico. As the Brazos makes its way downstream, it gathers flows from tributary rivers, such as the Clear Fork, Bosque, Lampasas, Leon, Little River, and Navasota. The BRA has statutory responsibility for conserving and developing the water resources of the Brazos River Basin and making them available for beneficial use. The BRA also supplies water to the San Jacinto-Brazos Coastal Basin and a small part of the Trinity River Basin.

Water Supply System Data

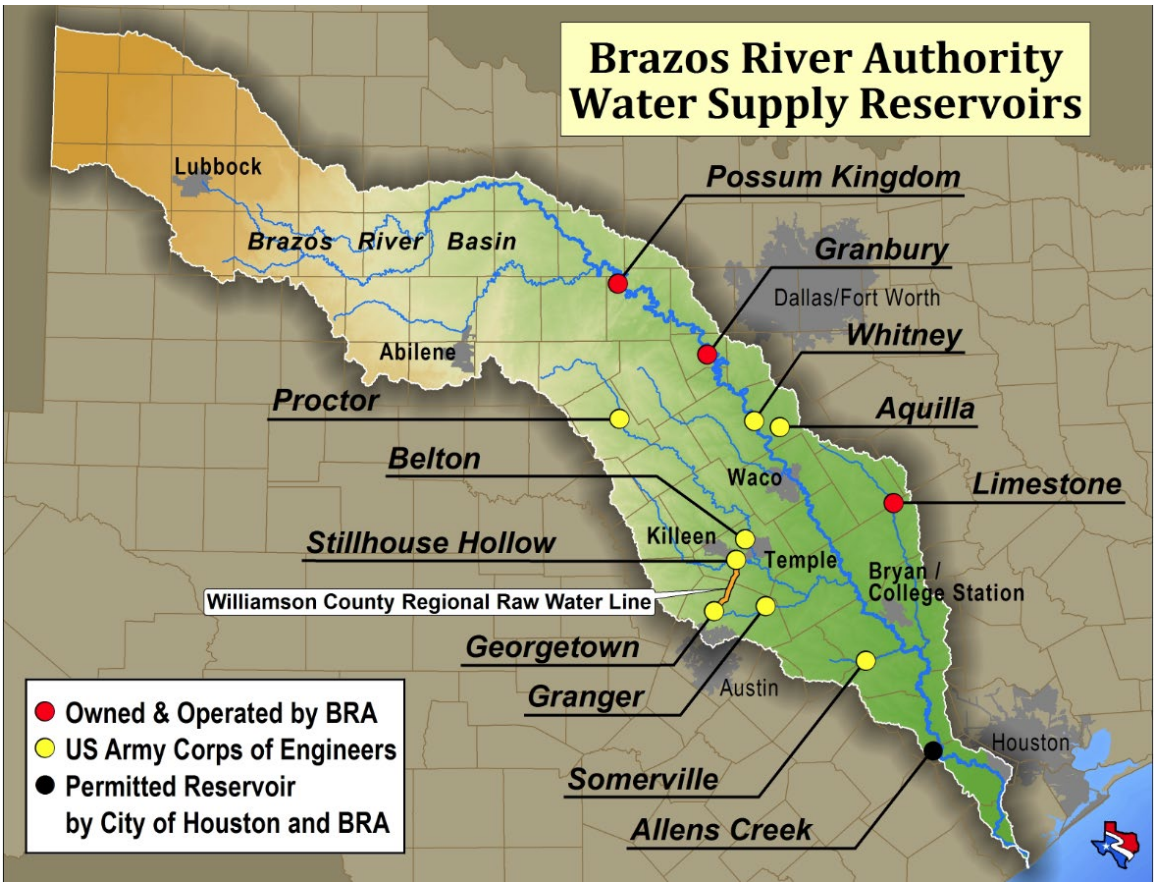
The BRA holds Texas water rights for three reservoirs that it owns and operates for water supply – Possum Kingdom Lake, Lake Granbury, and Lake Limestone. The BRA also holds Texas water rights and contracts with the U.S. Army Corps of Engineers for storage space in eight multi-purpose federal reservoirs – Lakes Whitney, Belton, Proctor, Somerville, Stillhouse Hollow, Granger, Georgetown and Aquilla. In addition to these water rights, the BRA also holds the System Operation Permit that was issued in 2016, which authorizes the use of naturally occurring flows in the basin, and return flows from wastewater treatment plants, in conjunction with the water supply in its 11 existing reservoirs. Additionally, the BRA holds a water right jointly with the City of Houston and the Texas Water Development Board for the proposed Allens Creek Reservoir. BRA is currently a thirty percent owner in this proposed project. Figure 1 shows the location of the existing reservoirs for which the BRA has water rights.

The BRA makes raw water available on a wholesale basis from the 11 existing reservoirs to municipal, industrial, mining and agricultural irrigation water customers. Altogether and including BRA's thirty percent share of Allens Creek Reservoir, the BRA has total authorized firm yield priority diversions of 691,796 acre-feet per year. The System Operation Permit issued by Final Order on November 30, 2016, authorizes the total diversion of 334,345 acre-feet per year of non-firm water subject to the associated Water Management Plan, which was accepted by the Texas Commission on Environmental Quality on April 2, 2018, making this the date of the final permit. The Water Management Plan governs the operating principles upon which decisions are made for diversion, storage, and use of water appropriated under the System Operation Permit. Additionally, the BRA has contractual arrangements to divert water under permits issued to the Lower Colorado River Authority, City of Stamford, City of Abilene and Palo Pinto County Municipal Water District No. 1.

The BRA makes treated water available on a wholesale basis from the East Williamson County Regional Water System (EWCRWS) adjacent to Lake Granger. Customers of the EWCRWS include the City of Taylor, Jonah Water Special Utility District, and Lone Star Regional Water Authority.

In addition to its water supply system, associated water rights, and water right permits, the BRA operates the Williamson County Regional Raw Water Line (WCRRWL) connecting Lake Stillhouse Hollow to Lake Georgetown.

Figure 1: Brazos River Authority Water Supply Facilities



Reservoir System Operation Plan

To the maximum extent possible within regulatory, institutional, and physical constraints, the BRA seeks to optimize water supply from its reservoirs and run-of-the-river supplies through coordinated system operation authorized by the BRA's System Operation Permit and System Order.

The System Operation Permit allows the BRA to use naturally occurring flows in the basin and return flows from wastewater treatment plants, in conjunction with the water supply in its 11 existing reservoirs. The uncontrolled natural flow, originating downstream of the BRA's reservoirs during wet times, can be firmed up by releases from the upstream BRA reservoirs during dry times and collectively achieve a "System" yield that is substantially greater than the sum of the individual reservoir yields.

The System Operation Order also gives the BRA the flexibility to operate the BRA's reservoirs as a system. However, unlike the System Operation Permit, the additional water that made is available under this water right is not recognized.

The BRA also has the ability under Certificate of Adjudication 12-5166 (Excess Flows) to utilize unappropriated flows at specific locations in the lower Brazos River Basin to meet customer demands on a non-priority basis, accounting for these diversions by assigning them to a BRA reservoir included in the System Operation Order.

Specification of Conservation Goals

Water conservation will become an increasingly critical element in meeting the water supply needs within the Brazos River Basin. This section presents the BRA's water conservation goals.

The Brazos River Basin is very large and has highly varied climatic conditions. The basin includes a multitude of water users, some of which purchase water from the BRA and others which store and divert water under their own water rights, and some which are both a purchaser and a water right holder. Upon request, the BRA provides assistance to its customers (industries, municipalities, and irrigators) in the development and implementation of conservation programs. The BRA adopts the following conservation goals:

- Conservation Pricing: Encourage water rate structures that communicate the value of water and that will effectively promote its long-term efficient use.

- Water Supply Operations: To the maximum extent possible within regulatory, institutional, and physical constraints, optimize benefits from the BRA's reservoirs through system operation and coordinated use of excess unregulated flows.

- Leak Detection: Maintain a program of regular inspection, maintenance and repair of pipelines and pump stations in the BRA's delivery system. Emphasize control of leaks and water losses.

- Education and Public Awareness: Continue to develop and improve the BRA's existing water conservation education and information program, with the objective to enhance public cooperation and support for water conservation.

- Reuse: Pursue wastewater reuse as opportunities arise and support opportunities for customers to pursue wastewater reuse projects.

- Water Resource Projects: When authorized by the BRA's Board of Directors, cooperate with various local entities in planning, developing and operating regional water resource projects and pollution prevention and abatement programs.

- Environmental Leadership Policy: Implement the Environmental Leadership Policy of the BRA encompassing the Brazos River Basin.

- Data Collection and Sharing: Cooperate with federal and state agencies in monitoring, developing, and disseminating water quantity and quality data.

- Site-Specific Activities: Develop and implement appropriate water conservation plans and programs to meet the needs of specific projects, areas, or circumstances.

- Wholesale Water Sale Contracts: As new contracts are executed and existing contracts are renewed or amended, require contract holders to develop and implement conservation plans pursuant to Texas Commission on Environmental Quality rules. Long-term contract holders shall submit copies of their water conservation and drought contingency plans to the BRA.

- The BRA will provide contract holders with information on ways to reduce water consumption and be water wise. The information may include methods and recommendations to reduce water consumption and water waste plus methods for improving water use efficiency as applicable to the water contract holder's type of use.

- Promotion of Conservation Activities: Encourage wholesale water customers and other users that supply potable water to others to consider and implement the following conservation activities, as appropriate:

    - Set specific conservation goals including, where appropriate, per capita water use targets, maximum acceptable water loss, and a time frame for achieving these goals.

    - Establish conservation-oriented rate structures such as uniform or increasing block rates and/or seasonal rates to inhibit the waste or inefficient use of water. Similar rate structures should also be applied to wastewater returned to the sewerage system for treatment.

    - Establish an aggressive program for calibrating water meters and for repairing or replacing those found to have an error of five percent or more. The program should focus initially on master meters and those of major users, then expand to include the meters of all users.

    - Establish and maintain an active leak detection and repair program to identify sections of distribution systems with excessive water losses. Implement

maintenance programs which will result in long-term solutions to repetitive line breaks or other events which result in the loss of water.

- Establish a goal to reduce annual water loss in distribution systems to no more than 12 percent within five years of the date of the water conservation plan and maintain unaccounted losses at no more than 12 percent for each year thereafter. (Water suppliers in rural areas with large distances between customers may set a goal higher than 12 percent, if appropriate.)

- Publicize the financial benefits of water conservation to the community by avoiding the cost of expanding the water supply and wastewater treatment systems.

- Encourage the use of landscaping that will minimize water requirements.

- Publicize and encourage demand reduction practices, i.e., off-peak watering of lawns, etc.

The BRA will adopt any other water conservation practice, method, or technique which the BRA finds to be appropriate for achieving the stated goals of this Water Conservation Plan.

Description of Practices Utilized to Measure and Account for Diversions

The Texas Commission on Environmental Quality Brazos Watermaster Program (Watermaster) and BRA's current raw water contract forms require that all diversions of water by the BRA's water customers must be metered or otherwise measured with an error of less than plus or minus five percent and reported to the BRA in a timely manner. Further, all BRA customers are required to have their meters verified by the Watermaster prior to diversion of water. Metering devices must also be tested and calibrated each contract year with reports of such testing and calibration results furnished to the BRA.

Monitoring and Record Management Program

The U.S. Geological Survey operates numerous stream gaging stations throughout the basin which provide information on BRA reservoirs and stream flows, including releases from the reservoirs. The BRA and the U.S. Army Corps of Engineers also perform daily water balance accounting for all reservoirs in the BRA System.

Permit 5851 (System Operation Permit) requires the BRA to maintain an accounting/delivery plan that estimates daily amounts of water used, the source, type of use, priority date, losses associated with the conveyance, specific points of diversion, associated travel times, and the commencement and termination of transit for conveyed waters. BRA's accounting plan is available to the public in electronic format during normal business hours.

BRA has water use reporting requirements outlined in its water supply agreements in addition to the reporting requirements imposed by the Watermaster. The BRA coordinates with its customers, the Watermaster and other water right holders in the basin on a regular

basis to ensure the requirements are met and to ensure the water supplies in the basin are being effectively managed.

The BRA preserves its records in accordance with its Records Retention Policy, which is modeled after the procedures used by the Texas State Library. This policy is consistent with the provisions of the Local Government Records Act (Texas Water Code § 49.065(c); Texas Local Government Code §§ 201.001-205.009).

Metering, Leak Detection, and Repair

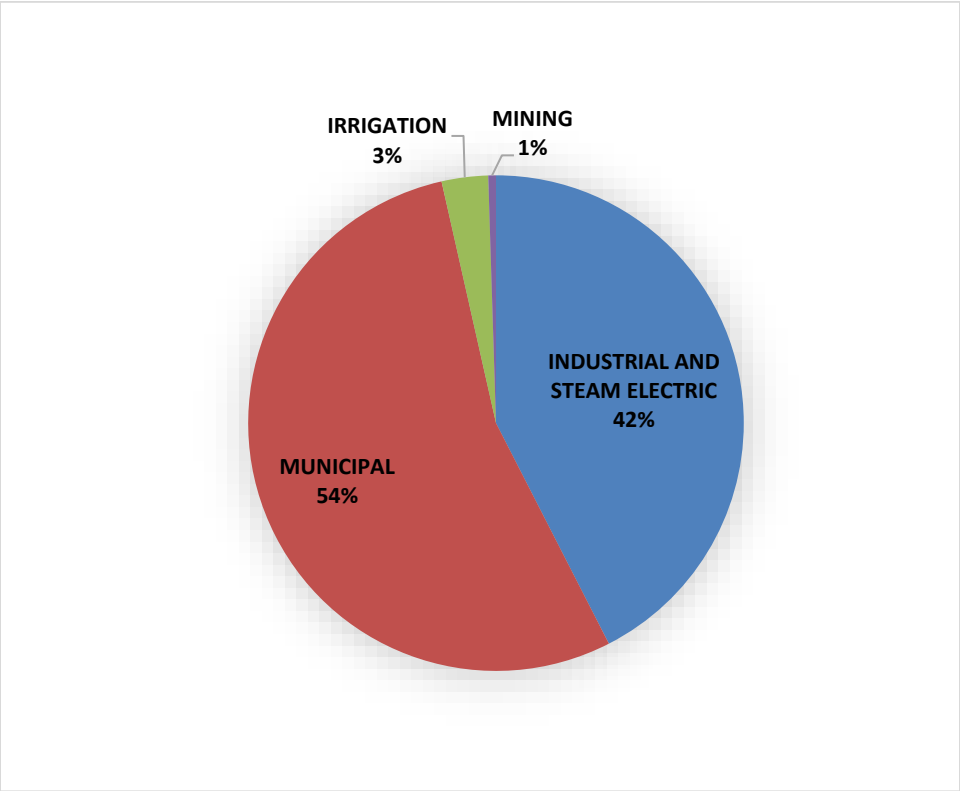
Currently the BRA uses lakeside diversion or the bed and banks of the Brazos River and its tributaries to deliver water to the majority of its customers. The BRA also delivers some water by pipeline in the WCRRWL. Deliveries through this pipeline are expected to increase over time. The BRA maintains a program of regular inspection, maintenance, and repair of the pipeline and pump station, focusing on the monitoring of water loss and the detection and repair of leaks.

BRA Long Term Contracts by Type of Use

Of the 704,901 acre-feet of firm water available for diversion under BRA reservoir water rights and contractual arrangements (excludes the Allens Creek water right), approximately 664,089 acre-feet is contracted with municipalities, water supply districts, water supply corporations, electric utilities and industries, irrigators, mining operations, and other uses throughout the basin. The System Operation Permit authorizes an additional total diversion of 334,345 acre-feet per year of non-firm water subject to the associated Water Management Plan, which was accepted by the Texas Commission on Environmental Quality in April 2018. For this report, customers that are authorized to divert water for multiple uses are categorized by the type of use they primarily report under. The combined amount contracted to Industrial and Steam Electric companies is 282,080 acre-feet, which represents 42% of total contracted amount. Municipal commitments add up to 357,659 acre-feet, representing 54% of the total contracted amount, and approximately 21,115 acre-feet are committed to irrigation uses, representing 3% of the total contracted amount. The remaining 1% of the contracted amount is committed to mining and other uses[1]. Figure 2 shows the breakdown of the BRA's current long term commitments.

1 Other uses include uses under non-revenue generating commitments, such as firefighting, roadside parks, state parks, fish hatchery and environmental flows.

Figure 2: Current Long Term Commitments – 664,089 acre-feet



Conservation Requirements in BRA Contracts

In order to manage, protect, and prolong the beneficial use of water resources in the Brazos basin, the Brazos River Authority will maintain Water Conservation and Drought Contingency Plans in accordance with State requirements and its water rights. BRA customers will be required to comply with these plans. The BRA requires every new, renewed, and amended contract to comply with the BRA's Water Conservation Plan.

Documentation of Coordination with Regional Water Planning Groups

The BRA is providing a copy of this Water Conservation Plan to each of the Regional Water Planning Groups located within the Brazos River Basin (Region B, Region C, Region F, Brazos G, Region H, Lower Colorado (Region K) and Llano-Estacado (Region O)).

Means for Implementation and Enforcement

This Water Conservation Plan and all plans developed hereunder are required to be followed by purchasers in all of the BRA's water availability agreements. Violation of the Plan is a violation of the agreement provision and will be treated as such.

A copy of the resolution by the Board of Directors (Board) of the BRA adopting this Water Conservation Plan may be found in Appendix B.

Review and Update of Water Conservation Plan

The BRA will review and update this Water Conservation Plan, as appropriate, every five years to coincide with development of the Regional Water Plans prepared by the Regional Water Planning Groups located within the Brazos River Basin. Each update will include an assessment of water conservation goals and new or updated information.

Part I: Water Conservation Plan for Wholesale Water Providers

Population Data

Figure 3 shows the location of the Brazos River Basin, the San Jacinto-Brazos Coastal Basin, and the Brazos Colorado Coastal Basin. Table 1 shows the projected populations for the Brazos River Basin and the San Jacinto-Brazos and Brazos-Colorado Coastal Basins as approved by the Texas Water Development Board for the 2017 State Water Plan. For 2010, the population of the Brazos River Basin was 2.5 million, the population of the San Jacinto-Brazos Coastal Basin was 1.0 million and the population of the Brazos-Colorado Coastal Basin was 84,776. The projected year 2070 population for the Brazos River Basin is 5.10 million, the projected year 2070 population for the San Jacinto-Brazos Coastal Basin is 2.19 million, and the projected 2070 population for the Brazos-Colorado Coastal Basin is 239,589.

Figure 3: Brazos River Basin Location Map

Table 1: Population Projections for the Brazos River Basin and the San Jacinto-Brazos and Brazos-Colorado Coastal Basins

Year	Projected Brazos River Basin Population	Projected San Jacinto-Brazos Population	Projected Brazos-Colorado Population
2020	2,664,156	1,363,787	96,429
2030	3,106,051	1,557,240	112,393
2040	3,570,891	1,722,483	132,718
2050	4,056,759	1,882,407	158,552
2060	4,570,376	2,035,444	192,766
2070	5,098,479	2,187,637	239,589

Customer Data

As of April 2019, the BRA had approximately 664,089 acre-feet of water per year committed under long-term contracts. Table 2 lists customers with long-term contracts for 5,000 acre-feet per year or more. Appendix C lists projected population, demand, and per capita water use for the BRA's major municipal customers as contained in the 2017 State Water Plan.

Table 2: Brazos River Authority Long-Term Contracts for 5,000 Acre-Feet per Year or More

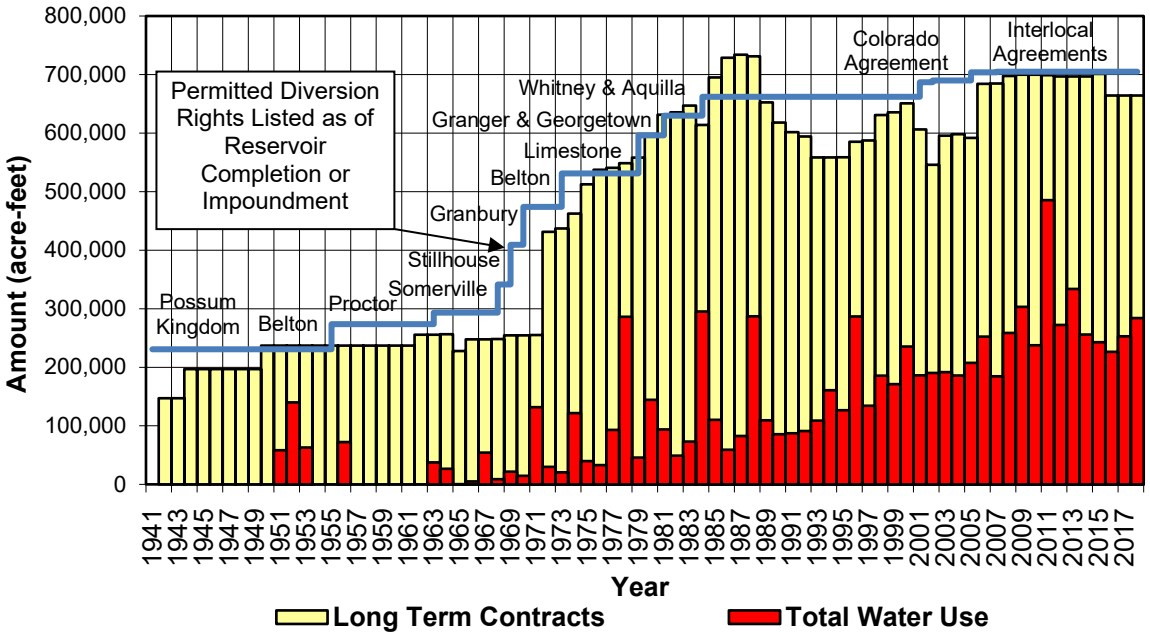
Entity	Contract Amount (Acre-Feet per Year)
NRG Texas	104,837
TXU (Luminant)	82,188
Bell Country WCID #1	62,509
Gulf Coast Water Authority	46,780
City of Round Rock	45,782
City of Georgetown	45,707
City of Temple	30,453
Dow Pipeline Company	16,000
City of Cleburne	15,000
Central Texas WSC	12,045
City of Abilene	11,681
Johnson County SUD	9,210
City of Granbury	10,800
Exelon Generation Co.	10,000
Brazos Electric Company	8,000
Bluebonnet WSC	8,301
Kempner WSC	8,900

Table 2: Continued	
Entity	**Contract Amount (Acre-Feet per Year)**
Acton MUD	7,000
Calpine Bosque Energy Center, LLC.	6,500
Upper Leon River MWD	6,437
Sugar Land	6,388
Aquilla WSD	5,953
City of Gatesville	5,898
Aluminum Company of America	5,000

Water Use Data

Figure 4 shows the history of annual water use from BRA water rights and the BRA's total permitted diversions. The BRA's annual use (through its wholesale customers) has been increasing over the years, with high water use in dry years, including 1978, 1984, 1988, 1996, 2000, 2006, 2008, 2009, 2011, and 2013.

Figure 4: Permitted Diversion Rights* and Total Annual Water Use



* Permitted Diversion Rights - include Permitted Reservoir Diversions and Contractual Agreements

Wastewater Data

The BRA currently operates nine (9) wastewater treatment facilities – the Temple-Belton Regional Sewerage System , the Doshier Farm Wastewater Treatement Plant (City of Temple), the Clute-Richwood Regional Sewerage System, the City of Sugar Land's Wastewater Treatment Plants (South, North, Greatwood, and New Territory), and the City of Hutto's Wastewater Treatment Plants (Central and South).

Water Conservation Goals for Municipal Users

In accordance with 30 TAC §288.5, the BRA has set specific, quantified five-year and ten-year targets for water savings. These goals include targets for municipal use in gallons per capita per day (gpcd) for the BRA's service area and maximum acceptable water loss.

Most of BRA's municipal customers are located within the Brazos G Regional Water Planning Area. The Texas Water Development Board's 2017 State Water Plan (State Plan) recommends water conservation strategies for every municipal water user group in the area whose water use is greater than 140 gpcd (page 93 of the State Plan). Therefore, the BRA adopts 140 gpcd as its ten-year goal. BRA's five-year goal is 147 gpcd and represents the level of water use an entity would need to achieve in five years if it is to reach 140 gpcd in 10 years, assuming a one percent (1%) reduction per year.

The maximum acceptable water loss goal for distribution systems within the BRA's service area is 12 percent. (Water suppliers in rural areas with large distances between customers may set a goal higher than 12 percent, if appropriate.)

These goals are used as a recommendation to the BRA's customers at the end user level. BRA customers that are already meeting these goals or achieving even lower gpcd use and/or meeting the water loss goal are commended and encouraged to continue to do so.

The goals contained in this Plan are provided as guidance for customers within the Brazos River Basin. Current or future BRA water sales, contracts or other agreements will not depend upon adoption or achievement of these goals by BRA customers. The BRA will continue to encourage customers to adopt goals based on criteria specific to the customer's situation.

Part II: Water Conservation Plan for Agricultural Users

BRA Water Rights Authorized for Irrigation Use

Of the twelve (12) water rights held by the BRA that are associated with reservoirs, the water rights for Lake Aquilla and Lake Whitney do not authorize diversions of stored water for irrigation use. Table 3 shows the authorized storage capacity and diversion right amount for each of the BRA reservoirs, excluding the proposed Allens Creek Reservoir.

Table 3: BRA Irrigation Water Rights in Existing Reservoirs

Water Right	Reservoir or Source	Storage Capacity (acre-feet)	Authorized Irrigation Use (acre-feet)*
CA 5155	Possum Kingdom	724,739	250,000
CA 5156	Granbury	155,000	14,500
CA 5159	Proctor	59,400	18,000
CA 5160	Belton	457,600	149,500
CA 5161	Stillhouse Hollow	235,700	73,700
CA 5162	Georgetown	37,100	4,100
CA 5163	Granger	65,500	5,500
CA 5164	Somerville	160,110	50,000
CA 5165	Limestone	225,400	70,000
CA 5158	Aquilla	52,400	0
CA 5157	Whitney	50,000	0
TOTAL		**2,222,949**	**635,300**

* System Operation Order authorizes diversions in excess of the amount listed in this table for the purpose of irrigation, but may not exceed the total authorized diversions for all purposes from that reservoir in any year.

Irrigation and Agricultural Irrigation Contracts

As of March 2019, the BRA has 23 customers with 21,115 acre-feet of water per year committed under long-term irrigation contracts. Of those 23 customers, 11 are for agricultural irrigation use totaling 16,260 acre-feet. Irrigation customers that meet the definition of agricultural use in the TAC Title 30, Part 1, Rule §288.1 pay the BRA Agriculture Water Rate which is equal to 70 percent of the System Water Rate. Table 4 lists the current irrigation and agricultural irrigation customers of the BRA.

Table 4: BRA Irrigation and Agricultural Irrigation Contracts

Entity	Contract Amount (Acre-Feet per Year)
Agricultural Rate Irrigation Customers[1]	
GULF COAST WATER AUTHORITY	5,625
LAKE PROCTOR IRRIGATION AUTH.	3,743
NORTH LEON RIVER IRRIGATION	2,909

Table 4: Continued

Entity	Contract Amount (Acre-Feet per Year)
LENMO INC.	2,000
KING RANCH TURFGRASS, LP	1,300
HORIZON TURF GRASS, INC.	350
MM TERRY RANCH, LTD	125
JERRY GLAZE	100
CARR-THOMAS RANCH	50
ALL SEASONS TURF GRASS	50
COUNTRY HARVEST	8
Non-Agricultural Rate Irrigation Customers[2]	
DOUBLE DIAMOND, INC.	1,000
WHITE BLUFF PROPERTY OWNERS	1,000
PECAN PLANTATION OWNER'S ASSOC	750
SUGAR TREE, INC.	500
DECORDOVA BEND ESTATES OWNERS	400
HILL COUNTRY HARBOR VILLAGE, L.P.	250
RANCH OWNER'S ASSOCIATION	250
REX R. WORRELL	240
MOUNTAIN LAKES RANCH PROPERTY	200
WILDFLOWER COUNTRY CLUB	200
GRANBURY RECREATIONAL ASSOC.	50
SUN CITY GEORGETOWN	15

[1] Agricultural Rate Customers – Irrigation customers that meet the Agricultural definition in the *Texas Administrative Code* Title 30, Part 1, Rule §288.1. These customers pay the BRA Agricultural Rate for their water, which is equal to 70 percent of the BRA System Rate.

[2] Non-Agricultural Rate Customers – Irrigation customers that do not qualify for the Agricultural Rate.

Practices Used to Account for Water Deliveries

The BRA maintains an accounting/delivery plan that estimates daily amounts of water used, the source, type of use, priority date, losses associated with the conveyance, specific points of diversion, associated travel times, and the commencement and termination of transit for conveyed waters.

Delivery Efficiency

The BRA supplies irrigation water for lakeside diversion from BRA reservoirs, and uses the natural bed and banks of the Brazos River and its tributaries, to deliver water. Delivery efficiency is achieved through reservoir management decisions that seek to minimize evaporation, transportation, and other losses when possible. Transportation losses are channel losses in the natural stream channel, which may consist of evaporation, transpiration, filling of bank storage, alluvium recharge and illegal diversions. Channel losses are variable with season, antecedent weather conditions, temperature and location. Channel loss estimates used by the BRA.

Table 5: Estimated Chanel Loss Factors

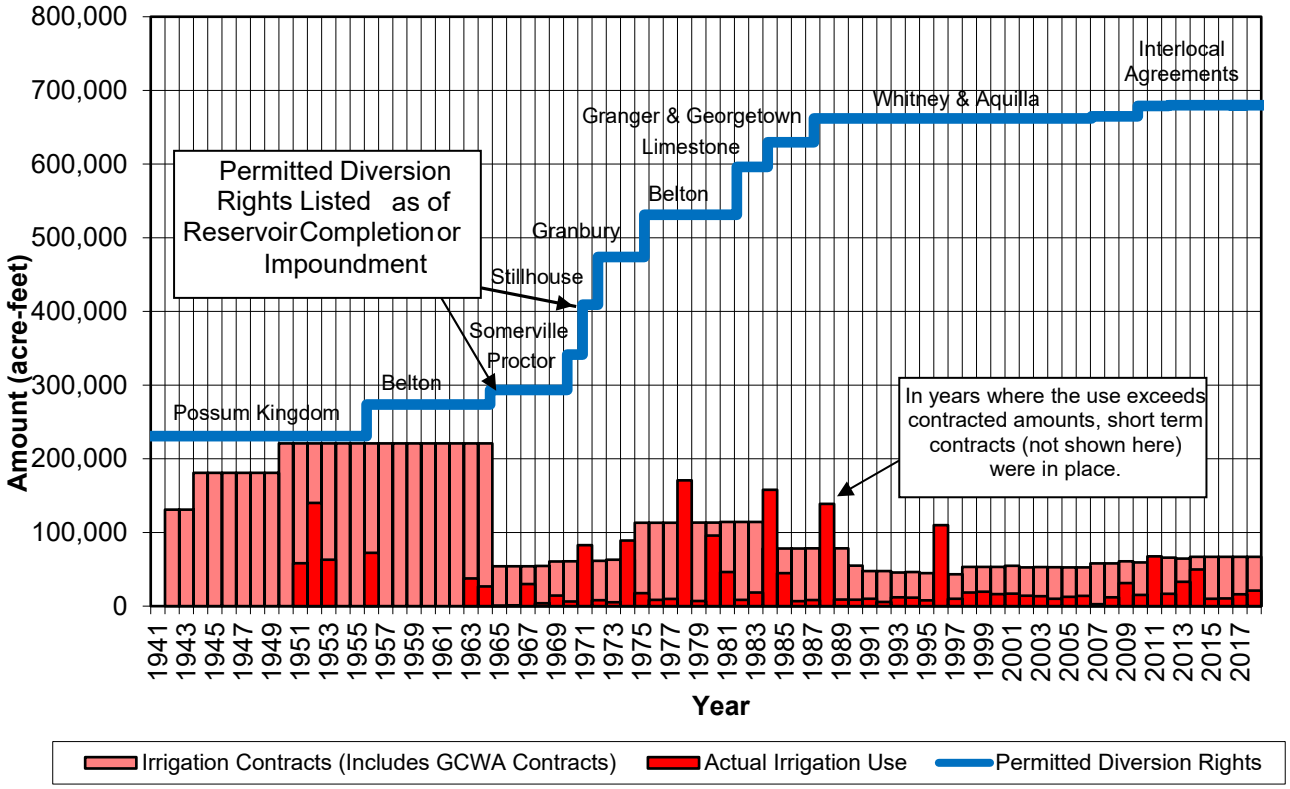
RESERVOIR	***USGS Stream Gages***				
	WACO	*HIGHBANK*	*BRYAN*	*HEMPSTEAD*	*RICHMOND*
Possum Kingdom	*7%*	*8%*	*10%*	*12%*	*15%*
Granbury	*3%*	*4%*	*6%*	*8%*	*11%*
Whitney	*1%*	*2%*	*3%*	*6%*	*9%*
Aquilla	*1%*	*2%*	*3%*	*6%*	*9%*
Lake Belton			*6%*	*9%*	*12%*
Stillhouse			*6%*	*8%*	*11%*
Granger			*4%*	*6%*	*9%*
Limestone			*2%*	*5%*	*8%*
Somerville				*2%*	*5%*

Historical Diversions

Figure 5 shows the history of annual irrigation water use from BRA water rights. The BRA's annual irrigation water use has generally been decreasing through time, with spikes in water use occurring in dry years including 1971, 1974, 1978, 1980, 1984, 1988, 1996, and 2011.

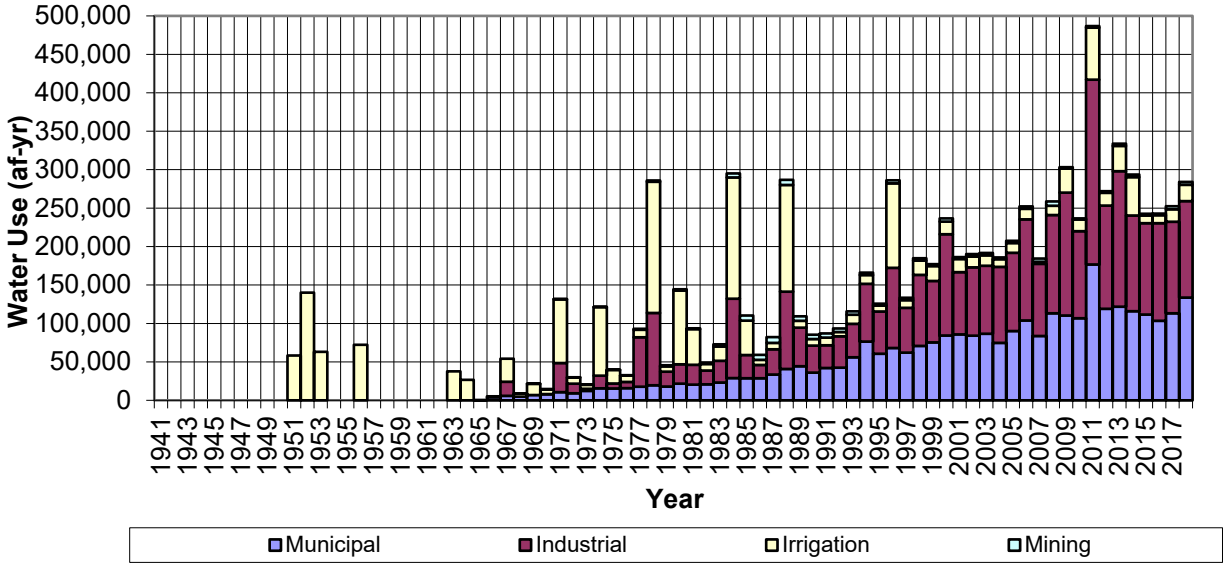
Figure 6 shows the history of annual water use for municipal, irrigation, industrial and mining from BRA water rights. Over the last 20 years irrigation use has ranged from 17 percent to 1 percent of total water delivered by the BRA in any one year. The average annual amount of water delivered by the BRA for irrigation use over the last ten years is 27,117 acre-feet, or nine percent of total water delivered.

Figure 5: Permitted Diversion Rights* and Irrigation Water Use



* Permitted Diversion Rights- include Permitted Reservoir Diversions and Contractual Agreements.

Figure 6: Total Water Use by Type



Water Pricing Policy

In October 2004, the BRA Board of Directors first adopted a temporary policy for pricing water for agricultural use. Previously, water for agricultural use was priced at the same rate as all other uses. In July 2009, the Board adopted a formal policy for pricing water for agricultural use. Appendix D contains the agriculture water pricing policy. The pricing policy sets the Agriculture Rate equal to seventy percent (70%) of the System Rate. Only those customers strictly meeting the Agricultural definition in Texas Administrative Code, Title 30, Rule 288.1 qualify for the reduced Agricultural Rate. If the customer's water supply agreement authorizes other uses in addition to agricultural use, the reduced Agricultural Rate will not apply.

Water Conservation Goals for Agricultural Irrigation Users

In accordance with 30 TAC §288.4, the BRA has established 12 percent as both the quantified five and ten-year target for water savings that includes maximum acceptable water losses for agricultural irrigation use storage and distribution systems.

The five and ten-year target is to encourage agricultural irrigation customers to reduce annual water loss in storage and distribution systems to no more than 12 percent.

These goals are provided as guidance for BRA's agricultural irrigation customers. Current or future BRA water sales, contracts or other agreements will not depend upon adoption or achievement of these goals by BRA customers. The BRA will continue to encourage customers to adopt goals based on criteria specific to the customer's situation.

APPENDIX A

Texas Administrative Code
Title 30, Part 1, Chapter 288, Subchapter A, Rules 288. 4 and 288.5

<<Prev Rule

Texas Administrative Code

Next Rule>>

TITLE 30 ENVIRONMENTAL QUALITY

PART 1 TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

CHAPTER 288 WATER CONSERVATION PLANS, DROUGHT CONTINGENCY PLANS, GUIDELINES AND REQUIREMENTS

SUBCHAPTER A WATER CONSERVATION PLANS

RULE §288.4 Water Conservation Plans for Agricultural Use

(a) A water conservation plan for agricultural use of water must provide information in response to the following subsections. If the plan does not provide information for each requirement, the agricultural water user must include in the plan an explanation of why the requirement is not applicable.
(1) For an individual agricultural user other than irrigation:
(A) a description of the use of the water in the production process, including how the water is diverted and transported from the source(s) of supply, how the water is utilized in the production process, and the estimated quantity of water consumed in the production process and therefore unavailable for reuse, discharge, or other means of disposal;
(B) specific, quantified five-year and ten-year targets for water savings and the basis for the development of such goals. The goals established by agricultural water users under this subparagraph are not enforceable;
(C) a description of the device(s) and/or method(s) within an accuracy of plus or minus 5.0% to be used in order to measure and account for the amount of water diverted from the source of supply;
(D) leak-detection, repair, and accounting for water loss in the water distribution system;
(E) application of state-of-the-art equipment and/or process modifications to improve water use efficiency; and
(F) any other water conservation practice, method, or technique which the user shows to be appropriate for achieving the stated goal or goals of the water conservation plan.
(2) For an individual irrigation user:
(A) a description of the irrigation production process which shall include, but is not limited to, the type of crops and acreage of each crop to be irrigated, monthly irrigation diversions, any seasonal or annual crop rotation, and soil types of the land to be irrigated;
(B) a description of the irrigation method, or system, and equipment including pumps, flow rates, plans, and/or sketches of the system layout;
(C) a description of the device(s) and/or methods, within an accuracy of plus or minus 5.0%, to be used in order to measure and account for the amount of water diverted from the source of supply;
(D) specific, quantified five-year and ten-year targets for water savings including, where appropriate, quantitative goals for irrigation water use efficiency and a pollution

abatement and prevention plan. The goals established by an individual irrigation water user under this subparagraph are not enforceable;
(E) water-conserving irrigation equipment and application system or method including, but not limited to, surge irrigation, low pressure sprinkler, drip irrigation, and nonleaking pipe;
(F) leak-detection, repair, and water-loss control;
(G) scheduling the timing and/or measuring the amount of water applied (for example, soil moisture monitoring);
(H) land improvements for retaining or reducing runoff, and increasing the infiltration of rain and irrigation water including, but not limited to, land leveling, furrow diking, terracing, and weed control;
(I) tailwater recovery and reuse; and
(J) any other water conservation practice, method, or technique which the user shows to be appropriate for preventing waste and achieving conservation.
(3) For a system providing agricultural water to more than one user:
(A) a system inventory for the supplier's:
(i) structural facilities including the supplier's water storage, conveyance, and delivery structures;
(ii) management practices, including the supplier's operating rules and regulations, water pricing policy, and a description of practices and/or devices used to account for water deliveries; and
(iii) a user profile including square miles of the service area, the number of customers taking delivery of water by the system, the types of crops, the types of irrigation systems, the types of drainage systems, and total acreage under irrigation, both historical and projected;
(B) specific, quantified five-year and ten-year targets for water savings including maximum allowable losses for the storage and distribution system. The goals established by a system providing agricultural water to more than one user under this subparagraph are not enforceable;
(C) a description of the practice(s) and/or device(s) which will be utilized to measure and account for the amount of water diverted from the source(s) of supply;
(D) a monitoring and record management program of water deliveries, sales, and losses;
(E) a leak-detection, repair, and water loss control program;
(F) a program to assist customers in the development of on-farm water conservation and pollution prevention plans and/or measures;
(G) 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 applicable provisions of this chapter;
(H) official adoption of the water conservation plan and goals, by ordinance, rule, resolution, or tariff, indicating that the plan reflects official policy of the supplier;

(I) any other water conservation practice, method, or technique which the supplier shows to be appropriate for achieving conservation; and
(J) documentation of coordination with the regional water planning groups, in order to ensure consistency with appropriate approved regional water plans.
(b) A water conservation plan prepared in accordance with the rules of the United States Department of Agriculture Natural Resource Conservation Service, the Texas State Soil and Water Conservation Board, or other federal or state agency 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 that agency.
(c) An agricultural water user 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. An agricultural water user shall review and update the next revision of its water conservation plan every five years to coincide with the regional water planning group.

Source Note: The provisions of this §288.4 adopted to be effective May 3, 1993, 18 TexReg 2558; amended to be effective February 21, 1999, 24 TexReg 949; amended to be effective April 27, 2000, 25 TexReg 3544; amended to be effective August 15, 2002, 27 TexReg 7146; amended to be effective October 7, 2004, 29 TexReg 9384; amended to be effective December 6, 2012, 37 TexReg 9515

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<<Prev Rule

Texas Administrative Code

Next Rule>>

TITLE 30	ENVIRONMENTAL QUALITY
PART 1	TEXAS COMMISSION ON ENVIRONMENTAL QUALITY
CHAPTER 288	WATER CONSERVATION PLANS, DROUGHT CONTINGENCY PLANS, GUIDELINES AND REQUIREMENTS
SUBCHAPTER A	WATER CONSERVATION PLANS
RULE §288.5	**Water Conservation Plans for Wholesale Water Suppliers**

A water conservation plan for a wholesale water supplier must provide information in response to each of the following paragraphs. If the plan does not provide information for each requirement, the wholesale water supplier shall include in the plan an explanation of why the requirement is not applicable.

(1) Minimum requirements. All water conservation plans for wholesale water suppliers must include the following elements:
(A) a description of the wholesaler's service area, including population and customer data, water use data, water supply system data, and wastewater data;
(B) specific, quantified five-year and ten-year targets for water savings including, where appropriate, target goals for municipal use in gallons per capita per day for the wholesaler's service area, maximum acceptable water loss, and the basis for the development of these goals. The goals established by wholesale water suppliers under this subparagraph are not enforceable;
(C) a description as to which practice(s) and/or device(s) will be utilized to measure and account for the amount of water diverted from the source(s) of supply;
(D) a monitoring and record management program for determining water deliveries, sales, and losses;
(E) a program of metering and leak detection and repair for the wholesaler's water storage, delivery, and distribution system;
(F) a requirement in every water supply contract entered into or renewed after official adoption of the water conservation plan, 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 of this chapter. If the customer intends to resell the water, then 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 applicable provisions of this chapter;
(G) 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. The reservoir systems operations plans shall include optimization of water supplies as one of the significant goals of the plan;
(H) a means for implementation and enforcement, which shall be evidenced by a copy of the ordinance, rule, resolution, or tariff, indicating official adoption of the water conservation plan by the water supplier; and a description of the authority by which the water supplier will implement and enforce the conservation plan; and
(I) documentation of coordination with the regional water planning groups for the service area of the wholesale water supplier in order to ensure consistency with the appropriate approved regional water plans.
(2) Additional conservation strategies. Any combination of the following strategies shall be selected by the water wholesaler, in addition to the minimum requirements of paragraph (1) of this section, if they are necessary in order to achieve the stated water conservation goals of the plan. The commission may require by commission order that any of the following strategies be implemented by the water supplier if the commission determines that the strategies are necessary in order for the conservation plan to be achieved:
(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) a program to assist agricultural customers in the development of conservation pollution prevention and abatement plans;
(C) a program for reuse and/or recycling of wastewater and/or graywater; and
(D) any other water conservation practice, method, or technique which the wholesaler shows to be appropriate for achieving the stated goal or goals of the water conservation plan.
(3) Review and update requirements. The wholesale water supplier 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. A wholesale water supplier shall review and update the next revision of its water conservation plan every five years to coincide with the regional water planning group.

Source Note: The provisions of this §288.5 adopted to be effective May 3, 1993, 18 TexReg 2558; amended to be effective February 21, 1999, 24 TexReg 949; amended to be effective April 27, 2000, 25 TexReg 3544; amended to be effective October 7, 2004, 29 TexReg 9384; amended to be effective December 6, 2012, 37 TexReg 9515

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APPENDIX B

Resolution Adopting Water Conservation Plan

Brazos River Authority

RESOLUTION OF THE BOARD OF DIRECTORS OF THE BRAZOS RIVER AUTHORITY APRIL 29, 2019

Agenda Item No. 8
Water Conservation Plan Update

"**BE IT RESOLVED** by the Board of Directors of the Brazos River Authority that the Water Conservation Plan, as presented at the April 29, 2019, Board of Directors' Meeting and prepared in conformance with the requirements of the Texas Commission on Environmental Quality, is hereby adopted; and

BE IT FURTHER RESOLVED by the Board of Directors of the Brazos River Authority that this newly adopted Water Conservation Plan supersedes the Water Conservation Plan dated April 28, 2014; and

BE IT FURTHER RESOLVED that the General Manager/CEO is directed to submit the adopted Brazos River Authority Water Conservation Plan to the Texas Commission on Environmental Quality."

The aforementioned resolution was approved by the Board of Directors of the Brazos River Authority on April 29, 2019, to certify which witness my hand and seal.

Cynthia A. Flores
Presiding Officer

SUBSCRIBED AND SWORN TO BEFORE ME on this the 29 day of April, 2019, to certify which witness my hand and official seal.

NOTARY PUBLIC STATE OF TEXAS
Jennifer J White
Notary Public
State of Texas
Commission Expires 5/21/2021
Notary ID# 314027-4

Notary Public in and for the
State of Texas

APPENDIX C

Projected Population, Demand, and Per Capita Water Use for Major Municipal Customers

				Projected Water Demands (ACFT)					
BRA Customer	**WUG Name**	**County**	**Region**	**2020**	**2030**	**2040**	**2050**	**2060**	**2070**
Acton MUD	ACTON MUD	HOOD	G	2,862	4,460	5,497	6,024	6,631	7,308
Acton MUD	ACTON MUD	JOHNSON	G	56	76	98	122	149	177
Aquilla WSD	FILES VALLEY WSC	HILL	G	121	125	127	131	135	138
Aquilla WSD	HILLSBORO	HILL	G	1,945	2,027	2,077	2,144	2,204	2,255
Bell County WCID #1	439 WSC	BELL	G	1,044	1,134	1,233	1,351	1,489	1,644
Bell County WCID #1	BELTON	BELL	G	3,807	4,306	4,872	5,480	6,099	6,715
Bell County WCID #1	COPPERAS COVE	CORYELL	G	4,266	4,655	5,133	5,586	6,122	6,666
Bell County WCID #1	COPPERAS COVE	LAMPASAS	G	126	182	222	265	304	340
Bell County WCID #1	FORT HOOD	BELL	G	3,954	3,870	3,815	3,810	3,804	3,804
Bell County WCID #1	FORT HOOD	CORYELL	G	3,672	3,679	3,627	3,622	3,617	3,616
Bell County WCID #1	HARKER HEIGHTS	BELL	G	6,224	7,079	8,042	9,061	10,087	11,106
Bell County WCID #1	KILLEEN	BELL	G	19,467	21,902	24,713	27,748	30,864	33,969
Bell County WCID #1	NOLANVILLE	BELL	G	1,382	1,749	2,154	2,575	2,991	3,401
Bluebonnet WSC	ELM CREEK WSC	BELL	G	254	288	327	370	413	457
Bluebonnet WSC	ELM CREEK WSC	CORYELL	G	44	48	54	58	64	70
Bluebonnet WSC	ELM CREEK WSC	MCLENNAN	G	200	221	241	262	285	308
Bluebonnet WSC	MCGREGOR	MCLENNAN	G	796	808	820	840	869	899
Bluebonnet WSC	MOFFAT WSC	BELL	G	479	481	487	500	517	536
Bluebonnet WSC	PENDLETON WSC	BELL	G	245	246	255	266	277	289
Brenham	BRENHAM	WASHINGTON	G	4,079	4,359	4,542	4,747	4,922	5,070
Central Texas WSC	ARMSTRONG WSC	BELL	G	406	418	434	454	478	502
Central Texas WSC	BELL-MILAM FALLS WSC	BELL	G	344	356	371	390	411	432
Central Texas WSC	BELL-MILAM FALLS WSC	FALLS	G	195	200	198	191	197	203
Central Texas WSC	BELL-MILAM FALLS WSC	MILAM	G	255	264	269	279	290	300
Central Texas WSC	BELL-MILAM FALLS WSC	WILLIAMSON	G	49	60	74	89	107	126
Central Texas WSC	DOG RIDGE WSC	BELL	G	438	488	547	613	682	751
Central Texas WSC	EAST BELL WSC	BELL	G	442	497	560	630	702	775
Central Texas WSC	HOLLAND	BELL	G	112	108	106	105	106	107
Central Texas WSC	LOTT	FALLS	G	75	75	73	70	71	73

				Projected Water Demands (ACFT)					
BRA Customer	**WUG Name**	**County**	**Region**	**2020**	**2030**	**2040**	**2050**	**2060**	**2070**
Central Texas WSC	ROGERS	BELL	G	172	177	183	192	202	213
Central Texas WSC	ROSEBUD	FALLS	G	173	174	170	165	170	175
Central Texas WSC	WEST BELL COUNTY WSC	BELL	G	789	816	800	798	797	797
Cleburne	CLEBURNE	JOHNSON	G	5,927	6,446	7,010	7,678	8,445	9,276
Coryell City WSD	CORYELL CITY WSD	MCLENNAN	G	125	147	166	186	207	227
Gatesville	GATESVILLE	CORYELL	G	4,424	4,939	5,532	6,066	6,658	7,253
Georgetown	CHISHOLM TRAIL SUD	BELL	G	553	632	721	814	906	998
Georgetown	CHISHOLM TRAIL SUD	WILLIAMSON	G	4,412	5,471	6,818	8,280	9,948	11,678
Georgetown	CHISHOLM TRAIL SUD	BURNET	K	70	83	95	106	116	124
Georgetown	GEORGETOWN	WILLIAMSON	G	15,944	19,787	24,665	29,960	36,006	42,273
Graham	GRAHAM	YOUNG	G	2,666	2,764	2,830	2,918	3,018	3,119
Granbury	GRANBURY	HOOD	G	1,216	1,432	1,586	1,725	1,837	1,925
Gulf Coast Water Authority	BACLIFF MUD	GALVESTON	H	539	516	506	514	521	528
Gulf Coast Water Authority	BAYOU VISTA	GALVESTON	H	276	270	265	262	262	262
Gulf Coast Water Authority	CLEAR LAKE SHORES	GALVESTON	H	562	575	571	571	570	570
Gulf Coast Water Authority	GALVESTON	GALVESTON	H	16,623	17,422	18,285	19,244	20,165	21,152
Gulf Coast Water Authority	HITCHCOCK	GALVESTON	H	949	1,079	1,157	1,224	1,285	1,337
Gulf Coast Water Authority	KEMAH	GALVESTON	H	1,181	1,538	1,588	1,629	1,665	1,695
Gulf Coast Water Authority	LA MARQUE	GALVESTON	H	3,137	3,339	3,351	3,376	3,419	3,459
Gulf Coast Water Authority	LEAGUE CITY	GALVESTON	H	14,194	15,650	16,806	17,792	18,386	18,808
Gulf Coast Water Authority	LEAGUE CITY	HARRIS	H	389	430	456	476	491	503
Gulf Coast Water Authority	MISSOURI CITY	FORT BEND	H	9,166	10,907	12,686	14,423	15,547	16,205
Gulf Coast Water Authority	PEARLAND	FORT BEND	H	502	533	658	784	911	1,061

				Projected Water Demands (ACFT)					
BRA Customer	**WUG Name**	**County**	**Region**	**2020**	**2030**	**2040**	**2050**	**2060**	**2070**
Gulf Coast Water Authority	PEARLAND	HARRIS	H	2,028	2,467	2,937	3,285	3,546	3,742
Gulf Coast Water Authority	SAN LEON MUD	GALVESTON	H	373	408	435	462	489	516
Gulf Coast Water Authority	SANTA FE	GALVESTON	H	1,695	1,696	1,717	1,755	1,810	1,870
Gulf Coast Water Authority	STAFFORD	FORT BEND	H	2,995	3,004	3,043	3,102	3,181	3,271
Gulf Coast Water Authority	SUGAR LAND	FORT BEND	H	11,753	12,899	13,114	13,266	13,361	13,480
Gulf Coast Water Authority	TEXAS CITY	GALVESTON	H	7,077	7,522	7,896	8,270	8,665	9,037
Gulf Coast Water Authority	TIKI ISLAND	GALVESTON	H	243	241	240	241	241	242
Jarrell-Schwertner WSC	JARRELL-SCHWERTNER WSC	BELL	G	186	209	235	264	294	324
Jarrell-Schwertner WSC	JARRELL-SCHWERTNER WSC	WILLIAMSON	G	461	561	690	833	1,000	1,174
Johnson County SUD	JOHNSON COUNTY SUD	HILL	G	24	24	25	26	26	27
Johnson County SUD	JOHNSON COUNTY SUD	JOHNSON	G	1,279	1,431	1,596	1,790	2,011	2,250
Jonah Water SUD	JONAH WATER SUD	WILLIAMSON	G	1,830	2,239	2,768	3,350	4,023	4,722
Kempner WSC	KEMPNER	LAMPASAS	G	202	219	231	246	259	272
Kempner WSC	KEMPNER WSC	BELL	G	350	398	451	507	565	622
Kempner WSC	KEMPNER WSC	CORYELL	G	541	602	674	738	810	882
Kempner WSC	KEMPNER WSC	LAMPASAS	G	1,539	1,669	1,770	1,882	1,987	2,084
Kempner WSC	KEMPNER WSC	BURNET	G	135	160	181	201	220	237
Kempner WSC	LAMPASAS	LAMPASAS	G	1,193	1,278	1,343	1,421	1,500	1,573
Kempner WSC	SALADO WSC	BELL	K	1,726	1,863	2,017	2,182	2,348	2,514
Liberty Hill	LIBERTY HILL	WILLIAMSON	G	158	192	237	286	343	402
Lorena	LORENA	MCLENNAN	G	309	339	367	396	429	461
Marlin	MARLIN	FALLS	G	1,771	1,827	1,820	1,772	1,823	1,878
Pecan Grove MUD #1	PECAN GROVE MUD #1	FORT BEND	H	2,000	1,947	1,907	1,907	1,908	1,913
Pecan Grove MUD #1	PECAN GROVE MUD #1	FORT BEND	H	16	16	15	15	15	15

				Projected Water Demands (ACFT)					
BRA Customer	**WUG Name**	**County**	**Region**	**2020**	**2030**	**2040**	**2050**	**2060**	**2070**
Possum Kingdom WSC	POSSUM KINGDOM WSC	PALO PINTO	G	777	826	858	889	915	936
Possum Kingdom WSC	POSSUM KINGDOM WSC	STEPHENS	G	33	34	34	34	34	35
Richmond	RICHMOND	FORT BEND	H	2,023	2,046	2,098	2,207	2,333	2,463
Rosenberg	ROSENBERG	FORT BEND	H	4,706	4,818	4,978	5,185	5,472	5,826
Rosenberg	ROSENBERG	FORT BEND	H	1	5	11	20	31	47
Round Rock	BRUSHY CREEK MUD	WILLIAMSON	G	4,366	4,693	4,659	4,639	4,635	4,634
Round Rock	FERN BLUFF MUD	WILLIAMSON	G	1,216	1,204	1,196	1,191	1,189	1,189
Round Rock	ROUND ROCK	WILLIAMSON	G	24,148	29,808	37,049	44,943	53,991	63,377
Stamford	STAMFORD	HASKELL	G	9	9	9	9	9	9
Stamford	STAMFORD	JONES	G	834	865	885	910	932	951
Stephens County Regional SUD	STEPHENS REGIONAL SUD	EASTLAND	G	14	14	14	13	13	13
Stephens County Regional SUD	STEPHENS REGIONAL SUD	PALO PINTO	G	5	5	5	5	5	5
Stephens County Regional SUD	STEPHENS REGIONAL SUD	SHACKELFORD	G	2	2	2	2	2	2
Stephens County Regional SUD	STEPHENS REGIONAL SUD	STEPHENS	G	262	260	255	253	254	255
Stephens County Regional SUD	STEPHENS REGIONAL SUD	THROCKMORTON	G	16	15	15	14	14	14
Taylor	TAYLOR	WILLIAMSON	G	2,840	3,006	3,241	3,522	3,869	4,232
Temple	LITTLE RIVER-ACADEMY	BELL	G	377	409	447	490	534	578
Temple	MORGAN'S POINT RESORT	BELL	G	595	684	787	897	1,009	1,121
Temple	TEMPLE	BELL	G	19,485	22,186	25,212	28,415	31,644	34,842
Temple	TROY	BELL	G	169	180	193	209	228	247
Wellborn SUD	WELLBORN SUD	BRAZOS	G	1837	2070	2318	2634	2982	3368
Wellborn SUD	WELLBORN SUD	ROBERTSON	G	356	401	450	511	578	653
Whitney	WHITNEY	HILL	G	431	449	461	475	488	500

				Projected Population					
BRA Customer	**WUG Name**	**County**	**Region**	**2020**	**2030**	**2040**	**2050**	**2060**	**2070**
Acton MUD	ACTON MUD	HOOD	G	19,725	31,885	39,831	43,891	48,381	53,347
Acton MUD	ACTON MUD	JOHNSON	G	382	542	707	888	1,083	1,292
Aquilla WSD	FILES VALLEY WSC	HILL	G	784	835	869	905	932	953
Aquilla WSD	HILLSBORO	HILL	G	9,117	9,707	10,106	10,518	10,830	11,083
Bell County WCID #1	439 WSC	BELL	G	7,584	8,435	9,318	10,292	11,369	12,559
Bell County WCID #1	BELTON	BELL	G	21,841	25,287	29,041	32,897	36,680	40,404
Bell County WCID #1	COPPERAS COVE	CORYELL	G	35,928	40,796	46,213	50,948	55,996	61,021
Bell County WCID #1	COPPERAS COVE	LAMPASAS	G	1,061	1,588	1,994	2,410	2,778	3,109
Bell County WCID #1	FORT HOOD	BELL	G	17,282	17,282	17,282	17,282	17,282	17,282
Bell County WCID #1	FORT HOOD	CORYELL	G	16,051	16,429	16,429	16,429	16,429	16,429
Bell County WCID #1	HARKER HEIGHTS	BELL	G	32,012	37,064	42,566	48,218	53,763	59,222
Bell County WCID #1	KILLEEN	BELL	G	153,371	177,572	203,934	231,012	257,581	283,732
Bell County WCID #1	NOLANVILLE	BELL	G	6,061	7,774	9,640	11,557	13,438	15,289
Bluebonnet WSC	ELM CREEK WSC	BELL	G	2,376	2,784	3,229	3,686	4,134	4,575
Bluebonnet WSC	ELM CREEK WSC	CORYELL	G	408	464	525	579	637	694
Bluebonnet WSC	ELM CREEK WSC	MCLENNAN	G	1,865	2,135	2,373	2,613	2,852	3,087
Bluebonnet WSC	MCGREGOR	MCLENNAN	G	5,198	5,442	5,657	5,874	6,090	6,302
Bluebonnet WSC	MOFFAT WSC	BELL	G	4,101	4,263	4,440	4,621	4,799	4,974
Bluebonnet WSC	PENDLETON WSC	BELL	G	2,075	2,174	2,283	2,395	2,504	2,612
Brenham	BRENHAM	WASHINGTON	G	17,355	18,886	19,929	20,966	21,772	22,430
Central Texas WSC	ARMSTRONG WSC	BELL	G	2,283	2,416	2,561	2,710	2,856	3,000

				Projected Population					
BRA Customer	**WUG Name**	**County**	**Region**	**2020**	**2030**	**2040**	**2050**	**2060**	**2070**
Central Texas WSC	BELL-MILAM FALLS WSC	FALLS	G	1,302	1,368	1,383	1,350	1,391	1,433
Central Texas WSC	BELL-MILAM FALLS WSC	MILAM	G	1,707	1,808	1,880	1,971	2,049	2,122
Central Texas WSC	BELL-MILAM FALLS WSC	WILLIAMSON	G	327	411	515	628	755	887
Central Texas WSC	DOG RIDGE WSC	BELL	G	3,145	3,642	4,182	4,737	5,282	5,818
Central Texas WSC	EAST BELL WSC	BELL	G	3,641	4,240	4,893	5,563	6,221	6,868
Central Texas WSC	EAST BELL WSC	FALLS	G	325	342	346	337	348	358
Central Texas WSC	HOLLAND	BELL	G	1,138	1,154	1,171	1,189	1,206	1,223
Central Texas WSC	LOTT	FALLS	G	824	866	875	855	880	907
Central Texas WSC	ROGERS	BELL	G	1,305	1,388	1,478	1,570	1,661	1,750
Cleburne	CLEBURNE	JOHNSON	G	32,501	36,195	40,006	44,185	48,693	53,517
Coryell City WSD	CORYELL CITY WSD	MCLENNAN	G	763	915	1,049	1,184	1,319	1,451
Gatesville	GATESVILLE	CORYELL	G	17,990	20,427	23,139	25,510	28,038	30,554
Georgetown	CHISHOLM TRAIL SUD	BELL	G	2,971	3,440	3,951	4,476	4,990	5,497
Georgetown	CHISHOLM TRAIL SUD	WILLIAMSON	G	23,739	29,821	37,396	45,554	54,804	64,369
Georgetown	CHISHOLM TRAIL SUD	BURNET	K	372	451	517	580	635	683
Georgetown	GEORGETOWN	WILLIAMSON	G	72,507	91,085	114,220	139,136	167,390	196,604
Graham	GRAHAM	YOUNG	G	9,281	9,792	10,159	10,546	10,924	11,289
Granbury	GRANBURY	HOOD	G	10,249	12,441	14,012	15,365	16,404	17,200
Gulf Coast Water Authority	BACLIFF MUD	GALVESTON	H	7,310	7,416	7,524	7,633	7,742	7,850
Gulf Coast Water Authority	BAYOU VISTA	GALVESTON	H	1,538	1,541	1,544	1,546	1,548	1,549
Gulf Coast Water Authority	CLEAR LAKE SHORES	GALVESTON	H	1,525	1,579	1,579	1,579	1,579	1,579

				Projected Population					
BRA Customer	**WUG Name**	**County**	**Region**	**2020**	**2030**	**2040**	**2050**	**2060**	**2070**
Gulf Coast Water Authority	HITCHCOCK	GALVESTON	H	8,604	10,217	11,248	12,053	12,692	13,205
Gulf Coast Water Authority	KEMAH	GALVESTON	H	4,685	6,166	6,392	6,572	6,719	6,842
Gulf Coast Water Authority	LA MARQUE	GALVESTON	H	20,111	21,970	22,429	22,810	23,133	23,414
Gulf Coast Water Authority	LEAGUE CITY	GALVESTON	H	106,764	120,273	130,742	139,323	144,257	147,634
Gulf Coast Water Authority	LEAGUE CITY	HARRIS	H	2,919	3,304	3,542	3,720	3,849	3,944
Gulf Coast Water Authority	MISSOURI CITY	FORT BEND	H	7,198	9,893	12,538	14,701	16,076	16,740
Gulf Coast Water Authority	PEARLAND	FORT BEND	H	10,014	11,747	13,444	14,174	14,632	15,298
Gulf Coast Water Authority	PEARLAND	HARRIS	H	58,637	71,707	84,738	97,048	104,776	109,256
Gulf Coast Water Authority	SAN LEON MUD	GALVESTON	H	5,650	6,439	7,082	7,773	8,529	9,352
Gulf Coast Water Authority	SANTA FE	GALVESTON	H	14,127	17,440	20,943	23,539	25,464	26,892
Gulf Coast Water Authority	STAFFORD	FORT BEND	H	5,547	6,066	6,466	6,866	7,266	7,667
Gulf Coast Water Authority	SUGAR LAND	FORT BEND	H	12,524	12,895	13,356	13,825	14,300	14,783
Gulf Coast Water Authority	TEXAS CITY	GALVESTON	H	51,369	56,474	60,714	64,373	67,607	70,539
Gulf Coast Water Authority	TIKI ISLAND	GALVESTON	H	972	979	987	994	998	1,002
Jarrell-Schwertner WSC	JARRELL-SCHWERTNER WSC	BELL	G	1,369	1,584	1,820	2,061	2,298	2,531
Jarrell-Schwertner WSC	JARRELL-SCHWERTNER WSC	WILLIAMSON	G	3,389	4,258	5,339	6,504	7,825	9,191
Johnson County SUD	JOHNSON COUNTY SUD	HILL	G	179	191	199	207	213	218
Johnson County SUD	JOHNSON COUNTY SUD	JOHNSON	G	9,931	11,458	13,034	14,762	16,627	18,622
Jonah Water SUD	JONAH WATER SUD	WILLIAMSON	G	12,985	16,312	20,456	24,918	29,978	35,210
Kempner WSC	KEMPNER	LAMPASAS	G	1,207	1,334	1,432	1,533	1,622	1,702
Kempner WSC	KEMPNER WSC	BELL	G	2,004	2,320	2,664	3,018	3,365	3,707

				Projected Population					
BRA Customer	**WUG Name**	**County**	**Region**	**2020**	**2030**	**2040**	**2050**	**2060**	**2070**
Kempner WSC	KEMPNER WSC	LAMPASAS	G	8,817	9,747	10,465	11,199	11,849	12,433
Kempner WSC	KEMPNER WSC	BURNET	G	769	930	1,066	1,196	1,311	1,410
Kempner WSC	LAMPASAS	LAMPASAS	G	7,402	8,183	8,786	9,402	9,947	10,438
Kempner WSC	SALADO WSC	BELL	K	5,453	5,950	6,491	7,047	7,592	8,129
Liberty Hill	LIBERTY HILL	WILLIAMSON	G	1,479	1,858	2,330	2,838	3,414	4,010
Lorena	LORENA	MCLENNAN	G	1,900	2,142	2,356	2,571	2,785	2,995
Marlin	MARLIN	FALLS	G	6,483	6,812	6,883	6,721	6,925	7,135
Pecan Grove MUD #1	PECAN GROVE MUD #1	FORT BEND	H	11,421	11,446	11,491	11,530	11,563	11,593
Pecan Grove MUD #1	PECAN GROVE MUD #1	FORT BEND	H	89	89	90	90	90	90
Possum Kingdom WSC	POSSUM KINGDOM WSC	PALO PINTO	G	1,812	1,945	2,035	2,117	2,180	2,230
Possum Kingdom WSC	POSSUM KINGDOM WSC	STEPHENS	G	76	79	80	81	81	82
Richmond	RICHMOND	FORT BEND	H	12,400	12,890	13,510	14,375	15,236	16,093
Rosenberg	ROSENBERG	FORT BEND	H	40,381	42,520	44,831	47,204	49,946	53,226
Rosenberg	ROSENBERG	FORT BEND	H	3	40	97	174	281	428
Round Rock	BRUSHY CREEK MUD	WILLIAMSON	G	17,636	19,198	19,198	19,198	19,198	19,198
Round Rock	FERN BLUFF MUD	WILLIAMSON	G	5,932	5,932	5,932	5,932	5,932	5,932
Round Rock	ROUND ROCK	WILLIAMSON	G	150,712	189,329	237,417	289,207	347,936	408,660
Stamford	STAMFORD	HASKELL	G	34	34	34	34	35	36
Stamford	STAMFORD	JONES	G	3,278	3,470	3,605	3,720	3,816	3,894
Stephens County Regional SUD	STEPHENS REGIONAL SUD	EASTLAND	G	126	129	129	129	129	129
Stephens County Regional SUD	STEPHENS REGIONAL SUD	PALO PINTO	G	39	41	43	45	46	47

				Projected Population					
BRA Customer	**WUG Name**	**County**	**Region**	**2020**	**2030**	**2040**	**2050**	**2060**	**2070**
Stephens County Regional SUD	STEPHENS REGIONAL SUD	STEPHENS	G	2,395	2,483	2,523	2,549	2,567	2,580
Stephens County Regional SUD	STEPHENS REGIONAL SUD	THROCKMORTON	G	139	139	139	139	139	139
Taylor	TAYLOR	WILLIAMSON	G	17,209	18,702	20,561	22,563	24,834	27,182
Temple	LITTLE RIVER-ACADEMY	BELL	G	2,231	2,488	2,768	3,056	3,338	3,616
Temple	MORGAN'S POINT RESORT	BELL	G	5,179	6,139	7,184	8,258	9,312	10,349
Temple	TEMPLE	BELL	G	79,253	91,759	105,381	119,374	133,103	146,616
Temple	TROY	BELL	G	1,874	2,091	2,328	2,571	2,810	3,045
Wellborn SUD	WELLBORN SUD	BRAZOS	G	11,851	12,000	12,000	12,000	12,000	12,000
Wellborn SUD	WELLBORN SUD	ROBERTSON	G	9,309	10,667	12,073	13,793	15,636	17,668
Whitney	WHITNEY	HILL	G	2,250	2,396	2,495	2,596	2,673	2,736

		Gallons per Capita per Day Water Use					
Authority Customer	**Water User Group**	**2020**	**2030**	**2040**	**2050**	**2060**	**2070**
Acton MUD	ACTON MUD	139	130	125	123	123	123
Aquilla WSD	BRANDON-IRENE WSC	128	118	113	110	109	109
Aquilla WSD	FILES VALLEY WSC	146	137	133	131	129	129
Aquilla WSD	HILL COUNTY WSC	128	121	119	117	117	116
Aquilla WSD	HILLSBORO	200	190	186	183	182	182
Bell County WCID #1	439 WSC	133	123	120	118	117	117
Bell County WCID #1	BELTON	165	156	152	150	149	148
Bell County WCID #1	COPPERAS COVE	116	106	102	99	98	98
Bell County WCID #1	FORT HOOD	215	204	200	197	197	197
Bell County WCID #1	HARKER HEIGHTS	182	174	171	169	168	167
Bell County WCID #1	KILLEEN	122	113	110	108	107	107
Bell County WCID #1	NOLANVILLE	212	204	201	199	199	199
Bluebonnet WSC	BRUCEVILLE-EDDY	174	165	161	158	157	156
Bluebonnet WSC	ELM CREEK WSC	104	96	92	91	90	89
Bluebonnet WSC	MCGREGOR	146	137	133	129	128	127
Bluebonnet WSC	MOFFAT WSC	113	104	101	98	97	96
Bluebonnet WSC	MOODY	124	115	110	107	105	105
Bluebonnet WSC	PENDLETON WSC	116	105	101	100	99	99
Bluebonnet WSC	WOODWAY	352	342	338	334	333	333
Brenham	BRENHAM	219	210	206	203	202	202
Brushy Creek MUD	BRUSHY CREEK MUD	231	221	218	217	216	216
Central Texas WSC	ARMSTRONG WSC	168	159	154	151	150	149
Central Texas WSC	BELL-MILAM FALLS WSC	142	134	130	128	126	126
Central Texas WSC	BUCKHOLTS	118	111	108	105	103	103
Central Texas WSC	DOG RIDGE WSC	135	124	120	117	116	115
Central Texas WSC	EAST BELL WSC	118	109	106	103	102	102
Central Texas WSC	HOLLAND	97	88	84	81	79	78

		Gallons per Capita per Day Water Use					
Authority Customer	**Water User Group**	**2020**	**2030**	**2040**	**2050**	**2060**	**2070**
Central Texas WSC	ROGERS	127	118	114	111	109	109
Central Texas WSC	ROSEBUD	111	101	96	93	93	93
Central Texas WSC	WEST BELL COUNTY WSC	149	138	134	131	131	130
Cleburne	CLEBURNE	172	163	159	156	155	155
Coryell City WSD	CORYELL CITY WSD	154	146	143	141	140	140
Gatesville	GATESVILLE	229	220	216	213	212	212
Georgetown	CHISHOLM TRAIL SUD	174	166	164	163	162	162
Georgetown	GEORGETOWN	205	196	194	193	192	192
Graham	GRAHAM	266	256	252	249	247	247
Granbury	GRANBURY	115	106	103	101	100	100
Jarrell-Schwertner WSC	JARRELL-SCHWERTNER WSC	133	121	118	115	114	114
Johnson County SUD	JOHNSON COUNTY SUD	124	115	111	109	108	108
Jonah Water SUD	JONAH WATER SUD	137	126	123	121	120	120
Kempner WSC	KEMPNER WSC	164	156	153	151	150	150
Kempner WSC	KEMPNER	158	149	147	144	143	143
Kempner WSC	LAMPASAS	154	144	139	136	135	135
Kempner WSC	SALADO WSC	292	283	280	277	276	276
Liberty Hill	LIBERTY HILL	106	95	92	91	90	90
Lorena	LORENA	154	145	141	139	138	138
Marlin	MARLIN	254	244	239	236	235	235
Palo Pinto CO MWD No 1	MINERAL WELLS	155	146	142	139	137	137
Possum Kingdom WSC	POSSUM KINGDOM WSC	392	383	379	376	375	375
Stamford	STAMFORD	237	227	223	219	218	218
Stevens County Regional SUD	STEPHENS REGIONAL SUD	107	98	94	91	89	89
Upper Leon MWD	COMANCHE	113	103	99	96	94	94
Upper Leon MWD	DE LEON	95	85	81	78	76	76
Upper Leon MWD	DUBLIN	94	84	80	76	75	75
Upper Leon MWD	GORMAN	88	79	74	71	70	70
Upper Leon MWD	HAMILTON	162	153	149	146	144	144

		Gallons per Capita per Day Water Use					
Authority Customer	**Water User Group**	**2020**	**2030**	**2040**	**2050**	**2060**	**2070**
Wellborn SUD	WELLBORN SUD	186	176	173	172	171	170
West Central Texas MWD	ABILENE	172	162	158	155	153	153
West Central Texas MWD	ALBANY	258	248	244	241	240	239
West Central Texas MWD	ANSON	137	127	123	119	118	118
West Central Texas MWD	BRECKENRIDGE	161	152	147	144	142	142
White Bluff Property Owners	WHITE BLUFF COMMUNITY WS	198	192	190	189	188	188
Whitney	WHITNEY	180	171	167	165	163	163

Data Sources for Appendix C:

TWDB Website 2016 Regional Water Plan Population Demand Projections for 2020-2070 and Municipal Water Demand Projections for 2020-2070 (acft);
http://www.twdb.texas.gov/waterplanning/data/projections/2017/demandproj.asp

2016 Brazos G Plan, Vol. 1, Table 2.4. Per Capita Water Use for Water User Groups in the Brazos G Regional Water Planning Area (GPCD)

APPENDIX D

Board Resolution Adopting Agricultural Water Pricing Policy

Brazos River Authority

RESOLUTION OF THE BOARD OF DIRECTORS OF THE BRAZOS RIVER AUTHORITY JULY 27-28, 2009

Agenda Item 19
Plan for Pricing Water for Agricultural Use

"**BE IT RESOLVED** by the Board of Directors of the Brazos River Authority that it recognizes the different economics between customers of Brazos River Authority System Water solely for Agricultural Uses, and other users of System Water; and

BE IT FURTHER RESOLVED that there are System Water and Interruptible Water customers whose use of the Brazos River Authority's water is for Agriculture as defined in the State of Texas Water Code, Chapter 11; and

BE IT FURTHER RESOLVED that the Agriculture Rate shall be an amount equal to Seventy Percent (70%) of the System Rate for each Fiscal Year and shall be offered to System Water and Interruptible Water customers that meet the definitions contained within this Resolution; and

BE IT FURTHER RESOLVED that the Agriculture Rate shall be adopted every subsequent Fiscal Year concurrent with the adoption of the Annual Budget and the System Rate for that Fiscal Year."

The aforementioned resolution was approved by the Board of Directors of the Brazos River Authority on **July 27, 2009,** to certify which witness my hand and seal.

Christopher DeCluitt
Presiding Officer

SUBSCRIBED AND SWORN TO BEFORE ME on this the 28th day of July, 2009, to certify which witness my hand and official seal.

TINA L. RUSSELL
NOTARY PUBLIC STATE OF TEXAS
COMMISSION EXPIRES:
NOVEMBER 25, 2010

Notary Public in and for the
State of Texas