2026 BRAZOS G INITIALLY PREPARED PLAN VOLUME I

Prepared for

The Brazos G Regional Water Planning Group

March 3, 2025

carollo®

TBPELS NO. F-558

In association with:

AGS Advanced Groundwater Solutions, LLC

PLUMMER

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BRAZOS G REGIONAL WATER PLANNING GROUP
Executive Committee

Voting Members

MEMBER	COUNTY	INTEREST
Mr. Wayne Wilson, (Chair)	Brazos	Agriculture
Ms. Gail Peek (Vice-Chair)	McLennan	Small Business
Mr. David Collinsworth (Secretary/Treasurer)	McLennan	River Authorities
Mr. Dirk Aaron	Bell	GMA 8
Mr. Dale Adams	Nolan	GMA 7
Mr. Ryan Bayle	Hood	Electric Generating Utilities
Mr. Charles Beseda	Hill	Water Utilities
Mr. David Blackburn	Bell	Counties
Mr. Jim Briggs	Williamson	Municipalities
Ms. Luci Dunn	Taylor	Environmental
Judge Scott M. Felton	McLennan	Counties
Mr. Alan Gardenhire	Milam	Industries
Mr. Zach Holland	Grimes	GMA 14
Commissioner Gary Myers	Stonewall	Counties
Ms. Jennifer Nations	Brazos	Municipalities
Mr. Gary Newman	Williamson	Public
Mr. Lynn Smith	Knox	GMA 6
Mr. Dale Spurgin	Jones	Agriculture
Ms. Kathy Turner Jones	Johnson	Water Districts
Ms. Lisa Tyer	McLennan	Municipalities
Mr. Patrick Wagner	Erath	Water Districts
Mr. Jerry K. “Kenny”Weldon	Erath	Municipalities
Mr. Gary Westbrook	Milam	GMA 12

Plan Administrator

Brazos River Authority

Ms. Pam Hanneman
Water Resources Regional Planner

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PREPARED BY:

DRAFT DOCUMENTS

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EXECUTIVE SUMMARY

ES.1 Background

Since 1957, the Texas Water Development Board (TWDB) has been charged with preparing a comprehensive and flexible long-term plan for the development, conservation, and management of the state's water resources. The current state water plan, Water for Texas, January 2022, was produced by the TWDB and based on approved regional water plans pursuant to requirements of Senate Bill 1 (SB1), enacted in 1997 by the 75th Legislature, and further modified by subsequent legislation. As stated in SB1, the purpose of the regional water planning effort is to:

> *"Provide for the orderly development, management, and conservation of water resources and preparation for and response to drought conditions in order that sufficient water will be available at a reasonable cost to ensure public health, safety, and welfare; further economic development; and protect the agricultural and natural resources of that particular region."*

SB1 also provides that future regulatory and financing decisions of the Texas Commission on Environmental Quality (TCEQ) and the TWDB be consistent with approved regional plans.

The TWDB is the state agency designated to coordinate the overall statewide planning effort. The Brazos G Area, which is comprised of all or portions of 37 counties (Figure ES-1), is one of the State's 16 regional water planning areas established by the TWDB. The Brazos G Regional Water Planning Group (BGRWPG) was originally appointed by the TWDB to represent a wide range of legislatively-defined stakeholder interests and acts as the steering and decision-making body of the regional planning effort. As members (who serve without pay) leave the planning group, new members are appointed by the BGRWPG through solicitation of nominations. The BGRWPG adopted bylaws to govern its operations and, in accordance with its bylaws, designated the Brazos River Authority (BRA) as the administrative agency and principal contractor to receive grants from the TWDB to develop the water plan. Ms. Pamela Hanneman currently serves as the Regional Planning Project Manager for the BRA. The BGRWPG selected Carollo Engineers, Inc., (Carollo) as the prime consultant for the planning and engineering tasks necessary for plan development. The firms of Plummer, Inc., (Plummer) and Advanced Groundwater Solutions, LLC., (AGS) have contributed as subconsultants to Carollo.

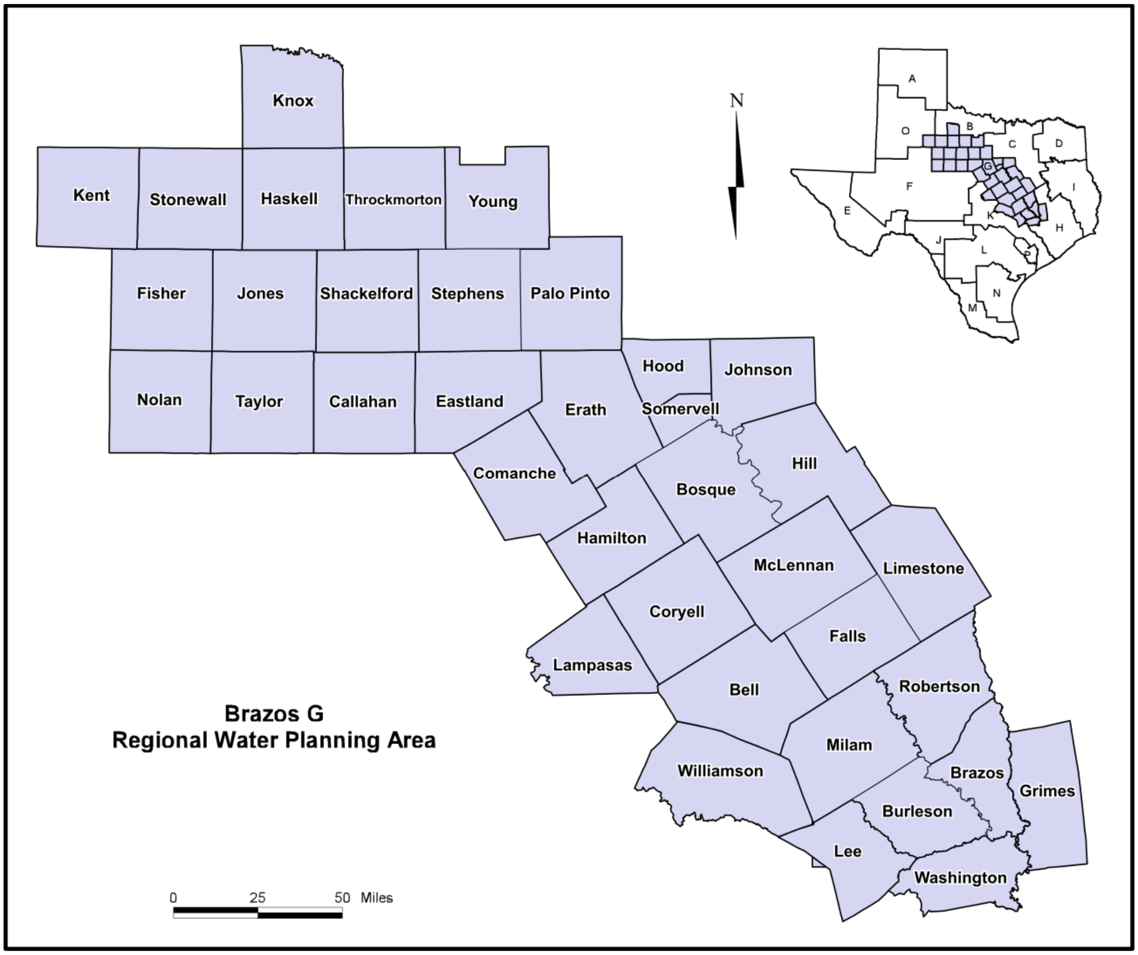

Figure ES-1 Brazos G Regional Water Planning Area

The BGRWPG consists of 23 voting members who represent the following 12 interest groups:

- The public.
- Counties.
- Municipalities.
- Industries.
- Agriculture.
- The environment.
- Small businesses.
- Electric-generating utilities.
- River authorities.
- Water districts.
- Water utilities.
- Groundwater management areas.

The BGRWPG also includes several non-voting members who participate in the deliberations of the BGRWPG and contribute excellent knowledge and insight to the group. Table ES-1 lists the voting and non-voting members and interest groups represented on the BGRWPG who contributed to the development of the 2026 Brazos G Regional Water Plan (both current and recently resigned).

The regional water plans are developed on a 5-year cycle, with previous plans developed in 2001, 2006, 2011, 2016, and 2021. In accordance with legislative and rule requirements, all of the regional water plans must be completed and adopted by October 20, 2025. The TWDB will then compile the 16 plans into the 2027 State Water Plan. The regional water plans will continue to be updated every 5 years.

Table ES-1 Current and Recent Brazos G RWPG Members

Interest Group	Name
Voting Members	
Agricultural	Judge Dale Spurgin Wayne Wilson (Chairman)
Counties	Judge David Blackburn Judge Scott M. Felton Commissioner Gary Myers
Electric Generating Utilities	Ryan Bayle
Environmental	Luci Dunn
Industry	Alan Gardenhire
Municipalities	Jim Briggs Jennifer Nations Lisa Tyer Jerry K. “Kenny” Weldon
Public	Gary Newman
River Authorities	David Collinsworth
Small Business	Gail L. Peek
Water Districts	Patrick Wagner Kathy Turner
Groundwater Management Areas	Dirk Aaron Dale Adams Zach Holland Lynn Smith Gary Westbrook
Water Utilities	Charles Beseda
Non-Voting Members	
Texas Water Development Board	John Maurer Jean Devlin (former)
Texas Parks and Wildlife Department	Jennifer Bronson-Wilson
Texas Department of Agriculture	Lauren Moore
Texas Sate Soil and Water Conservation Board	Allen Nash

The planning horizon to be used is the 50-year period from 2030 to 2080. This planning period allows for long-term forecasting of future water demands and supplies sufficiently in advance of needs to allow for appropriate water management measures to be implemented. As required by statute, the TWDB has promulgated planning rules and guidelines to focus the efforts and to provide for general consistency among the planning areas so that the regional plans can then be aggregated into the overall State Water Plan.

The 2026 Brazos G Regional Water Plan is organized in accordance with TWDB guidelines by chapter as follows.

ES	Executive Summary
Chapter 1	Description of the Brazos G Area
Chapter 2	Projected Population and Water Demands
Chapter 3	Evaluation of Current Water Supplies
Chapter 4	Comparison of Water Demands with Water Supplies to Determine Needs
Chapter 5	County and Wholesale Water Provider Plans (Volume I)
Chapter 5	Evaluation of Water Management Strategies (Volume II)
Chapter 6	Consistency with Long Term Protection of the State's Water, Agricultural and Natural Resources
Chapter 7	Drought Response Information, Activities and Recommendations
Chapter 8	Recommendations for Unique Stream Segments, Unique Reservoir Sites and Other Legislative Policy Recommendations
Chapter 9	Implementation and Comparison to the 2021 Brazos G Regional Water Plan
Chapter 10	Public Participation and Adoption of Plan
Appendices	Various appendices containing supporting information

ES.2 Description of the Brazos G Area

The Brazos G Area can be described by a single word - **diverse**. From the piney woods of Brazos and Grimes Counties to the rolling plains of Nolan County; from sparsely populated Stonewall County to rapidly-growing Williamson County, often listed as the fastest growing county in the nation; from the prodigious Carrizo-Wilcox Aquifer in the southeast to the meager dribbles from windmills in Shackelford County; from up to 50 inches of annual rainfall in the east to as low as 22 inches annually in the west; from the Chisholm Trail through Stephens County to the NAFTA trail known as Interstate Highway 35 (IH-35); these diverse characteristics make for a wide variation in water supplies, demands, and availability of affordable options to meet needs.

ES.3 Population and Water Demand Projections

The TWDB publishes draft population and water demand projections for each county in the state for use by the regional water planning groups. Population projections were developed for municipal water user groups (WUGs), which are defined as private or publicly owned water systems that provide more than 100 acre-feet per year (acft/yr) for municipal use, and "County-Other" to aggregate those people living outside the WUG-sized utilities. In the Brazos G Area, population projections were completed for 289 municipal WUGs, including 37 County-Other WUGs. Multiple municipal WUGs are located in more than one county, resulting in 389 individual municipal WUG projections when the portions of WUGs located in different counties are separated. Water demand projections were also developed for other types of non-municipal use on a county-wide basis, including manufacturing, steam-electric, mining, irrigation, and livestock uses.

Figure ES-2 illustrates population growth in the entire Brazos G Regional Water Planning Area (BGRWPA) for 1900 to 2020 and projected growth for 2030 to 2080.

Population trends may be further understood by dividing the planning region into three subregions: the northwestern Rolling Plains, the central IH-35 Corridor, and the southeastern Lower Basin. Figure ES-3 illustrates historical population growth in the three sub-regions from 1900 to 2020 and projected growth from 2030 to 2080. Projected growth is greatest in the IH-35 Corridor.

Water demand projections have been compiled for six categories of water use: (1) Municipal, (2) Manufacturing, (3) Steam-Electric Cooling, (4) Mining, (5) Irrigation, and (6) Livestock. Each of the non-municipal uses is aggregated on a county basis and is defined as a separate WUG within each county. The TWDB has developed and provided water demand projections for each of the five non-municipal WUGs in each of the 37 counties in the Brazos G Area.

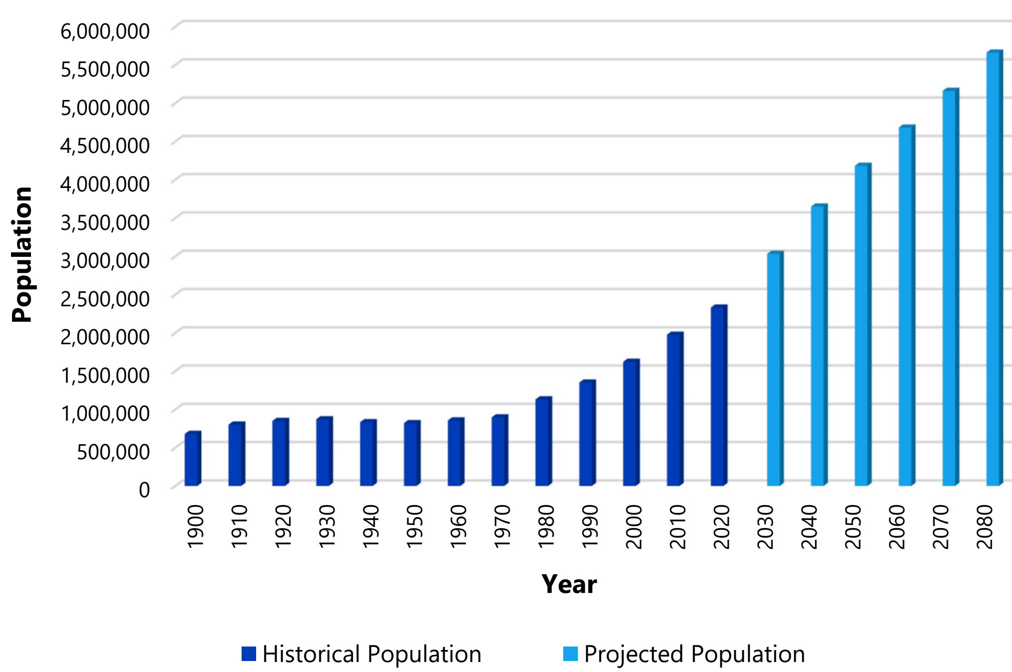

Figure ES-2 Historical and Projected Brazos G Area Population

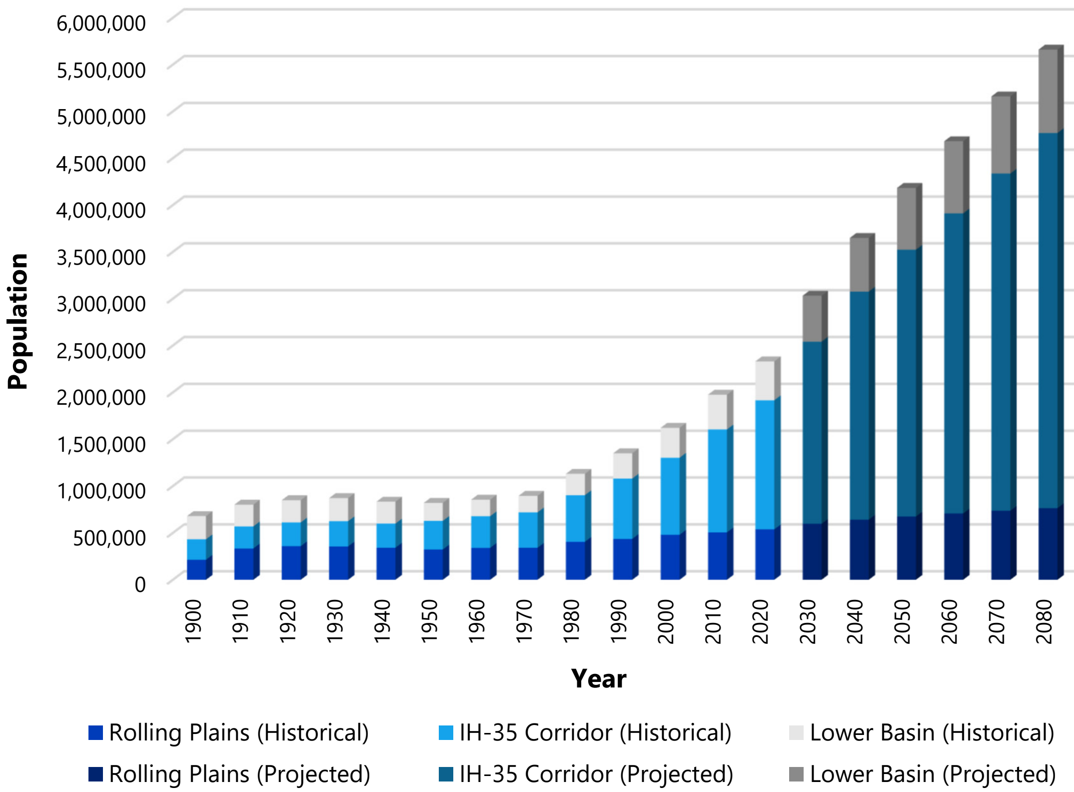

Figure ES-3 Historical and Projected Population by Subregion

Annual total water use for the region is projected to increase from 1,119,518 acft/yr in 2030 to 1,571,453 acft/yr in 2080, a 40 percent increase, as shown in Table ES-2. The six types of water use as percentages of total water use are shown for 2030 and 2080 in Figure ES-5. The projections indicate that municipal water use as percentages of the total water use will increase from 2030 to 2080, while steam electric, irrigation, manufacturing, and livestock water use are projected to decrease as percentages of the total. Water use for mining is projected to be constant between 2030 and 2080.

Table ES-2 Brazos G Area Total Water Demand by Type of Use (acre-feet/year)

Water Use	Historical (1)		Projections (1)					
	2010	2020	2030	2040	2050	2060	2070	2080
Municipal	326,414	383,011	552,334	654,908	746,902	832,014	915,785	1,002,767
Manufacturing	46,131	9,718	16,847	17,474	18,124	18,800	19,498	20,223
Steam-Electric	76,545	204,266	158,660	158,660	158,660	158,660	158,660	158,660
Mining	53,383	16,454	27,389	28,139	25,835	26,406	25,893	26,283
Irrigation	298,754	310,817	320,150	320,150	319,772	319,536	319,382	319,382
Livestock	51,943	44,064	44,138	44,138	44,138	44,138	44,138	44,138
Brazos G Total	**853,170**	**968,330**	**1,119,518**	**1,223,469**	**1,313,431**	**1,399,554**	**1,483,356**	**1,571,453**

Note:
(1) 2010 demand was obtained from the 2021 Plan, and the 2020 demand was obtained from the TWDB Water Use Survey. Projections from Texas Water Development Board.

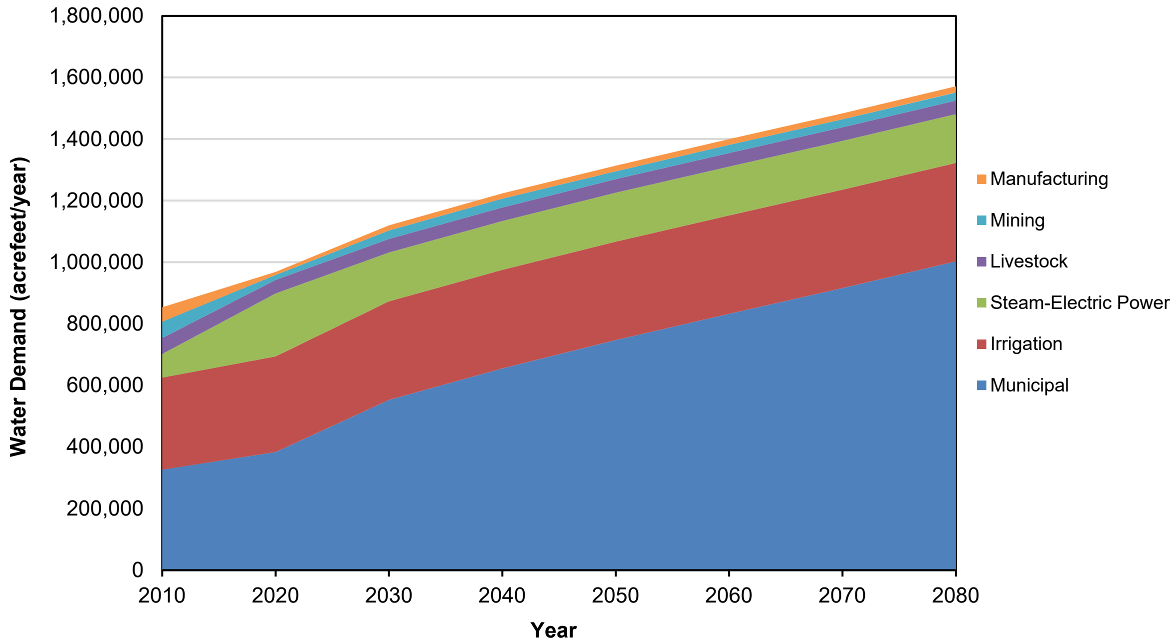

Figure ES-4 Projected Total Water Demand

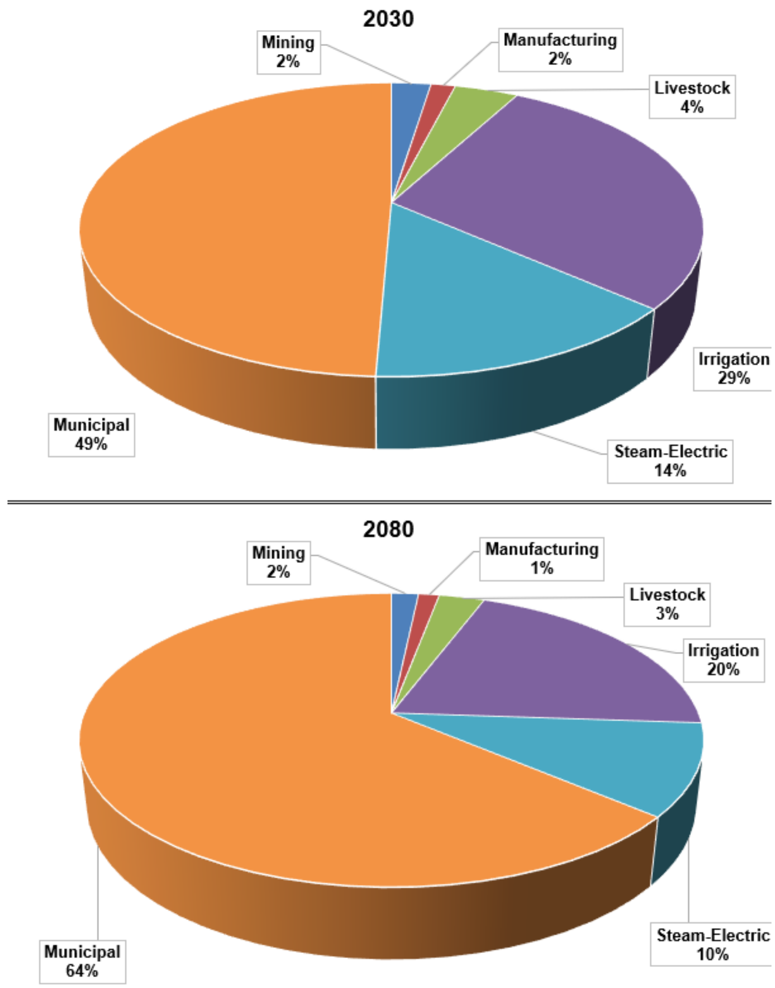

Figure ES-5 Total Water Demand by Type of Use in 2030 and 2080

ES.4 Water Supply

ES.1.1 Surface Water Supplies

Streamflow in the Brazos River and its tributaries, along with reservoirs in the Brazos River Basin, comprise a vast supply of surface water in the Brazos G Area. Diversion and use of this surface water occurs throughout the entire region with over 1,000 water rights currently issued. These water rights provide authorization for an owner to divert, store, and use the water; however, they do not guarantee that a dependable supply will be available from the water source. The availability of water to a water right is dependent on several factors, including hydrologic conditions (i.e., rainfall, runoff, spring flow), priority date of the water right, quantity of authorized storage, and any special conditions associated with the water right (i.e., instream flow requirements, maximum diversion rate). The principal tributaries to the Brazos River in the planning area are the Clear Fork, the Double Mountain Fork, the Salt Fork, Bosque River, Little River, Navasota River, and Yegua Creek. Major water supply reservoirs are owned by the BRA (three in the planning area), U.S. Army Corps of Engineers (nine in the area), West Central Texas MWD, the City of Abilene, and Texas Utilities. The western part of the area is heavily dependent on surface water sources, largely due to limited quantities of groundwater.

ES.1.1.1 Surface Water Rights

The State of Texas owns the surface water resources of the State, and issues water rights to utilize surface water. The TCEQ maintains a database of all active water rights referred to as "WRactive", which is available for download from the TCEQ website. The July 2024 version of this database indicates that TCEQ has issued 1,134 active water rights totaling 3,854,018 acft/yr of authorized diversions for the Brazos River Basin. Since 2020, three permanent water rights totaling 52,976 acft/yr have been issued. The summary statistics referenced herein are based on the information reflected in this July 2024 version of the database.

The Brazos G Area includes many of the water rights in the Brazos River Basin. A total of 987 water rights exists in the Brazos G portion of the Brazos River Basin, with a total authorized diversion of 1,457,202 acft/yr. In the Brazos G portion of the Brazos River Basin, 31 water rights (3.1 percent) make up 1,225,975 acft/yr (84.1 percent) of the authorized diversion volume. The remaining 956 water rights primarily consist of small irrigation rights distributed throughout the area. It is important to note that a small percentage of the water rights represent a large percentage of the total authorized diversion volume in the Brazos River Basin. The BRA System Operation Permit alone comprises 11 percent of the total authorized diversion volume. Forty-six other major water rights comprise 3,148,642 acft/yr (82 percent) of the authorized diversion volume. The BRA, Gulf Coast Water Authority, and Dow Chemical Company are the three largest water right holders and own approximately 71 percent of the total authorized diversion amount in the basin. The remaining 1,090 water rights primarily consist of the small irrigation rights distributed throughout the river basin. Figure ES-6 shows a comparison of significant water rights in the Brazos River Basin by number of rights and diversion volume.

The Brazos River Basin Water Availability Model (Brazos WAM) Run 3 maintained by the TCEQ for surface water permitting was used as the basis to determine surface water supply available to WUGs and WWPs in the Brazos G Area. The latest official WAM utilized for the purposes of the 2026 Brazos G Regional Water Plan now has an extended period of naturalized flow data from 1949 through 2018, reflecting the effects of more recent drought conditions than what was represented in the previous official model. The model input data has been modified by the BGRWPG to conservatively account for expected future return flows (discharge of wastewater effluent), future sedimentation conditions for major reservoirs, and existing subordination agreements. This resulting modified WAM is termed the "Brazos G WAM."

The firm yield - the 100% reliable amount that can be withdrawn annually through the drought of record - was computed for each major reservoir (greater than 5,000 acft authorized storage capacity), and smaller reservoirs that serve as water sources. Source availabilities for run-of-river water rights are based on the minimum annual supply (computed on a monthly basis). Surface water supplies were allocated to individual WUGs and WWPs from sources based upon a listing of water right ownership as maintained by TCEQ, and contractual agreements between water rights holders and wholesale customers. Supplies were constrained based upon facility limitations to access the raw water supply, such as intake capacity and water treatment plant capacity.

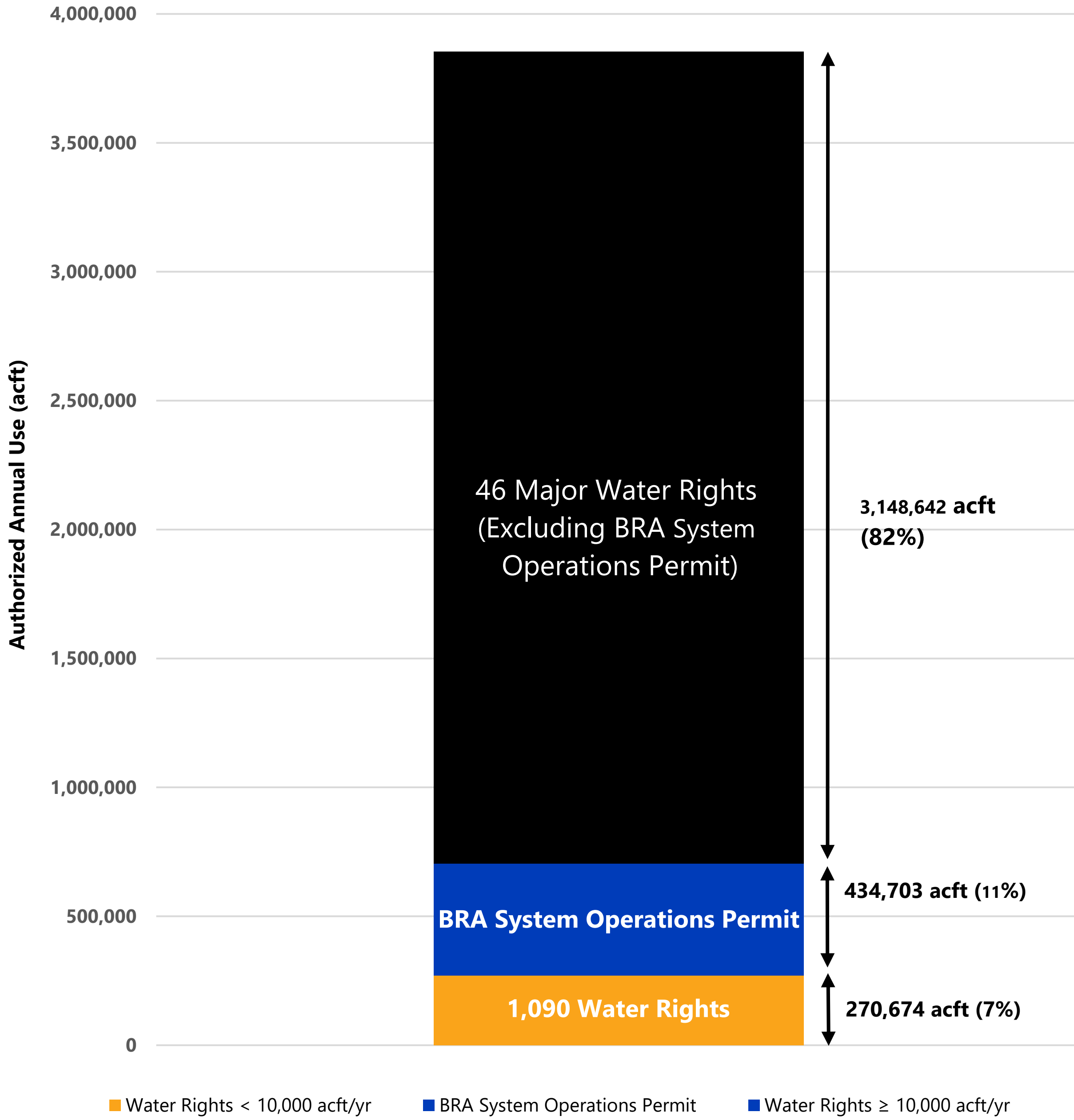

Figure ES-6 Distribution of Water Rights in the Region G Portion of the Brazos River Basin

ES.1.1.2 New Drought of Record

The drought of record has historically been considered the drought of the 1950's drought, which forms the basis for water supply determinations for most of the state. In some parts of the upper Brazos Basin, the drought of the 1990s has continued past the turn of the century, and in many places streamflow data indicate that its severity is greater than that of the drought that occurred in the 1950s. The region of Texas near Abilene has experienced drought conditions in almost all years from the early 1990s until 2016. An analysis of updated critical periods for reservoir yield analysis using the extended period for the Brazos G WAM, naturalized streamflows, and the Palmer Drought Severity Index indicates that a new drought of record has occurred in the upper Brazos Basin (above Possum Kingdom Reservoir), but that the 1950's drought should continue to be considered the drought of record for the mid and lower Brazos G Area.

ES.1.2 Groundwater Supplies

Groundwater supplies in 21 counties in the Brazos G Area are regulated by 13 Groundwater Conservation Districts (GCDs). These GCDs are part of Groundwater Management Areas 6, 7, 8, 12, and 14, which are tasked with determining Desired Future Conditions (DFCs) and the Modeled Available Groundwater (MAG) for the jointly regulated aquifers in their areas. The GCDs and GMAs affecting the Brazos G Area are shown in Figure ES-7.

In general terms, the MAG represents the annual volume of groundwater available which may be developed and, according to modeling, will still maintain aquifer parameters within the criteria established in the aquifer DFCs. When evaluating proposed pumping for regulatory approval, the MAG serves as a guideline and may be one of multiple guidelines referenced. However, for planning purposes, the MAGs are considered hard caps of which annual groundwater production cannot exceed.

Seventeen aquifers underlie parts of the Brazos G Area, including six of the major and eleven of the minor aquifers in Texas. If developed fully, these sources can provide a combined reliable supply of about 574,366 acft/yr, (2080 decade) based on the most recent MAGs and other availability estimates for aquifers without a MAG estimate. The Seymour Aquifer supplies significant quantities of water in the western part of the region. Other aquifers that are depended on in the western part of the region are the Blaine, Dockum, Cross Timbers, Edwards-Trinity (Plateau). The Trinity and Edwards-BFZ (Northern Segment) are heavily relied upon in the IH-35 corridor and to the west. In the eastern part of the region, the Carrizo-Wilcox and Brazos River Alluvium have a prolific water supply with lesser amounts pumped from the Gulf Coast, Queen City, Sparta, Trinity, Navasota River Alluvium and Yegua-Jackson Aquifers.

MAG was allocated to each existing user based upon currently installed well capacity for municipal WUGs and WWPs, and recent pumping estimates for county-aggregated WUGs. When the existing capacities exceeded the MAG, supplies were adjusted proportionally so that the MAG would not be exceeded, consistent with requirements for regional water planning.

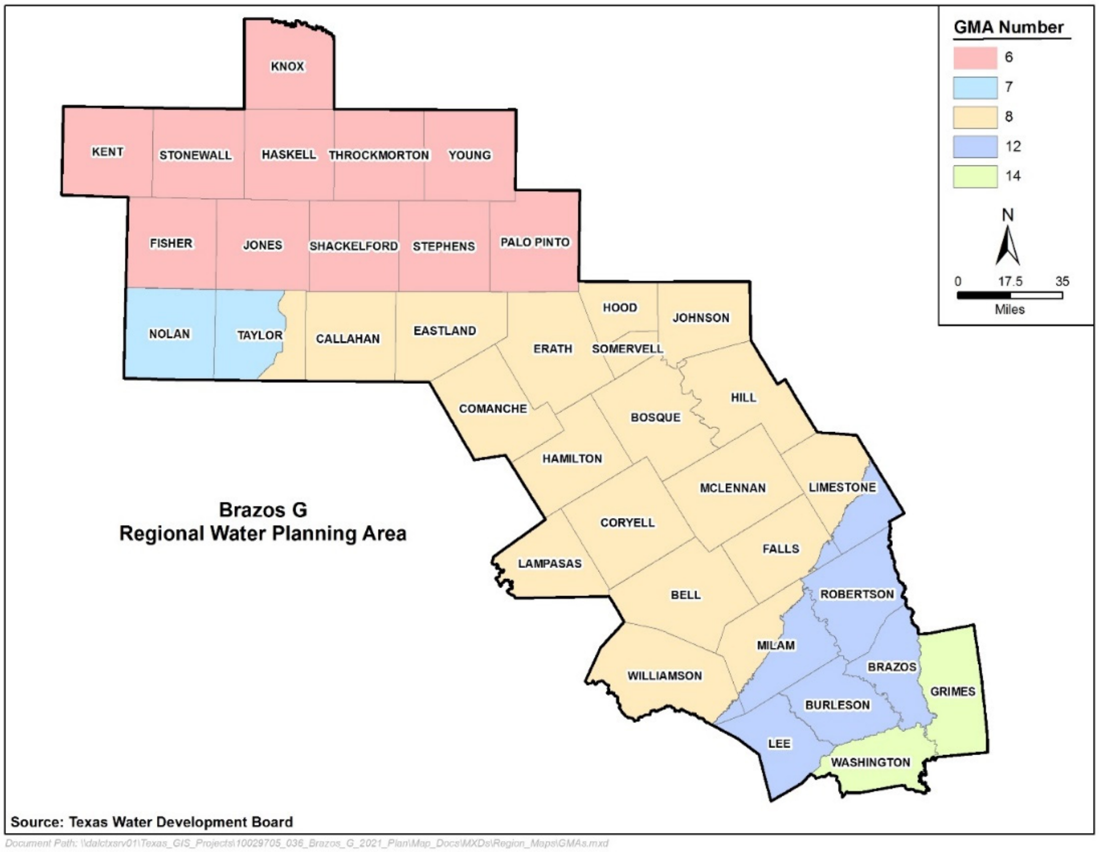

Figure ES-7 Groundwater Conservation Districts and Groundwater Management Areas Located Wholly or Partially in the Brazos G Area

ES.1.3 Water Quality

Natural salt pollution has been recognized as a serious and widespread water quality problem in the Brazos River Basin. No other pollution source, man-made or natural, has had the impact of the natural salt sources located in the upper basin. A substantial part of the salt load in the Brazos River is contributed by Croton Creek and Salt Croton Creek. The natural salt pollution producing area is a semi-arid region of salt and gypsum encrusted hills and canyon-like stream valleys. Numerous stream segments within the Brazos G Area are listed on the State's 303(d) list for bacteria levels that exceed the standards for contact recreation; however, bacteria, unlike salts, are easily managed through required conventional water treatment to meet drinking water standards. There are several special water quality studies that are on-going in the Brazos River Basin as described in the Brazos River Authority's 2022 Basin Summary Report. A list of special studies by basin is provided in Chapter 3. As the Brazos River flows to the Gulf, inflows from tributaries dilute the concentration of dissolved minerals, improving the quality of water.

ES.1.4 Supply and Demand Comparison

Supplies are compared with projected demands, and shortages (needs) or surpluses are computed for each WUG and WWP. Detailed tabulations of water needs from various database reports are presented in the Executive Summary Appendix. This database is referred to as DB27, as it serves as the technical repository of regional water planning data that will ultimately be used for the purposes of the 2027 State Water Plan. These standard TWDB DB27 Database Reports are hereby incorporated as part of the regional water plan, and may be accessed by:

1. Navigate to the TWDB Database Reports application at https://www3.twdb.texas.gov/apps/SARA/reports/list
2. Enter '2026 Regional Water Plan' into the "Report Name" field to filter to all DB27 reports associated with the 2026 Regional Water Plans.
3. Click on the report name hyperlink to load the desired report.
4. Enter planning region letter parameter, click view report.

A comparison of total supplies available (developed groundwater supplies and firm surface water) with demand for all use categories in the planning area shows a surplus in the 2030 planning decade, but an overall shortage past 2040. These mask surpluses that are projected to occur in individual water supply entities and WUGs. However, all 37 counties in the Brazos G Area are projected to have at least one municipal WUG shortage. A list of the reports available and incorporated herein is provided at the end of this Executive Summary.

ES.1.5 Water Supply Strategies to Meet Needs

The water management strategies in Table ES-3 were identified by the BGRWPG as potentially feasible to meet shortages. These strategies were evaluated by the consultant team and compared to criteria utilizing a formal process adopted by the BGRWPG. The methods by which the strategies were evaluated, and the technical evaluations of the potentially feasible water management strategies are presented in Volume II.

Table ES-3 Potentially Feasible Water Management Strategies Evaluated for the 2026 Brazos G Regional Water Plan

Chapter (Volume II)	*Water Management Strategy and Description*
2	**Water Conservation** (implement accelerated use of various water conservation techniques to achieve water savings above what is already included in the TWDB water demand projections)
3	**Wastewater Reuse** (use highly treated wastewater treatment plant effluent to meet non-potable and potable water needs)
4	**New Reservoirs** (new or updated evaluations of the following proposed new reservoirs) • Brushy Creek Reservoir • Cedar Ridge Reservoir • Coryell County Off-Channel Reservoir • City of Groesbeck Off-Channel Reservoir • NCTMWA Lake Creek Reservoir • New Throckmorton Reservoir • Turkey Peak Dam
5	**Groundwater** • City of Bryan Groundwater Strategies • City of College Station Groundwater Strategies • City of Georgetown Groundwater Strategies
6	**Conjunctive Use** (conjunctively use surface water supplies with available groundwater supplies) • Lake Granger Augmentation • Oak Creek Reservoir Conjunctive Operation
7	**Aquifer Storage and Recovery** (Inject or percolate excess surface water into groundwater aquifers, storing for future use) • Acton MUD ASR • City of Bryan ASR • City of College Station ASR • Lake Georgetown ASR • Lake Granger ASR • Fort Cavazos ASR
8	**Regional Water Supply Projects** • Bosque County Regional Project • Brushy Creek RUA Water Supply Project • East Williamson County Water Supply Project • Lake Belton to Stillhouse Hollow Pipeline • Lake Whitney Water Supply Project (Cleburne) • Rolling Plains Groundwater Conservation District Managed Aquifer Recharge Project • Somervell County Water Supply Project • West Texas Water Partnership Supply to Abilene (Region F evaluation)
9	**Augmentation of Existing Reservoir Supplies** • Lake Aquilla Storage Reallocation • Lake Granger Storage Reallocation • Lake Whitney Reallocation • Lake Waco Reallocation
10	**Brush Control** (increase deep percolation and discharge to streams by removing unwanted brush
11	**Miscellaneous Strategies** (various pipelines, treatment plants and groundwater wells to meet projected needs of water user groups and wholesale water providers)

ES.5 Water Plan Findings

Conservation is considered first as a water management strategy for all WUGs with identified needs before any other water management strategies. Second-Tier water needs are those water needs remaining after implementation of conservation and direct reuse strategies. A presentation of Second-Tier water needs for each WUG is included in Reports 7 and 8 in the Executive Summary Appendix. The individual plans for each WUG in Chapter 5 also include a presentation of water needs remaining after advanced conservation.

The 2026 Brazos G Regional Water Plan includes recommendations for 167,951 acft/yr of municipal conservation and water loss reduction savings and another 53,596 acft/yr for both direct and indirect wastewater reuse by 2080. The conservation savings are more than those already included in the TWDB demand projections. Conservation savings for municipal users reflect a 1% annual reduction in per capita consumption until a target of 140 gallons per capita per day (GPCD) is reached. Conservation recommendations for several entities in Williamson County go beyond this and call for a reduction to a target of 120 gpcd by 2080.

Water management strategies and projects recommended to meet water needs are presented for WUGs and WWPs in Chapter 5. Table ES-4 includes a summary of recommended strategies and projects.

Table ES-4 Summary of Strategies and Projects Recommended for WUGs and/or WWPs

Recommended Strategies and Projects	WUGs Receiving Supply	Supply Developed						Total Project Cost
		2030	2040	2050	2060	2070	2080	
Irrigation Conservation	19	7,271	12,121	16,523	16,408	16,649	16,649	$11,387,916
Manufacturing Conservation	9	312	546	792	818	847	879	$601,236
Mining Conservation	16	608	1,056	1,434	1,414	1,326	1,322	$989,064
Municipal Conservation	149	25,957	61,548	88,193	113,747	135,331	160,028	$110,030,292
ASR	15	31,321	52,049	52,153	54,528	56,564	60,690	$0
Increased or New WTP Capacity	14	9,517	15,897	16,366	16,470	16,617	15,706	$0
Municipal Water Loss Reduction	44	6,426	6,750	7,080	7,398	7,645	7,923	$0
Purchase of Water/Voluntary Redistribution	47	19,945	24,963	28,804	21,862	23,355	27,205	$0
Reuse	21	39,887	41,093	50,373	50,373	50,373	50,373	$0
Blaine Groundwater	4	971	923	880	843	810	810	$0
Brazos River Alluvium Groundwater	1	325	325	325	325	325	325	$0
Carrizo-Wilcox Groundwater	39	174,526	178,855	193,585	207,762	218,078	216,878	$0

Recommended Strategies and Projects	WUGs Receiving Supply	Supply Developed						Total Project Cost
		2030	2040	2050	2060	2070	2080	
Cross Timbers Groundwater	5	799	799	799	799	799	799	$0
Edwards Groundwater	7	1,468	1,468	1,468	1,468	2,083	2,083	$0
Edwards-BFZ Groundwater	1	3,071	12,900	12,900	12,900	25,010	25,010	$0
Ellenburger-San Saba Groundwater	1	73	83	97	115	133	133	$0
Gulf Coast Groundwater	7	2,383	2,600	2,248	1,928	1,860	1,860	$0
Marble Falls Groundwater	1	203	195	198	201	204	204	$0
Other Groundwater	1	30	30	30	30	30	30	$0
Queen City Groundwater	3	949	949	949	949	949	949	$0
Seymour Groundwater	3	445	447	447	450	453	456	$0
Sparta Groundwater	9	641	1,855	2,472	3,799	4,899	6,099	$0
Trinity Groundwater	46	26,631	25,471	26,253	27,166	28,221	28,242	$0
Woodbine Groundwater	6	383	382	383	607	1,445	1,445	$0
Yegua-Jackson Groundwater	6	1,913	4,678	4,678	4,674	4,732	5,768	$0
Bosque County Regional Project	5	0	1,070	1,070	1,070	1,070	1,070	$0
Brushy Creek Reservoir	1	0	2,000	2,000	2,000	2,000	2,000	$0
Cedar Ridge Reservoir	12	0	26,273	26,293	26,319	26,342	26,342	$0
Coryell County OCR	3	0	0	1,827	1,827	1,827	1,827	$0
East Williamson County Water Supply Plan	1	0	0	56	56	56	56	$0
Georgetown - North Option Alternative	1	50,000	50,000	50,000	50,000	50,000	50,000	$0
Groesbeck OCR	1	0	1,750	1,750	1,750	1,750	1,750	$0
Lake Aquilla Pool Reallocation	2	0	0	0	1,950	1,950	1,950	$0
Lake Granger Augmentation-Ph 2 (Surface Water)	3	0	2,414	2,455	2,525	2,593	2,613	$0

Recommended Strategies and Projects	WUGs Receiving Supply	Supply Developed						Total Project Cost
		2030	2040	2050	2060	2070	2080	
Lake Waco Reallocation	1	0	0	1,700	1,700	1,700	1,700	$0
Lake Whitney Overdrafting with Off-Channel Reservoir	1	0	0	5,320	5,320	5,320	5,320	$0
NCTMWA Lake Creek Reservoir	5	0	0	6,090	6,090	6,090	6,090	$0
New Throckmorton Reservoir	2	0	0	1,280	1,280	1,280	1,280	$0
Oak Creek Reservoir-Conjunctive Use	2	475	512	549	586	623	660	$0
Storage Reallocation of Lake Whitney	3	0	0	93,355	93,355	93,355	93,355	$0
Turkey Peak Reservoir	3	5,730	5,730	5,730	5,730	5,730	5,730	$0

New supplies of water into the Brazos G Area total 565,550acft/yr by 2080, comprised of newly developed groundwater, supply transferred from other regions, newly developed surface water supplies, and reuse, as well as supplies made available through conservation, water loss reduction, and augmentation of existing facilities, including water treatment plant expansions. These totals do not reflect water trades between users of existing supplies in Brazos G but represent entirely new supplies to the Brazos G Area. Total project costs for these new supplies exceed $9 billion.

Overdrafting of Lakes Georgetown and Granger when the reservoirs are nearly full and injecting part of this supply into the Trinity Aquifer through Aquifer Storage and Recovery (ASR) projects can yield an additional 20,545 acft/yr of supply when the ASR well field is operated in conjunction with the reservoirs. Similar ASR strategies for the Simsboro, Sparta, Queen City, and Trinity (McLennan County) aquifers add an additional 22,138 acft/yr of supply.

Williamson County is projected to experience substantial growth in County-Other, which is specifically outside of areas that will be served by existing WUGs. The 2026 Plan includes multiple strategies to meet the needs of Williamson County-Other users, but successful development of these projects will require considerable cooperation amongst current WUGs and WWPs, and possibly formation of - or collaboration with - a regional provider to develop the large projects needed to meet these needs. Similar plans are presently being considered in Bell County.

Existing supplies combined with recommended water management strategies do not exceed the Modeled Available Groundwater (MAG) from any aquifer in any county. This is a planning requirement which limits the number of available water management strategies in some cases. Nevertheless, GCDs are not required to utilize the applicable MAG for permitting and regulation of their jurisdiction; thus, the permitting of supplies may exceed amounts of source availability shown herein. Future utilization of existing supplies and new water management strategies will increase use from the water supply sources available to users in the Brazos G Area.

Alternative water management strategies are presented in the Executive Summary Appendix. An alternative strategy can replace a recommended strategy by a vote of the regional water planning group, avoiding the need for new availability analyses and costing of the alternative strategy. Such a change would still necessitate review and approval from the TWDB as part of the regional planning process.

The BGRWPG has recommended that irrigation, manufacturing, mining and steam-electric needs in some counties remain unmet, because there are no water management strategies identified that can economically meet those needs. In addition, municipal needs remain unmet due to required infrastructure not being available or feasible, or other information exists indicating a strategy would not be feasibly implemented by the WUG or WWP. This has been a particular focus area of the BGRWPG, as there are cases where existing groundwater permit amounts exceed the MAGs for a given area, and thus recommending a different strategy would be infeasible. In such cases, the BGRWPG elected to avoid recommending an infeasible strategy. It should be noted, however, that these needs are typically only unmet should a drought of severity equivalent to the drought of record occur prior to strategies scheduled to be in place. A summary of unmet needs is presented in Table ES-5.

Implementation of the 2026 Brazos G Regional Water Plan provides for the development of new water supplies that will be reliable in the event of a repeat of the most severe drought on record. Implementation of all recommended water management strategies would often provide supplies sufficient to meet more than the projected needs with which the strategies are associated.

Table ES-5 Needs for WUGs Left Unmet in the 2026 Brazos G Regional Water Plan

County	Water User Group	Needs Left Unmet (acft/yr)					
		2030	2040	2050	2060	2070	2080
Municipal WUGs							
Stonewall	Aspermont	16	0	0	0	0	0
Bell	Bell County WCID 3	132	401	894	1,387	1,509	1,629
Bell	Belton	0	0	0	256	294	817
Knox	Benjamin	21	19	0	0	0	0
Johnson	Bethesda WSC	157	143	396	392	24	655
Limestone	Bistone Municipal Water Supply District	0	10	73	57	20	75
Hill	Brandon Irene WSC	52	40	13	0	0	13
Williamson	Brushy Creek MUD	479	108	0	0	8	28
Johnson	Burleson	95	220	269	520	612	1,622
Williamson	Cedar Park	2,630	919	0	0	0	0
Falls	Cego-Durango WSC	0	6	34	58	89	133
Bell	Central Texas College District	145	128	111	93	75	75
Coryell	Copperas Cove	0	991	2,286	3,119	3,424	1,924
Lampasas	Copperas Cove	0	35	88	134	154	88
Lampasas	Corix Utilities Texas Inc	516	526	545	554	564	571
Bell	County-Other, Bell	473	564	598	536	163	11
Comanche	County-Other, Comanche	1	0	0	0	0	0
Grimes	County-Other, Grimes	199	229	255	265	268	261

County	Water User Group	Needs Left Unmet (acft/yr)					
		2030	2040	2050	2060	2070	2080
Hill	County-Other, Hill	127	134	153	175	185	183
Hood	County-Other, Hood	539	1,024	1,900	2,759	3,181	3,471
Lee	County-Other, Lee	5	2	0	0	0	0
McLennan	County-Other, McLennan	0	169	214	232	249	250
Robertson	County-Other, Robertson	44	15	0	0	0	0
Washington	County-Other, Washington	1	1	1	0	0	0
Williamson	County-Other, Williamson	2,336	4,804	6,540	13,690	14,128	19,491
Young	County-Other, Young	41	56	66	94	88	103
Bosque	Cross Country WSC	0	0	0	0	0	5
McLennan	Cross Country WSC	0	0	0	0	0	131
Johnson	Crowley	3	7	12	18	25	33
Hill	Double Diamond Utilities	35	0	0	0	0	0
Palo Pinto	Double Diamond Utilities	346	310	273	232	168	95
Bell	Elm Creek WSC	73	93	106	90	74	97
Coryell	Elm Creek WSC	22	22	23	17	11	9
McLennan	Elm Creek WSC	0	0	3	0	0	11
Williamson	Florence	18	18	20	21	23	25
Stephens	Fort Belknap WSC	0	0	0	0	2	4
Young	Fort Belknap WSC	0	0	0	17	21	64
Coryell	Fort Gates WSC	154	118	96	94	94	92
Throckmorton	Fort Griffin SUD	9	5	5	4	2	0
Johnson	Fort Worth	0	0	209	420	601	660
Coryell	Gatesville	128	0	0	0	0	0
Bell	Georgetown	0	0	200	0	223	256
Williamson	Georgetown	0	1,172	25,304	39,666	41,125	55,201
McLennan	Gholson WSC	0	0	49	0	0	79
Johnson	Godley	0	0	0	0	27	55
Palo Pinto	Gordon	27	5	0	0	0	0
Young	Graham	1,356	1,097	253	89	0	0
Limestone	Groesbeck	537	0	0	0	0	0
Bell	Harker Heights	0	0	171	311	0	0
Haskell	Haskell	538	473	0	0	0	0
Bosque	Hilco United Services	204	194	192	210	228	248
Hill	Hilco United Services	736	667	629	645	668	691
Bosque	Hog Creek WSC	18	10	2	0	0	0
McLennan	Hog Creek WSC	73	42	10	0	0	0
Williamson	Hutto	620	982	1,751	3,067	5,164	9,041

County	Water User Group	Needs Left Unmet (acft/yr)					
		2030	2040	2050	2060	2070	2080
Hill	Itasca	1	1	1	1	0	1
Bell	Jarrell-Schwertner	183	216	237	256	279	300
Williamson	Jarrell-Schwertner	2,443	3,131	3,565	4,011	4,482	4,964
Johnson	Johnson County SUD	620	470	866	1,172	1,095	2,495
Williamson	Jonah Water SUD	1,690	3,273	5,212	7,824	10,759	14,062
Bell	Killeen	0	0	0	0	624	4,203
Knox	Knox City	163	138	0	0	0	0
Lampasas	Lampasas	291	337	482	612	677	652
Williamson	Leander	1,019	100	530	48	1,145	1,499
Falls	Levi WSC	89	104	112	105	118	138
Johnson	Mansfield	990	1,446	2,010	2,640	3,169	3,726
McLennan	McGregor	39	0	0	0	0	0
Limestone	Mexia	767	729	685	657	636	603
Johnson	Mountain Peak SUD	320	541	849	1,328	1,902	2,634
Knox	Munday	202	183	0	0	0	0
Hill	Navarro Mills WSC	0	0	0	1	1	1
Taylor	North Runnels WSC	68	77	85	93	103	114
Williamson	Paloma Lake MUD 1	128	134	137	138	138	138
Williamson	Paloma Lake MUD 2	103	108	110	111	111	111
Hill	Post Oak SUD	115	80	55	42	35	36
Limestone	Post Oak SUD	15	8	4	2	1	1
Limestone	Prairie Hill WSC	128	110	101	96	92	88
McLennan	Prairie Hill WSC	128	132	142	159	179	201
Hill	Rio Vista	1	1	1	1	1	1
Johnson	Rio Vista	0	0	0	0	6	46
Williamson	Round Rock	804	1,037	8,111	9,495	10,788	11,782
Williamson	Sonterra MUD	936	2,267	3,843	5,551	7,474	9,638
Erath	Stephenville	0	0	0	0	102	865
Williamson	Taylor	1,801	3,238	4,870	6,391	8,094	9,995
Brazos	Texas A&M University	3,392	1,086	0	0	0	0
McLennan	Texas State Technical College	139	0	0	0	0	0
Bell	The Grove WSC	0	0	4	11	16	49
Coryell	The Grove WSC	0	0	1	2	2	7
Milam	Thorndale	63	78	96	113	126	147
Throckmorton	Throckmorton	84	71	0	0	0	0
Brazos	Wickson Creek SUD	0	0	0	0	0	39
Williamson	Williamson County WSID 3	40	155	359	643	966	1,333

County	Water User Group	Needs Left Unmet (acft/yr)					
		2030	2040	2050	2060	2070	2080
Non-Municipal WUGs							
Bell	Irrigation	31	0	0	0	0	0
Comanche	Irrigation	8,288	7,673	7,074	7,101	7,144	7,178
Grimes	Irrigation	8	4	1	1	1	1
Hamilton	Irrigation	0	0	0	3	6	7
Haskell	Irrigation	6,562	0	0	0	0	0
Johnson	Irrigation	229	217	207	207	207	207
Knox	Irrigation	8,629	8,165	6,267	3,758	5,787	6,000
McLennan	Irrigation	111	9	0	0	0	0
Nolan	Irrigation	9,287	9,056	8,441	8,199	8,038	8,038
Robertson	Irrigation	11,219	9,741	8,536	8,652	8,757	8,757
Stephens	Irrigation	87	84	81	81	81	81
Taylor	Irrigation	1,008	409	409	409	409	409
Williamson	Irrigation	212	206	198	198	198	198
Young	Irrigation	194	184	174	174	174	174
Comanche	Livestock	784	784	784	784	784	784
Palo Pinto	Livestock	0	0	34	73	109	144
Somervell	Livestock	21	21	21	21	21	21
Eastland	Manufacturing	0	0	0	0	0	15
Lampasas	Manufacturing	37	45	49	58	61	53
Limestone	Manufacturing	220	223	226	234	241	251
Taylor	Manufacturing	0	0	0	402	526	0
Burleson	Mining	3,384	3,273	3,161	3,161	3,161	3,161
Eastland	Mining	222	235	220	235	222	222
Haskell	Mining	4	4	4	4	4	4
Limestone	Mining	2,923	2,892	2,858	2,878	1,953	2,019
Somervell	Mining	833	898	959	1,031	1,089	1,129
Taylor	Mining	368	172	199	228	250	256
Limestone	Steam-Electric Power	989	1,173	1,904	2,594	3,244	3,877
Robertson	Steam-Electric Power	4,900	5,084	0	0	0	0
Somervell	Steam-Electric Power	9,181	9,537	10,765	12,052	13,393	14,714
Young	Steam-Electric Power	610	633	659	633	596	628
Total Municipal		***29,668***	***35,010***	***76,212***	***110,725***	***126,612***	***168,066***
Total Irrigation		***45,865***	***35,748***	***31,388***	***28,783***	***30,802***	***31,050***
Total Livestock		***805***	***805***	***839***	***878***	***914***	***949***
Total Manufacturing		***257***	***268***	***275***	***694***	***828***	***319***
Total Mining		***7,734***	***7,474***	***7,401***	***7,537***	***6,679***	***6,791***
Total Steam-Electric		***15,680***	***16,427***	***13,328***	***15,279***	***17,233***	***19,219***
Total Brazos G		***100,009***	***95,732***	***129,443***	***163,896***	***183,068***	***226,394***

ES.6 Other Aspects of the 2026 Brazos G Regional Water Plan

In addition to providing a roadmap for development of supplies to meet future water needs in the basin, the 2026 Brazos G Regional Water Plan includes other elements of value and interest to water supply managers and others in the Brazos G Area.

- The plan provides a concise summary of physiographic, hydrologic and natural resources in the Brazos G Area.
- The plan provides a comprehensive understanding of how water supplies have been developed and are managed in the Brazos G Area.
- The plan provides information on appropriate droughts of record in the Brazos G Area.
- The plan provides recommendations for drought management and emergency supply measures that may assist water managers with developing plans for their systems.
- The plan includes information on how the BGRWPG conducted outreach specifically to rural entities in the planning area to collect and evaluate information to support plan development, including keeping track of which rural entities were contacted by the BGRWPG's technical consultant, which entities were not responsive to RWPG contact efforts, and including a summary of the rural outreach efforts. Particular focus was given to those rural public water systems that had self-reported water restrictions to TCEQ due to water supply issues during this planning cycle, reported to TCEQ that they had less than 180 days of water supply remaining during this planning cycle, have not previously engaged in the regional planning process, and have already been identified as facing significant near-term shortages under drought conditions in previous regional water planning.
- The plan includes recommendations to the TWDB and the Texas Legislature regarding key water policy issues and the direction of water supply management in Texas.
- The plan includes those WUGs identified as not having engaged with the BGRWPG towards development of the 2026 Initially Prepared Plan to date.

ES.7 Executive Summary Appendix – Required Reports from DB27 (reflecting database entries as of January 29, 2025)

The database utilized for this round of planning is referred to as DB27, as it serves as the technical repository of regional water planning data that will ultimately be used for the purposes of the 2027 State Water Plan. These standard TWDB DB27 Database Reports are part of the regional water plan, and may be accessed at https://www3.twdb.texas.gov/apps/SARA/reports/list.

Report	Description
1	WUG Population
2	WUG Demand
3	Source Availability
4	WUG Existing Water Supply
5	WUG Needs/Surplus
6	WUG Second-Tier Identified Water Need
7	WUG Data Comparison to 2021 RWP
8	Source Data Comparison to 2021 RWP
9	WUG Unmet Needs
10a	Recommended WUG Water Management Strategies
11	Recommended Projects Associated with Water Management Strategies
12	Alternative WUG Water Management Strategies
13	Alternative Projects Associated with Water Management Strategies
14	WUG Management Supply Factor
15	Recommended Water Management Strategy Supply Associated with a new or amended IBT Permit
16	WUG Recommended WMS Supply Associated with a new or amended IBT Permit and Total Recommended Conservation WMS Supply
17	Sponsored Recommended WMS Supplies Unallocated to WUGs
18	MWP Existing Sales and Transfers
19	MWP WMS Summary

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CHAPTER 1 DESCRIPTION OF THE PLANNING AREA

1.1 Background

Senate Bill 1 (SB1), which was passed into law in June 1997 and enacted by the 75th Texas Legislature, stemmed from increased awareness of Texas' vulnerability to drought and of the limitations of existing water supplies to meet the needs of the state's growing population. Senate Bill 2 (SB2), enacted in September 2001, expanded on the regional water planning process as created by SB1, and provided for further analysis and planning for water resources in the state. With rapidly growing populations, the need to adequately plan for existing and future water needs is vital to the economic health of the region and State. Some areas of the State are already facing near-term water shortages, and the projected population is expected to double by 2060. The purpose of SB1 and SB2 is to ensure that the water needs of all Texans are met in the 21st century.

The SB1/SB2 legislation calls for a "bottom up" water planning process wherein Regional Water Planning Groups (RWPGs) are formed with members representing a minimum of 11 different interests, including the environment, industry, municipalities, water authorities, and the public. The Texas Water Development Board (TWDB) has established 16 regional water planning areas: each with its own RWPG. Each RWPG is tasked with preparing a regional water plan for its area that assesses the available water supplies, the projected demands on these supplies and identifies a means to meet future water needs while maintaining long-term protection of the State's resources.

In accordance with SB2 (as amended), all the regional water plans must be completed, adopted and submitted to the TWDB by October 20, 2025. The TWDB will approve and compile the 16 regional plans into the 2027 State Water Plan. The regional and state water plans will continue to be updated every 5 years.

1.1.1 Brazos G Regional Water Planning Area

The Brazos G Regional Water Planning Area (BGRWPA), shown in Figure 1.1, comprises all or portions of 37 central Texas counties. The Brazos G Area is about 31,600 square miles in area, or 12 percent of the State's total area. About 90 percent of the region lies in the Brazos River Basin. Figure 1.2 shows the major features of the BGRWPA, such as major cities, reservoirs, and highways. This figure also shows that parts of several counties extend into the Red, Trinity, Colorado, and San Jacinto River Basins. Cities in the region with current populations greater than 50,000 are Abilene, Bryan, Cedar Park, College Station, Georgetown, Killeen, Leander, Round Rock, Temple, and Waco.[1]

The region's geography varies from the rugged, uneven terrain and sandy soils of Kent and Knox Counties in the northwest to the hilly, forested areas and rich soils in Grimes and Washington Counties in the southeast. In the central part of the region are the Blackland Prairies in Hill and McLennan Counties.[2]

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[1] U.S. Census Bureau, *2020 Census*, https://www.census.gov/programs-surveys/decennial-census/decade/2020/2020-census-results.html.

[2] The Dallas Morning News, *1997-1998 Texas Almanac*, 1998.

Members of the Brazos G RWPG who contributed to the development of the 2026 Brazos G Regional Water Plan are listed in Table 1.1. These members represent 12 interests: the public, counties, municipalities, industries, agriculture, the environment, small businesses, electric-generating utilities, river authorities, water districts, groundwater districts and water utilities. The Brazos G RWPG has retained the services of engineering firms and other specialists to assist the RWPG with the preparation of the regional plan, and it has designated the Brazos River Authority (BRA) as its administrative contracting agency.

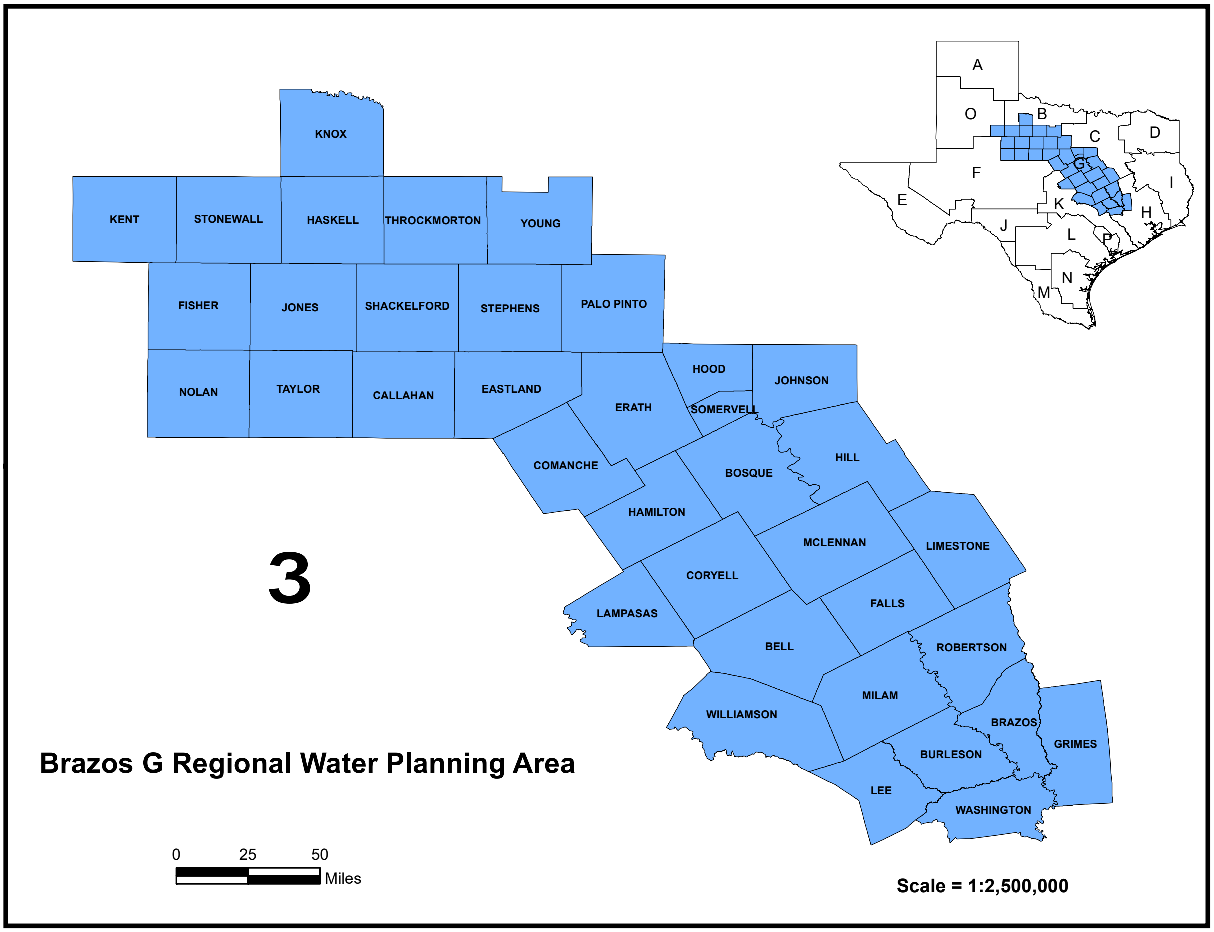

Figure 1.1 Location Map

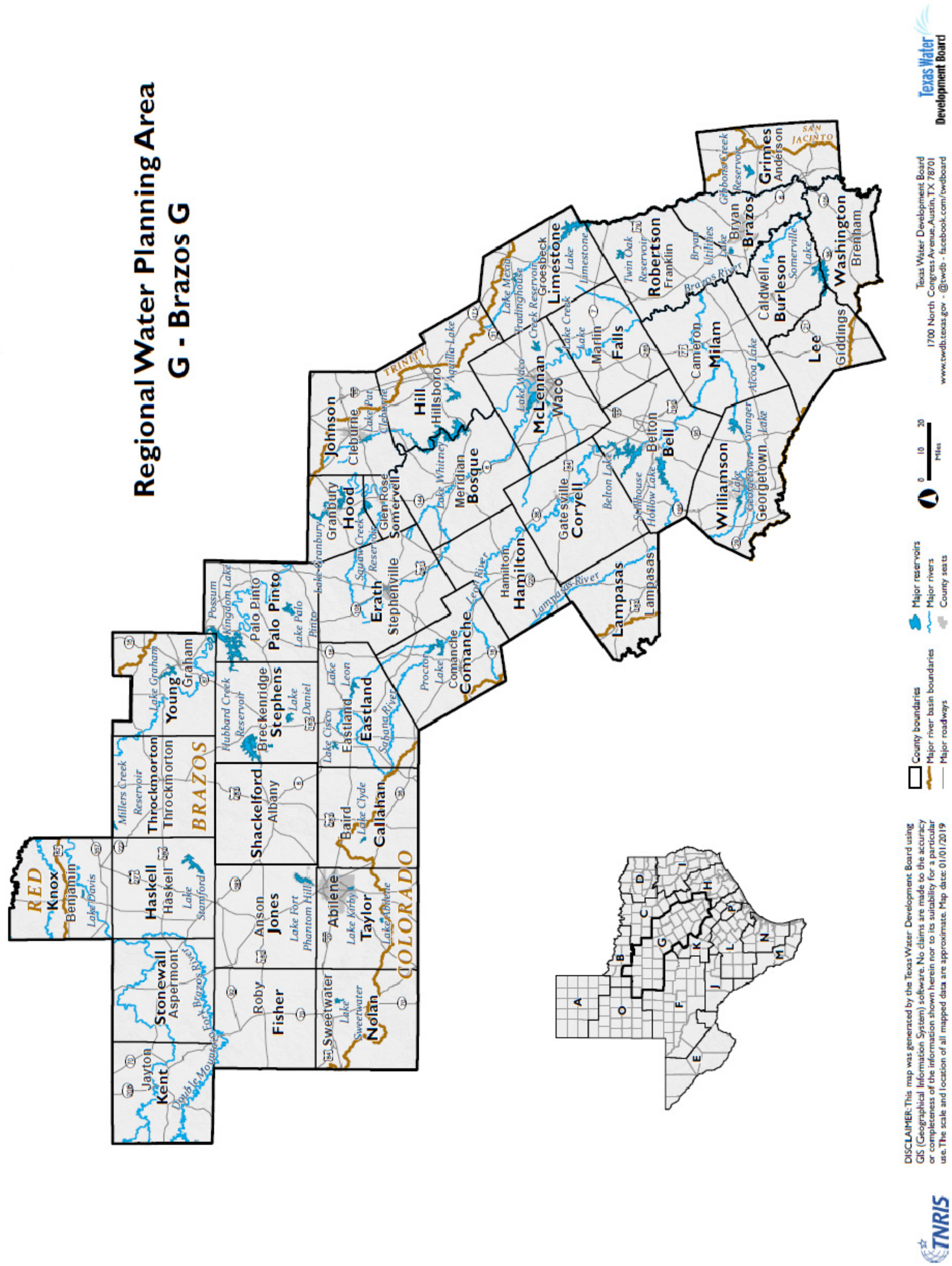

Figure 1.2 Major Features of the Brazos G Area

Table 1.1 Current and Recent Brazos G RWPG Members

Interest Group	Name
Voting Members	
Agricultural	Judge Dale Spurgin Wayne Wilson (Chairman)
Counties	Judge David Blackburn Judge Scott M. Felton Commissioner Gary Myers
Electric Generating Utilities	Ryan Bayle
Environmental	Luci Dunn
Industry	Alan Gardenhire
Municipalities	Jim Briggs Jennifer Nations Lisa Tyer Jerry K. “Kenny” Weldon
Public	Gary Newman
River Authorities	David Collinsworth
Small Business	Gail L. Peek
Water Districts	Patrick Wagner Kathy Turner
Groundwater Management Areas	Dirk Aaron Dale Adams Zach Holland Lynn Smith Gary Westbrook
Water Utilities	Charles Beseda
Non-Voting Members	
Texas Water Development Board	John Maurer Jean Devlin (former)
Texas Parks and Wildlife Department	Jennifer Bronson-Wilson
Texas Department of Agriculture	Lauren Moore
Texas State Soil and Water Conservation Board	Allen Nash

1.2 Population

1.2.1 Regional Trends

Figure 1.3 illustrates population growth in the entire BGRWPA for 1900 to 2020 and projected growth for 2030 to 2080. Table A.1 in Appendix A gives historical population data for each county in the BGRWPA, as well as regional and State population totals, for 1990 to 2020.

From 1900 to 1970, the population in the Brazos G Area grew slowly at an average rate of 0.4 percent per year from 680,093 people to 895,682. During the same period, the total population of Texas grew at an average rate of 1.9 percent annually, from 3,048,710 to 11,196,730. Beginning in the 1970s, however, both the State's and the region's population began to increase at faster rates. Growth in the region was about 2 percent annually, which approximates the State's total growth rate of 2 percent. Population in the BGRWPA is expected to increase by an average of 1.6 percent annually, reaching 5.66 million by 2080. This is roughly double the census population in 2020.

Population trends may be further understood by dividing the BGRWPA into three subregions: the northwestern Rolling Plains, the central IH-35 Corridor, and the southeastern Lower Basin. Table A.2 in Appendix A provides historical population data for all counties in each subregion from 1900 to 2020.

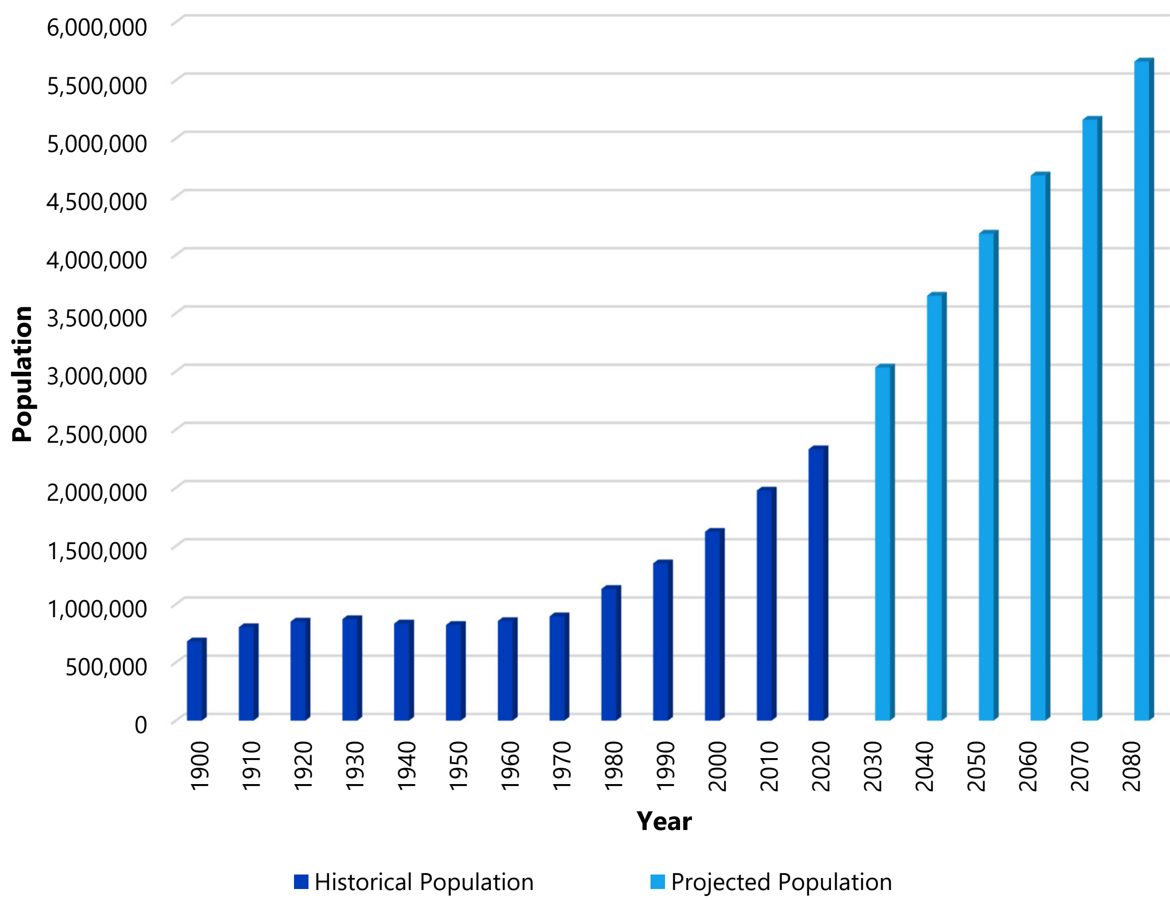

Figure 1.3 Historical and Projected BGWRPA Population

Figure 1.4 illustrates historical population growth in the three subregions from 1900 to 2020 and projected growth from 2030 to 2080. Figure 1.5 and Figure 1.6 illustrate population distribution by county for years 2030 and 2080, respectively. The greatest growth is projected to occur along the IH-35 corridor, which connects some of the larger cities in the region and the state. Table 1.2 presents 2020 populations and projected populations for 2030 and 2080 for the major cities in each subregion. Major cities are defined as those having at least 10,000 people in 2020. This table also presents the percent change in populations from 2030 to 2080 in each city. The overall division of the population between large cities and rural areas is expected to increase from 61.0 percent in 2020 to 65.0 percent by 2080.

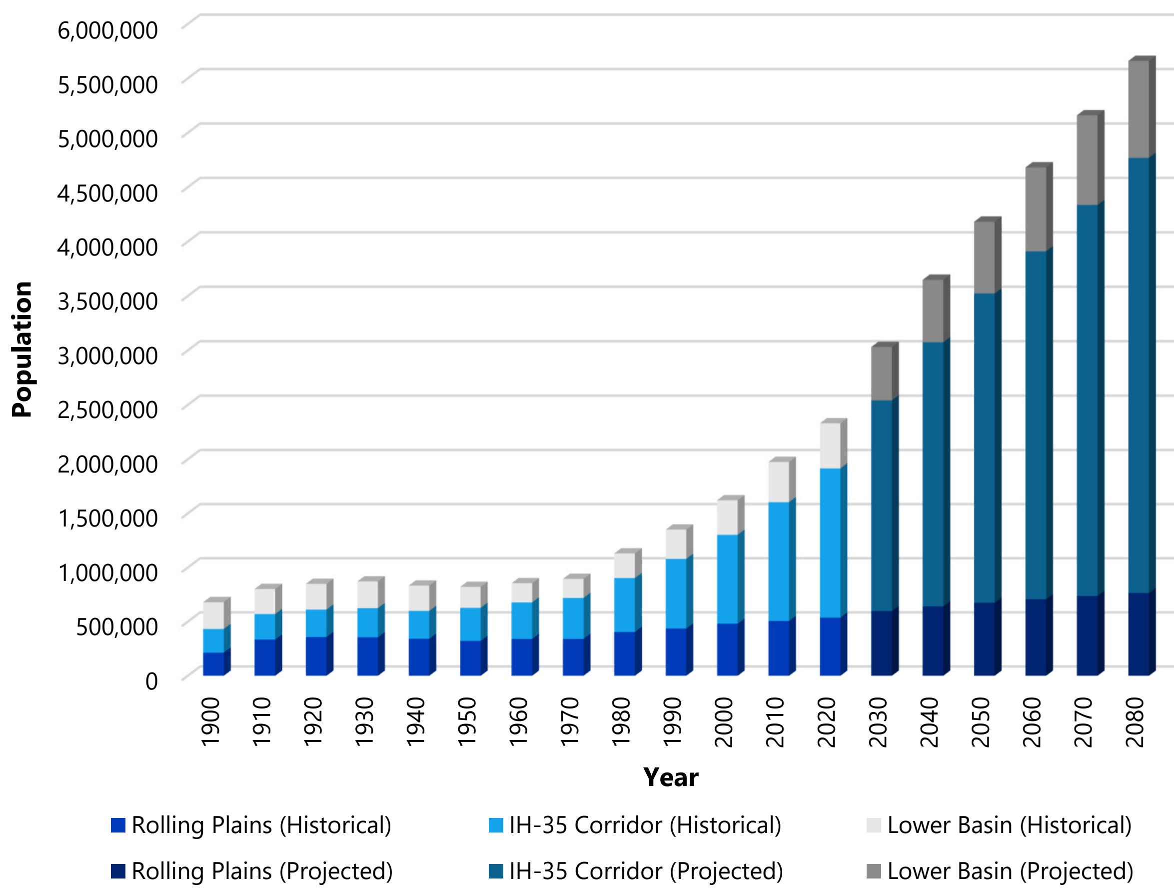

Figure 1.4 Historical and Projected Population by Subregion

1.2.2 Rolling Plains

The counties in the Rolling Plains subregion are Knox, Kent, Stonewall, Haskell, Throckmorton, Young, Fisher, Jones, Shackelford, Stephens, Palo Pinto, Nolan, Taylor, Callahan, Eastland, Erath, Hood, Somervell, Comanche, Hamilton, Bosque, Coryell, and Lampasas. These counties, with about 23 percent of the BGRWPA's population in 2020, have grown moderately since 1970 at an average rate of 1.0 percent per year. Major cities in this subregion include Abilene, Copperas Cove, Gatesville, Granbury, Mineral Wells, Stephenville, and Sweetwater.

1.2.3 IH-35 Corridor

The counties in the IH-35 Corridor are Johnson, Hill, McLennan, Bell, and Williamson. Population growth in these counties has been rapid since 1970, averaging 3.0 percent annually. In this subregion, cities with a current population greater than 10,000 include Bellmead, Belton, Burleson, Cedar Park, Cleburne, Fort Hood, Georgetown, Harker Heights, Hewitt, Hutto, Killeen, Leander, Robinson, Round Rock, Taylor, Temple, and Waco.[3] Total population in the IH-35 Corridor was about 59 percent of the region's total in year 2020, and it is expected to keep growing rapidly.

1.2.4 Lower Basin

Counties in the Lower Basin are Limestone, Falls, Milam, Robertson, Lee, Burleson, Brazos, Washington, and Grimes. This subregion also has seen a relatively high growth rate averaging 1.9 percent annually since 1970. Major cities include Brenham, Bryan, and College Station. The Lower Basin had 18 percent of the population of the BGRWPA in 2020.

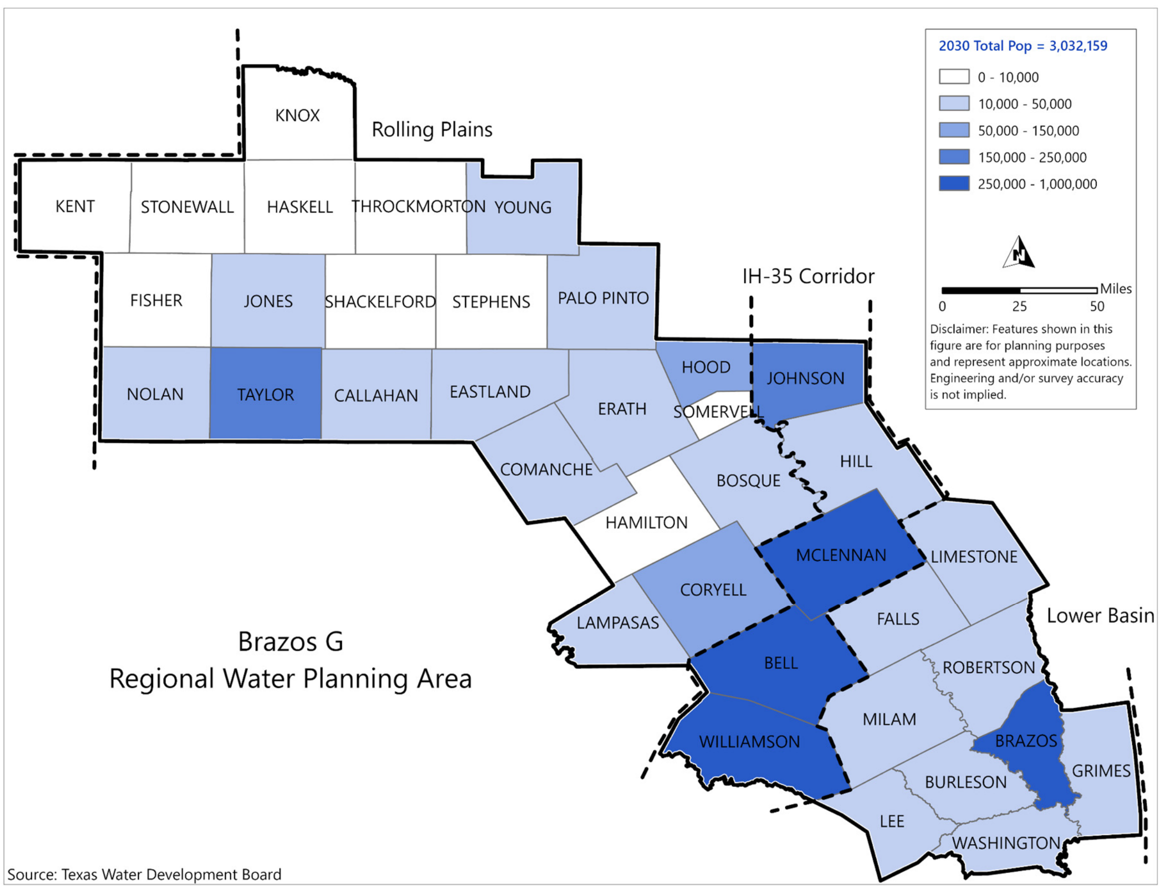

Figure 1.5 2030 Population Distribution by County

[3] U.S. Census Bureau, *2020 Census*, https://www.census.gov/programs-surveys/decennial-census/decade/2020/2020-census-results.html

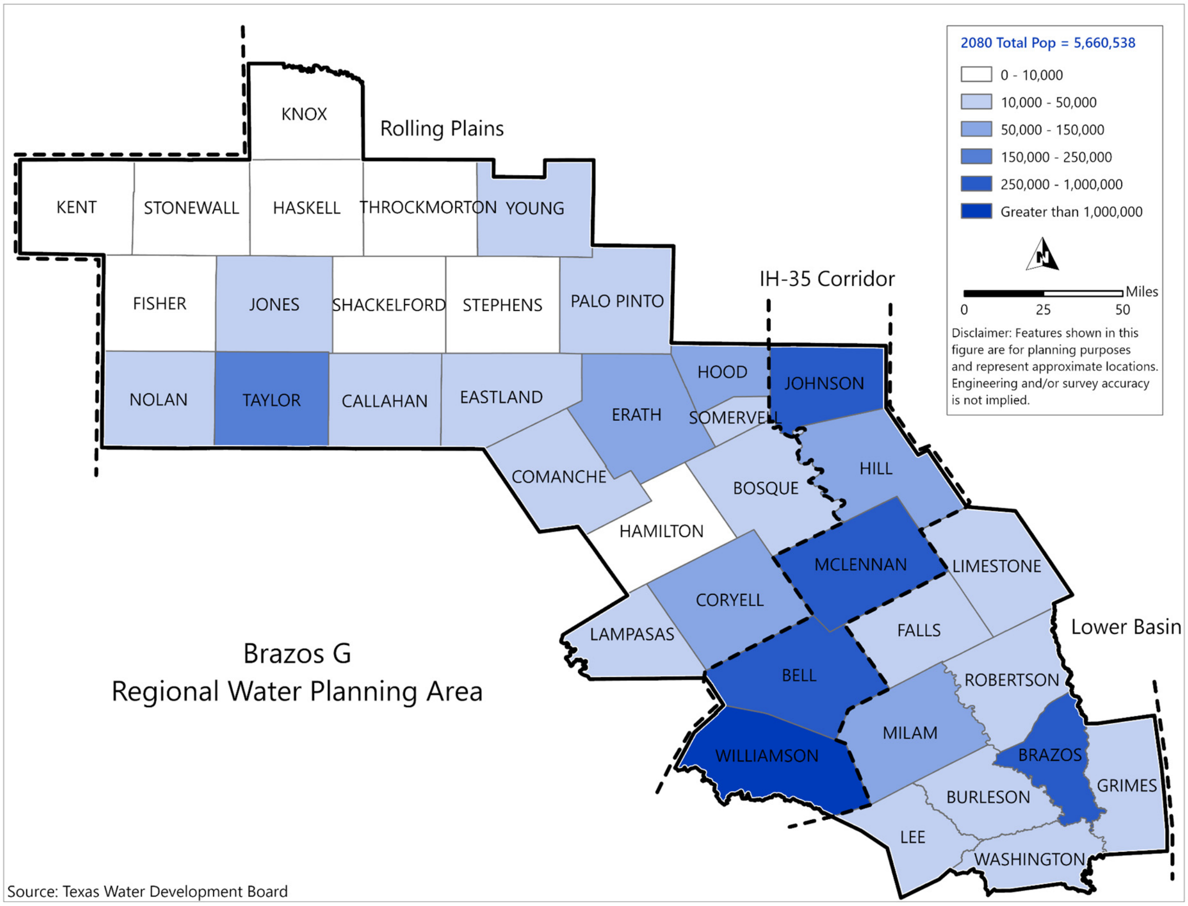

Figure 1.6 2080 Population Distribution by County

Table 1.2 Population of Major Cities in the BGRWPA (Greater than 10,000 People in 2020)

City	County	Population Data(1)			% Change
		2020	2030	2080	(2030 to 2080)
Rolling Plains					
Abilene	Jones, Taylor	120,609	134,466	184,001	36.8
Copperas Cove	Coryell	33,519	48,375	78,916	63.1
Gatesville	Coryell	14,984	15,649	16,353	4.5
Granbury	Hood	14,124	16,684	29,871	79.0
Mineral Wells(2)	Palo Pinto	14,626	16,926	19,737	16.6
Stephenville	Erath	20,372	26,797	46,758	74.5
Sweetwater	Nolan	11,457	11,590	10,768	-7.1

City	County	Population Data[1]			% Change
		2020	2030	2080	(2030 to 2080)
IH-35 Corridor					
Bellmead	McLennan	10,471	11,152	12,735	14.2
Belton	Bell	23,310	28,600	53,719	87.8
Burleson[2]	Johnson	43,515	42,810	81,047	89.3
Cedar Park	Williamson	83,703	92,024	92,024	0.0
Cleburne	Johnson	27,492	36,047	59,118	64.0
Fort Hood	Bell, Coryell	27,811	36,200	43,451	20.0
Georgetown	Williamson	123,177	247,802	1,041,920	320.5
Harker Heights	Bell	33,013	36,879	50,000	35.6
Hewitt	McLennan	15,779	17,127	17,127	0.0
Hutto	Williamson	16,813	23,452	120,937	415.7
Killeen	Bell	152,631	173,431	297,387	71.5
Leander	Williamson	66,009	137,045	190,010	38.6
Robinson	McLennan	11,340	13,570	26,268	93.6
Round Rock[2]	Williamson	123,672	145,880	233,092	59.8
Taylor	Williamson	15,767	27,500	95,847	248.5
Temple	Bell	85,214	115,562	164,252	42.1
Waco	McLennan	137,862	156,758	230,264	46.9
Lower Basin					
Brenham	Washington	16,490	17,003	17,232	1.3
Bryan	Brazos	81,200	103,527	273,294	164.0
College Station	Brazos	96,208	124,105	187,998	51.5
Total, Major Cities		**1,410,697**	**1,845,809**	**3,661,391**	**98.4**
% of Region Total		**60.5%**	**60.9%**	**64.7%**	
Total, Rural Areas		**920,202**	**1,186,350**	**1,999,147**	**68.5**
% of Region Total		**39.5%**	**39.1%**	**35.3%**	
Region Total		**2,330,899**	**3,032,159**	**5,660,538**	**86.7**

Notes:
(1) 2020 population data obtained from U.S. Census. 2030 and 2080 projections are based on TWDB.
(2) Represents only the portion of the city located in Region G.

1.3 Economic Activities

The BGRWPA includes all or part of the following metropolitan statistical areas as defined by the Texas State Data Center: Abilene, Austin-Round Rock-San Marcos, College Station-Bryan, Dallas-Fort Worth-Arlington, Killeen-Temple, and Waco. The economy of the region can be divided into the following general sectors: agriculture, agribusiness, mineral production, wholesale and retail trade, and varied manufacturing. Table 1.3 lists 2022 payrolls and employment in the BGRWPA by subregion and economic sector[4,5]. As of this writing, 2022 was the most recent year for which such data were available. Payroll and employment in the Brazos G Area were concentrated along the IH-35 Corridor, which in 2022 had a total payroll of about $25.2 billion and employment of approximately 530,300 people. Primary economic activities were construction, manufacturing, retail trade, and services, accounting for about 73 percent of the region's total payroll in 2022.

Table 1.3 2022 Economic Data (x$1,000)

Economic Sector (1)	Rolling Plains	IH-35 Corridor	Lower Basin	Region Total
Agricultural, Forestry, Fishing	$6,732	$2,930	$73,074	$82,736
Mining	$280,491	$220,331	$153,932	$654,754
Construction	$586,283	$2,585,079	$548,780	$3,720,142
Manufacturing	$751,526	$2,477,716	$699,968	$3,929,210
Transportation, Public Utilities	$537,303	$946,998	$344,450	$1,828,751
Wholesale Trade	$280,970	$1,240,687	$317,328	$1,838,985
Retail Trade	$784,638	$3,018,253	$563,707	$4,366,598
Finance, Insurance, Real Estate	$453,674	$2,010,410	$386,872	$2,850,956
Services	$2,581,100	$11,651,487	$2,019,241	$16,251,828
Unclassified	$316	$1,902	$0	$2,218
Not Categorized	$119,826	$1,079,767	$237,045	$1,436,638
Total Payroll	**$6,453,831**	**$25,239,930**	**$5,347,562**	**$37,041,323**
Total Employed(2)	**178,837**	**530,301**	**161,390**	**870,528**

Notes:
(1) Data from U.S. Census Bureau.
(2) Data from Bureau of Labor Statistics.

[4] U.S. Census Bureau, "2022 Economic Data," Online, https://data.census.gov/.
[5] U.S. Bureau of Labor Statistics, "Quarterly Census of Employment and Wages: 2022 Annual Averages," Online

1.4 Climate

Average temperatures from 1981 to 2023[6] in the Brazos G area range from lows of 28° F to 40° F to highs of 55°F to 62°F in January. For July, average temperatures across the planning area range from an lows of 70° F to 75° F to highs of 94° F to 97° F. Average annual precipitation[7] ranges from 22 to 26 inches in in the northwestern most counties of the region to 38 to 50 inches in the southeastern most counties. Figure 1.7 depicts average annual precipitation for the entire region.

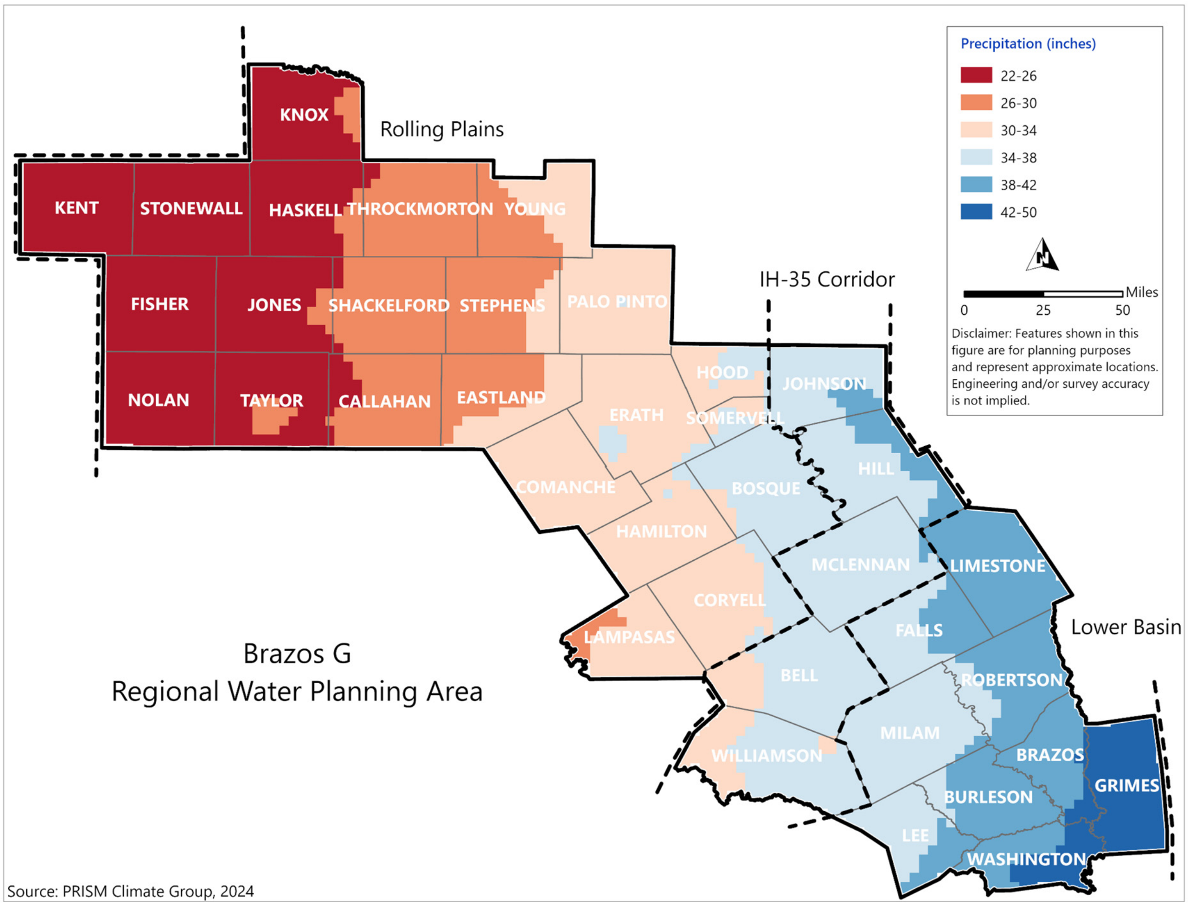

Figure 1.7 Average Annual Precipitation (1981 to 2022)

[6] PRISM Climate Group - Northwest Alliance for Computation Science and Engineering, 2024, Historical Past and Recent Years Datasets for Precipitation and Temperature, http://www.prism.oregonstate.edu/
[7] Texas Water Development Board (TWDB), Water Data for Texas – Lake Evaporation and Precipitation Dataset. Accessed at: https://waterdatafortexas.org/lake-evaporation-rainfall

1.5 Sources of Water

Table A.3 in Appendix A provides historical data on use of groundwater and surface water within the BGRWPA from 1980 to 2021. These data suggest that the planning area depended slightly more on surface water than on groundwater. Figure 1.8 shows the proportion of surface water use to groundwater use in 1980, 1990, 2000, 2010, 2017 and 2021. While the proportions were equal in 1980, surface water use was greater by 2 percent in 1990, and 3 percent in 2000. In 2010, surface water use was slightly less than groundwater, or 1 percent. In 2017, surface water use was 4 percent more than groundwater and in 2021 surface water was 6 percent greater.

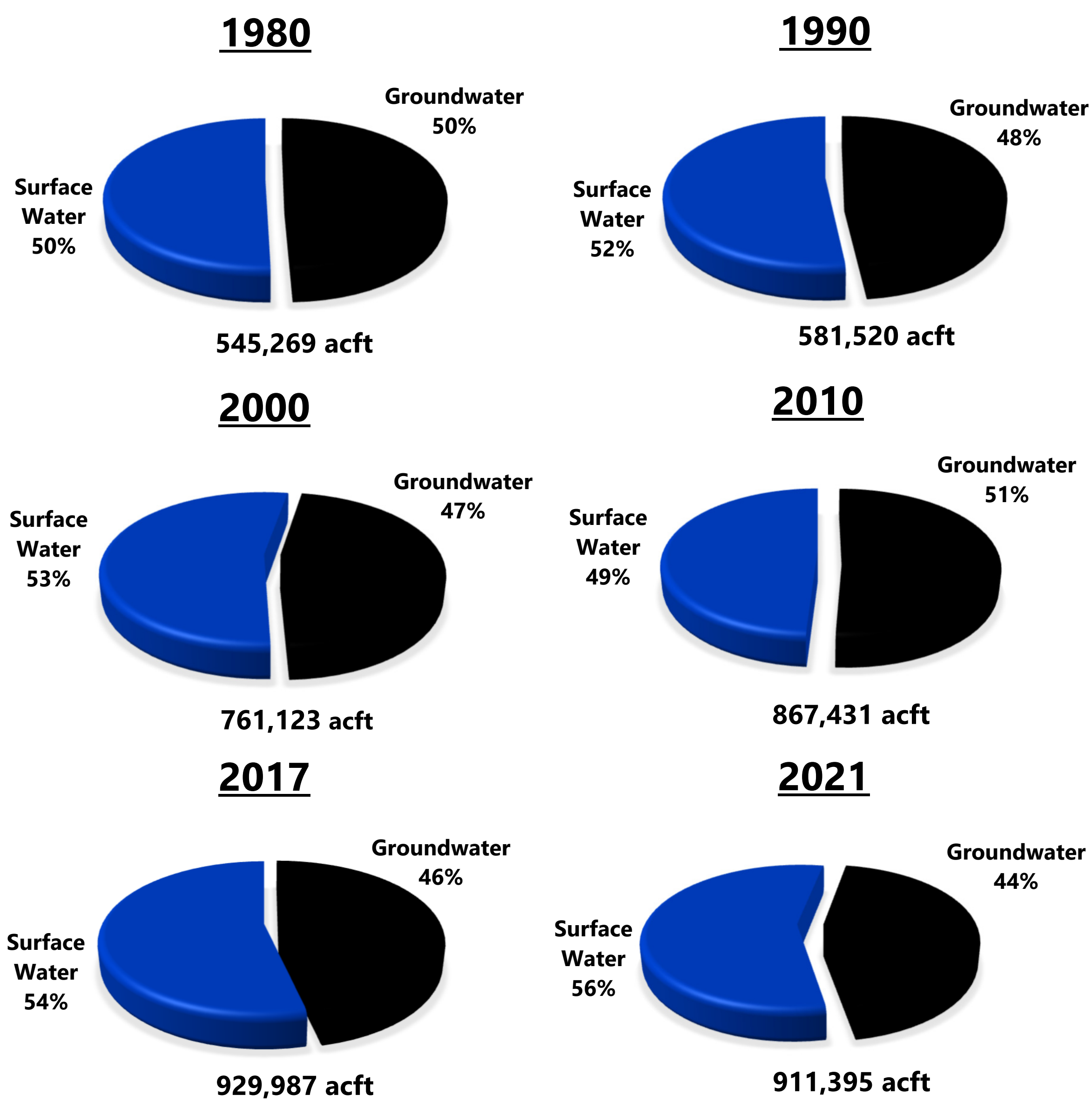

Figure 1.8 BGRWPA Historical Water Use by Source (1981 to 2021)

1.5.1 Groundwater

1.5.1.1 Aquifers

Portions of six major and eleven minor aquifers extend into the Brazos G Area (Figure 1.9 and Figure 1.10)[8]. Major aquifers are defined generally as those aquifers that supply large amounts of water to large areas of the State[9]. Minor aquifers are defined as those that supply large amounts of water to small areas of the State or provide small supplies to wide areas. Figure 1.11 shows historical water pumpage for each aquifer in the BGRWPA in 1980, 1990, 2000, 2010, 2017, and 2021. In 2021, about 78 percent of the groundwater pumped came from four aquifers: Brazos Valley Alluvium, Carrizo-Wilcox, Seymour, and Trinity[10]. Table 1.4 presents historical pumpage in 2020 and projected availability in 2080 of groundwater in each aquifer in the BGRWPA.

Fewer than half of the aquifers in the BGRWPA have potential for further development. Seven of them extend only slightly into the planning area. The aquifers that do offer potential for further development are all in the southeastern part of the region.

In the western part of the region, the Seymour Aquifer is the most significant in terms of usage and yield. The Seymour Aquifer has an uneven distribution, is highly developed, and most of its water is used for irrigation. The Seymour Aquifer is prone to depletion if subjected to a combination of prolonged drought and heavy use, but groundwater supply in the aquifer has remained mostly constant. Along with the Seymour, the fringes of three aquifers, the Dockum, Blaine, and Edwards-Trinity (Plateau), extend into the west end of the planning area, but these offer little room for further development. In the northeastern part of the region, there is a wide area with no major or minor aquifers, including Throckmorton, Young, Shackelford, Stephens, and Palo Pinto Counties. In these areas, locally occurring groundwater is not associated with a defined major or minor aquifer system and is primarily used for domestic and livestock purposes.

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8 Texas Water Development Board (TWDB), *Water for Texas*, 1997.

9 Texas Water Commission, *Groundwater Quality in Texas - An Overview of Natural and Man-Affected Conditions*, TWC Report No. 89-01, 1989.

10 TWDB, *Estimated Groundwater Pumpage by County and Aquifer*, 2021.

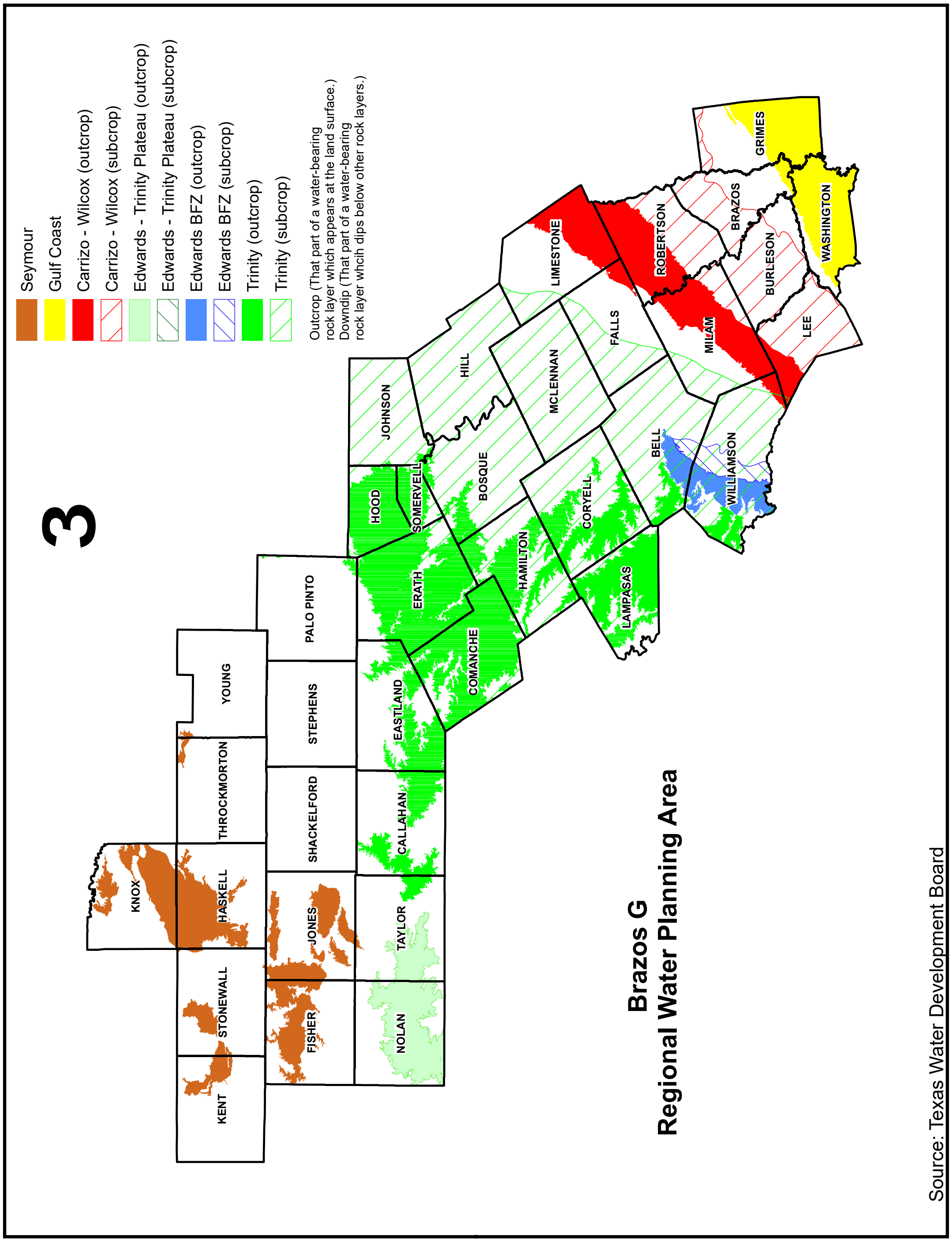

Figure 1.9 Major Aquifers

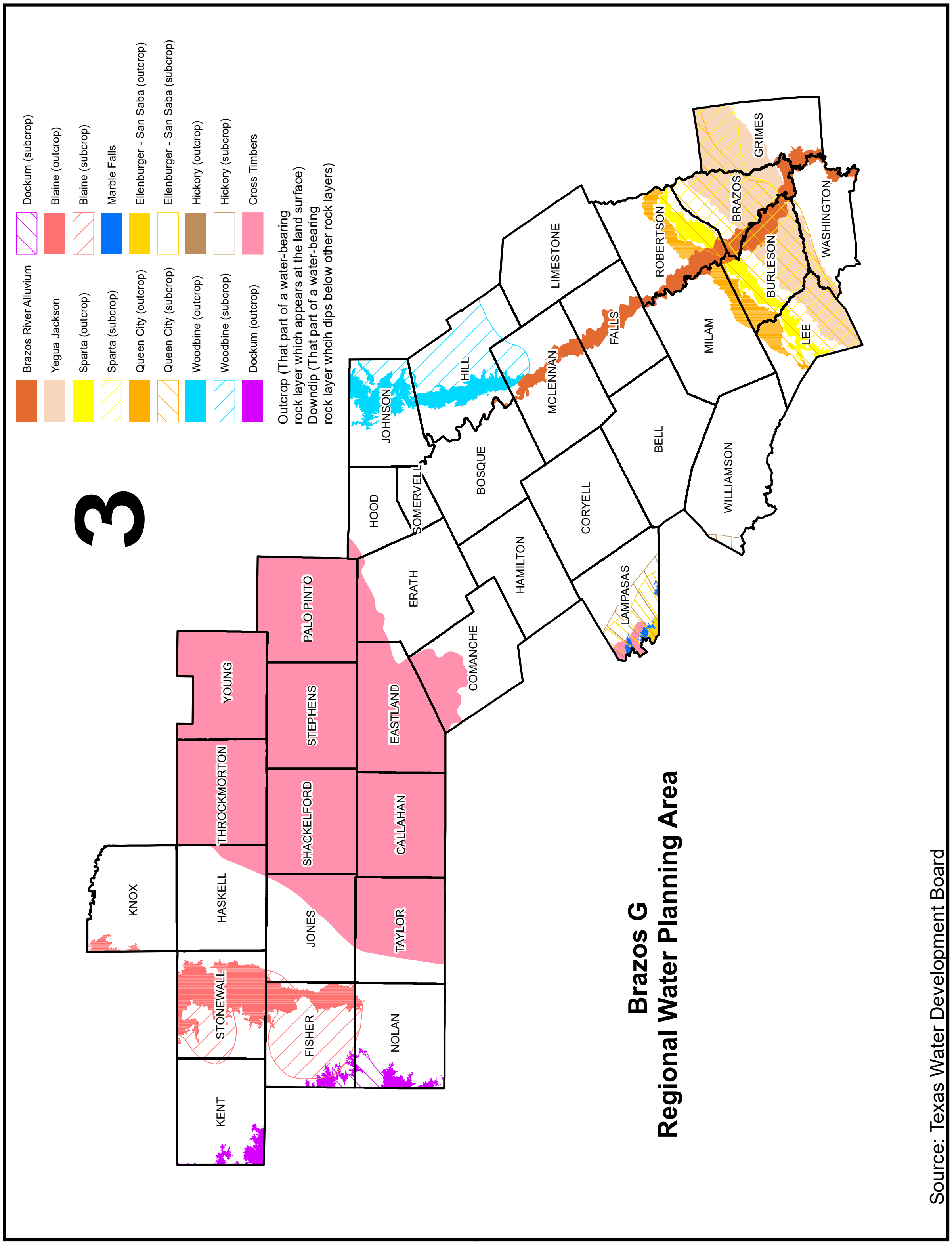

Figure 1.10 Minor Aquifers

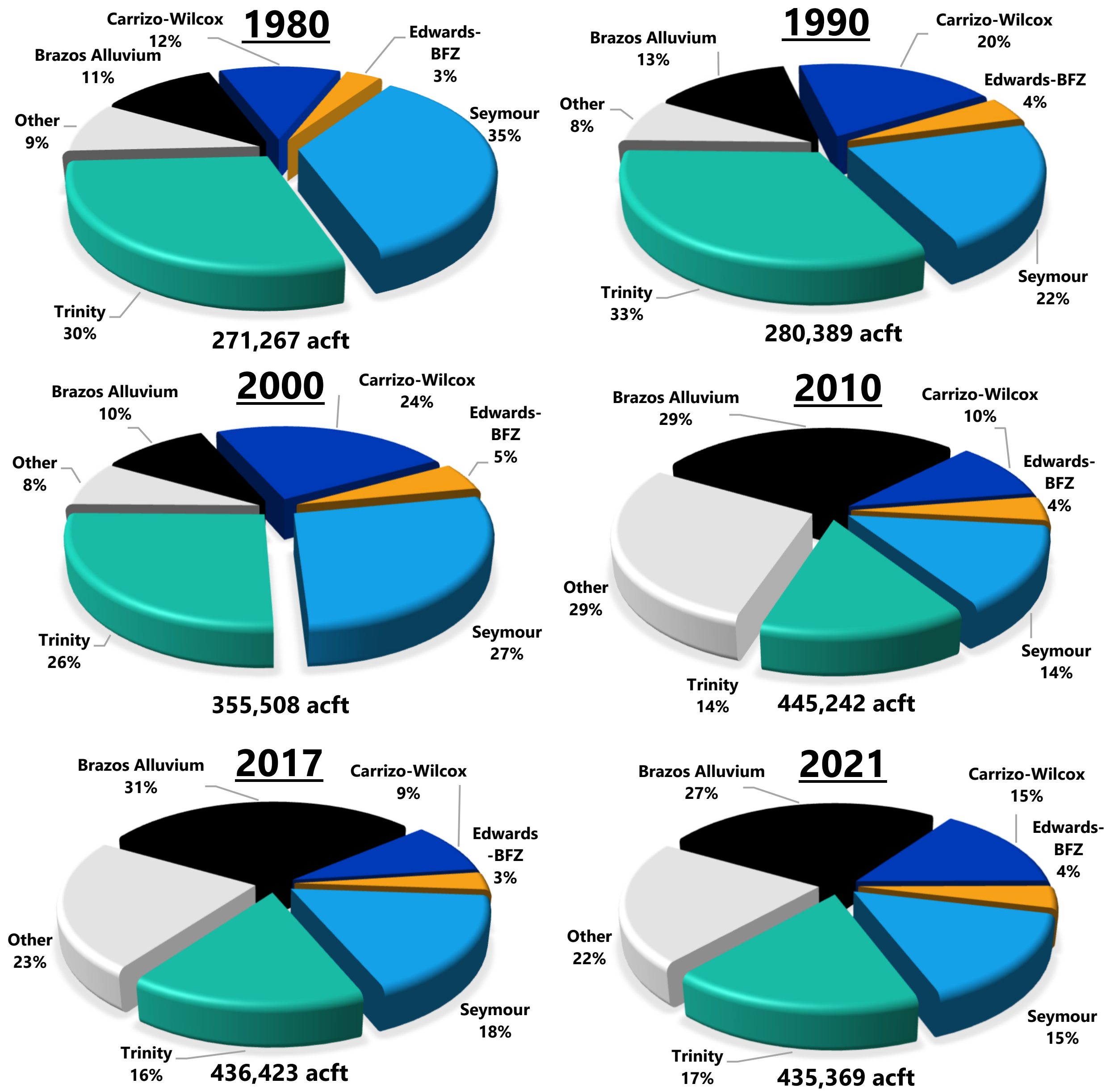

Figure 1.11 Brazos G Area Historical Water Pumpage by Aquifer

Table 1.4 Historical Pumpage and Future Availability in Brazos G Area Aquifer

Aquifer	2021 Pumpage (acft)	2080 Availability (acft/yr)	Remarks
Western Area			
Seymour	67,199	79,828	Fully developed
Dockum	15,700	12,079	Limited extent within region
Edwards-Trinity-Plateau	670	1,182	Limited extent within region
Blaine	385	22,320	Limited extent within region

Aquifer	2021 Pumpage (acft)	2080 Availability (acft/yr)	Remarks
Cross Timbers	66	3,414	Recently named minor aquifer
Subtotal:	*84,020*	*118,823*	
Central Area			
Trinity	75,366	125,343	Overdeveloped in some areas
Edwards-Bfz	16,958	9,931	Overdeveloped in drought
Woodbine	385	2,567	Limited extent within region
Ellenburger-San Saba	22	2,595	Limited extent within region
Marble Falls	13	2,839	Limited extent within region
Hickory	ND(1)	113	Limited extent within region
Subtotal:	*92,744*	*143,388*	
Southeastern Area			
Brazos River Alluvium	115,112	238,272	Added potential, water quality variable
Carrizo-Wilcox	65,780	299,958	Large added potential
Gulf Coast	4,619	93,073	Added potential
Sparta	4,487	19,016	Added potential
Yegua-Jackson	2,931	14,755	
Queen City	2,362	10,108	
Navasota River Alluvium	ND(1)	2,216	
Subtotal:	***195,291***	***677,398***	
Other and Undifferentiated	63,314	847	Many widely-scattered sources
Total:	**435,369**	**940,456**	

Notes:
(1) ND indicates no data available.

The Trinity Aquifer is the most significant groundwater source in the central part of the BGRWPA. It is widespread and furnishes small to moderate amounts of groundwater in 17 counties. In the confined portions of the aquifer, however, development has resulted in significant declines in water levels.

In the southeastern part of the area, groundwater supplies are dominated by the Carrizo-Wilcox System and the Gulf Coast Aquifer. The Carrizo-Wilcox has significant potential for further development, but the Gulf Coast Aquifer in this area has low to moderate potential. Several minor aquifers also have potential for further development over wide areas in this sector. The Brazos Alluvium, which lies along the Brazos River, also extends into the central portion of the area and has some potential for additional development, but most of the BGRWPA's undeveloped groundwater lies in the southeastern sector.

The Trinity Aquifer and all other aquifers to the southeast have outcrop areas under water-table conditions and downdip areas with overlying confining layers where artesian conditions may occur. Most of these aquifers contain fresh water to considerable depths, and all contain slightly saline water just downdip (commonly to the southeast) of the fresh water.

Maps in Appendix B show the locations of fresh water, defined as containing less than 1,000 milligrams per liter (mg/L) total dissolved solids (TDS), and slightly saline water, defined as having 1,000 to 3,000 mg/L TDS, within various aquifers. Maps are included for all aquifers within the BGRWPA that have availability estimated to exceed 5,000 acre-feet per year (acft/yr). The use of aquifers with groundwater containing more than 1,000 mg/L TDS is an option only where consumers can use the saline water or where special treatment (desalination or blending) is available. More detailed descriptions and availability of water from each aquifer in the BGRWPA are in Appendix B.

1.5.1.2 Major Springs

The BGRWPA contains few major springs, defined as springs with discharges commonly greater than 1 cubic foot per second (cfs). The majority of these issue from the Edwards-Balcones Fault Zone (BFZ) Aquifer in Bell and Williamson Counties and from the Marble Falls Aquifer in Lampasas County. Of the Edwards Aquifer springs, all but one are intermittent. The three largest Edwards springs are:

1. Salado Springs at Salado in Bell County along the Lampasas River with discharges ranging from 5 to 60 cfs.
2. Berry Springs, which is located 5 miles north of Georgetown in Williamson County, with discharges ranging from 0 to 50 cfs.
3. San Gabriel Springs at Georgetown in Williamson Co. with discharges ranging from 0 to 25 cfs.

Springs from the Marble Falls Aquifer include Hancock Park Springs along the Sulfur River, which is a tributary to the Lampasas River, with discharges reportedly ranging from 6 to 12 cfs, and Swimming Pool Springs at Hancock Park with a reported discharge of 1.3 to 1.6 cfs. Both springs are in the City of Lampasas in Lampasas County.

Some springs in the region significantly affect the quality of the water in the Brazos River. These are primarily the salt springs and seeps, such as those along Salt Croton and Croton Creeks, in the upper Brazos River Basin in Dickens, Kent, and Stonewall Counties. These natural saltwater sources cause the water in the main stem of the Brazos River above Possum Kingdom Lake to be too saline for most uses during low flow periods. For example, from 1963 to 1986, TDS and chloride concentrations in Croton Creek near Jayton averaged 7,933 mg/L and 3,169 mg/L, respectively. The mean values for TDS and chlorides in the Salt Croton Creek near Aspermont from 1969 to 1977 were 71,237 mg/L and 41,516 mg/L, respectively. Water in Possum Kingdom Lake usually contains more than 400 mg/L chloride and 1,200 mg/L TDS. The natural chloride pollution in the upper Brazos River affects water quality in the lower basin. In the Brazos River at Richmond, it has been estimated that 85 percent (or about 95 mg/L for the years 1946 to 1986)[11] of the chloride is from the upper basin.

There are many smaller springs in the Brazos G Area, but cataloging is inconsistent and incomplete. Only a few small springs have been cataloged in just nine of the 37 counties in the BGRWPA.[12] These springs flow substantially less than 1 cfs, and most flow only a few gallons per minute (1 cfs = 448.8 gpm).

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[11] Ganze, C. Keith and Ralph A. Wurbs, "Compilation and Analysis of Monthly Salt Loads and Concentrations in the Brazos River Basin," U.S. Army Corps of Engineers, Contract No. DACW63-88-M-0793, January 1989.
[12] Brune, Gunnar, *Major and Historical Springs of Texas: TWDB Report 189*, 1970.

1.5.2 Surface Water

The BGWRPA lies within the Brazos River Basin, the boundaries of which are the Red River Basin to the north, the Colorado River Basin to the west, the Trinity and San Jacinto River Basins to the east, and the counties of Fayette, Austin, Waller, and Montgomery to the south. The total drainage area for the Brazos River Basin is about 45,400 square miles, and of this about 28,400 square miles are in the BGRWPA.

The Brazos River is the third-largest river in Texas and the largest river between the Rio Grande River and the Red River in terms of total watershed area[13]. The Brazos River rises in three upper forks: the Double Mountain Fork, Salt Fork, and Clear Fork. Twenty-nine major reservoirs provide surface water to the BGRWPA. Major reservoirs, listed in Table 1.5, are defined as having an authorized conservation capacity greater than 10,000 acft. This table shows amounts of storage and annual use that the Texas Commission on Environmental Quality (TCEQ) authorizes for each reservoir. Figure 1.2 shows locations of some of the reservoirs in the BGRWPA, and Table A.5 in Appendix A provides more detailed information about all reservoirs in the BGRWPA with a permitted capacity greater than or equal to 2,500 acft. Diversions permitted for municipal, industrial, irrigation, and mining uses for each BGRWPA subregion are listed in Table 1.6. Total diversions permitted by use in each BGWRPA county are given in Table A.6 in Appendix A.

Table 1.5 Major Reservoirs in BGRWPA (Authorized Capacity Greater than 10,000 acft)

Reservoir	Stream	County	Authorized Storage (acft)	Authorized Use (acft/yr)	Owner
Abilene	Elm Creek	Taylor	11,868	1,675	City of Abilene
Alcoa Lake	Sandy Creek	Milam	15,650	14,000	Aluminum Co. of America
Aquilla	Aquilla Creek	Hill	52,400	13,896	U.S. Army Corps of Engineers(1)
Belton	Leon River	Bell	469,600	130,257	U.S. Army Corps of Engineers(2)
Brushy Creek		Falls	45,000	2,027	Cisco
Cisco	Sandy Creek	Eastland	45,000	2,027	City of Cisco
Cleburne	Nolan Creek	Johnson	25,600	6,000	City of Cleburne
Daniel	Gonzales Creek	Stephens	11,400	2100	City of Breckenridge
Dansby Power Plant	Unnamed Trib. Brazos River	Brazos	15,227	850	City of Bryan
Fort Phantom Hill	Elm Creek	Jones	73,960	38,662	City of Abilene
Georgetown	North Fork San Gabriel River	Williamson	37,100	13,610	U.S. Army Corps of Engineers(1)
Gibbons Creek	Gibbons Creek	Grimes	32,084	9,740	Texas Municipal Power Agency
Graham/Eddleman	Flint Creek	Young	52,386	11,000	City of Graham

[13] The Dallas Morning News, *2004-2005 Texas Almanac*, 2004.

Reservoir	Stream	County	Authorized Storage (acft)	Authorized Use (acft/yr)	Owner
Granbury	Brazos River	Hood	155,000	64,712	Brazos River Authority
Granger	San Gabriel River	Williamson	65,500	19,840	U.S. Army Corps of Engineers(1)
Hubbard Creek	Hubbard Creek	Stephens	317,750	56,000	West Central Texas MWD
Leon	Leon River	Eastland	28,000	6,300	Eastland Co. WSD
Limestone	Navasota River	Robertson	225,400	65,074	Brazos River Authority
Millers Creek Lake	Millers Creek	Baylor	30,696	5,000	North Central Texas MWA
Palo Pinto	Palo Pinto Creek	Palo Pinto	44,100	13,480	Palo Pinto MWD
Possum Kingdom	Brazos River	Palo Pinto	724,739	230,750	Brazos River Authority
Proctor	Leon River	Comanche	59,400	19,658	U.S. Army Corps of Engineers(1)
Somerville	Yegua Creek	Washington	160,110	48,000	U.S. Army Corps of Engineers(1)
Squaw Creek	Squaw Creek	Somervell	151,500	23,180	Texas Utilities Electric Co.
Stamford	Paint Creek	Haskell	60,000	10,000	City of Stamford
Stillhouse Hollow	Lampasas River	Bell	235,700	67,768	U.S. Army Corps of Engineers(1)
Tradinghouse	Tradinghouse Creek	McLennan	37,800	27,000	Texas Utilities Electric Co.
Truscott Brine	Bluff Creek	Knox	107,000	N/A	Red River Authority of Texas
Twin Oak	Duck Creek	Robertson	30,319	13,200	Texas Utilities Electric Co.
Waco	Bosque River	McLennan	176,124	79,870	U.S. Army Corps of Engineers(5)
Whitney	Brazos River	Hill	50,000	18,336	U.S. Army Corps of Engineers(1)
Totals			**3,546,413**	**1,014,012**	

Notes:
(1) Water rights held by the Brazos River Authority.
(2) Water rights held by the Brazos River Authority and the Department of the Army (Fort Hood).
(3) Millers Creek Lake is listed in Baylor County in Region B, but is used exclusively in the Brazos G Area.
(4) Storage authorization includes both Lake Stamford and College Lake.
(5) Water rights held by the City of Waco.

Table 1.6 Permitted Surface Water Diversions by Subregion

Subregion	Permitted Diversion (acft/yr)(1)					
	Municipal	Industrial	Irrigation	Mining	Other(2)	Total
Rolling Plains	583,087	41,678	59,792	9,064	640	694,261
IH-35 Corridor	833,875	45,963	22,368	1,248	3,625	907,079
Lower Basin	131,606	48,998	34,960	53	1,884	217,501
Region Total	**1,548,568**	**136,639**	**117,120**	**10,365**	**6,149**	**1,818,841**

Notes:
(1) Available supply may be less than the permitted diversion based on hydrologic conditions and priority of individual water rights.
(2) Category includes consumptive amounts for recreation and other uses as classified by the TCEQ.

1.6 Wholesale Water Providers

Wholesale water providers are defined in 31 TAC §357 as any person or entity that sells wholesale water to water user groups or other wholesale water providers, or that the RWPG expects or recommends to deliver or sell water to water user groups or other wholesale water providers during the period covered by the regional water plan. It is the responsibility of the RWPG to identify wholesale water providers within the region to be evaluated for plan development. There are 12 identified wholesale water providers located primarily in the BGRWPA. These providers are listed in Table 1.7 and described below.

1.6.1 Brazos River Authority

The largest provider of water in the BGRWPA is the BRA. The BRA also operates water and wastewater treatment systems, has programs to assess and protect water quality, does water supply planning, and supports water conservation efforts in the Brazos River Basin. The BRA provides water from three wholly owned and operated reservoirs: Lake Granbury, Possum Kingdom Lake, and Lake Limestone. The BRA also owns water rights for the proposed Allens Creek Reservoir in Region H. In addition to these sources, the BRA contracts for conservation storage space in the eight U.S. Army Corps of Engineers reservoirs in the region: Lakes Proctor, Belton, Stillhouse Hollow, Georgetown, Granger, Somerville, Whitney, and Aquilla. The total permitted capacity of the 12 constructed reservoirs in the BRA system is approximately 2.3 million acft. The BRA holds rights for diversion in the region totaling 661,901 acft, and contracts to supply water to municipal, industrial, and agricultural water customers in the BGRWPA and other regions. The BRA's largest current municipal customers, based on contracted supply, include Bell County Water Control and Improvement District No. 1, the City of Georgetown, and the City of Temple.

In 2016 the BRA obtained Water Use Permit No. 5851 (System Operations Permit) from the TCEQ for the diversion, impoundment, and use of (1) previously unappropriated state water in the Brazos River Basin, and (2) BRA owned return flows discharged into state watercourses not already authorized for use by other entities. The water right currently authorizes a maximum combined diversion of up to 434,703 acft/yr. Diversions are authorized in 40 individual stream segments basin-wide, with each stream segment assigned a specific maximum annual diversion amount.

Table 1.7 Wholesale Water Providers in the Brazos G Area

Entity	Current Contracts (acft/yr)	Water Source
Brazos G WWPs		
Aquilla WSD	5,392	Lake Aquilla
Bell County WCID 1	62,259	Lake Belton, Reuse
Bluebonnet WSC	7,125	Lake Belton
Brazos River Authority	729,707(1,2)	Lakes Aquilla, Belton, Georgetown, Granbury, Granger, Limestone, Possum Kingdom, Proctor, Somerville, Stillhouse Hollow, Whitney, and BRA System Operations Permit
Brazos River Authority	25,000(3)	Highland Lakes Supply, Colorado Basin
Central Texas WSC	18,013	Lake Stillhouse Hollow, Trinity Aquifer
Eastland County WSD	5,395	Eastland Lake, Lake Leon
FHLM WSC	-	Lake Waco
North Central Texas MWA	1,682(2)	Millers Creek Lake
Palo Pinto County MWD 1	9,906	Lake Palo Pinto
Upper Leon MWD	4,572	Lake Proctor
Salt Fork Water Quality Corporation	-	Local saline groundwater
West Central Texas MWD	15,620	Hubbard Creek Reservoir

Notes:

(1) Includes 11,403 acft/yr in the Lake Aquilla System, 254,663 acft/yr in the Little River System, 326,715 acft/yr in the Main Stem/Lower Basin System, and 136,927 of System Operations Permit supply contracts (based on contractual commitment list provided by BRA, dated 11/20/2023).

(2) Includes contracts in other regions.

(3) House Bill 1437 supplies from the Lower Colorado River Authority (based on contractual commitment list provided by BRA, dated 11/20/2023).

1.6.2 Aquilla Water Supply District

Aquilla Water Supply District is located in Hill County and obtains raw water from Lake Aquilla through a contract with the BRA. The district supplies treated water to five wholesale customers. The City of Hillsboro is the district's largest customer with a contract for 3,640 acft/yr. Total existing contracted sales for Aquilla Water Supply District are in the amount of 5,392 acft/yr.

1.6.3 Bell County WCID No. 1

Bell County WCID No. 1 currently obtains raw water from Lake Belton for distribution to its customers and will soon also obtain water through new facilities at Lake Stillhouse Hollow. Major customers include 439 WSC and the Cities of Belton, Copperas Cove, Harker Heights, and Killeen. Bell County WCID No. 1 is currently contracted for a total treated water supply volume of 62,259 acft/yr, plus an additional supply to meet demands for Bell County WCID No. 3.

1.6.4 Bluebonnet Water Supply Corporation

The Bluebonnet Water Supply Corporation (WSC) is located in Bell County. The WSC obtains raw water from Lake Belton, and sells treated water to eight entities in the BGRWPA. The largest customer is the City of McGregor, which holds a contract for 2,139 acft/yr. The total annual contracted supply to be provided by Bluebonnet WSC is 7,125 acft.

1.6.5 Central Texas Water Supply Corporation

Central Texas WSC contracts with the BRA to obtain raw water from Lake Stillhouse Hollow and pumps groundwater from the Trinity Aquifer. The corporation sells treated water under contract to 17 municipal water user groups, the largest with the Bell Milam Falls WSC for 2,327 acft/yr. Supply contracts by the Central Texas WSC total 18,013 acft/yr.

1.6.6 Eastland County Water Supply District

The Eastland County Water Supply District owns and operates Lake Leon and has a water right to divert 5,800 acft for municipal and industrial purposes and 500 acft for irrigation. The district also receives supply from the Eastland Lake. The district currently provides treated water to entities in Eastland County through the Cities of Eastland and Ranger. Current supply contracts by the Eastland County WSD total 5,395 acft/yr plus an additional treated supply volume to meet demands for Eastland County-Manufacturing.

1.6.7 FHLM Water Supply Corporation

Several Public Water Supply entities in Falls, Hill, Limestone, and McLennan Counties formed the FHLM Water Supply Corporation to address the elevated arsenic levels, groundwater compliance issues, Trinity Aquifer depletion, and exchange information concerning treatment technologies and operations and maintenance considerations among the member entities. The main purpose of creating the FHLM WSC was to serve as the financing vehicle to obtain funding to support regional water projects for the area. The FHLM WSC has contracted 336 acft/yr of surface water supplies from the City of Waco to be used by member utilities for blending and/or replacing existing groundwater supply.

1.6.8 North Central Texas Municipal Water Authority

North Central Texas Municipal Water Authority supplies treated water to seven entities across Knox, Haskell and Stonewall Counties. The district has water rights to divert 5,000 acft/yr of raw water from Millers Creek Reservoir for municipal, industrial, and mining purposes. Current supply contracts from the North Central Texas Municipal Water Authority, including contracts for out of region sales, total 1,682 acft/yr.

1.6.9 Palo Pinto County Municipal Water District No. 1

Palo Pinto County Municipal Water District No. 1 owns and operates Lake Palo Pinto, which is used to supply water to entities in Palo Pinto and Parker Counties. The district has rights to 18,500 acft a year for municipal and steam electric power uses. Treated water is supplied to the City of Mineral Wells (and its customers), Lake Palo Pinto Water Supply Corporation, and steam-electric entities in Palo Pinto County. Current supply contracts form the Palo Pinto County MWD No. 1 total 9,906 acft/yr, including the additional treated water volume to meet demands for the City of Mineral Wells.

1.6.10 Salt Fork Water Quality Corporation

The Salt Fork Water Quality Corporation (SFWQC) was formed to develop a project for reducing surface water salinity in the Brazos River Basin. The project concept involves constructing a series of wells to be used for intercepting highly saline water currently being discharged to waterways from a series of seeps and springs in the Upper Brazos Basin. Captured water would be treated and processed to remove the salt which could then be used for commercial application, while the resulting freshwater would be available to for use by local municipal utilities. This project has yet to be developed, and the SFWQC does not currently hold any supply contracts.

1.6.11 Upper Leon Municipal Water District

The Upper Leon Municipal Water District obtains water from Lake Proctor through contracts with the BRA. The MWD provides treated water to the Cities of Comanche, De Leon, Dublin, Gorman, Hamilton, and Stephenville, as well as other entities throughout Comanche County. Current supply contracts from the Upper Leon MWD total 4,572 acft/yr.

1.6.12 West Central Texas Municipal Water District

The West Central Texas Municipal Water District diverts raw water from Hubbard Creek Reservoir, which it owns and operates, for distribution to the Cities of Abilene, Albany, Anson, and Breckenridge. This district has rights to 56,000 acft/yr of water for municipal, industrial, irrigation, and mining uses. Current supply contracts from the West Central Texas MWD total 15,620 acft/yr.

1.7 Major Water Providers

The Brazos G RWPG defines Major Water Providers (MWPs) to be:

1. Any WWP that is not also a municipal WUG, or
2. Any WUG with a total municipal demand in the Brazos G Area of at least 1,000 acft/yr, including contractual sales to other municipal utilities.

Based on the above definition, the Brazos G RWPG has identified 105 WUGs and WWPs as Major Water Providers for the 2026 Brazos G Plan, listed in Table 1.8. This 2026 Brazos G Plan includes data summaries specific to these MWPs.

Table 1.8 Major Water Providers in the Brazos G Area

Major Water Providers					
439 WSC	Brushy Creek MUD	Eastland County WSD	Hutto	Morgans Point Resort	Sweetwater
Abilene	Bryan	Fern Bluff MUD	Jarrell-Schwertner	Mountain Peak SUD	Tarrant Regional Water District - via other WWPs
Acton MUD	Burleson	FHLM WSC	Johnson County SUD	Navasota	Taylor
Alvarado	Cameron	Files Valley WSC	Jonah Water SUD	North Bosque WSC	Temple
Anson	Cedar Park	Fort Cavazos(1)	Keene	North Central Texas Municipal Water Authority	Texas A and M University
Aquilla WSD	Central Texas WSC	Fort Worth	Kempner WSC	Palo Pinto County MUD No.1	Texas State Technical College
Arlington	Cisco	Gatesville	Killeen	Potosi WSC	Upper Leon Municipal Water District
Bell County WCID 1	Cleburne	Georgetown	Lacy Lakeview	Robinson	Venus
Bell County WCID 3	Clifton	Gholson WSC	Lampasas	Rockdale	Waco
Bellmead	College Station	Giddings	Leander	Round Rock	Wellborn SUD
Belton	Colorado River Municipal Water District	Gordon	Liberty Hill	Salado WSC	West Central Texas MWD
Bethesda WSC	Copperas Cove	Graham	Lower Colorado River Authority	Salt Fork Water Quality Corporation (SFWQC)	Wickson Creek SUD
Bistone Municipal Water Supply District	Corix Utilities Texas Inc	Granbury	Mansfield	Somervell County Water District	Williamson County MUD 11
Bluebonnet WSC	Coryell City Water Supply District	Harker Heights	Manville WSC	Sonterra MUD	Williamson County WSID 3
BRA	Cross Country WSC	Hewitt	Marlin	Southwest Milam WSC	Woodway
Brandon Irene WSC	Dog Ridge WSC	Hilco United Services	McGregor	Stamford	
Brenham	Double Diamond Utilities	Hillsboro	Mexia	Steamboat Mountain WSC	
Bruceville Eddy	Dublin	Huntsville	Mineral Wells	Stephenville	

Notes:
(1) Fort Cavazos formerly Fort Hood, all references herein should be assumed to be same.

1.8 Current Water Users and Demand Centers

1.8.1 Regional Water Use

Total water use by each county in the BGRWPA is summarized in Figure 1.12 for 2021 Water use can be classified into four general types of use: municipal, industrial, agricultural, and non-consumptive. Figure 1.13 shows historical water use by municipalities, industries, and agriculture in the BGRWPA. Industrial use can be further broken down into three sub-categories: manufacturing, steam-electric cooling, and mining. Agricultural use consists of the subcategories of water used for irrigation and livestock. Historical water use in the planning area for six categories is summarized in Table 1.9.

In Appendix A, Table A.7 gives historical water-use data for all counties in the BGRWPA, and Table A.8 gives historical water-use data by category of use. Historical surface water use greater than or equal to 1,000 acft is given in Appendix D by each water-right holder.

1.8.2 Municipal Use

Municipal water use includes water consumed for residential and commercial enterprises and institutions. Residential and commercial uses are categorized together because they are similar types of uses (i.e., they both use water primarily for drinking, cleaning, sanitation, air-conditioning, and landscape watering). Generally, municipal use does not include water use by large industries. Projections for future municipal use account for population growth and anticipated efforts at water conservation. Municipal use of 387,752 acft accounted for about 41 percent of the region's total water use in 2021. Figure 1.14 shows municipal water use in each BGRWPA county in 2017.

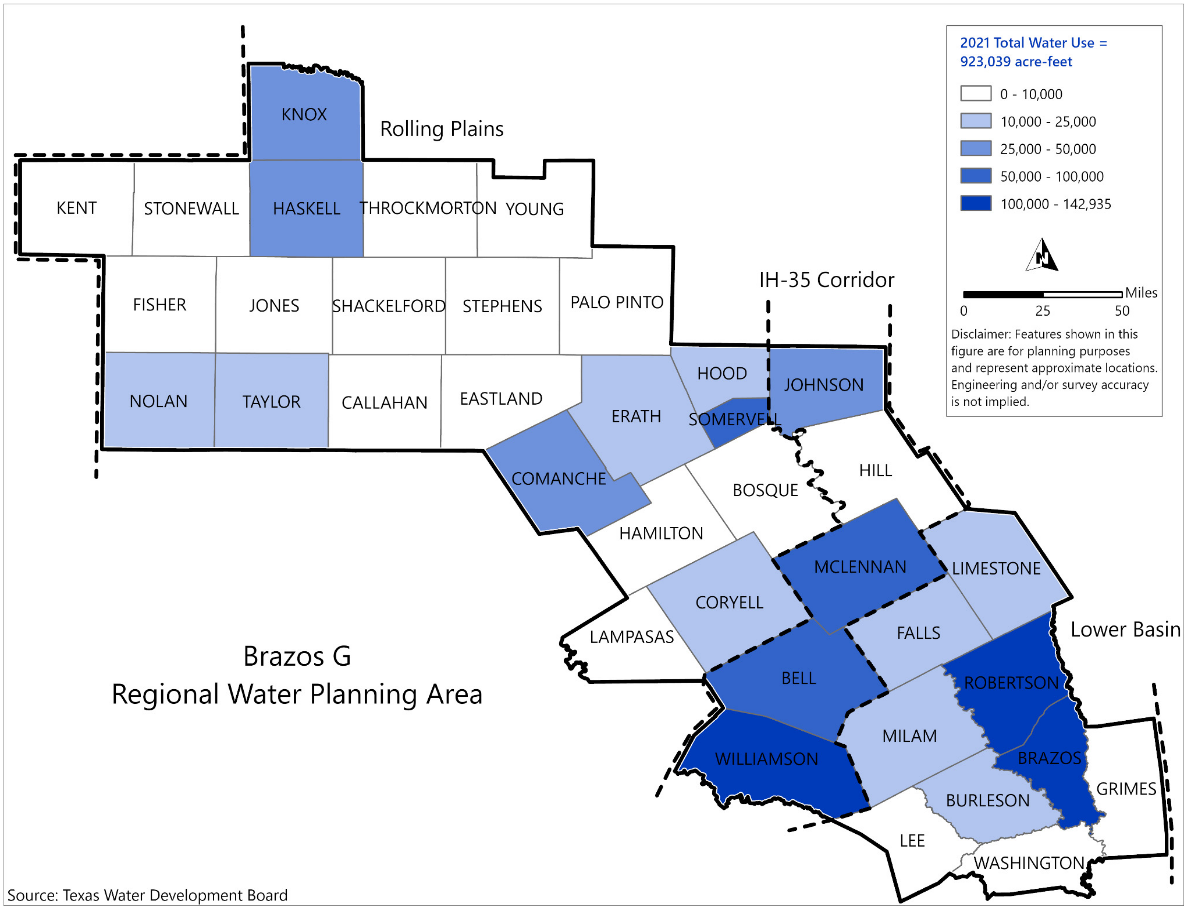

Figure 1.12 2021 Total Water Use by County

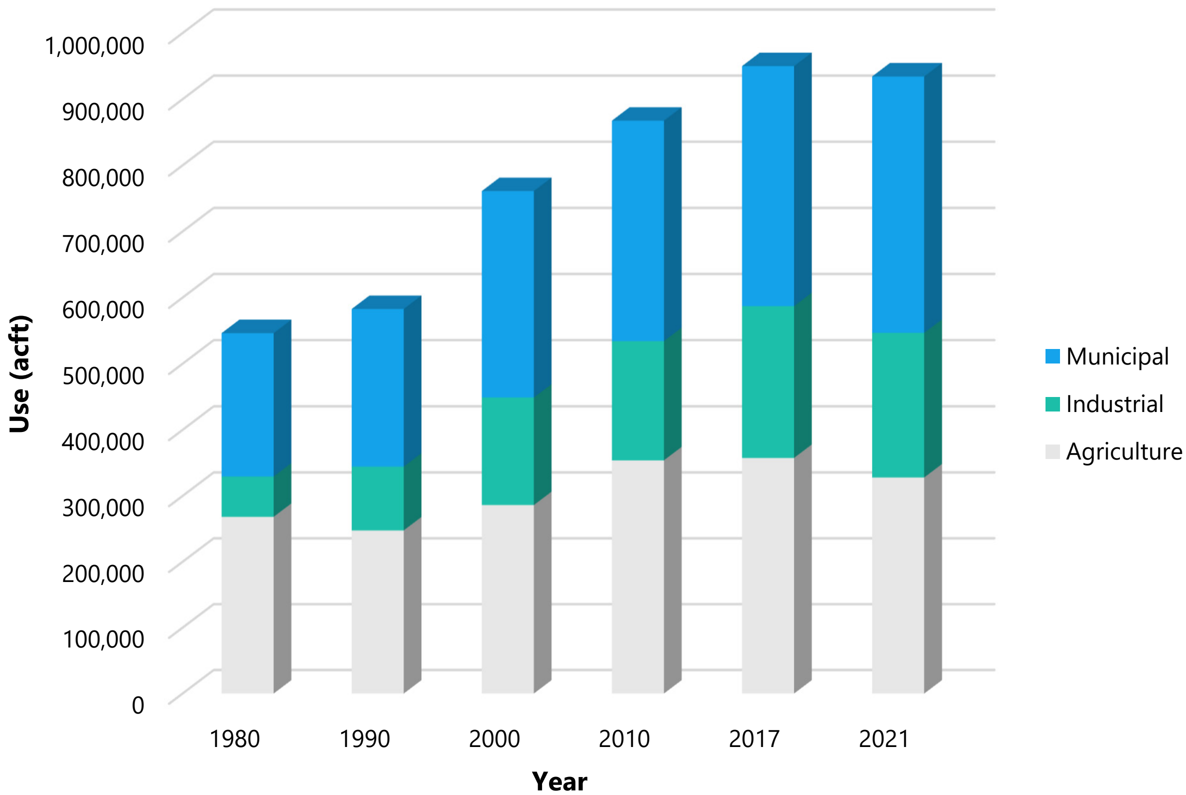

Figure 1.13 Historical Water Use by Type

Table 1.9 Historical Water Use[(1)] (acft/yr)

Category	1980	1990	2000	2010	2017	2021
Municipal Use	216,782	238,260	312,169	333,404	362,937	387,752
Manufacturing Use	21,124	32,240	60,522	9,006	10,582	10,081
Steam-Electric Use	28,686	57,657	97,921	113,553	205,181	199,296
Mining Use	11,413	6,944	4,382	57,644	13,730	9,246
Irrigation Use	229,387	200,954	232,911	298,754	315,648	284,769
Livestock Use	38,916	46,771	53,222	55,208	41,987	43,303
Total Use	546,308	582,826	761,127	867,569	950,065	934,447
Percent of State Total	3.06%	3.71%	4.69%	6.28%	6.79%	6.50%

Notes:
(1) Historical data obtained from TWDB.

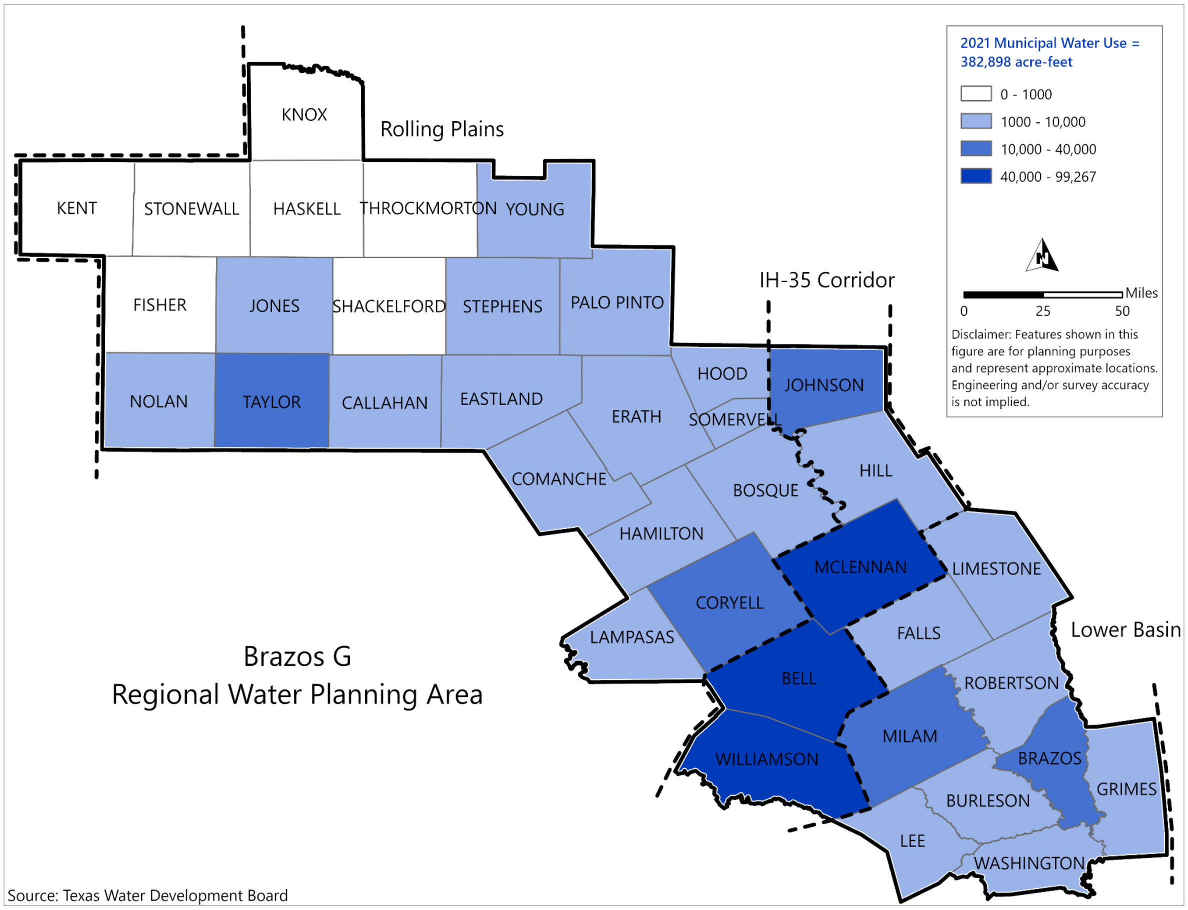

Figure 1.14 2021 Municipal Water Use

1.8.3 Industrial Use

Industrial use consists of water used for manufacturing, for steam-electric cooling during power generation, and for mining operations. Projections for industrial use account for expected growth of industries, population changes, available mineral reserves, and production rates. In 2021, industrial use was 218,623 acft, or about 23 percent of the total water used in the BGRWPA. Refer to Figure 1.15 for 2021 industrial water use by county.

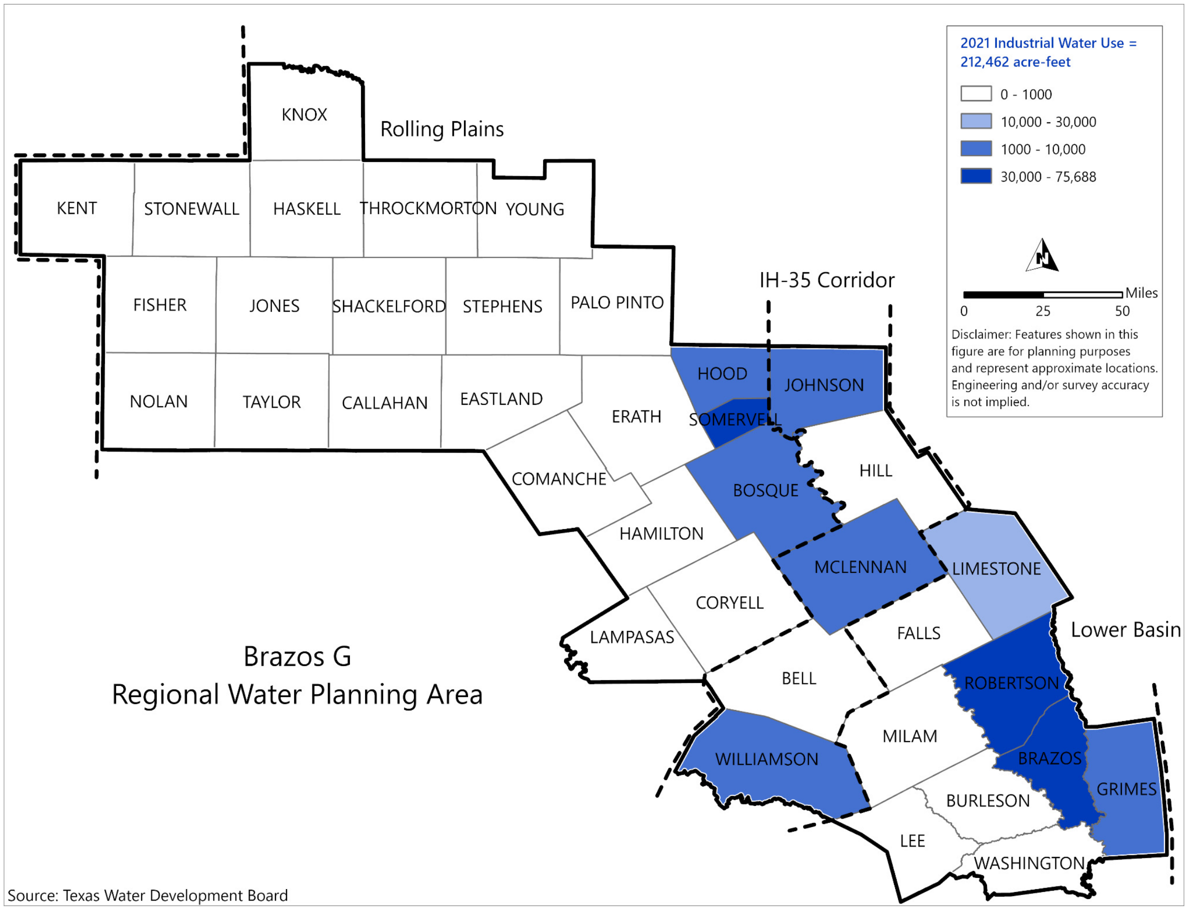

Figure 1.15 2021 Industrial Water Use (Manufacturing, Steam-Electric Cooling, and Mining)

1.8.3.1 Manufacturing

Manufacturing use is water used for producing finished goods. Manufacturing use was 10,081 acft in 2021, or 5 percent of total industrial water usage that year.

1.8.3.2 Steam-Electric Cooling

This category is water used during the power-generation process and is typically losses due to forced evaporation during cooling. Water that is diverted and not consumed (i.e., return flow) is not included in the power-generation total. Water use for steam-electric cooling in 2021 was 199,296 acft, or 91 percent of total industrial water use.

1.8.3.3 Mining

Mining use is water consumed for exploration and production of oil and gas, and for mining of lignite, sand, gravel, and such. Mining use in 2021 was 9,246 acft, or 4 percent of the total industrial water use.

1.8.4 Agricultural Use

Agricultural use is water used for irrigation and for watering livestock. Agricultural use was 328,072 acft in 2021 or 35 percent of the BGRWPA's total water use. Agricultural water use by each county in the planning area in 2021 is summarized in Figure 1.16.

1.8.4.1 Irrigation

Irrigation use in 2021 totaled 284,769 acft, or about 87 percent of the total agricultural water use. Refer to Appendix F for more detailed information about irrigation use in the BGRWPA.

1.8.4.2 Livestock Watering

The estimate of use for livestock watering is based on a determination of the total number of livestock in the region. A uniform water-consumption rate for each type of animal is applied to this total number. The categories of livestock considered are cattle and calves, poultry, sheep and lambs, and hogs and pigs. Livestock watering totaled 43,303 acft, or 13 percent of agricultural use in 2021. Refer to Appendix F for more detailed information on water used for livestock.

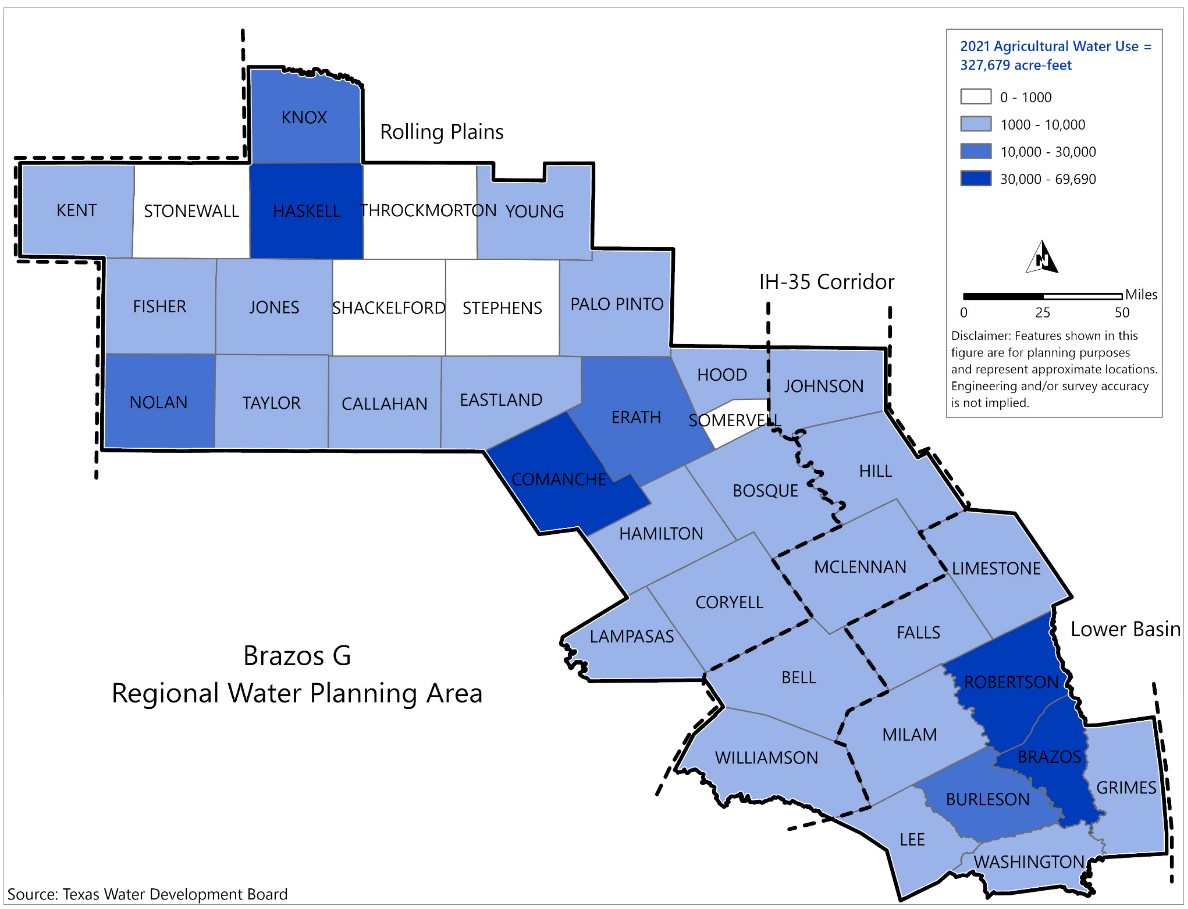

Figure 1.16 2021 Agricultural Water Use (Livestock and Irrigation)

1.8.5 Non-Consumptive Use

Non-consumptive use is water that is diverted and then returned to the river basin with minimal change in volume and temperature or is used but never leaves the river system. Most of the non-consumptive water use in the BGRWPA is associated with recreational use and the return flow from power generation. Water-related recreational activities include boating, camping, fishing, and swimming. Recreational use in the BGRWPA is supported by numerous state parks and by public facilities for boating and camping at various lakes and reservoirs.

Navigation is another form of non-consumptive use. Other than small watercraft used primarily for recreation on lakes and rivers, the BGRWPA includes no use of water for navigation. No water management strategy considered by the BGRWPG will affect navigation, either in the BGRWPA or in adjacent regions.

Power generation demands large amounts of water for cooling equipment. Fifteen steam-electric power-generating facilities were operating in the BGRWPA in 2019 (TWDB WUS), although the number of facilities has declined within the region. Most of the diverted water was returned to the Brazos River Basin. Water that is lost to evaporation during the cooling process is considered industrial use and is discussed in Section 1.5.3.

1.9 Natural Resources

1.9.1 Regional Vegetation

The BGRWPA lies within several different vegetational areas, or ecoregions.[14]

Figure 1.17 shows the locations of these ecoregions, which are relatively homogenous areas in terms of geography, hydrology, and land use. The five ecoregions in the BGRWPA are the Rolling Plains, Blackland Prairies, Post Oak Savannah, Cross Timbers and Prairies, and Edwards Plateau. A general description for each ecoregion is provided below. More detailed information is provided in Appendix E.

1.9.1.1 Rolling Plains

The Rolling Plains are part of the Great Plains of the central United States. The Rolling Plains region covers about 24 million acres of gently rolling to moderately rough terrain. The region is bordered on the west by the Caprock Escarpment, on the south by the Edwards Plateau, and on the east by the Cross Timbers and Prairies region. Annual precipitation averages about 22 to 30 inches, and elevations range from 800 to 3,000 feet above sea level. The eastern part of the Rolling Plains is called the Reddish Prairie. Soils vary from coarse sands in outwash terraces near streams to tight clays or red-bed clays and shales.

1.9.1.2 Blackland Prairies

The Blackland Prairies region consists of nearly level to gently rolling topography. It covers about 11.5 million acres from Grayson and Red River Counties in northeast Texas to Bexar County in the south-central part of the State where it merges with the brush land of the Rio Grande Plains. Annual precipitation is 30 to 45 inches, and elevations range from 300 to 800 feet above sea level.

[14] Gould, F.W., *The Grasses of Texas*, Texas A&M University Press, College Station, Texas, 1975.

The term Blackland comes from the uniformly dark-colored, calcareous clays in the Alfisols (fertile mineral soils). Soils in the Blackland Prairies are interspersed with gray-colored, acidic sandy loams. This highly fertile region has widely been used for agriculture, but it is increasingly used for ranching.[15] Experts estimate that less than one percent of the Blackland Prairies remain in a near-natural condition.[16]

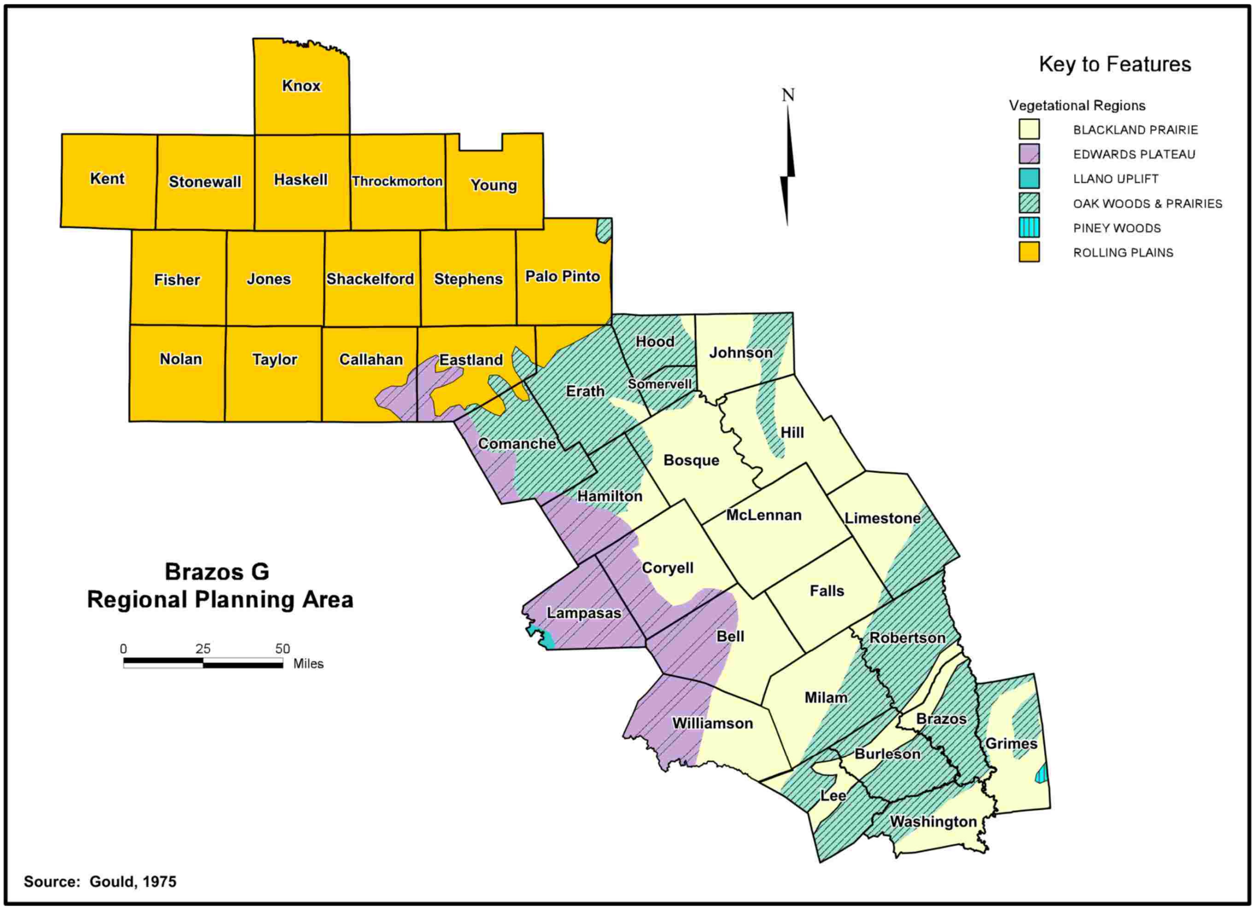

Figure 1.17 Vegetational Areas of the Brazos G Area

1.9.1.3 Post Oak Savannah

The Post Oak Savannah covers about 8.5 million acres in east-central Texas and consists of closely associated and intermingled prairies and woodlands on slightly acidic sandy or clay loams. Topography in this region is gently rolling to hilly, with moderate to deeply dissected drainage paths. Soils in uplands are generally light-colored, acidic sandy loams or sands, and soils in bottomlands are light-brown to dark-gray acidic sandy loams or clays. Much of this vegetational area is used for crops and grazing.

[15] Gould, F.W. and Schuster, J.L. and Hatch, S.L., *Texas Plants B, An Ecological Summary*, Texas Agricultural Experiment Station, Texas A&M University, College Station, Texas, 1990.
[16] Smeins and Diamond, 1986.

1.9.1.4 Cross Timbers and Prairies

The Cross Timbers and Prairies vegetational area covers about 17 million acres in north- central Texas. Geology in this area is diverse, and the topography varies from gently rolling to hilly to deeply dissected. Rapid surface drainage is typical throughout the region. Soils are typically brown, neutral-to-slightly acidic, sandy or clay loams.

1.9.1.5 Edwards Plateau

The Edwards Plateau area covers about 24 million acres. This includes a large portion of the Hill Country in west-central Texas, the Llano Uplift, and the Stockton Plateau. Average annual precipitation increases from west to east across this region. Limestone or caliche typically underlie the shallow, variably textured soils, although granitic rock underlies soil in the Llano Uplift. Land use in this vegetational area is dominated by the ranching of cattle, sheep, and goats. This region reportedly once was dominated by grassland or an open savannah climax community, except in steep canyons and slopes where junipers and oaks were dominant. The widespread disturbance associated with grazing livestock eventually allowed brush and tree species to spread widely throughout the original grasslands and savannahs.

1.9.2 Regional Geology

Figure 1.18 shows the varied geology of the planning area. Generally, the formations in the northwest part of the planning area are the older Blaine and San Angelo Formations of the Paleozoic era. The central part of the planning area is typically dominated by younger formations from the Cretaceous era, such as the Trinity Group; the Navarro and Taylor Groups; and the Austin, Eagle Ford, Woodbine, and U. Washita Groups. The youngest formations are in the southern part of the planning area. These formations include the Cook Mountain, Weches, Sparta, and Yegua, among others. Many areas near streams and rivers are dominated by alluvial deposits.

1.9.3 Soils

The soils of the upper Brazos River Basin are agriculturally and ecologically important. Throughout the Brazos G Area, soils are varied and are influenced by both geology and surface drainage. Figure 1.19 shows the locations of different orders of soil in the BGRWPA. These soil types are briefly described in the following subsections.

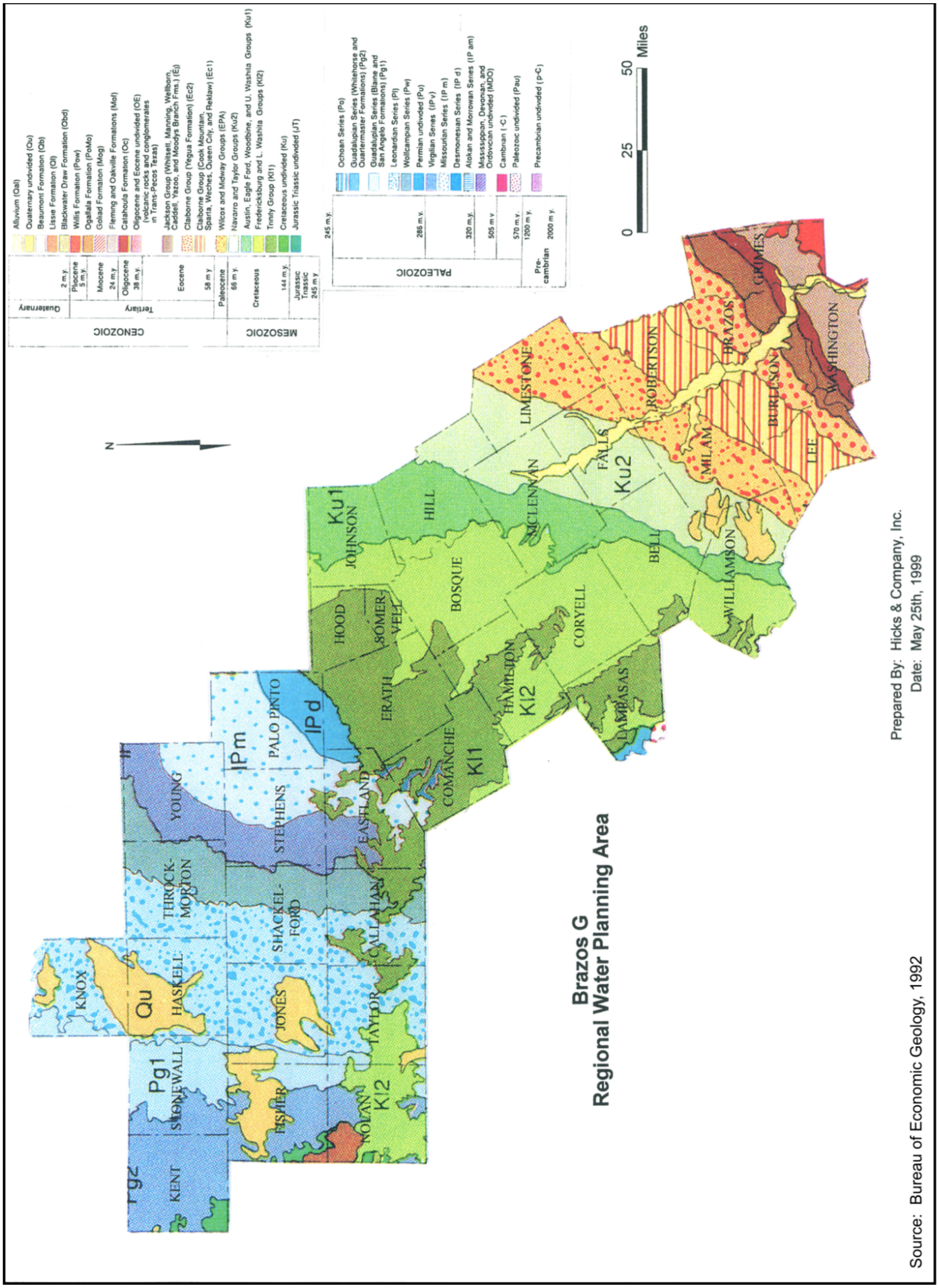

Figure 1.18 Geology of the Brazos G Area

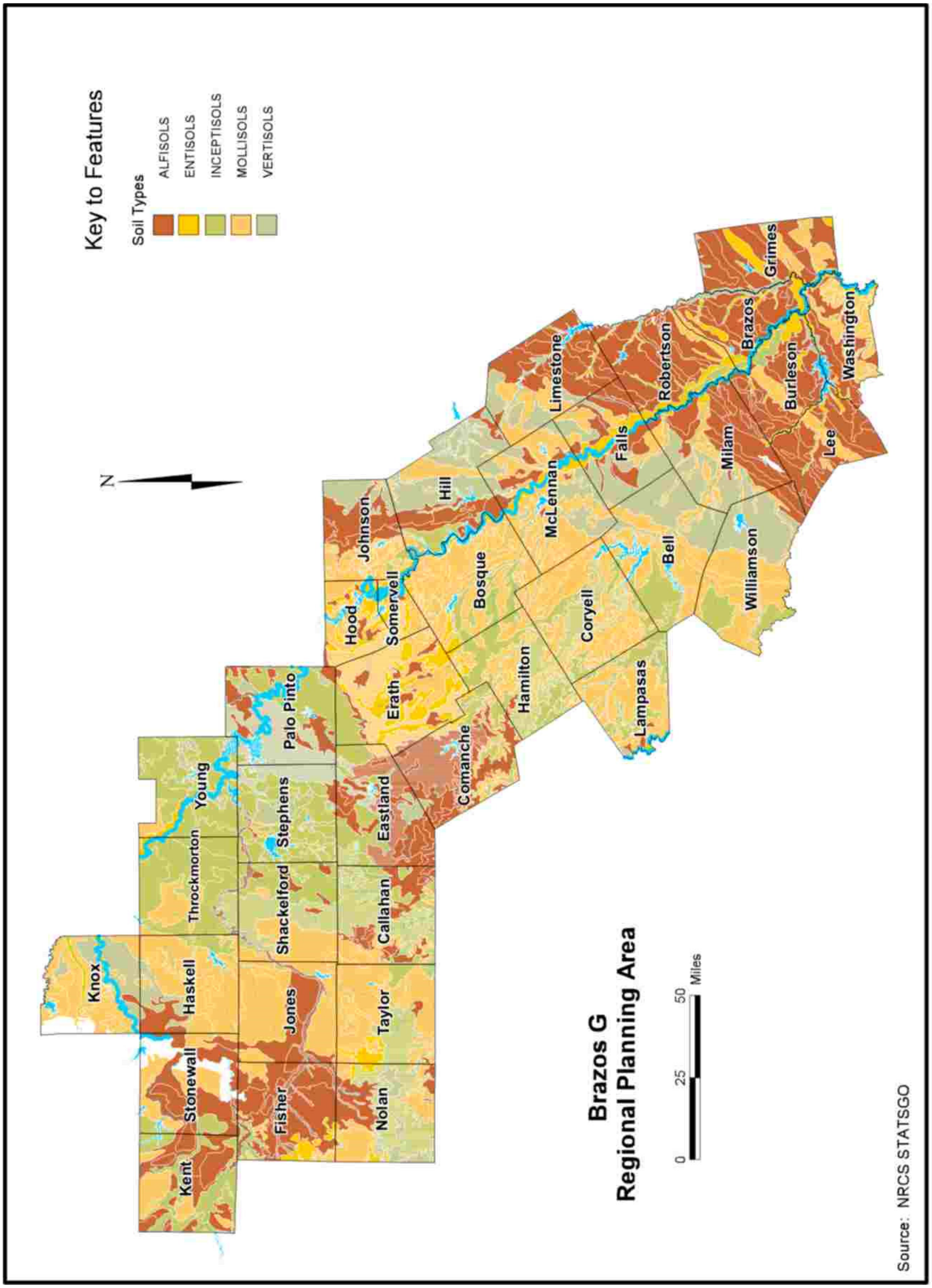

Figure 1.19 Soils of the Brazos G Area

1.9.3.1 Alfisols

Alfisols are mineral soils with a gray-to-brown surface horizon. These soils form under humid, cool-to-hot areas of native grasslands. They are productive and favor good crop yields.

1.9.3.2 Entisols

Entisols are typical of rangeland in west and southwest Texas. In this order, soils range from infertile sands and bedrock to highly productive soils on recent alluvium. A characteristic common to all Entisols is the lack of significant profile development.

1.9.3.3 Inceptisols

Inceptisols are thought to form relatively quickly from the alteration of parent material. Productivity varies among soils in this order, and it is affected by factors such as levels of organic matter and drainage. Typically, Inceptisols have slightly higher profile development than Entisols.

1.9.3.4 Mollisols

Mollisols are considered important agriculturally and are characterized by a thick, dark surface horizon. These soils develop under grassland-prairie vegetation typical of the central United States. Mollisols cover more land area in the United States than any other soil order.

1.9.3.5 Vertisols

Vertisols have a high clay content and therefore may develop deep cracks from shrinking during dry periods. The fine texture of Vertisols and their tendency to shrink excessively makes them generally unstable for building foundations and even for some agricultural uses.

1.9.4 Wetlands

Wetlands are defined by the U.S. Army Corps of Engineers as areas that, due to a combination of hydrologic and soil conditions, are capable of supporting hydrophytic vegetation. In the Brazos G Area, wetlands are found primarily in narrow strips along rivers and streams.

As a natural resource, wetlands are especially valued because of their location on the landscape, the wide variety of ecological functions they perform, and the uniqueness of their plant and animal communities. Many wetlands are also valued for their aesthetic qualities, as sites for educational research, as sites of historic and archaeological importance, and as locations for storing or conveying floodwaters. Wetlands provide high-quality habitats for wildlife, including foraging and nesting areas for birds and spawning and nursery areas for fish.

1.9.5 Water Resources

Rivers and reservoirs are important ecological resources for the Brazos G Area. These support diverse aquatic plants and animals as well as terrestrial wildlife living along the banks. Important rivers and creeks in the planning area include the Brazos, Leon, Bosque, Lampasas, San Gabriel, South Wichita, Little, Clear Fork of the Brazos, and Yegua Creek. These rivers contribute to unique vegetational communities that provide habitat for wildlife.

There are more than 40 species of aquatic amphibians, reptiles, and mammals in the planning area. Waterfowl heavily use the mature, hardwood, bottomland forests and forested wetlands often associated with rivers. Aquatic habitats include riffles and pools, which support both invertebrates and fish.

Reservoirs (Figure 1.20) provide habitat for inland fish stocks and waterfowl. Many reservoirs in the planning area provide habitat for fish stocks and waterfowl including Lake Stamford, Hubbard Creek Reservoir, Possum Kingdom Lake, Lake Leon, Lake Proctor, Lake Whitney, Lake Stillhouse Hollow, Lake Belton, Lake Waco, and Lake Somerville.

Although few in number, the major springs and seeps in the planning area that produce frequent flows are often rich in wildlife habitat and ecological diversity. Springs represent a transition from groundwater to surface water. Where frequent springflow occurs, an abundance of moisture is provided, resulting in diverse vegetational communities unique to such areas. Typical vegetation includes willows, cottonwoods, hackberry, elms, rushes, sedges, and smartweed. These vegetational communities often provide optimal habitat for native wildlife.

1.9.6 Wildlife Resources

1.9.6.1 Biotic Provinces

Just as Texas has been divided into major plant zones,[17] the State has also been classified into biotic provinces based on the distribution of topographic features, climate, vegetation types, and terrestrial vertebrates[18] (Figure 1.21). The BGRWPA includes the Kansan, Austroriparian, Balconian, and Texan biotic provinces.

[17] Gould, Op. Cit., 1975.
[18] Blair, 1950.

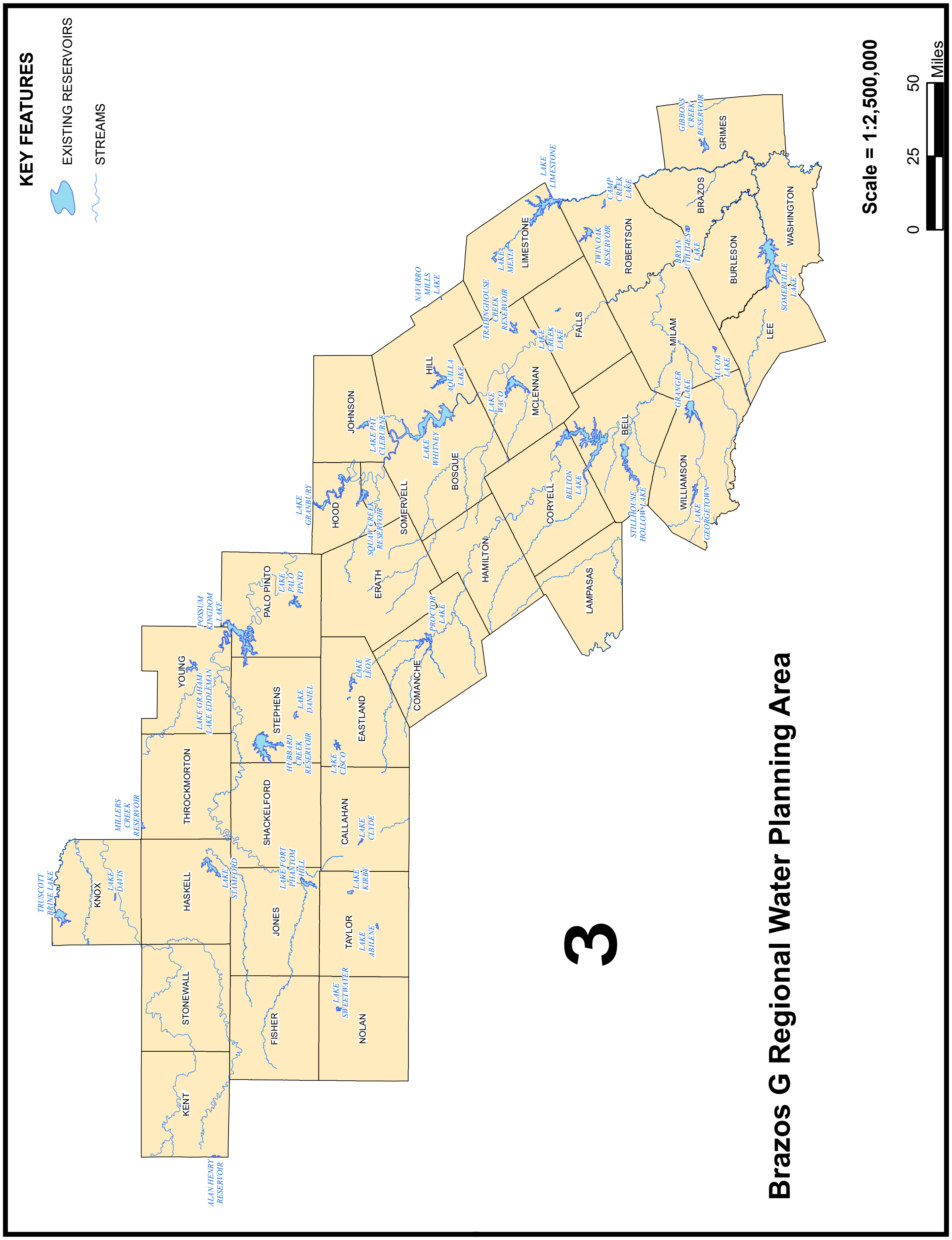

Figure 1.20 Water Resources of the Brazos G Area

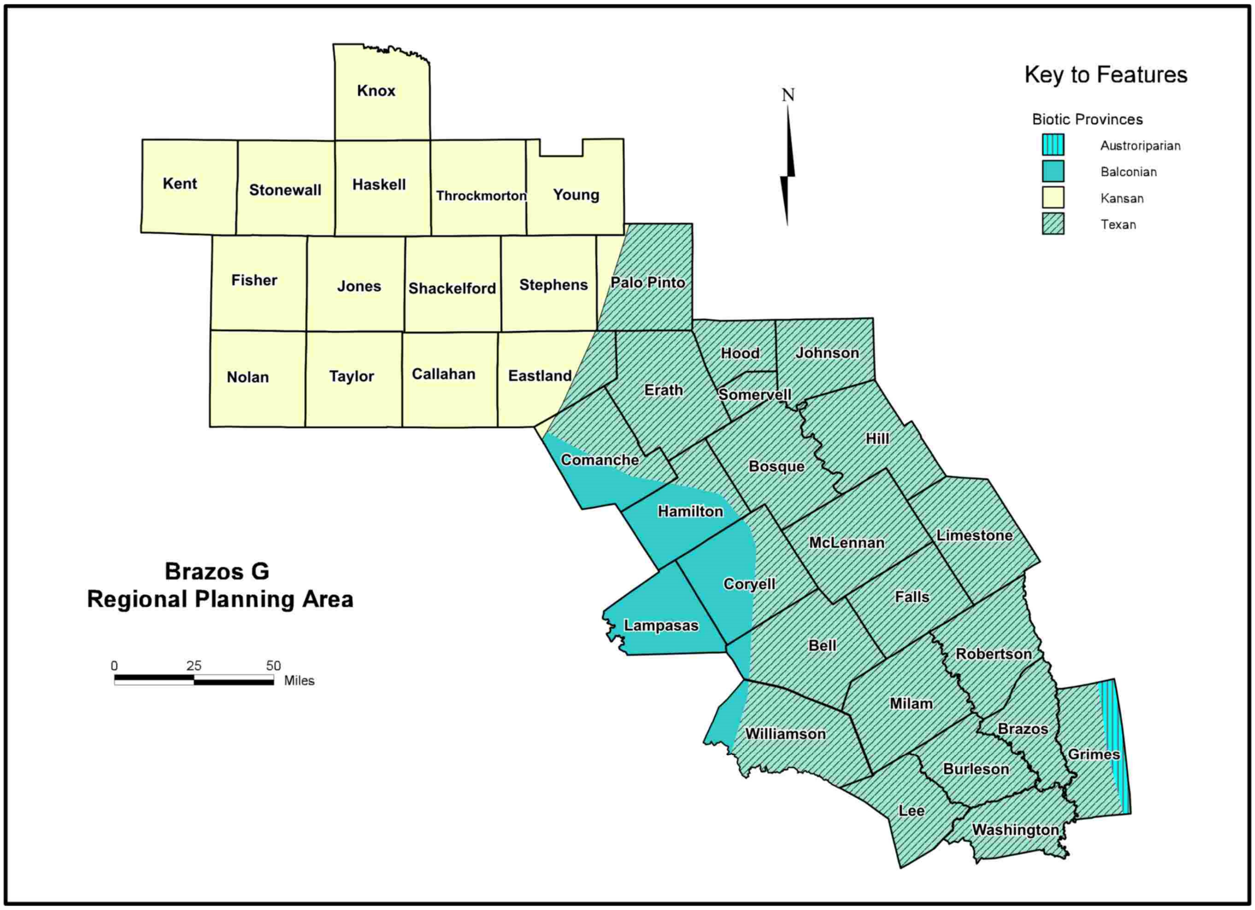

Figure 1.21 Biotic Provinces of the Brazos G Area

1.9.6.2 Kansan

The Kansan province runs southward from the Texas panhandle and across the Rolling Plains area of the Brazos G Area. It meets the Texan biotic province at the western boundary of the Cross Timbers and Prairies vegetational area. There is little available moisture in the province, and moisture that is available decreases from east to west. The plant associations vary. However, they fall into three general categories of associations: the mixed-grass plains, the mesquite-grass association, and the short-grass plains.

1.9.6.3 Austroriparian

The western fringe of the Austroriparian province extends into the southeastern rim of the Brazos G Area. This province comprises the pine and hardwood forests of the eastern Gulf Coastal plain. The province is limited to the west due to low moisture. However, vegetational communities found in the westward extensions of the province occur along drainageways where environmental conditions allow.

1.9.6.4 Balconian

The Balconian province includes most of the Edwards Plateau excluding the region west of the Pecos River. The Edwards Plateau is a physio-graphically discrete unit. It has a variety of wildlife, and its vegetation is different from that found in adjacent provinces. The abundant vertebrate species are a mixture of Austroriparian, Tamaulipan, Chihuahuan, and Kansan.

Most of the Balconian province lies on Cretaceous limestone, but igneous intrusives and sediments of Precambrian age are exposed in the Llano Uplift. Limestone caverns and springs are common features of this province. Massive outcrops of limestone are characteristic of the stream canyons, and limestone fragments occur at the surface over almost the entire area.

Rainfall amounts typically decrease from east to west. The most characteristic plant association is the juniper-oak scrub. Mesquite is also distributed throughout the province.

1.9.6.5 Texan

The Texan biotic province has no true endemic species of vertebrates. In this area, western species tend to encroach into open habitats, and eastern species encroach along the many wooded drainageways extending through the landscape. The Texan province has supported 49 species of mammals, 39 species of snakes, 16 species of lizards, 2 types of land turtles, 18 types of toads and frogs (anurans), and 5 species of salamander (urodeles).

1.9.6.6 Threatened and Endangered Species

In planning water-management strategies, one major consideration is the potential impact on threatened and endangered species. Table E-1 in Appendix E gives a complete list of threatened and endangered species in each county in the BGRWPA. Some of the more widely seen of these are the golden-cheeked warbler (Dendroica chrysoparia), the black-capped vireo (Vireo atricapillus), and the bald eagle (Haliaeetus leucocephalus).

1.9.7 Agricultural Resources

Agriculture is a mainstay of the BGRWPA rural economy. Among livestock, cattle were the most significant component, approaching 1.86 million head with an additional 110,659 dairy cows in 2022. Almost 17 million acres, or about 84 percent of BGRWPA’s total area, were classified as farmland in 2022. Of the 17 million acres of farmland, about 4.3 million acres were classified as cropland, of which about 2.1 million acres were harvested. Refer to Appendix E for detailed listings of agricultural information for the BGRWPA.

The Texas Department of Agriculture has specified several Agricultural Statistics Districts for the purpose of keeping records. The districts within the BGRWPA the Blacklands (District No. 40), Cross Timbers (District No. 30), East Texas South (District No. 52), Edwards Plateau (District No. 70), Northern Low Plains (District No. 21), South Central (District No. 81), and Southern Low Plains (District No. 22). Note, these Agricultural Statistics Districts have changed slightly in names, numbering, and boundaries since the 2021 RWP.

1.9.7.1 Blacklands

The Blacklands counties (District No. 40) are Bell, Bosque, Coryell, Falls, Hamilton, Hill, Johnson, Limestone, McLennan, Milam, and Williamson. Edwards Plateau (District No. 70), which contains Lampasas County, is included for the purposes of this analysis. The Blacklands is noted for dryland production of corn for grain, grain sorghum, wheat for grazing and grain, cotton, and hay. Irrigation in the Blacklands is limited by lack of sufficient groundwater supply.

1.9.7.2 Cross Timbers

The Cross Timbers counties (District No. 30) are Callahan, Comanche, Eastland, Erath, Hood, Palo Pinto, Shackelford, Somervell, Stephens, Throckmorton, and Young. Combined, these counties lead the State in dairy production. This is due to several factors such as available groundwater from the Trinity Aquifer, soils suitable for forage production, topography conducive to dairy operation, and an existing infrastructure. The major crops produced in the Cross Timbers are hay and silage, with smaller amounts of peanuts, pecans, and vegetables irrigated from the Trinity Aquifer.

1.9.7.3 East Texas South and South Central

East Texas South (District No. 52) and South Central (District No. 81) counties are Brazos, Burleson, Grimes, Lee, Robertson, and Washington. This subregion has limited row-crop agriculture because suitable topography and soils are limited. Hay and silage are the major agricultural products. The Brazos River Bottoms counties (Brazos, Burleson, and Robertson) produce most of the crops in the subregion, including corn for grain, grain sorghum, and cotton. The Brazos River Alluvium is the major source of groundwater for the Brazos River Bottoms.

1.9.7.4 Southern Low Plains

Counties in the Southern Low Plains (District No. 22) are Fisher, Haskell, Jones, Knox, Nolan, Stonewall, and Taylor. The Northern Low Plains (District No. 21), which contains Kent County, is included for the purpose of this analysis. The major dryland products are extensive row-crops, such as cotton, and wheat. Irrigation comes from the Seymour Aquifer where available. Major crops include wheat and cotton. Hay and silage are also produced, but because of low rainfall, their acreage is much less than in other districts in the BGRWPA.

1.9.7.5 Threats and Constraints to Water Supply

Projected population growth in the region, particularly along the IH-35 Corridor, will strain existing municipal supplies. The population of Williamson County within Region G, for example, is projected to increase more than 450% between 2020 and 2080 to about 2,426,093 people. Water will become even more valuable, especially in the western and central parts of the BGRWPA, due to limited options for new reservoirs and because the aquifers in these areas have limited potential for further development.

Other concerns include the high content of chloride in surface-water runoff from the upper Brazos River Basin. Water with high chloride content is more expensive to treat and therefore places capital constraints on suppliers who obtain surface water from affected streams and reservoirs.

Zebra mussels are an invasive species impacting water quality in reservoirs and impairing the operation of water supply infrastructure. The Texas Parks and Wildlife Department maintains an up-to-date list of the occurrences of zebra mussels at the following web site:

https://tpwd.texas.gov/huntwild/wild/species/exotic/zebramusselmap.phtml

According to the website, as of July 2023, the following reservoirs in the Brazos G Area are either "infested", i.e., established reproducing populations, or "positive", i.e., zebra mussels or their larvae have been detected: Lake Belton, Lake Georgetown, Lake Granger, and Lake Stillhouse Hollow. The Little River, downstream of Lakes Belton, Stillhouse Hollow, Georgetown and Granger is also positive for zebra mussels. Several reservoirs in the adjacent Trinity and Colorado River Basins are also infested or positive.

1.9.8 Susceptibility of Water Supplies to Drought

1.9.8.1 Groundwater

The 16 aquifers within the BGRWPA vary in drought resistance, but all tend to have more resistance than most surface-water reservoirs. Most of the thick, deep, and extensive sand aquifers with moderate to high transmissivity react very slowly to droughts. Their supplies are virtually drought-proof even during long droughts. These aquifers, such as the Carrizo-Wilcox and Gulf Coast Aquifers, store enormous amounts of water. Somewhat thinner, yet still extensive, sand aquifers with low to moderate transmissivity commonly are only slightly less drought resistant. These aquifers include the Trinity, Woodbine, Queen City, Sparta, and Hickory. The geological characteristics of the Carrizo-Wilcox Aquifer, classified as a confined aquifer, exacerbate the challenges associated with groundwater management. Confined aquifers are characterized by layers of impermeable rock that confine the groundwater, maintaining it under pressure and causing water levels to rise when accessed via wells. However, the extensive groundwater extraction can disturb this delicate balance. Large-scale pumping activities can significantly alter water pressure dynamics, resulting in a decline in water levels within wells. Consequently, accessing water becomes more difficult and costly for communities reliant on this resource.

During long droughts, shallow alluvial aquifers from which large withdrawals are made experience water level declines that are relatively large in comparison to total saturated thickness. Supplies from these aquifers, such as the Seymour and Brazos River Alluvium Aquifers, can be affected by drought but generally only by extended droughts. In extended droughts, available well yields are typically reduced, and pumps must run longer for a given level of supply.

In thin aquifers with shallow supplies, drought resistance may not be adequate. Such aquifers in the BGRWPA include the Dockum, Blaine, and Edwards-Trinity (Plateau). Also, shallow supplies in or near outcrop areas of aquifers, even of major aquifers, may have limited drought resistance.

Aquifers composed of limestone and/or dolomite are commonly the least drought- resistant. This is because these aquifers typically have only about one-tenth as much storage per cubic foot as sand aquifers. For limestone aquifers, the amount of well development is also an important factor in drought resistance. Thus, the Edwards (BFZ) Aquifer, with more developed well capacity than is available in extended droughts, is the least drought-resistant of all the aquifers in the BGRWPA.

Depending on location and exact local conditions, springflows and some Edwards (BFZ) well supplies are substantially reduced in only moderate droughts. In contrast, the Marble Falls and Ellenburger-San Saba Aquifers, which are relatively undeveloped by wells, can more slowly discharge a part of their stored water during long droughts.

In the Brazos G Area, for supplies drawing from the Edwards (BFZ) Aquifer, drought planning is critical. All of the other aquifers in the region are drought resistant due to their inherent characteristics.

1.9.8.2 Surface Water

Surface water supplies in the region vary greatly, as annual rainfall ranges from 20 to 24 inches in Kent County in the northwest, to 40 to 48 inches in Grimes County in the southeast. Evaporation rates show a similarly wide variation, with the highest rates occurring in the northwestern part of the region.

Drought originates from a deficiency of precipitation over an extended period of time, usually a season or more. This deficiency results in a water shortage for some activity, group, or environmental sector. Drought should be considered relative to some long-term average condition of balance between precipitation and evapotranspiration (i.e., evaporation + transpiration). It is also related to the timing (i.e., principal season of occurrence, delays in the start of the rainy season, occurrence of rains in relation to principal crop growth stages) and the effectiveness of the rains. Other climatic factors such as high temperature, high wind, and low relative humidity are often associated with drought and can significantly aggravate its severity.

Hydrological drought is associated with the effects of periods of precipitation shortfalls on surface water supply. The frequency and severity of hydrological drought is often defined on a watershed or river basin scale. Although all droughts originate with a deficiency of precipitation, hydrologists are more concerned with how this deficiency affects the water supply. Firm yields of reservoirs are estimated based on water that would be available through a repeat of the historic drought of record, which includes the effects of reduced runoff and high evaporation rates during the drought period. Water supply from run-of-the-river diversions are estimated based on water that would be available[19] through a repeat of the drought of record as well, but without the benefit of using stored water. The water supply estimates throughout this water plan are reliable through a repeat of the drought of record and are therefore not particularly susceptible to drought-induced shortages. However, the northwestern counties of the Brazos G Area are currently suffering through a particularly dry spell and data indicate new record drought conditions.

In 2009, 2011, 2012, and 2013 priority calls were made in the Brazos Basin. In July 2013 TCEQ issued an Order for the Brazos Basin including Possum Kingdom Lake and below Possum Kingdom Lake. The Order suspended or modified approximately 900 water rights in the Brazos Basin in 21 counties. The Order required the owners of larger reservoirs affected by the Order to submit pass-through plans, detailing their response to the priority call. The priority call was rescinded on October 10, 2013.

On April 9, 2014, the TCEQ directed that a new Watermaster be appointed for the Brazos River Basin including Possum Kingdom Lake and the watershed below the lake. The purpose of the Watermaster is to maintain compliance with water rights by monitoring stream flows, reservoir levels and water use. It is also the responsibility of the Watermaster to mediate the curtailment of water use if a priority call is initiated.

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[19] Estimates of municipal and industrial run-of-river diversions are for 100 percent reliability. For irrigation uses, run-of-river reliability less than 100 percent is often acceptable.

1.9.9 Identified Water Quality Problems

Water quality varies throughout the upper, middle and lower portions of the BGRWPA. Water quality is generally good in aquifers and in the tributaries of the Brazos River. However, high concentrations of chloride are found in the main stem of the Brazos River. Three factors affecting water quality in the Brazos G Area are wastewater disposal, high-density agricultural activities, and natural saline contamination.[20] Except for the third factor, these threats are associated with the growth of both population and the economy, which are expected to continue in the future.

Water quality data collection and assessment studies have been conducted since 1991 through the Texas Clean Rivers Program (CRP). Through collaborative efforts with other agencies and basin residents, the BRA identifies and evaluates water quality and watershed management issues, establishes priorities for corrective actions, and implements activities to improve and protect the Brazos River basin. Identified surface water quality problems within the BGRWPA are summarized according to specific regions in the basin and are based on information from the Texas Clean Rivers Program 2022 Basin Summary Report.[21]

1.9.9.1 Upper Basin Region

The Upper Basin Region includes the Salt and Double Mountain Forks and the Clear Fork of the Brazos River. Water quality data reveal water quality impacts represented by high conductivity levels, along with high total dissolved solids and chloride concentrations. Impairments have been identified in the Salt Fork and Double Mountain Forks of the Brazos River for chloride, bacteria, and mercury in edible tissue (Lake Alan Henry). Concerns have been identified for bacteria, chlorophyll a/nutrients, dissolved oxygen, and selenium.

Within the Clear Fork watershed, land use is predominantly agricultural, with Abilene representing the only urban area. All but one classified segment meet water quality standards to support their designated uses. The Clear Fork Brazos River segment was listed in 2018 as impaired for bacteria. In addition, the Clear Fork of the Brazos has concerns for nitrate and chlorophyll a, along with an increasing trend in chloride concentrations. Chloride concentrations in this region are noted to be a natural feature and dependent upon weather conditions. There are also reported increasing concerns for nutrient levels in this segment.

While this area contributes only 14 to 18 percent of the total Brazos River flow, the area contributes 45 to 55 percent of the total dissolved minerals and about 75 to 85 percent of the dissolved salts. Special studies in the area include:

- Biological Assessments of California Creek.

[20] Texas Natural Resource Conservation Commission (TNRCC), *Summary Report: Regional Assessments of Water Quality Pursuant to the Texas Clean Rivers Act (Senate Bill 818)*, 1992.

[21] Brazos River Authority (BRA), Texas Clean Rivers Program 2022 Basin Summary Report, available online at https://brazos.org/Portals/0/Documents/CRP/Brazos-River-Basin-Summary-Report-2022.pdf

1.9.9.2 Upper Central Basin Activity Region

The Upper Central Basin of the Brazos River includes eight lakes, five watersheds, and a variety of land uses interconnected throughout the watersheds. The Upper Central Basin Region generally covers from Bell County north to Hood County. Numerous watershed protection and management projects are being conducted in this region to address declining water quality due to impacts from industrial, agricultural, municipal, and natural causes.

Impairments have been identified in the Upper Watershed of the Brazos River for bacteria and sulfate/Total Dissolved Solids. Concerns have been identified for nutrient/Chlorophyll a. Salt Fork and Double Mountain Forks of the Brazos River for chloride, bacteria, and mercury in edible tissue (Lake Alan Henry). Concerns have been identified for bacteria, chlorophyll a/nutrients, dissolved oxygen, and selenium.

Concerns in the Aquilla Watershed have been identified for nutrient/Chlorophyll a, dissolved oxygen, and arsenic in sediment, each within Hackberry Creek.

The Bosque River Watershed drains approximately 1,652 square miles and discharges into Lake Waco. Impairments have been identified for depressed dissolved oxygen and bacteria. Concerns have been identified for chlorophyll a/nutrients, bacteria, dissolved oxygen, and the microbenthic community in the North Bosque River.

Impairments identified in the Leon River Watershed include bacteria and dissolved oxygen. Concerns have been identified for specific segments in the watershed for dissolved oxygen, bacteria, and chlorophyll a/nutrients.

The Lampasas Watershed includes Stillhouse Hollow Lake and Salado Creek. Water quality issues include identified impairments for dissolved oxygen, and concerns for chlorophyll a/nutrients, dissolved oxygen, and bacteria.

Numerous activities and special studies have been performed in this area to study and improve water quality conditions, including:

- Reservoir Fisheries Habitat Improvement Project, a partnership initiated in 2016 between BRA and the Texas Parks and Wildlife Department (TPWD) to perform habitat improvement projects on Possum Kingdom Lake, Lake Granbury, Lake Proctor, Lake Aquilla, Lake Whitney, Lake Belton, Stillhouse Hollow Lake, Lake Georgetown, Lake Granger, Lake Limestone, and Lake Somerville.
- Brazos Basin Instream Flow Monitoring Program to Inform on Environmental Flow Standards, initiated by the BRA in 2012 to perform extensive environmental studies at select locations in the Brazos River basin to gather data related to the Texas Commission on Environmental Quality's adopted Senate Bill 3 environmental flow baseline.
- A Total Maximum Daily Load for Atrazine in Aquilla Reservoir.
- Two Total Maximum Daily Loads for Phosphorus in the North Bosque River.
- Biological Assessments initiated by BRA for long-term aquatic life monitoring on the North Bosque River at Cooper's Crossing in 2008.
- A Watershed Protection Plan for the Leon River developed by stakeholders and approved by the Environmental Protection Agency (EPA) in early 2015 and presently in the implementation phase.
- A Watershed Protection Plan for Nolan Creek/South Nolan Creek developed by the Nolan Creek Watershed Partnership and accepted by the EPA in February 2019.

- Belton Lake, Proctor Lake, and Stillhouse Hollow Lake are part of a Reservoir Fisheries Habitat Improvement project.
- Biological Assessments in Resley Creek (an unclassified tributary of the Leon River) and the Leon River above Belton Lake.
- The Lampasas River Watershed Protection Plan to address bacteria issues in the watershed was approved by the EPA in May 2013 and by a Steering Committee in September 2013 and is in the implementation phase.

1.9.9.3 Lower Central Basin Activity Region

The Lower Central Basin includes the Little River Watershed (Lake Georgetown and Lake Granger), the Central Watershed (Lake Brazos Dam), and the Navasota River Watershed (Lake Mexia, Lake Springfield, and Lake Limestone). Portions of the area are subject to non-point source discharges and nutrient loading from agricultural activities.

The western portion of the Little River watershed is rapidly developing while the eastern portion of the watershed remains rural. It is reported that recent major industrial manufacturing movements will see urbanization spread even more rapidly eastward, potentially leading to additional land application of fertilizers, pesticides, pet waste, septic systems, and new sewage outfalls which can result in increased concentrations of nutrients, bacteria, and organic constituents. Data collected recently show that current water quality in the watershed overall is good and that most segments support their designated use classifications. Impairments have been identified for bacteria in the watershed, while concerns have been identified for chlorophyll a/nutrients, dissolved oxygen, and bacteria.

The Central Watershed of the Brazos River has primarily agricultural land usage, with two rapidly growing urban areas (Waco and Bryan/College Station). Impairments in portions of the watershed have been identified for bacteria and dissolved oxygen, and concerns have been identified for bacteria, dissolved oxygen, chlorophyll a/nutrients, microbenthic and fish communities, and fish kills in Tradinghouse Reservoir and Tehuacana Creek.

The Navasota Watershed covers approximately 2,235 square miles, with primarily agricultural land uses and one growing urban area (Bryan/College Station). Most of the water quality in the area is good, although there are segments of the watershed that are reported to exceed state standards for E. coli and dissolved oxygen. Impairments have been identified within the watershed for bacteria, dissolved oxygen, and pH, while concerns have been identified for chlorophyll a/nutrients, dissolved oxygen, bacteria, and toxic substances in sediment.

Special studies in the area include:

- Big Elm Watershed Protection Plan.
- Candidate Conservation Agreement with Assurances for the Balcones Spike and Texas Fawnsfoot in the Brazos River Basin.
- The U.S. Army Corps of Engineers (USACE) Sustainable Rivers Program presently underway to bring projects to the Little River System which will evaluate reservoir release strategies using the lower fraction of the USACE controlled reservoir flood pools, including Lake Georgetown, Lake Granger, Stillhouse Hollow Lake, and Lake Belton.
- Reservoir Fisheries Habitat Improvement Project.
- Characterization of Middle Yegua, Davidson, and Deer Creeks project.

- Watershed Characterization of the Thompsons Creek Watershed.
- TPWD Tehuacana Creek water quality reporting.
- Navasota River Below Lake Limestone Watershed Protection Plan.
- Three Total Maximum Daily Loads for Indicator Bacteria in the Carters Creek Watershed.
- Brazos Basin Instream Flow Monitoring Program to Inform on Environmental Flow Standards.
- Biological Assessments on Duck Creek.

Additionally, elevated naturally occurring arsenic levels have been experienced in Trinity Aquifer groundwater produced from certain areas of Falls, Hill, Limestone, and Milam Counties which has created compliance issues with USEPA drinking water standards.

1.9.9.4 Lower Basin Activity Region

The Lower Basin area includes the Yegua Creek Watershed, including Lake Somerville. Land use is mainly rural and cattle production with small urban areas and limited crop production areas. Water quality issues in portions of the area include identified impairments to bacteria, depressed dissolved oxygen, and pH, while concerns have been identified for bacteria, chlorophyll a, and dissolved oxygen.

Special studies in the area include:

- Characterization of Middle Yegua, Davidson, and Deer Creeks.
- Reservoir Fisheries Habitat Improvement.

1.9.10 Identified Threats to Agricultural and Natural Resources

Drought and water quality are the two primary threats to agricultural and natural resources in the Brazos G Area.

1.9.10.1 Threats to Agricultural Resources

Drought is the primary threat to agricultural resources in the Brazos G Area. During extended droughts, surface water sources crucial for unconfined livestock become severely depleted. Grazing lands and watering holes, essential for sustaining cattle and other free-roaming livestock, are significantly affected. With dwindling water sources, ranchers face the difficult task of providing adequate hydration and nutrition to their herds. Reduced access to water not only jeopardizes the health and well-being of livestock but also impairs their ability to graze effectively, leading to diminished forage availability and quality. Extended drought conditions not only diminish surface water supplies but also disrupt forage production cycles.

The scarcity of precipitation during critical growing seasons hampers the growth of essential forage crops, further exacerbating the challenges faced by livestock producers. Insufficient forage availability translates to reduced feed options for livestock, compelling ranchers to seek alternative feeding strategies or incur additional expenses to procure feed from external sources. Consequently, the overall productivity and profitability of livestock operations in the Brazos G Area are significantly compromised.

The reliance on groundwater for crop irrigation further magnifies the impact of drought on agricultural sustainability in the Brazos G Area. Limited groundwater availability during dry periods constrains farmers' ability to irrigate crops adequately, compromising yield potential and economic viability. As water becomes scarcer, farmers are forced to prioritize irrigation, often at the expense of other agricultural activities or face significant reductions in crop yields. Rural water systems, particularly in the northwest part of the region, face heightened vulnerability during drought periods. These systems, often reliant on groundwater sources, experience reduced water availability, leading to challenges in meeting the needs of both human populations and confined livestock operations.

Water quality can also pose a threat to agricultural resources. Increased levels of salts and total dissolved solids may damage certain crops and require additional water for irrigation. High levels of salts can accumulate on the surface soils, creating a hardpan effect that impedes percolation of irrigated water. As water quality degrades, crop selection and production may be limited. An additional threat to crop production is the migration into agricultural land of municipal well fields to supply groundwater to growing cities. Groundwater Conservation Districts and Underground Water Conservation Districts have been created in part to manage groundwater supplies that may have competing interests.

1.9.10.2 Threats to Natural Resources

The Brazos River Basin within the BGRWPA is a freshwater eco-region that is defined as primarily temperate coastal rivers and lakes habitat, with high-ranking habitats for fish, reptiles and amphibian species.[22] The identified threats to biological resources within the Brazos River Basin are multifaceted, with their origins rooted in various human activities and environmental changes. Land use disturbance, such as urbanization, agriculture, and deforestation, can lead to habitat loss, fragmentation, and degradation, directly impacting the flora and fauna dependent on these ecosystems. Moreover, reduced stream flow resulting from prolonged droughts amplifies the stress on aquatic habitats, leading to diminished water availability and altered hydrological regimes. These changes can disrupt the reproductive cycles, migration patterns, and overall health of aquatic species, further exacerbating biodiversity loss within the basin.

In addition to natural phenomena like drought, current and future water diversions from water supply projects pose a significant threat to the ecological integrity of the Brazos River Basin. These diversions can alter the flow regimes of rivers and streams, disrupting the natural balance of aquatic ecosystems and exacerbating habitat fragmentation. Lower lake levels resulting from water diversions and climate variability can impact not only the aquatic habitats within the lakes but also the surrounding riparian zones. Decreased water levels lead to the loss of critical habitat for aquatic species and riparian vegetation, exacerbating the decline in species richness and biodiversity. The impacted quality of surface and groundwater due to pollution from agricultural runoff, industrial discharge, and urban wastewater further compounds these challenges, threatening the health and viability of both terrestrial and aquatic ecosystems within the basin. Declining flows can affect the availability and quality of aquatic habitats and streamside vegetation and also contribute to changes in water temperature and chemistry.

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[22] Abell, R.A, D.M. Olson, E. Dinerstein, P.T. Hurley, J.T. Diggs, W. Eichbaum, S. Walters, W. Wettengel, T. Allnutt, C.J. Loucks, and P. Hedao. 2000. Freshwater Eco-regions of North America – A Conservation Assessment. World Wildlife Fund. Island Press. Washington D.C. 320 pp.

As discussed in Section 1.7.2, water quality in the Brazos River Basin has been degraded by increased concentrations of chlorides, dissolved metals, ammonia, nitrates, and phosphates, pesticides, algae, and fecal coliform bacteria. Under lower flow conditions, greater effects from pesticide contamination could occur through higher concentrations of chlorinated hydrocarbons and organic phosphates. A summary of potential effects that identified threats would have on biological resources is presented in Table 1.10. The water resources impacted by water quality concerns identified in Section 1.7.2 within the Brazos River Basin are presented in Table 1.11.

Reduced stream flows and reservoir levels, which are brought on by drought and increases in water use, pose the greatest potential threat to aquatic species in the region. Lower stream flows would alter the proportion of stream runs, riffles, pools, and backwater sloughs and decrease the wetted perimeter (total available habitat). These changes in habitat may benefit some species, primarily hardy, generalist species, but would negatively impact most species and result in reduced species richness. Riparian vegetation is also threatened by less over bank flooding and a shift to more mesic (drier) conditions with a decline in those species that are dependent on flooding processes (cottonwood, willow, and pecan) and an increase in species tolerating drier conditions (hackberry and mesquite).

Lower reservoir levels can have varying effects on habitat and biodiversity, depending on their duration and timing. When reservoir levels remain low for extended periods, the available habitat for aquatic species diminishes. This reduction in habitat availability can lead to lower species diversity and decreased species abundance. Aquatic organisms dependent on specific water depths and shoreline habitats may struggle to find suitable areas for breeding, foraging, and refuge. Consequently, the overall ecosystem health may decline, affecting the ecological balance within the reservoir. In contrast, if lower reservoir levels occur seasonally and are followed by subsequent rising lake levels, there can be potential positive effects, particularly on fishery production.

Seasonal fluctuations in water levels can stimulate productivity within the reservoir ecosystem. For example, during periods of low water levels, exposed shoreline areas may experience increased nutrient availability and sunlight exposure, promoting the growth of aquatic vegetation and phytoplankton. These conditions can enhance food availability and habitat complexity, ultimately benefiting fish populations. However, the extent of these positive effects depends on the timing and duration of both the low and rising water levels. If the low water levels coincide with critical periods in the life cycles of fish species, such as spawning or nursery habitat requirements, the benefits to fishery production may be limited. Additionally, rapid fluctuations in water levels can disrupt fish spawning behaviors and nesting sites, potentially offsetting any gains in fishery productivity.

Table 1.10 Summary of Regional Threats to Biological Resources in the Brazos River Basin

Threat	Potential Effects to Aquatic Organisms	Potential Effect to Riparian Vegetation
Rivers & Streams		
Lower Streamflows	Decreased stream runs, riffles, pools, and backwater sloughs resulting in lower habitat diversity and species richness.	Less overbank flooding and shift to more mesic (drier) conditions with decline in species dependent on flooding processes and increase in species tolerating drier conditions.

Threat	Potential Effects to Aquatic Organisms	Potential Effect to Riparian Vegetation
Rivers & Streams (continued)		
Lower Water Quality	Lower habitat suitability; lower habitat diversity, species richness, and abundance; possible direct and indirect adverse effects from point and non-point source contaminants.	Potentially enhanced growth from higher concentrations of phosphorus, nitrates, and other nutrients; but increased growth could be suppressed by lower water tables from declining flows, increased salinities or exposure to contaminants.
Reservoirs		
Lower Reservoir Levels	If prolonged, less available habitat resulting in lower species diversity & species abundance. If seasonal, potential positive effects through enhanced fishery production, depending on timing and duration of subsequent rising lake levels.	Increase in growth of shoreline herbaceous and woody vegetation during lower lake levels, but growth suppressed or reversed by rising lake levels and seasonal inundation.
Bays & Estuaries		
Reduced freshwater inflows	Possible change in hydrological dynamics of estuary. Projected effects would be minimal due to limited coastal marsh habitats associated with the Brazos River Estuary.	Effects considered minimal due to limited coverage resulting from previous levee construction and river channelization.

Table 1.11 Location of Threats to Biological Resources Related to Water Quality in the Brazos River

Identified Threats	Upper Basin	Upper Central Basin	Lower Central Basin	Lower Basin
Increased Chlorides	Salt and Double Mountain Forks, Clear Fork Brazos River segment, White River Lake	Upper Brazos River		
Bacteria	Salt Fork and Double Mountain Forks, Clear Fork Brazos River segment. Miller's Creek Reservoir	Upper Brazos River, Aquilla Watershed, Lake Waco, Leon River, Bosque River, Stillhouse Hollow Lake and Salado Creek	Lake Georgetown, Lake Granger, Lake Brazos Dam, Lake Mexia, Lake Springfield, and Lake Limestone	Yegua Creek Watershed, Lower Brazos River Watershed, Upper and Middle Oyster Creek Watersheds

Identified Threats	Upper Basin	Upper Central Basin	Lower Central Basin	Lower Basin
Dissolved Oxygen	Salt Fork and Double Mountain Forks	Upper Brazos River. Aquilla Watershed, Bosque River, Lake Waco, Leon River, Stillhouse Hollow Lake and Salado Creek	Lake Georgetown, Lake Granger, Lake Brazos Dam, Lake Mexia, Lake Springfield, and Lake Limestone	Yegua Creek Watershed, Lower Brazos River Watershed
Increased Nutrients(1)	Salt and Double Mountain Forks, Clear Fork Brazos River segment, California Creek	Upper Brazos River, Aquilla Watershed, Bosque River, Lake Waco, Leon River, Stillhouse Hollow Lake and Salado Creek	Lake Georgetown, Lake Granger, Lake Mexia, Lake Springfield, and Lake Limestone, Lake Brazos Dam	Yegua Creek Watershed, Lower Brazos River Watershed, Upper and Middle Oyster Creek Watersheds
Algae		North Bosque River, Lake Waco	Lake Brazos Dam	
Pesticides & Heavy Metals	Salt Fork and Double Mountain Forks	Aquilla Watershed, Upper Brazos River	Trinity Aquifer groundwater, Lake Brazos Dam	

Notes:
(1) Includes: Ammonia, Phosphorus, Nitrogen, Nitrate-Nitrogen.

1.10 Drought Preparations

With the significant historical growth across the state and considering the current projections for future growth in the Brazos G area, the demand for water is expected to continue increasing. Preparation and planning for potential future drought(s) is critical to ensuring a sufficient water supply is available to meet user demands. Refer to Chapter 7 of this plan for detailed information concerning the drought of record in the Brazos G area, current drought preparation and considerations, and recommendations for additional regional level drought response planning tools.

Drought contingency plans are required by the State for wholesale water suppliers, irrigation districts, and retail water suppliers. For surface water right-holders that supply 1,000 acft/yr or more for non-irrigation use and 10,000 acft/yr for irrigation use, SB1 requires a water conservation plan. To aid entities in the region with the development of these plans, example water conservation and drought management plans are provided in Appendices J and K.

In addition, conservation plans are commonly included in the management plans of Groundwater Conservation Districts or Underground Water Conservation Districts.

1.11 Existing Programs and Goals

1.11.1 Groundwater Regulation

1.11.1.1 Priority Groundwater Management Areas

The Texas Legislature authorized the TCEQ to identify and delineate priority groundwater management areas (PGMAs) as "those areas of the state that are experiencing or that are expected to experience, within the immediately following 25-year period, critical groundwater problems, including shortages of surface water or groundwater, land subsidence resulting from groundwater withdrawal, and contamination of groundwater supplies" (§Section 35.007, Chapter 35, Title 2, Texas Water Code).

Following a PGMA designation, the TCEQ may recommend creating a groundwater conservation district. Citizens in the PGMA have two years to establish a Groundwater Conservation District (GCD). If a GCD is not established in the required timeframe, a GCD will be established that is consistent with the original TCEQ recommendation, which will be governed by a locally elected board of directors.

TCEQ designated two PGMA areas in the BGRWPA, the Central Texas-Trinity Aquifer PGMA and the Northern Trinity and Woodbine Aquifers PGMA, shown on Figure 1.22. The TCEQ designated the Central Texas-Trinity Aquifer PGMA on October 31, 2008. Counties in this PGMA include Bosque, Coryell, Hill, McLennan, and Somervell. The Northern Trinity and Woodbine Aquifers PGMA was designated on February 11, 2009. This PGMA includes Collin, Cooke, Dallas, Denton, Ellis, Fannin, Grayson, Hood, Johnson, Montague, Parker, Tarrant, and Wise counties. Only Hood and Johnson counties are in the Brazos G Area.

At the time of this plan, all affected counties in the PGMA areas are part of GCDs. In 2007 the Upper Trinity GCD was formed, which includes Hood County. In May 2009, Bosque County joined the Middle Trinity GCD. The Tablerock GCD, which included Coryell County, was dissolved by the Legislature; Coryell County joined the Middle Trinity GCD in 2009. In 2009, the Texas Legislature created the Prairielands GCD and the Southern Trinity GCD. The Prairieland GCD includes Johnson, Hill and Somervell counties. At this time, only McLennan County is part of the Southern Trinity GCD. A map of groundwater conservation districts is presented in Figure 1.23.

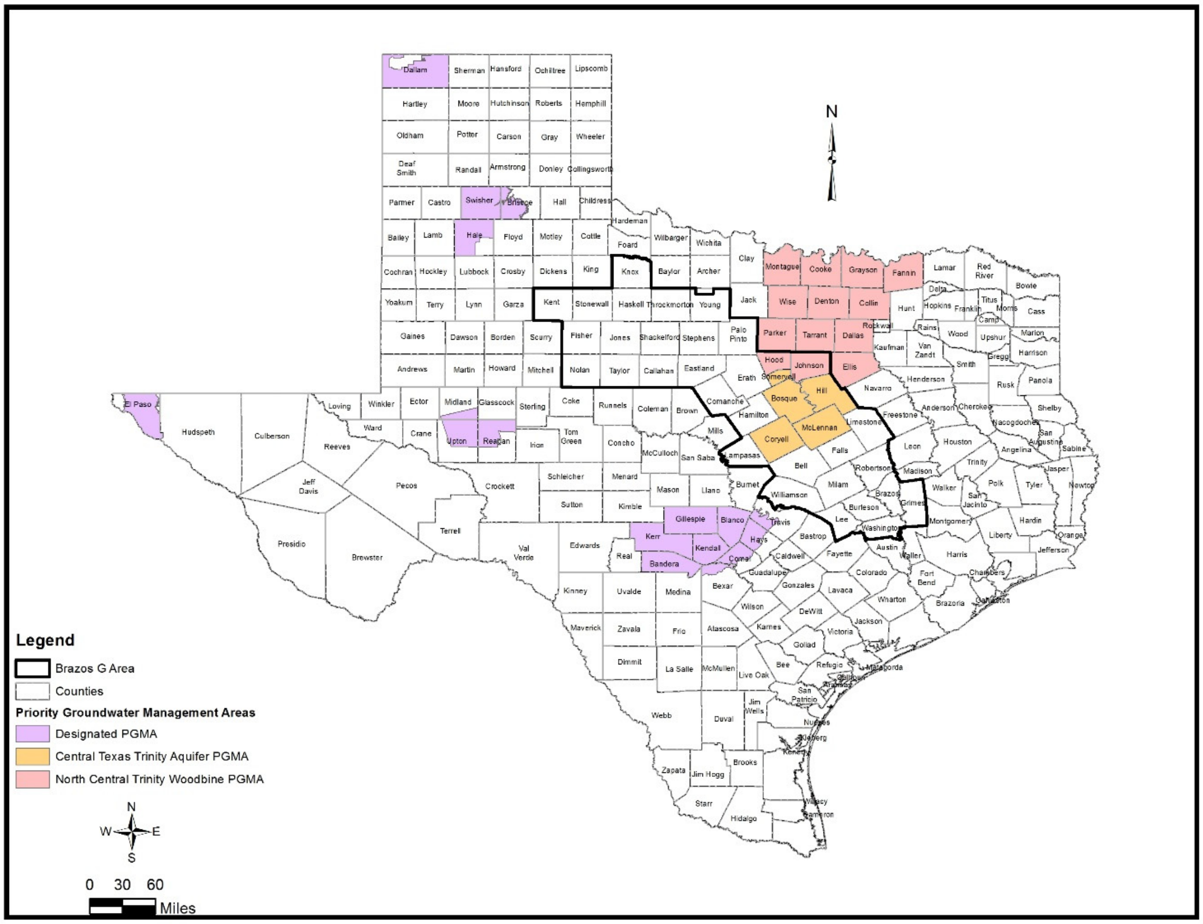

Figure 1.22 Priority Groundwater Management Areas

1.11.1.2 Groundwater Conservation Districts and Groundwater Management Areas

There are thirteen GCDs in the BGRPA, as shown on Figure 1.23 and listed in Table 1.12. All GCDs are required to develop and implement a management plan to manage groundwater resources. A list of the GCDs' management plan approval dates are shown on Table 1.12 and are available through the TWDB website.

In 2001, Senate Bill 2 of the 77th Texas Legislature authorized the TWDB to designate Groundwater Management Areas (GMAs) that would include all major and minor aquifers of the state. Sixteen GMAs were delineated and adopted by the TWDB in 2002 and cover all major and minor aquifers in Texas. The BGRWPA intersects GMA 6, 7, 8, 12, and 14. These GMAs are shown on Figure 1.23 and are listed in Table 1.13.

In 2005, House Bill 1763 of the 79th Texas Legislature required GCDs in groundwater management areas to meet and define the Desired Future Conditions (DFCs) of the groundwater resources within the groundwater management area. The legislation requires that the DFCs be defined by September 1, 2010 and every 5 years thereafter. This requires joint planning among the GCDs in each GMA to determine Desired Future Conditions.

Desired Future Conditions are defined by statute to be "the desired, quantified condition of groundwater resources (such as water levels, spring flows, or volumes) within a management area at one or more specified future times as defined by participating groundwater conservation districts within a groundwater management area as part of the joint groundwater planning process." The most common DFCs are based on the volume of groundwater in storage over time, water levels (limiting decline within the aquifer), water quality (limiting deterioration of quality) or spring flow (defining a minimum flow to sustain).

After the DFCs are determined by the GMAs, the TWDB performs quantitative analysis to determine the amount of groundwater available for production that does not exceed the DFC. For aquifers where a Groundwater Availability Model (GAM) exists, the GAM is used to develop the MAG (Available Groundwater). The MAG estimated through this process is then used by RWPGs as the available groundwater for the planning period. For aquifers or local groundwater that are not listed as a minor or major aquifer, the water availability is based on historical use and available hydrogeological records. Table 1.13 shows the status of the Desired Future Conditions development, and the status of the determination of Modeled Available Groundwater (MAG) for each GMA in the BGRWPA.

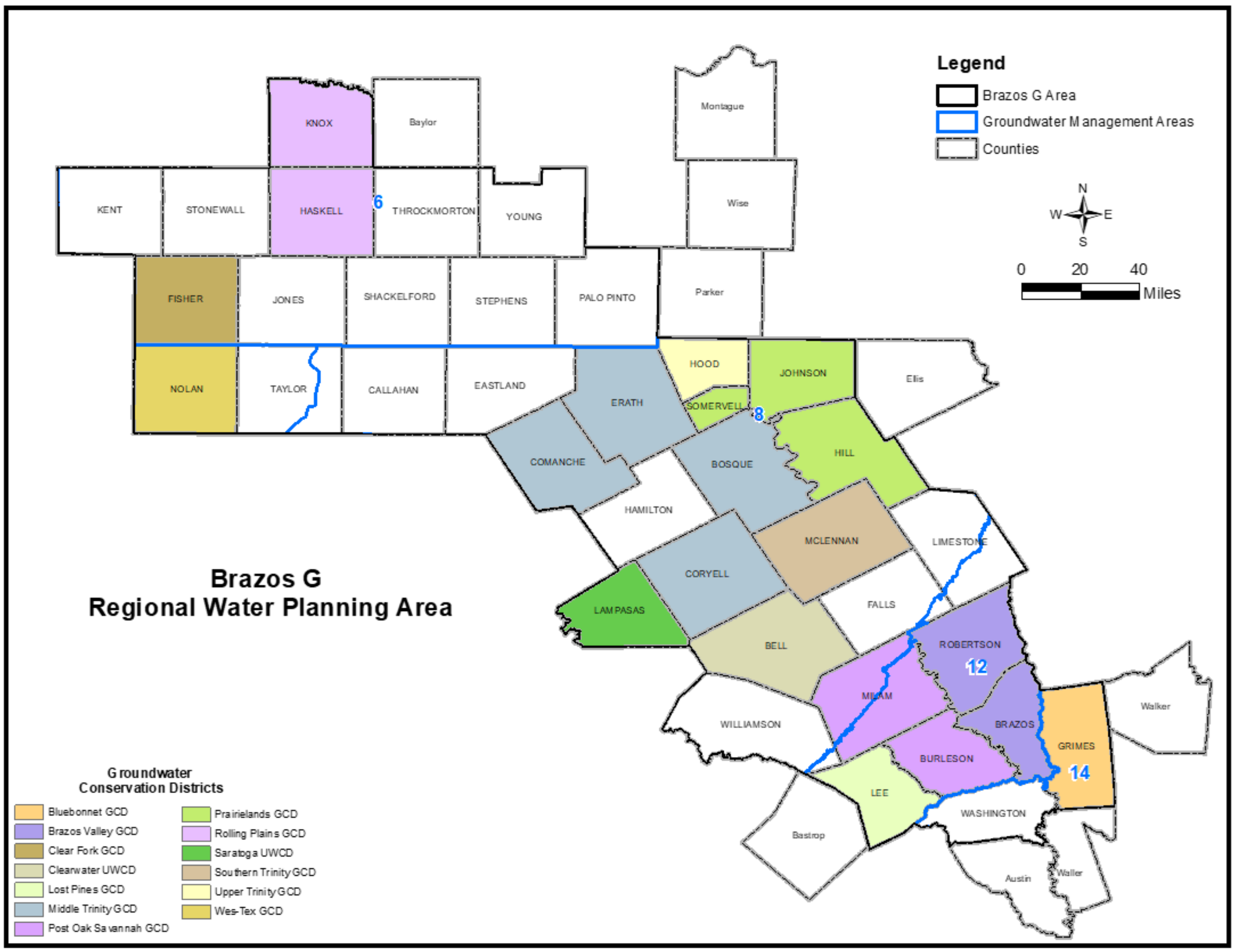

Figure 1.23 Groundwater Conservation Districts and Groundwater Management Areas Located Wholly or Partially within the Brazos G Area

Table 1.12 Groundwater Conservation District Management Plan Approval Dates

Name of District	Date Plan Approved
Bluebonnet Groundwater Conservation District	1/27/2022
Brazos Valley Groundwater Conservation District	5/13/2019
Clear Fork Groundwater Conservation District	2/25/2022
Clearwater Groundwater Conservation District	12/20/2020
Lost Pines Groundwater Conservation District	9/21/2022
Middle Trinity Groundwater Conservation District	7/27/2022
Post Oak Savannah Groundwater Conservation District	11/15/2022
Prairielands Groundwater Conservation District	5/31/2019
Rolling Plains Groundwater Conservation District	8/25/2020
Saratoga Groundwater Conservation District	8/31/2020
Southern Trinity Groundwater Conservation District	9/9/2021
Upper Trinity Groundwater Conservation District	7/6/2020
Wes-Tex Groundwater Conservation District	3/18/2020

Table 1.13 Groundwater Conservation Districts, Aquifers, Desired Future Conditions (DFCs), and Modeled Available Groundwater (MAG) Status by GMA for the Brazos G Area

Groundwater Management Areas			
Groundwater Management Area 6			
Clear Fork GCD, Rolling Plains GCD			
Aquifer	Major or Minor Aquifer?	Desired Future Conditions Status	Modeled Available Groundwater Status
Seymour	Major	11/18/2021	Submitted 11/14/2022, GR 21-011 MAG
Dockum	Minor	11/18/2021	Submitted 11/14/2022, GR 21-011 MAG
Blaine	Minor	11/18/2021	Submitted 11/14/2022, GR 21-011 MAG
Cross Timbers	Minor	No DFC adopted(1)	-
Groundwater Management Area 7			
Wes-Tex GCD			
Aquifer	Major or Minor Aquifer?	Desired Future Conditions Status	Modeled Available Groundwater Status
Edwards-Trinity (Plateau)	Major	8/19/2021	Submitted 8/12/2022, GR 21-012 MAG
Dockum	Minor	No DFC adopted(1)	-
Groundwater Management Area 8			
Clearwater UWCD, Middle Trinity GCD, Post Oak Savannah GCD[2], Prairielands GCD, Saratoga UWCD, Southern Trinity GCD, Upper Trinity GCD			
Aquifer	Major or Minor Aquifer?	Desired Future Conditions Status	Modeled Available Groundwater Status
Trinity	Major	11/4/2021	Submitted 11/1/2022, GR 21-013 MAG

Groundwater Management Areas			
Groundwater Management Area 8 (continued)			
Clearwater UWCD, Middle Trinity GCD, Post Oak Savannah GCD[2], Prairielands GCD, Saratoga UWCD, Southern Trinity GCD, Upper Trinity GCD			
Edwards (BFZ)	Major	11/4/2021	Submitted 11/1/2022, GR 21-013 MAG
Brazos River Alluvium	Minor	No DFC adopted(1)	-
Ellenburger - San Saba	Minor	11/4/2021	Submitted 11/1/2022, GR 21-013 MAG
Hickory	Minor	11/4/2021	Submitted 11/1/2022, GR 21-013 MAG
Marble Falls	Minor	11/4/2021	Submitted 11/1/2022, GR 21-013 MAG
Woodbine	Minor	11/4/2021	Submitted 11/1/2022, GR 21-013 MAG
Groundwater Management Area 12			
Brazos Valley GCD, Post Oak Savannah GCD[2], Lost Pines GCD			
Aquifer	**Major or Minor Aquifer?**	**Desired Future Conditions Status**	**Modeled Available Groundwater Status**
Carrizo-Wilcox	Major	11/30/2021	Submitted 11/1/2022, GR 21-017 MAG
Brazos River Alluvium	Minor	11/30/2021	Submitted 11/1/2022, GR 21-017 MAG
Queen City	Minor	11/30/2021	Submitted 11/1/2022, GR 21-017 MAG
Sparta	Minor	11/30/2021	Submitted 11/1/2022, GR 21-017 MAG
Yegua-Jackson	Minor	11/30/2021	Submitted 11/1/2022, GR 21-017 MAG
Groundwater Management Area 14			
Bluebonnet GCD			
Aquifer	**Major or Minor Aquifer?**	**Desired Future Conditions Status**	**Modeled Available Groundwater Status**
Gulf Coast	Major	1/5/2022	Submitted 9/8/2022, GR 21-019 MAG

Notes:
(1) No DFC is currently adopted by GMA for this aquifer and no corresponding MAG has been published by the GMA. Availability estimates presented elsewhere in this plan are based on historic modeling and/or modeling during MAG development for other aquifers. 2 Post Oak Savannah GCD is in GMA 8 and GMA 12.

1.11.1.3 Texas Clean Rivers Act

In 1991, the 72nd Legislature passed the Texas Clean Rivers Act[23] to establish for the first time a watershed basis for water quality planning in Texas.[24][25] The Act requires each river basin in the State to be assessed for water quality and management strategies on an on-going basis. It also requires reports to be provided to the TCEQ every even-numbered year.[26] The Act provides specific guidelines for accomplishing the water quality assessments, including: (1) comprehensive assessments on a watershed basis with emphasis on non-point sources, nutrients, and toxic materials; (2) delegation of responsibility for assessments to river authorities; (3) formation of river basin steering committees; (4) discharge permitting on a basin-wide basis; and (5) assessment fees charged to wastewater- and water-rights permittees.

The BRA is a partner with the TCEQ in the Clean Rivers Program for the BGRWPA. The program provides funding for BRA staff to assess water quality in the Brazos River Basin and to document local problems. Also, the program provides fee payers with site-specific information on water quality such as receiving water assessments and flow data. The Basin Summary 2022 Report[27] for the Brazos River Basin provides an assessment of water quality for the basin, drawing attention in part to: (1) the exceedance of state standards raising concerns for recreation due to elevated bacteria levels, dissolved oxygen depletion, and natural salt impacts to the usability of water, (2) the need for more long-term data on water quality, (3) non-point source pollution, (4) wastewater and watershed management issues, (5) impacts to ecosystems, and (6) the needs for funding and public education. The 2022 Basin Summary provides detailed findings about water quality and related items for selected sub-watersheds of the basin. The findings most relevant to the BGRWPA were summarized in Section 1.7.2.

1.11.2 Clean Water Act

The 1972 Federal Water Pollution Control Act, which as amended is called the Clean Water Act, is the federal law with the most impact on water quality protection in the BGRWPA. As amended in 1977 and again in 1987, the Clean Water Act: (1) establishes the framework for monitoring and controlling industrial and municipal point-source discharges through the National Pollutant Discharge Elimination System (NPDES), (2) authorizes federal assistance for the construction of municipal wastewater treatment facilities, and (3) requires cities to obtain permits for stormwater or non-point-source discharges.[28] The Clean Water Act also includes provisions to protect specific aquatic resources. Section 303 establishes a non-degradation policy for high quality waters and provides for establishment of state standards for receiving water quality. Section 401 allows states to enforce water quality requirements for federal projects such as dams. Section 404 provides safeguards for wetlands and other waters from the discharge of dredged or fill material. Section 305 calls for the TCEQ to prepare and submit a water quality inventory to the U.S. Environmental Protection Agency.[29]

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[23] Senate Bill 818, amending the Texas Water Code, Sections 5.103, 5.105, 26.011; T.A.C. Sections 320.1-320.9.

[24] TNRCC, Op. Cit., 1992.

[25] TNRCC, Op. Cit., 1999.

[26] BRA, "Planning and Environmental Division", [Online] Available URL: http://www.brazos.org/home.htm, 1999.

[27] BRA, Op. Cit., 2022.

[28] 33 USCA, Sections 1251 through 1387.

[29] TWDB, 1997.

Other provisions protect particular types of ecosystems such as lakes (Section 314), estuaries (Section 320), and oceans (Section 403).[30] Several of these provisions are relevant to specific water quality concerns in the BGRWPA.

1.11.3 Safe Drinking Water Act

The Safe Drinking Water Act, passed in 1974 and amended in 1986 and 1996, allows the U.S. Environmental Protection Agency to set standards for drinking water quality. These standards are divided into two categories: National Primary Drinking Water Regulations (primary standards that must be met by all public water suppliers) and National Secondary Water Regulations (secondary standards that are not enforceable, but are recommended). Primary standards protect water quality by limiting levels of contaminants that are known to adversely affect public health and that are anticipated to occur in water. Secondary standards have been set for contaminants that may affect cosmetic or aesthetic qualities of water (e.g., taste, odor, or color). For some constituents, the State of Texas has secondary standards that differ from the National standards.

1.11.4 Source Water Assessment and Protection Program

The TCEQ's Source Water Assessment and Protection (SWAP) Program can be an important part of water resource management. The SWAP Program, authorized by the Safe Drinking Water Act, assists local jurisdictions in preventing contamination of drinking water supplies. It identifies sources of public drinking water, determines potential contaminants, assesses water systems' susceptibility to contamination, and informs the public of the results. It is part of a comprehensive, integrated approach to clean ground and surface water undertaken by the TCEQ.

The centerpiece of the SWAP Program is a focus on prevention. Water can be easily contaminated, but it is difficult and expensive to clean up. Through the SWAP Program, by preventing contamination, jurisdictions are able to avoid the cost of removing contamination and maintain clean, reliable sources for drinking water.

The SWAP Program is designed to assist Texas communities in protecting their drinking water sources. Its goal is to increase public awareness of the importance of protecting drinking water sources and actions that can be taken to protect those sources. The SWAP Process involves seven steps:

1. Delineation (or mapping) of source water protection areas, any areas surrounding a drinking water source, whether from ground or surface water.
2. Conducting an inventory of actual or potential sources of contamination in the delineated area.
3. Conducting an analysis of the relative susceptibility of the water supply to those contamination sources and presenting the results to the public water supply in the form of a Source Water Susceptibility Assessment Report. These results provide insights into activities near your water sources and serve as the starting point for implementing source water protection.
4. Working with selected local communities to make information available to the public.

[30] Adler, R.W., Landman, J. and Cameron, D., *The Clean Water Act: Twenty Years Later*, Island Press, Washington D.C., 1993.

5. Voluntary application of best management practices to prevent contamination, such as land use practices, regulations and permits, structural measures, good housekeeping practices, public education and emergency response planning.
6. Monitoring and continually assessing source water supplies; and,
7. Conducting triennial sampling and continually monitoring, assessing and conducting protection activities.

By conducting continual monitoring, assessment and protection activities, communities can minimize potential sources of contamination and protect source water supplies over the long-term.

1.11.5 State Water Availability Modeling Initiatives

1.11.5.1 TCEQ Water Availability Models

Water Availability Models (WAMs) are computer-based simulation models used to determine water availability for surface water rights under Texas' priority system. These models are used to evaluate water availability for newly requested water rights or water right amendments. The models are also used for regional water planning. There are twenty individual WAMs that cover the twenty-three river basins in Texas, including coastal basins. The original hydrologic period of record within most WAMs was approximately 1940 to 1997; however, the TCEQ has been working in coordination with stakeholders throughout the state to extend this period with more recent hydrologic data. An updated Brazos WAM has now been developed that extends the hydrologic data in the official model through 2018.

There are two WAM scenarios used and maintained by TCEQ staff:

1. Full Authorization (Run3) – In the Full Authorization scenario all water rights utilize their full authorized amounts. This scenario is used to evaluate perpetual water rights and amendments.
2. Current Conditions (Run 8) – The Current Conditions scenario Includes return flows, current reservoir conditions and has water rights diversions based on historical use. This scenario is used to evaluate term water rights.

Most of the Brazos G Planning Area falls within the area covered by the Brazos WAM. Existing supplies and future water management strategies were evaluated using a modified WAM Run 3. The modified WAM Run3 includes existing and future sediment conditions for reservoirs.

1.11.5.2 TWDB Groundwater Availability Models

Groundwater Availability Models (GAMs) were developed under the direction of the TWDB. The GAMs cover most of the major and minor aquifers within Texas. The GAMs are used in the regional planning process as discussed in 1.11.1. Based on the agreed upon Desired Future Condition (DFC) the GAMs are run to develop the MAG for each aquifer to be used in the Regional Planning Process.

1.12 Previous Water Supply Planning in the Brazos G Area

As discussed in previous sections, the Brazos G Area is large and diverse with varying needs of water users in the different parts of the region. In response to these different needs, the region has a history of successful local water supply planning and development. These studies are too numerous to identify and list in entirety here. Some of the more recent studies include:

1. Bosque County water treatment and distribution study to address water needs in Bosque County in the central Brazos River Basin. The study was completed in March 2004.[31]
2. The Brazos River Authority and Tarrant Regional Water District sponsored a water supply study for Parker and Johnson Counties in the central Brazos River Basin to meet the growing needs of this area. Phase 1 of the study was completed in April 2004.[32]
3. The West Central Brazos River Basin Regional Water Treatment and Distribution Facility Study evaluated water needs in the upper Brazos River Basin. This study was completed in August 2004.[33]
4. Bell/Williamson Regional Water Supply Facility Plan – Included eight participants in southern Bell County and Northern Williamson County. The study recommended the cooperation of these eight participants in development of infrastructure and water supply projects.
5. The City of Abilene and the Cities of Midland and San Angelo (Region F) have formed the West Texas Water Partnership (WTWP) to identify and secure long-range water supplies for the three cities and the surrounding region. Results from ongoing studies will be reflected in future regional water plans.
6. The Falls, Hill, Limestone, and McLennan Counties (FHLM)-TWDB Regional Water Facility Planning Study evaluated the feasibility of a regional water system to replace and/or supplement multiple smaller water systems currently providing service within the FHLM area. The study addresses elevated arsenic concentrations experienced by study participants and also evaluates water treatment and transmission alternatives to meet the arsenic Maximum Contaminant Level (MCL).[34]

Brief summaries of the Brazos G Regional and State Water Plans and several studies completed recently are presented in the following sections.

1.12.1 Brazos G Regional and State Water Plans

Since SB1 was passed in 1997, the Brazos G Regional Planning Group has completed four rounds of planning, with regional plans adopted in 2001, 2006, 2011, 2016, and 2021. These regional plans have been rolled up with 15 other regional plans into the State Water Plan in 2002, 2007, 2012, 2017, and 2022, respectively. Each successive plan has been updated to reflect the most relevant information at the time. This section provides a brief summary of each of the Brazos G Regional water Plans and the State Water Plans.

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[31] Carter-Burgess, March 2004, Bosque County Regional Water Treatment and Distribution Facilities Plan, Final Report to the Brazos River Authority.
[32] Freese and Nichols, April 2004, Regional Water Supply and Wastewater Service Study for Johnson and Parker Counties, Phase I.
[33] Freese and Nichols, August 2004, West Central Brazos River Basin Regional Water Treatment and Distribution Facility Plan.
[34] Susan Roth, 2015, Final Draft Report – FHLM Regional Water Facility Planning Study.

1.12.1.1 2001 Brazos G Regional Water Plan[35]

The 2001 Brazos G Regional Water Plan found that on a regional basis, there are sufficient water supplies to meet the projected demands. By 2050, the region was projected to have a surplus of about 500,000 acre-feet per year, yet there were some entities that did not have enough water to meet projected needs. The highest growth areas were identified along the I-35 corridor in the central part of the region, straining existing groundwater supplies. Slower economic growth and implementation of previous long-term planning in the upper Brazos G Area resulted in fewer municipal needs in this part of the region. However, water quality concerns in the upper Brazos River Basin can limit water supplies.

The major recommended strategies in the 2001 plan included four new major reservoirs, reallocation of hydropower storage in Lake Whitney, coordinated operation of reservoir systems for the Brazos River Authority and the City of Abilene, chloride control in the upper Brazos River Basin, and further development of groundwater from the Carrizo-Wilcox aquifer. Since the plan was completed, the California Creek Diversion Project, a recommended strategy in the 2001 plan for the City of Stamford to supplement supplies from Lake Stamford, has been constructed and is operational. Other smaller projects also have been completed or are in the design phase.

The recommended new major reservoirs include:

1. Millican Reservoir (Bundic Dam Site).
2. Little River Reservoir.
3. South Bend Reservoir (long-term strategy).
4. Breckenridge Reservoir (long-term strategy).

1.12.1.2 2006 Brazos G Regional Water Plan[36]

In the 2006 plan, a comparison of total supplies available in the region with demand for all use categories in the region shows a surplus past the year 2050. These mask shortages that are projected to occur to individual water supply entities and water user groups. Shortages were shown for entities in 32 of the 37 counties in the Brazos G Area. The recommended water strategies included advanced water conservation, wastewater reuse, system operation of Brazos River Authority Reservoirs, conjunctive use, desalination, aquifer storage and recovery, brush management, weather modification, six new on-channel and five new off-channel reservoirs, regional interconnection, Carrizo-Wilcox aquifer development and voluntary redistribution. The total supply from these recommended water supplies is over 590,000 acre-feet per year at an estimated cost of over $1 billion.

[35] Brazos G Regional Planning Group, January 2001, Regional Water Plan.

[36] Brazos G Regional Planning Group, January 2006, Regional Water Plan.

1.12.1.3 2011 Brazos G Regional Water Plan[37]

In the 2011 plan, a comparison of total supplies available in the region (developed groundwater supplies and firm surface water) with demand for all use categories in the region shows a surplus past the year 2040. These mask shortages that are projected to occur to individual water supply entities and water user groups. Shortages are projected for Williamson County starting at about the year 2020, while overall regional supplies are projected to exceed regional demands until past the year 2040. Even within most counties that have projected overall surpluses, there are individual entities that do not have sufficient supply to meet projected needs. Shortages were shown for entities in 31 of the 37 counties in the Brazos G Area. The recommended water strategies included advanced water conservation, wastewater reuse, system operation of Brazos River Authority Reservoirs, conjunctive use, desalination, aquifer storage and recovery, brush management, weather modification, nine new on-channel and six new off-channel reservoirs, regional interconnection, Carrizo-Wilcox aquifer development, voluntary redistribution, storage reallocation of federal reservoirs and reservoir connections. The total supply from these recommended water supplies is over 587,000 acre-feet per year at an estimated cost of over $3 billion.

1.12.1.4 2016 Brazos G Regional Water Plan[38]

Municipal demands are developed assuming a hot, dry year, with 2011 typically selected as the basis for estimating daily per capita use values (gpcd) for each WUG. Conservation is considered first as a water management.

The 2016 Brazos G Regional Water Plan includes recommendations for 99,573 acft/yr of municipal conservation savings and another 46,662 acft/yr for wastewater reuse. The conservation savings are in excess of those already included in the TWDB demand projections. Conservation recommendations for several entities in Williamson County go beyond this and call for a reduction to a target of 120 gpcd by 2070.

Total new supplies of water into the Brazos G Area total 397,655 acft/yr, comprised of newly developed groundwater, supply transferred from other regions, newly developed surface water supplies, or supplies made available through conservation or augmentation of existing facilities. Total project costs for these new supplies exceed $2.5 billion.

System operation of the Brazos River Authority's reservoirs can increase supplies in the Brazos G Area by nearly 167,000 acft/yr (assuming interruptible supplies can be firmed up through conjunctive operation with other sources), with additional supplies available to the Region H Area in the lower basin. This strategy would more efficiently utilize the existing resources of the BRA by expanding the supply that can be developed from the BRA's existing reservoirs, thus delaying the need for new reservoirs to meet growing needs in the basin. Related to this, overdrafting of Lake Granger when the reservoir is nearly full and injecting part of this supply into the Trinity Aquifer through an Aquifer Storage and Recovery (ASR) project can yield an additional 9,050 acft/yr of supply when the ASR well field is operated in conjunction with Lake Granger to meet demands.

[37] Brazos G Regional Planning Group, January 2011, Regional Water Plan.

[38] Brazos G Regional Planning Group, January 2016, Regional Water Plan.

During the Brazos G regional water planning process, water management strategies such as additional development of Carrizo-Wilcox Aquifer groundwater and the Lake Granger Augmentation Project were preferred options to include in the 2016 Brazos G Regional Water Plan. When confronted by the Modeled Available Groundwater (MAG) limitations of these two options, the BGRWPG had little alternative at that time but to make the Little River Off-Channel Reservoir a recommended strategy.

1.12.1.5 2021 Brazos G Regional Water Plan[39]

In the 2021 Brazos G Regional Water Plan, it was determined that the annual total water usage in the region was projected to significantly increase from 853,170 acre-feet in 2010 to 1,408,066 acre-feet in 2070, marking a 65 percent increase over the 50-year planning horizon. Over this period, municipal and steam-electric water usage were projected to increase, while mining, irrigation, and livestock water usage were anticipated to decline as proportions of the total.

The analysis utilized the drought as the basis for water supply determinations in the region, with hydrologic data extended to consider more recently observed drought conditions in the Brazos River basin. Fifteen aquifers underlying parts of the Brazos G Area were identified, with a combined reliable supply of approximately 500,100 acre-feet per year by the 2070 decade. Along with surface water supplies, the significance of groundwater supplies were highlighted, such as the Seymour Aquifer in the western part of the region, alongside the Dockum and Edwards-Trinity aquifers. In the eastern part, the Carrizo-Wilcox aquifer was identified as a prolific water supply, supplemented by lesser amounts from the Queen City, Sparta, and Brazos River Alluvium.

Strategies recommended in the 2021 Brazos G Plan included numerous and varied approaches such as water conservation, wastewater reuse, near-term construction of new reservoirs, groundwater development, the augmentation of existing reservoir supplies, brush control, desalination, aquifer storage and recovery, and regional water supply projects. The total new supplies of water into the Brazos G Area were estimated at 424,436 acre-feet per year, with associated project costs exceeding $9 billion.

The plan also provided recommendations for municipal conservation savings and wastewater reuse, totaling 103,439 acre-feet per year and 38,315 acre-feet per year, respectively. Furthermore, guidance on drought management and emergency supply measures was offered to assist water managers in managing their systems. Recommendations were made to the Texas Water Development Board and the Texas Legislature regarding key water policy issues and the direction of water supply management in Texas.

1.12.1.6 Water for Texas 2002[40]

This was the first State Water Plan to be adopted by the TWDB after the passage of SB1 in 1997. It was estimated that by 2050, almost 900 cities statewide (representing 38 percent of the projected population) and other water users will need either to reduce demand (through conservation and/or drought management) or develop additional sources of water beyond those currently available to meet their needs during droughts. The proposed water management strategies had an estimated cost of $17.9 billion.

[39] Brazos G Regional Planning Group, January 2021, Regional Water Plan.

[40] Texas Water Development Board, January 2002, Texas State Water Plan.

1.12.1.7 Water for Texas 2007[41]

The state was projected to grow from 21 million people in 2000 to approximately 46 million people in 2060. It was estimated that Texas would need 8.8 million acre-feet of water by 2060 to meet this growth. The 16 Regional Water Planning Groups identified 4,500 water management strategies to provide an additional 9.0 million acre-feet of water. The estimated cost of these strategies was approximately $30.7 billion. Without this investment there would be a potential $9.1 billion impact to businesses and workers by 2020 with increased impact of $98.4 billion by 2060.

1.12.1.8 Water for Texas 2012[42]

The 16 Regional Water Planning Groups (Planning Groups) identified a total of 2,569 water user groups. Of those groups, 895 (35 percent) in 2020 would have water supply needs if the state were facing drought conditions, increasing to 1,085 (42 percent) in 2060. The Water Planning groups recommended feasible water management strategies to meet most of those needs. Solutions proposed by the Planning Groups include strategies such as the use of currently developed surface water and groundwater sources, conservation, reuse, new interbasin transfers, and development of additional groundwater and surface water resources. 26 new reservoirs were recommended by the Planning Groups to meet identified needs of the water user groups. The Planning Groups estimated total capital costs over the next 50 years to meet needs for additional water supplies at $53 billion, including $27 billion to implement strategies for municipal water user groups. Meeting these costs will require a long-term financial commitment from local political subdivisions, regional authorities, and the State of Texas.

1.12.1.9 Water for Texas 2017[43]

The 16 Regional Water Planning Groups identified a total of 4.76 million acre-feet per year of water needs in 2020, increasing to 8.89 million acre-feet/year by 2070. These needs include 511,000 acre-feet/year of municipal needs in 2020 and 3.41 million acre-feet/year in 2070, a 567 percent increase. The 16 regional water planning groups recommended about 5,500 water management strategies. The principal strategies to address those needs include demand management (mostly in the form of conservation) (30 percent of the supply recommended), reuse of wastewater (14 percent), additional groundwater development (10 percent), and surface water strategies (45 percent). Planning groups recommended 26 new major reservoir that would provide about 1.1 million acre-feet per year of new supplies. About 2,500 individual projects are associated with the recommended water management strategies, with an estimated implementation cost of $63 billion.

[41] Texas Water Development Board, January 2007, Texas State Water Plan.

[42] Texas Water Development Board, January 2012, Texas State Water Plan.

[43] Texas Water Development Board, January 2017, Texas State Water Plan.

1.12.1.10 Water for Texas 2022[44]

The 16 Regional Water Planning Groups projected an increase in water needs from 3.1 million acre-feet per year in 2020 to 6.9 million acre-feet per year by 2070. These needs consist of 5.2 million acre-feet per year for municipal purposes in 2020, surging to 8.5 million acre-feet per year by 2070, marking a 63 percent rise. The Planning Groups have suggested around 5,800 water management strategies to tackle these demands. The primary strategies proposed include demand management, mainly through conservation (representing 31 percent of the recommended supply), wastewater reuse (15 percent), additional groundwater development (12 percent), aquifer storage and recovery resources (3 percent), seawater desalination (3 percent), and surface water strategies (37 percent). These strategies are tied to approximately 2,400 individual projects. If executed, these strategies could yield an additional 7.7 million acre-feet per year in water supplies to user groups by 2070, with an estimated implementation cost of $80 billion in 2018 dollars, not adjusting for future inflation.

1.12.2 Bosque County Regional Water Treatment and Distribution Facilities Plan

The 2001 Brazos G Regional Water Plan identified several water users in Bosque County with shortages over the planning period. In an attempt to address this widely known shortage, the Brazos River Authority, Texas Water Development Board, and the Cities of Clifton and Meridian jointly sponsored a study to determine the regional water needs and to evaluate existing and proposed water facilities.

The study evaluated four alternatives to supply water to the different users, including individual treatment and delivery systems to a regional facility that would serve all participants. The study recommended the regional facility, which would include expansion of the City of Clifton's water treatment plant and interconnections to the other participants, including Clifton, Childress WSC, Meridian, Valley Mills and Walnut Springs.

1.12.3 Falls, Hill, Limestone, and McLennan Counties (FHLM) – TWDB Regional Water Facility Planning Study

FHLM WSC, in conjunction with 26 other entities, commissioned this study to evaluate the feasibility of developing a regional water infrastructure plan to serve existing and future populations through 2040 in the study area within Falls, Hill, Limestone, and McLennan Counties. Changes to the Maximum Contaminant Level (MCL) for arsenic published by the United States Environmental Protection Agency (USEPA) in 2001 caused a number of water systems to be non-compliant due to naturally-occurring and elevated arsenic levels in local groundwater supplies. Additionally, regional declines in the Trinity Aquifer also created supply concerns beyond that of just the arsenic concentrations.

The study evaluated different alternatives for meeting the projects goals including blending of water with elevated arsenic concentrations, individual treatment systems violating the arsenic MCL, a new regional surface water treatment plant, and Carrizo-Aquifer development. The study recommended that the Carrizo-Wilcox Aquifer development project be implemented since it diversifies the water supply portfolio in a cost-effective manner for the member utilities while also securing long term water supplies.

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[44] Texas Water Development Board, January 2022, Texas State Water Plan.

The study noted that individual treatment by affected utilities would provide the shortest development time period, and if a negotiated Agreed Order with the USEPA couldn't not be obtained for implementing the recommended Carrizo-Wilcox Regional Groundwater Project, individual treatment or blending should be pursued to satisfy USEPA requirements related to the arsenic MCL.

1.12.4 Regional Water Supply and Wastewater Service Study for Johnson and Parker Counties, Phase I

The Brazos River Authority and Tarrant Regional Water District (TRWD) jointly commissioned a study to investigate the feasibility of developing regional water supply and wastewater treatment facilities to serve the unmet needs of the two counties. The first phase of the anticipated two-phase study was completed in April 2004. The primary objective of the first phase was to identify and evaluate raw water supply and water and wastewater treatment concepts of mutual interest to the Authority, TRWD and their primary wholesale customers. Subject to the Phase I identification of concepts deemed worthy of additional study, a Phase II study may further study those options that show promise from an engineering, economic, water quality and institutional standpoint.

Phase I of the study identified several water supply scenarios to serve water user groups with projected shortages in each county. The study focused on concepts that would blend the higher TDS water from the Brazos Basin with lower TDS water from the Trinity River Basin to reduce the need to desalinate the Brazos Basin water. The study concluded that a regional water treatment plant in northwest Johnson County treating a blend of BRA and TRWD water could economically serve a large area of northwest Johnson, southwest Tarrant, and southeast Parker counties, including the new growth in Fort Worth's extraterritorial jurisdiction. A second option involved a plant in northeast Johnson County which could supply a large area with unmet needs including the rapidly growing areas around Mansfield and Burleson. Phase II of the study is intended to provide more detailed information required by stakeholders to allow them to further evaluate these concepts in relation to their own interests and potential participation in a regional system. Phase II has not been initiated to date.

The Upper Trinity Groundwater Conservation District has performed a more recent planning study of the area. This study evaluated projected growth in population and water demands, and identified potential water management strategies.

1.12.5 West Central Brazos River Basin Regional Water Treatment and Distribution Facility Study

The Brazos River Authority, Texas Water Development Board, and the U.S. Economic Development Administration sponsored a water treatment and distribution study for water users in the upper Brazos River Basin. This study was initiated in response to the significant drought that occurred in the late 1990s and subsequent years and developed a plan to meet demands 25 percent greater than projected needs in order to account for the future uncertainties of droughts.

The West Central Brazos River Basin Regional Water Treatment and Distribution Facility Plan evaluated the water needs in an 18-county area, assessed the economic impacts of water shortages, and identified a plan to develop and efficiently utilize the water resources in the area. Specific concerns identified in the study included water quality of surface water sources, limited groundwater sources, and limited existing infrastructure to move water from areas with supply to areas with needs.

Recognizing the vulnerability of small surface lakes and the uncertainty of groundwater, this study focused on interconnecting existing supply sources and developing new supplies to provide a safe level of supply to water users and increase the reliability of existing sources to promote economic growth in the region. Collectively, over 25 potential water management strategies were evaluated to meet specific needs in the region. In addition, three general strategies (brush control, weather modification and saltwater control) were reviewed as potential means to improve water quality and quantity in the region.

The study conducted numerous hydraulic analyses to evaluate the possibility of moving water through existing and improved infrastructure, including the West Central Brazos Distribution System in Stephens County (formerly the Kerr-McKee pipeline). Two scenarios demonstrated the greatest potential impact to the region:

1. Interconnection between Abilene and North Central Texas MWA.
2. Interconnections among Shackelford WSC, Stephens County Rural WSC and the City of Throckmorton using the West Central Brazos Distribution System.

Other major strategies recommended in this study include:

- Regional water treatment plant to treat water from Possum Kingdom Lake.
- Connection from Lake Stamford to Throckmorton.
- Turkey Peak Reservoir in Palo Pinto County.
- Diverting water from the Clear Fork of the Brazos River to Hubbard Creek Lake and increasing the capacity to transport water to Abilene.

1.13 Summary of Water Loss Audits in Brazos G Area

Retail public water utilities are required to complete and submit a water loss audit form to the Texas Water Development Board. The first water loss audit reports were submitted to the TWDB by March 31, 2006. Entities with greater than 3,300 connections are required to submit their water loss audit to TWDB on an annual basis. In addition, all other retail public suppliers are required to submit a water loss audit once every five years with the next scheduled audit due May 1, 2024. State law requires that water loss audits be completed by a person trained to conduct water loss auditing. The TWDB offers in-person training across the State and offers the training through an online Water Loss Auditor Training Video. The water audit reporting requirements follow the International Water Association (IWA) and American Water Works Association (AWWA) Water Loss Control Committee methodology.

The primary purposes of a water loss audit are to account for all the water being used and to identify potential areas where water can be saved. Water losses are classified as either apparent loss or real loss. Apparent loss is the water that has been used but has not been tracked. It includes losses associated with inaccurate meters, billing adjustment and waivers, and unauthorized consumption. Real loss is the actual water loss of water from the system, and includes main breaks and leaks, customer service line breaks and leaks, and storage overflows. The sum of the apparent loss and the real loss make up the total water loss for a utility.

In the Brazos G Area in 2022, 109 public water suppliers submitted a water loss audit to TWDB. Table 1.14 summarizes the water loss audit information that was collected by the TWDB for the 2022 calendar year. The average total water loss was nearly 24%, which is higher than the 2017 statewide average of 14.56%. The region encourages the reduction in water loss where feasible.

Table 1.14 Summary of Water Loss Audits in the Brazos G Area

Statistic	Real Loss for WUGs with Less than 32 Connections per Mile (gal/mi/day)	Real Loss for WUGs with 32 or More Connections per Mile (gal/connection/day)	Apparent Daily Loss (gal/connection/day) Apparent Daily Loss	Total Water Use (gpcd)	Water Loss (gpcd)	Total Water Loss (%)
Median	570.30	34.80	5.61	106.00	18.00	16.98
Average	724.13	57.55	7.33	113.56	26.92	23.71

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CHAPTER 2 PROJECTED POPULATION AND WATER DEMANDS

2.1 Introduction

The Texas Water Development Board (TWDB) publishes population and water demand projections for each county in the state for use by the regional water planning groups. Population projections were developed for municipal water user groups (WUGs), which are defined as private or publicly owned water systems that provide more than 100 acre-feet per year (ac-ft/yr) for municipal use, and “County-Other” to capture those people living outside the WUG-sized utilities. In the Brazos G Area, population projections were completed for 289 municipal WUGs, including 37 County-Other WUGs. Multiple municipal WUGs are located in more than one county, resulting in 360 unique municipal WUG projections when the portions of WUGs located in different counties are separated. Water demand projections were also developed for other types of use on a county-wide basis, including manufacturing, steam-electric power generation, mining, irrigation, and livestock uses.

The TWDB has adopted revisions to the population and water demand projections for the Brazos G Area, as recommended by the Brazos G regional water planning group (RWPG). Revisions have been made to the population projections, and municipal, manufacturing, irrigation, livestock, and stream electric power water demand projections. Revisions to the population and municipal water demand projections for municipal WUGs resulted from coordination with individual utilities and included modifications to both population and/or projected per-capita water use (gallons per capita daily [gpcd]) projections. Water demand projections for these non-municipal categories were revised to reflect the dry year demand in a 10-year period from 2010-2019. Generally, where documentation was determined to be lacking the default methodologies proffered by the TWDB for projecting water demands were utilized.

2.2 Population Projections

As shown in Figure 2.1 the population of the 37-county area is projected to increase from 3,032,159 in 2030 to 5,660,538 in 2080, an increase of 86.7 percent (1.73 percent annual growth). This is somewhat greater than the projected statewide population growth during the same period of 53 percent (1.1 percent annually). In 2080, it is projected that 42.9 percent of the Brazos G Area population will live in Williamson County, 12.5 percent in Bell County, 10.4 percent in Brazos County, 7.3 percent in Johnson County, 7.2 percent in McLennan County, 3.9 percent in Taylor County, 2.6 percent in Milam County and 13.3 percent among remaining counties. Projections and growth rates for each of the 37 counties and 289 WUGs, including “County-Other,” in the Brazos G Area are presented in Table 2.1.

Growth in the Brazos G Area is concentrated along the Interstate Highway 35 (IH-35) corridor, stretching from Williamson County in the south to Johnson County in the north. Growth is also taking place along US Highway 183 in Williamson and Lampasas counties, Taylor and Jones counties (Abilene area), and Brazos County (Bryan/College Station area). Milam County is projected to be the fastest growing county between 2030 and 2080, growing at 2.7 percent annually. Williamson, Johnson, Brazos, Comanche, Erath, and Hood counties are also projected to grow at 1.0 percent or more annually. A comparison of the annual growth rates for all the counties is shown in Figure 2.2.

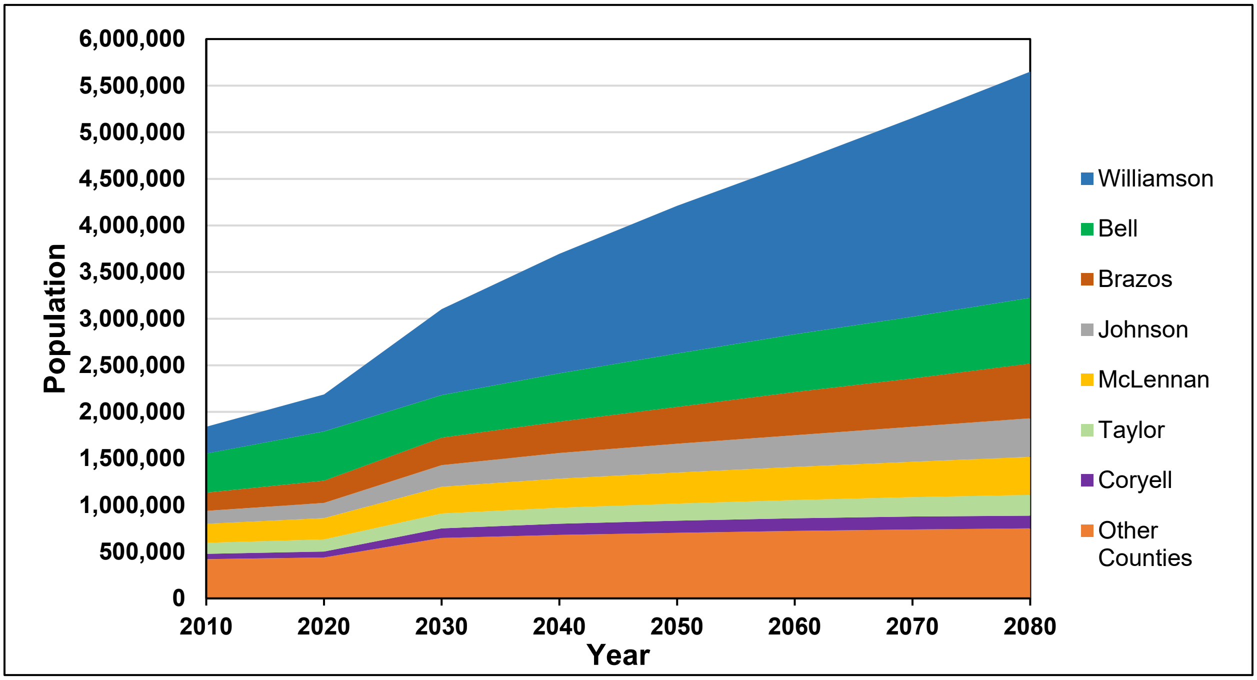


Figure 2.1 Population Projections

Table 2.1 Historical and Projected Population by Water User Group/County

UG/County	Historical		Projections						Annual Percent Growth	
	2010	2020	2030	2040	2050	2060	2070	2080	2010-2020	2020-2080
Bell County										
439 WSC	5,596	6,277	8,084	9,457	10,729	11,803	12,590	13,019	1.16%	1.22%
Bartlett	1,655	1,632	664	634	611	584	554	524	-0.14%	-1.88%
Bell Milam Falls WSC	4,904	5,061	2,263	2,404	2,511	2,573	2,642	2,721	0.32%	-1.03%
Belton	17,489	23,310	28,600	34,647	40,620	46,083	50,585	53,719	2.91%	1.40%
County-Other, Bell	-	-	4,610	5,192	5,408	5,012	4,320	3,347	-	-
Dog Ridge WSC	3,391	4,267	5,016	5,642	6,122	6,453	6,824	7,238	2.32%	0.88%
Elm Creek WSC	3,026	3,322	2,556	2,727	2,892	3,040	3,188	3,336	0.94%	0.01%
Fort Hood	29,240	27,811	20,634	21,461	22,287	23,114	23,940	24,767	-0.50%	-0.19%
Georgetown	76,135	123,177	4,394	5,982	6,533	6,542	6,648	6,555	4.93%	-4.77%
Harker Heights	26,654	33,013	36,879	42,566	48,218	50,000	50,000	50,000	2.16%	0.69%
Holland	1,091	1,054	1,209	1,232	1,251	1,269	1,288	1,306	-0.34%	0.36%
Jarrell-Schwertner	5,559	6,754	2,730	3,005	3,215	3,354	3,510	3,685	1.97%	-1.00%
Kempner WSC	14,671	16,506	2,224	2,438	2,601	2,707	2,826	2,961	1.19%	-2.82%
Killeen	127,314	152,631	173,431	198,764	221,697	247,195	272,291	297,387	1.83%	1.12%
Bell County WCID 2	1,494	1,643	1,796	1,902	1,983	2,027	2,077	2,135	0.96%	0.44%
Moffat WSC	3,914	2,805	2,066	1,844	1,646	1,469	1,311	1,170	-3.28%	-1.45%
Pendleton WSC	1,765	2,006	2,235	2,407	2,538	2,618	2,710	2,813	1.29%	0.57%
Rogers	960	921	918	891	868	839	808	774	-0.41%	-0.29%
Salado WSC	4,720	6,252	7,529	8,442	9,464	10,610	11,895	13,337	2.85%	1.27%
Temple	69,052	85,214	115,562	129,327	139,891	147,103	155,187	164,252	2.13%	1.10%
Troy	1,761	2,479	3,847	4,122	4,397	4,672	4,947	5,222	3.48%	1.25%
West Bell County WSC	3,466	3,908	4,335	4,650	4,890	5,034	5,199	5,384	1.21%	0.54%
Morgans Point Resort	3,626	4,079	5,300	5,800	6,300	6,800	7,300	7,800	1.18%	1.09%
Armstrong WSC	2,113	2,676	3,155	3,559	3,867	4,081	4,319	4,587	2.39%	0.90%
East Bell WSC	2,727	2,519	2,320	2,176	2,063	1,945	1,815	1,673	-0.79%	-0.68%
Bell County WCID 3	4,243	5,350	9,460	11,636	14,996	18,356	19,140	19,924	2.35%	2.22%
Central Texas College District	424	645	548	548	548	548	548	548	4.28%	-0.27%

UG/County	Historical		Projections						Annual Percent Growth	
	2010	2020	2030	2040	2050	2060	2070	2080	2010-2020	2020-2080
Little Elm Valley WSC	1,342	1,616	1,824	2,010	2,154	2,249	2,356	2,475	1.88%	0.71%
The Grove WSC	984	991	1,149	1,369	1,586	1,805	2,023	2,242	0.07%	1.37%
Bell County WCID 1	221	250	264	264	264	264	264	264	1.24%	0.09%
Bell County Total	419,537	528,169	455,602	517,098	572,150	620,149	663,105	705,165	2.33%	0.48%
Bosque County										
Childress Creek WSC	1,660	1,307	1,293	1,262	1,213	1,171	1,121	1,067	-2.36%	-0.34%
Clifton	3,449	3,474	3,511	3,776	4,061	4,368	4,697	5,052	0.07%	0.63%
County-Other, Bosque	-	-	6,648	5,964	5,083	4,219	3,269	2,224	-	-
Cross Country WSC	2,396	2,804	281	274	264	254	243	231	1.58%	-4.08%
Meridian	1,867	1,739	1,758	1,716	1,652	1,594	1,528	1,455	-0.71%	-0.30%
Valley Mills	1,242	1,258	1,247	1,269	1,292	1,315	1,340	1,364	0.13%	0.13%
Highland Park WSC	528	505	352	343	330	318	305	290	-0.44%	-0.92%
Hilco United Services	5,840	6,251	1,309	1,405	1,508	1,618	1,737	1,865	0.68%	-2.00%
Mustang Valley WSC	1,911	1,840	1,835	1,790	1,722	1,660	1,591	1,513	-0.38%	-0.33%
Smith Bend WSC	128	127	128	125	120	116	111	105	-0.08%	-0.32%
Hog Creek WSC	381	359	73	71	69	66	63	61	-0.59%	-2.91%
Bosque County Total	19,402	19,664	18,435	17,995	17,314	16,699	16,005	15,227	0.13%	-0.43%
Brazos County										
Bryan	76,916	81,200	103,527	122,757	145,418	172,357	217,070	273,294	0.54%	2.04%
College Station	81,672	96,208	124,105	140,635	165,452	194,489	191,010	187,998	1.65%	1.12%
County-Other, Brazos	-	-	2,497	2,584	2,961	3,131	3,436	3,864	-	-
Wellborn SUD	10,022	23,176	27,844	31,712	37,506	44,684	52,741	61,791	8.74%	1.65%
Wickson Creek SUD	14,321	18,532	18,215	20,731	24,501	29,168	34,407	40,294	2.61%	1.30%
Texas A and M University	-	-	19,681	19,681	19,681	19,681	19,681	19,681	-	-
Brazos County Total	182,931	219,116	295,869	338,100	395,519	463,510	518,345	586,922	1.82%	1.66%
Burleson County										
Caldwell	4,228	4,119	4,293	4,326	4,310	4,286	4,260	4,231	-0.26%	0.04%
County-Other, Burleson	-	-	7,076	7,080	6,970	6,847	6,708	6,555	-	-
Milano WSC	2,710	2,741	1,320	1,337	1,354	1,371	1,389	1,408	0.11%	-1.10%
Snook	511	378	1,170	1,179	1,173	1,161	1,152	1,143	-2.97%	1.86%

UG/County	Historical		Projections						Annual Percent Growth	
	2010	2020	2030	2040	2050	2060	2070	2080	2010-2020	2020-2080
Somerville	1,296	1,253	1,316	1,324	1,317	1,308	1,297	1,284	-0.34%	0.04%
Southwest Milam WSC	7,158	8,099	794	833	875	918	965	1,013	1.24%	-3.41%
Deanville WSC	2,280	1,835	1,926	1,940	1,928	1,914	1,898	1,881	-2.15%	0.04%
Cade Lakes WSC	427	415	436	439	437	434	430	426	-0.28%	0.04%
Burleson County Total	18,610	18,840	18,331	18,458	18,364	18,239	18,099	17,941	0.12%	-0.08%
Callahan County										
Baird	1,492	1,473	1,537	1,535	1,523	1,507	1,490	1,470	-0.13%	0.00%
Clyde	3,713	3,811	3,979	4,007	4,035	4,063	4,091	4,120	0.26%	0.13%
County-Other, Callahan	-	-	2,126	1,940	1,669	1,359	1,028	675	-	-
Cross Plains	960	881	920	918	910	899	887	872	-0.86%	-0.02%
Potosi WSC	5,611	6,520	231	231	229	226	223	219	1.51%	-5.50%
Coleman County SUD	-	-	169	177	185	193	202	211	-	-
Callahan County WSC	1,917	2,206	2,304	2,343	2,383	2,424	2,466	2,508	1.41%	0.21%
Eula WSC	2,287	2,517	2,629	2,711	2,797	2,884	2,975	3,068	0.96%	0.33%
Hamby WSC	1,249	1,256	243	251	258	266	274	282	0.06%	-2.46%
Westbound WSC	2,421	2,383	175	175	173	172	169	166	-0.16%	-4.34%
Callahan County Total	19,650	21,047	14,313	14,288	14,162	13,993	13,805	13,591	0.69%	-0.73%
Comanche County										
Comanche	4,399	4,278	4,307	4,259	4,183	4,158	4,138	4,120	-0.28%	-0.06%
County-Other, Comanche	-	-	7,117	6,845	6,445	6,276	6,087	5,870	-	-
De Leon	2,178	2,185	2,226	2,284	2,361	2,405	2,460	2,531	0.03%	0.25%
Comanche County Total	6,577	6,463	13,650	13,388	12,989	12,839	12,685	12,521	-0.17%	1.11%
Coryell County										
Copperas Cove	29,515	33,519	48,375	63,971	73,604	79,781	81,693	78,916	1.28%	1.44%
County-Other, Coryell	-	-	3,543	3,737	3,668	3,328	2,931	2,468	-	-
Elm Creek WSC	3,026	3,322	489	492	492	490	484	474	0.94%	-3.19%
Fort Hood	29,240	27,811	15,566	16,190	16,813	17,437	18,060	18,684	-0.50%	-0.66%
Gatesville	14,830	14,984	15,649	15,956	16,219	16,239	16,284	16,353	0.10%	0.15%
Kempner WSC	14,671	16,506	4,308	4,350	4,305	4,197	4,075	3,938	1.19%	-2.36%
Coryell City Water Supply District	4,811	5,872	4,984	5,099	5,163	5,131	5,098	5,069	2.01%	-0.24%

UG/County	Historical		Projections						Annual Percent Growth	
	2010	2020	2030	2040	2050	2060	2070	2080	2010-2020	2020-2080
Multi County WSC	3,218	3,743	3,306	3,386	3,425	3,400	3,373	3,348	1.52%	-0.19%
Central Texas College District	424	645	343	343	343	343	343	343	4.28%	-1.05%
Flat WSC	510	632	682	698	707	700	695	691	2.17%	0.15%
Fort Gates WSC	1,959	2,174	2,345	2,402	2,430	2,413	2,395	2,376	1.05%	0.15%
Mountain WSC	1,494	1,811	1,955	2,002	2,024	2,010	1,994	1,979	1.94%	0.15%
Mustang Valley WSC	1,911	1,840	27	27	28	27	28	26	-0.38%	-6.85%
Oglesby	530	478	515	528	534	530	526	522	-1.03%	0.15%
The Grove WSC	984	991	168	199	231	263	294	326	0.07%	-1.84%
Coryell County Total	107,123	114,328	102,255	119,380	129,986	136,289	138,273	135,513	0.65%	0.28%
Eastland County										
Cisco	3,935	3,919	3,947	4,027	4,135	4,172	4,225	4,295	-0.04%	0.15%
County-Other, Eastland	-	-	2,976	2,877	2,504	2,338	2,055	1,636	-	-
Eastland	3,955	3,537	3,515	3,187	2,908	2,684	2,499	2,357	-1.11%	-0.67%
Gorman	1,077	955	952	886	798	745	685	619	-1.20%	-0.72%
Ranger	2,447	2,279	2,273	2,146	2,039	1,959	1,899	1,865	-0.71%	-0.33%
Rising Star	751	699	698	659	626	601	583	572	-0.71%	-0.33%
Staff WSC	1,100	1,223	1,156	1,259	1,396	1,466	1,549	1,649	1.07%	0.50%
Westbound WSC	2,421	2,383	2,230	2,266	2,316	2,330	2,351	2,382	-0.16%	0.00%
Eastland County Total	15,686	14,995	17,747	17,307	16,722	16,295	15,846	15,375	-0.45%	0.04%
Erath County										
County-Other, Erath	-	-	18,207	19,748	21,549	23,679	26,068	28,756	-	-
Dublin	3,513	3,148	2,877	2,582	2,322	2,019	1,759	1,537	-1.09%	-1.19%
Stephenville	16,735	20,372	26,797	29,440	32,581	36,832	41,538	46,758	1.99%	1.39%
Gordon	654	635	6	6	6	6	6	6	-0.29%	-7.48%
Erath County Total	20,902	24,155	47,887	51,776	56,458	62,536	69,371	77,057	1.46%	1.95%
Falls County										
Bell Milam Falls WSC	4,904	5,061	1,254	1,169	1,079	993	901	797	0.32%	-3.03%
Bruceville Eddy	4,478	4,227	1,253	1,654	1,766	1,885	2,013	2,273	-0.58%	-1.03%
County-Other, Falls	-	-	6,889	6,241	5,485	4,767	3,806	2,510	-	-
Marlin	5,425	4,944	4,571	4,317	4,104	3,924	3,839	3,890	-0.92%	-0.40%

UG/County	Historical		Projections						Annual Percent Growth	
	2010	2020	2030	2040	2050	2060	2070	2080	2010-2020	2020-2080
Rosebud	1,416	1,270	1,190	1,109	1,036	953	892	853	-1.08%	-0.66%
West Brazos WSC	2,050	2,144	770	739	715	696	693	714	0.45%	-1.82%
East Bell WSC	2,727	2,519	117	119	122	125	132	143	-0.79%	-4.67%
Cego-Durango WSC	949	1,023	1,174	1,343	1,527	1,676	1,875	2,154	0.75%	1.25%
Levi WSC	862	941	393	515	635	718	802	882	0.88%	-0.11%
Little Elm Valley WSC	1,342	1,616	46	70	95	117	143	179	1.88%	-3.60%
North Milam WSC	1,348	982	9	7	6	5	4	3	-3.12%	-9.20%
Falls County Total	25,501	24,727	17,666	17,283	16,570	15,859	15,100	14,398	-0.31%	-0.90%
Fisher County										
The Bitter Creek WSC	1,624	1,554	667	642	625	616	606	596	-0.44%	-1.58%
County-Other, Fisher	-	-	907	874	850	835	823	811	-	-
Roby	604	549	533	514	498	491	483	475	-0.95%	-0.24%
Rotan	1,659	1,482	1,436	1,386	1,346	1,328	1,306	1,285	-1.12%	-0.24%
S U N WSC	2,115	2,212	16	15	15	15	16	14	0.45%	-8.09%
Fisher County Total	6,002	5,797	3,559	3,431	3,334	3,285	3,234	3,181	-0.35%	-1.00%
Grimes County										
County-Other, Grimes	-	-	10,456	10,977	11,335	11,491	11,551	11,445	-	-
Navasota	7,004	7,424	7,917	8,239	8,513	8,722	8,956	9,216	0.58%	0.36%
Wickson Creek SUD	14,321	18,532	4,771	5,214	5,578	5,899	6,261	6,668	2.61%	-1.69%
Dobbin Plantersville WSC	-	-	4,587	5,071	5,469	5,822	6,221	6,672	-	-
G and W WSC	-	-	1,398	1,500	1,584	1,656	1,737	1,827	-	-
MSEC Enterprises	-	-	196	305	474	736	1,143	1,776	-	-
TDCJ Luther Units	1,153	1,007	1,170	1,170	1,170	1,170	1,170	1,170	-1.34%	0.25%
TDCJ W Pack Unit	1,453	1,597	1,675	1,675	1,675	1,675	1,675	1,675	0.95%	0.08%
Grimes County Total	23,931	28,560	32,170	34,151	35,798	37,171	38,714	40,449	1.78%	0.58%
Hamilton County										
County-Other, Hamilton	-	-	3,461	3,433	3,389	3,348	3,297	3,235	-	-
Hamilton	2,775	2,676	2,700	2,693	2,693	2,654	2,610	2,562	-0.36%	-0.07%
Hico	1,284	1,228	1,224	1,197	1,171	1,146	1,120	1,096	-0.44%	-0.19%
Coryell City Water Supply District	4,811	5,872	257	263	273	273	273	273	2.01%	-4.99%

UG/County	Historical		Projections						Annual Percent Growth	
	2010	2020	2030	2040	2050	2060	2070	2080	2010-2020	2020-2080
Multi County WSC	3,218	3,743	624	563	465	461	457	452	1.52%	-3.46%
Hamilton County Total	12,088	13,519	8,266	8,149	7,991	7,882	7,757	7,618	1.13%	-0.95%
Haskell County										
County-Other, Haskell	-	-	2,221	2,178	2,090	2,058	2,022	1,985	-	-
Haskell	3,436	3,190	3,179	3,119	3,042	3,021	2,999	2,977	-0.74%	-0.12%
Haskell County Total	3,436	3,190	5,400	5,297	5,132	5,079	5,021	4,962	-0.74%	0.74%
Hill County										
Brandon Irene WSC	2,054	1,906	1,949	2,005	2,045	2,084	2,129	2,180	-0.75%	0.22%
County-Other, Hill	-	-	4,438	4,568	4,655	4,742	4,841	4,949	-	-
Files Valley WSC	2,485	3,077	3,600	3,707	3,776	3,847	3,928	4,019	2.16%	0.45%
Gholson WSC	2,021	2,365	1,125	1,160	1,180	1,201	1,228	1,257	1.58%	-1.05%
Hillsboro	7,922	7,930	14,997	15,442	15,726	16,026	16,364	16,742	0.01%	1.25%
Hubbard	1,425	1,396	1,480	1,523	1,550	1,580	1,613	1,651	-0.21%	0.28%
Itasca	1,687	1,603	1,698	1,748	1,780	1,814	1,852	1,895	-0.51%	0.28%
Navarro Mills WSC	-	-	17	19	18	19	19	20	-	-
Parker WSC	1,950	1,922	259	267	271	276	283	288	-0.14%	-3.11%
Rio Vista	841	953	5	5	5	6	6	6	1.26%	-8.10%
Double Diamond Utilities	1,237	2,536	1,342	1,381	1,407	1,434	1,463	1,497	7.44%	-0.87%
Whitney	2,374	2,289	2,424	2,496	2,541	2,590	2,646	2,707	-0.36%	0.28%
Woodrow Osceola WSC	2,395	2,681	2,842	2,926	2,979	3,035	3,100	3,172	1.13%	0.28%
Hill County WSC	2,579	2,841	3,010	3,102	3,157	3,217	3,284	3,361	0.97%	0.28%
Birome WSC	1,108	1,194	677	697	711	723	739	756	0.75%	-0.76%
Bold Springs WSC	1,624	1,706	128	132	134	138	140	143	0.49%	-4.05%
Chatt WSC	615	566	1,251	1,289	1,312	1,337	1,364	1,398	-0.83%	1.52%
Hilco United Services	5,840	6,251	4,651	4,790	4,877	4,971	5,075	5,191	0.68%	-0.31%
Post Oak SUD	1,435	1,494	878	904	920	938	957	979	0.40%	-0.70%
Hill County Total	39,592	42,710	46,771	48,161	49,044	49,978	51,031	52,211	0.76%	0.34%
Hood County										
Acton MUD	16,038	13,539	11,497	12,488	13,563	14,732	16,001	17,380	-1.68%	0.42%
County-Other, Hood	-	-	41,090	46,243	51,396	56,945	63,226	70,335	-	-

UG/County	Historical		Projections						Annual Percent Growth	
	2010	2020	2030	2040	2050	2060	2070	2080	2010-2020	2020-2080
Granbury	11,309	14,124	16,684	18,969	21,288	23,820	26,669	29,871	2.25%	1.26%
Tolar	701	950	1,153	1,333	1,517	1,720	1,947	2,205	3.09%	1.41%
Lipan	751	845	937	1,020	1,103	1,189	1,287	1,397	1.19%	0.84%
Santo SUD	1,913	2,064	10	7	5	4	3	2	0.76%	-10.92%
Hood County Total	30,712	31,522	71,371	80,060	88,872	98,410	109,133	121,190	0.26%	2.27%
Johnson County										
Fort Worth	-	-	-	-	5,081	8,066	10,001	9,917	-	-
Mansfield	-	-	6,512	9,258	12,029	14,640	17,563	20,835	-	-
Acton MUD	16,038	13,539	71	64	57	51	46	41	-1.68%	-9.21%
Alvarado	3,403	4,199	4,988	5,732	6,477	7,150	7,908	8,756	2.12%	1.23%
Bethany SUD	2,712	3,093	3,488	3,852	4,214	4,531	4,889	5,290	1.32%	0.90%
Bethesda WSC	23,540	29,776	35,321	40,859	46,413	51,444	57,094	63,439	2.38%	1.27%
Burleson	34,023	43,515	42,810	50,305	57,834	64,697	72,401	81,047	2.49%	1.04%
Cleburne	26,455	27,492	36,047	40,636	45,230	49,329	53,937	59,118	0.39%	1.28%
County-Other, Johnson	-	-	12,805	13,084	9,227	6,487	4,313	3,385	-	-
Crowley	-	-	178	262	349	429	520	622	-	-
Godley	944	1,155	1,365	1,562	1,760	1,939	2,139	2,363	2.04%	1.20%
Grandview	1,250	1,496	1,754	1,996	2,238	2,455	2,699	2,975	1.81%	1.15%
Johnson County SUD	37,979	45,092	69,832	88,295	98,435	107,461	117,620	129,052	1.73%	1.77%
Keene	5,395	5,713	6,066	6,361	6,650	6,876	7,130	7,421	0.57%	0.44%
Mountain Peak SUD	-	-	4,710	5,852	7,271	9,035	11,226	13,949	-	-
Parker WSC	1,950	1,922	1,676	1,657	1,635	1,599	1,560	1,519	-0.14%	-0.39%
Rio Vista	841	953	1,064	1,212	1,382	1,575	1,794	2,045	1.26%	1.28%
Venus	2,769	2,589	2,416	2,266	2,121	1,967	1,824	1,691	-0.67%	-0.71%
Double Diamond Utilities	1,237	2,536	550	737	926	1,103	1,301	1,524	7.44%	-0.85%
Johnson County Total	158,536	183,070	231,653	273,990	309,329	340,834	375,965	414,989	1.45%	1.37%
Jones County										
Anson	2,384	2,321	2,291	2,195	2,094	1,984	1,863	1,731	-0.27%	-0.49%
County-Other, Jones	-	-	7,090	6,767	6,374	5,928	5,410	4,818	-	-
Hamlin	2,062	1,763	1,544	1,350	1,182	1,039	926	837	-1.55%	-1.23%

UG/County	Historical		Projections						Annual Percent Growth	
	2010	2020	2030	2040	2050	2060	2070	2080	2010-2020	2020-2080
Hawley WSC	4,817	4,760	4,536	4,555	4,573	4,593	4,612	4,631	-0.12%	-0.05%
Stamford	3,176	2,939	2,846	2,628	2,391	2,135	1,841	1,490	-0.77%	-1.13%
Hamby WSC	1,249	1,256	206	188	168	146	120	88	0.06%	-4.33%
S U N WSC	2,115	2,212	983	1,157	1,347	1,558	1,824	2,174	0.45%	-0.03%
Jones County Total	15,803	15,251	19,496	18,840	18,129	17,383	16,596	15,769	-0.35%	0.06%
Kent County										
County-Other, Kent	-	-	245	247	242	252	264	277	-	-
Jayton	534	511	492	493	509	524	541	559	-0.44%	0.15%
Kent County Total	534	511	737	740	751	776	805	836	-0.44%	0.82%
Knox County										
County-Other, Knox	-	-	900	871	815	764	696	601	-	-
Knox City	1,087	1,020	1,004	999	996	991	986	984	-0.63%	-0.06%
Munday	1,233	1,183	1,162	1,178	1,199	1,210	1,239	1,292	-0.41%	0.15%
Red River Authority of Texas	-	-	56	55	49	45	40	33	-	-
Benjamin	-	-	186	183	169	157	141	125	-	-
Knox County Total	2,320	2,203	3,308	3,286	3,228	3,167	3,102	3,035	-0.52%	0.54%
Lampasas County										
Copperas Cove	29,515	33,519	1,429	2,252	2,828	3,411	3,671	3,632	1.28%	-3.64%
County-Other, Lampasas	-	-	740	764	768	761	749	739	-	-
Kempner WSC	14,671	16,506	10,482	10,860	10,908	10,782	10,641	10,479	1.19%	-0.75%
Lampasas	7,133	7,786	8,600	9,500	10,390	11,152	11,468	11,297	0.88%	0.62%
Corix Utilities Texas Inc	10,206	10,712	5,553	5,754	5,781	5,714	5,639	5,555	0.49%	-1.09%
Multi County WSC	3,218	3,743	45	49	48	47	47	45	1.52%	-7.10%
Lampasas County Total	64,743	72,266	26,849	29,179	30,723	31,867	32,215	31,747	1.11%	-1.36%
Lee County										
Aqua WSC	-	-	1,640	1,702	1,769	1,837	1,908	1,982	-	-
County-Other, Lee	-	-	2,717	2,696	2,531	2,342	2,137	1,915	-	-
Giddings	5,027	5,137	5,497	5,576	5,497	5,394	5,279	5,149	0.22%	0.00%
Lee County WSC	7,712	8,839	6,918	7,020	6,916	6,783	6,634	6,464	1.37%	-0.52%
Lexington	1,352	1,322	1,951	1,979	1,950	1,912	1,869	1,823	-0.22%	0.54%

UG/County	Historical		Projections						Annual Percent Growth	
	2010	2020	2030	2040	2050	2060	2070	2080	2010-2020	2020-2080
Southwest Milam WSC	7,158	8,099	515	544	575	609	643	680	1.24%	-4.04%
Lee County Total	21,249	23,397	19,238	19,517	19,238	18,877	18,470	18,013	0.97%	-0.43%
Limestone County										
Bistone Municipal Water Supply District	524	524	522	507	487	467	445	424	0.00%	-0.35%
Coolidge	884	738	736	714	685	658	627	597	-1.79%	-0.35%
County-Other, Limestone	-	-	2,782	2,712	2,619	2,534	2,446	2,352	-	-
Groesbeck	3,984	3,223	3,225	3,147	3,047	2,952	2,859	2,761	-2.10%	-0.26%
Mexia	7,522	6,948	6,936	6,746	6,495	6,262	6,017	5,762	-0.79%	-0.31%
Tri County SUD	1,210	3,527	3,515	3,411	3,271	3,140	3,004	2,857	11.29%	-0.35%
Birome WSC	1,108	1,194	91	90	85	82	79	76	0.75%	-4.49%
Point Enterprise WSC	-	-	469	455	435	418	400	380	-	-
Post Oak SUD	1,435	1,494	129	124	120	115	109	105	0.40%	-4.33%
Prairie Hill WSC	1,183	1,256	690	670	641	615	589	560	0.60%	-1.34%
SLC WSC	1,011	1,002	1,000	968	929	893	854	811	-0.09%	-0.35%
White Rock Water SUD	1,974	2,019	2,012	1,953	1,872	1,799	1,719	1,635	0.23%	-0.35%
Limestone County Total	20,835	21,925	22,107	21,497	20,686	19,935	19,148	18,320	0.51%	-0.30%
McLennan County										
Waco	123,008	137,862	156,758	171,499	184,144	197,795	213,102	230,264	1.15%	0.86%
Bellmead	10,009	10,471	11,152	11,534	11,869	12,109	12,397	12,735	0.45%	0.33%
Bruceville Eddy	4,478	4,227	5,343	5,387	5,750	6,138	6,551	6,869	-0.58%	0.81%
Chalk Bluff WSC	2,643	2,702	3,608	4,108	4,608	5,108	5,608	6,108	0.22%	1.37%
Childress Creek WSC	1,660	1,307	43	57	69	84	100	120	-2.36%	-3.90%
County-Other, McLennan	-	-	5,941	7,763	8,169	8,357	8,741	9,567	-	-
Crawford	610	728	870	989	1,090	1,206	1,336	1,480	1.78%	1.19%
Cross Country WSC	2,396	2,804	3,029	3,453	3,814	4,228	4,691	5,206	1.58%	1.04%
Elm Creek WSC	3,026	3,322	1,415	1,491	1,576	1,680	1,788	1,900	0.94%	-0.93%
Gholson WSC	2,021	2,365	3,435	3,958	4,403	4,921	5,496	6,136	1.58%	1.60%
H and H WSC	-	-	1,475	1,521	1,560	1,585	1,615	1,651	-	-
Hewitt	13,537	15,779	17,127	17,127	17,127	17,127	17,127	17,127	1.54%	0.14%
Lacy Lakeview	6,234	6,800	7,585	8,166	8,667	9,183	9,766	10,423	0.87%	0.71%

UG/County	Historical		Projections						Annual Percent Growth	
	2010	2020	2030	2040	2050	2060	2070	2080	2010-2020	2020-2080
Lorena	2,502	2,645	2,863	3,004	3,126	3,236	3,361	3,506	0.56%	0.47%
Mart	2,232	1,854	1,798	1,693	1,606	1,461	1,306	1,139	-1.84%	-0.81%
McGregor	5,042	5,342	9,961	10,520	11,005	11,458	11,977	12,573	0.58%	1.44%
Moody	1,459	1,491	1,868	2,118	2,368	2,618	2,868	3,118	0.22%	1.24%
North Bosque WSC	1,621	1,818	2,075	2,327	2,609	2,925	3,279	3,677	1.15%	1.18%
Riesel	900	943	1,231	1,314	1,398	1,482	1,565	1,649	0.47%	0.94%
Robinson	9,465	11,340	13,570	15,486	17,672	20,168	23,017	26,268	1.82%	1.41%
Valley Mills	1,242	1,258	20	16	13	10	8	6	0.13%	-8.52%
West	2,428	2,162	2,834	2,926	3,021	3,119	3,220	3,324	-1.15%	0.72%
West Brazos WSC	2,050	2,144	1,520	1,679	1,815	1,963	2,130	2,317	0.45%	0.13%
Woodway	8,504	9,445	10,240	10,240	10,240	10,240	10,240	10,240	1.06%	0.13%
Coryell City Water Supply District	4,811	5,872	1,050	1,093	1,129	1,160	1,194	1,234	2.01%	-2.57%
Axtell WSC	1,029	1,130	1,775	2,025	2,275	2,525	2,775	3,025	0.94%	1.65%
Birome WSC	1,108	1,194	543	608	666	730	801	880	0.75%	-0.51%
Bold Springs WSC	1,624	1,706	1,722	1,815	1,894	1,968	2,051	2,146	0.49%	0.38%
Central Bosque WSC	755	785	836	866	891	909	932	959	0.39%	0.33%
East Crawford WSC	683	726	985	1,038	1,084	1,126	1,175	1,230	0.61%	0.88%
Eol WSC	1,758	1,561	1,873	2,048	2,223	2,398	2,573	2,748	-1.18%	0.95%
Highland Park WSC	528	505	165	169	172	174	176	178	-0.44%	-1.72%
Hilltop WSC	692	719	765	792	815	832	852	876	0.38%	0.33%
Leroy Tours Gerald WSC	1,262	1,354	1,557	1,658	1,761	1,863	1,962	1,972	0.71%	0.63%
Levi WSC	862	941	1,800	1,887	1,961	2,026	2,102	2,189	0.88%	1.42%
McLennan County WCID 2	1,330	1,243	1,185	1,095	1,020	902	777	638	-0.67%	-1.11%
Prairie Hill WSC	1,183	1,256	694	808	903	1,017	1,142	1,280	0.60%	0.03%
Ross WSC	1,889	2,148	2,473	2,733	2,955	3,199	3,475	3,781	1.29%	0.95%
Spring Valley WSC	1,744	2,090	2,505	2,853	3,150	3,492	3,872	4,296	1.83%	1.21%
Texas State Technical College	425	2,057	1,000	1,000	1,000	1,000	1,000	1,000	17.08%	-1.19%
Windsor Water	649	557	647	680	715	751	789	830	-1.52%	0.67%
Hog Creek WSC	381	359	297	300	303	300	299	298	-0.59%	-0.31%
McLennan County Total	229,780	255,012	287,633	311,844	332,636	354,573	379,236	406,963	1.05%	0.78%

UG/County	Historical		Projections						Annual Percent Growth	
	2010	2020	2030	2040	2050	2060	2070	2080	2010-2020	2020-2080
Milam County										
Bell Milam Falls WSC	4,904	5,061	1,426	1,402	1,351	1,304	1,253	1,201	0.32%	-2.37%
Cameron	5,551	5,287	5,320	5,237	5,060	4,898	4,728	4,552	-0.49%	-0.25%
County-Other, Milam	-	-	7,187	47,187	77,187	122,187	122,187	122,187	-	-
Milano WSC	2,710	2,741	1,491	1,466	1,413	1,363	1,312	1,256	0.11%	-1.29%
Rockdale	5,326	5,180	7,428	7,480	7,533	7,586	7,639	7,693	-0.28%	0.66%
Southwest Milam WSC	7,158	8,099	5,588	5,493	5,297	5,114	4,922	4,721	1.24%	-0.90%
Thorndale	1,210	1,165	1,775	1,888	2,008	2,136	2,272	2,417	-0.38%	1.22%
North Milam WSC	1,348	982	976	959	923	891	858	820	-3.12%	-0.30%
Salem Elm Ridge WSC	921	872	878	863	831	803	773	743	-0.55%	-0.27%
Milam County Total	29,128	29,387	32,069	71,975	101,603	146,282	145,944	145,590	0.09%	2.70%
Nolan County										
Sweetwater	11,698	11,457	11,590	11,502	11,345	11,157	10,962	10,768	-0.21%	-0.10%
The Bitter Creek WSC	1,624	1,554	964	1,038	1,127	1,211	1,315	1,445	-0.44%	-0.12%
County-Other, Nolan	-	-	1,218	1,110	957	791	586	327	-	-
Roscoe	1,222	1,152	1,092	1,060	1,026	1,001	985	982	-0.59%	-0.27%
Nolan County Total	14,544	14,163	14,864	14,710	14,455	14,160	13,848	13,522	-0.27%	-0.08%
Palo Pinto County										
County-Other, Palo Pinto	-	-	3,089	3,093	3,061	3,043	3,027	3,007	-	-
Mineral Wells	16,603	14,626	16,926	17,863	18,795	19,737	19,737	19,737	-1.26%	0.50%
Strawn	640	528	547	548	542	539	536	532	-1.91%	0.01%
Double Diamond Utilities	1,237	2,536	945	947	937	932	926	921	7.44%	-1.67%
Possum Kingdom WSC	1,505	1,373	1,401	1,402	1,387	1,380	1,371	1,362	-0.91%	-0.01%
Gordon	654	635	653	653	646	644	640	635	-0.29%	0.00%
Lake Palo Pinto Area WSC	973	1,023	1,061	1,061	1,051	1,045	1,039	1,031	0.50%	0.01%
North Rural WSC	2,459	2,714	1,654	1,656	1,639	1,630	1,620	1,609	0.99%	-0.87%
Palo Pinto WSC	816	722	748	750	746	745	742	741	-1.22%	0.04%
Santo SUD	1,913	2,064	1,995	1,996	1,977	1,965	1,953	1,939	0.76%	-0.10%
Sportsmans World MUD	101	73	76	76	75	75	74	74	-3.19%	0.02%

UG/County	Historical		Projections						Annual Percent Growth	
	2010	2020	2030	2040	2050	2060	2070	2080	2010-2020	2020-2080
Sturdivant Progress WSC	2,099	2,229	2,285	2,288	2,264	2,251	2,237	2,222	0.60%	-0.01%
Palo Pinto County Total	29,000	28,523	31,380	32,333	33,120	33,986	33,902	33,810	-0.17%	0.28%
Robertson County										
Bremond	851	780	781	762	738	709	679	647	-0.87%	-0.31%
Calvert	1,154	932	1,042	1,016	983	942	899	856	-2.11%	-0.14%
County-Other, Robertson	-	-	1,926	1,769	1,584	1,382	1,174	954	-	-
Franklin	1,951	1,956	1,959	1,913	1,857	1,786	1,715	1,640	0.03%	-0.29%
Hearne	5,202	5,248	5,253	5,114	4,946	4,740	4,524	4,295	0.09%	-0.33%
Robertson County WSC	2,460	2,662	3,370	3,300	3,255	3,216	3,203	3,225	0.79%	0.32%
Wellborn SUD	10,022	23,176	1,808	1,761	1,702	1,632	1,558	1,480	8.74%	-4.48%
Wickson Creek SUD	14,321	18,532	392	382	370	355	338	322	2.61%	-6.53%
Twin Creek WSC	864	922	922	899	869	832	795	755	0.65%	-0.33%
Robertson County Total	36,825	54,208	17,453	16,916	16,304	15,594	14,885	14,174	3.94%	-2.21%
Shackelford County										
Albany	2,125	1,917	1,780	1,607	1,425	1,301	1,157	992	-1.02%	-1.09%
County-Other, Shackelford	-	-	228	174	131	97	72	52	-	-
Hamby WSC	1,249	1,256	485	525	558	568	579	597	0.06%	-1.23%
Fort Griffin SUD	1,087	1,117	461	466	469	462	456	452	0.27%	-1.50%
Shackelford County Total	4,461	4,290	2,954	2,772	2,583	2,428	2,264	2,093	-0.39%	-1.19%
Somervell County										
County-Other, Somervell	-	-	1,407	1,455	1,474	1,463	1,450	1,436	-	-
Glen Rose	2,443	2,592	2,776	2,865	2,905	2,890	2,872	2,853	0.59%	0.16%
Somervell County Water District	-	2,820	5,630	5,820	5,897	5,853	5,804	5,748	-	1.19%
Somervell County Total	2,443	5,412	9,813	10,140	10,276	10,206	10,126	10,037	8.28%	1.03%
Stephens County										
Breckenridge	6,210	5,577	5,483	5,189	4,767	4,473	4,199	3,798	-1.07%	-0.64%
County-Other, Stephens	-	-	315	258	215	180	153	132	-	-
Fort Belknap WSC	3,848	3,833	53	64	79	90	107	127	-0.04%	-5.52%
Stephens Regional SUD	2,677	2,788	2,565	2,635	2,715	2,790	2,945	3,114	0.41%	0.18%
Possum Kingdom WSC	1,505	1,373	12	6	3	2	1	1	-0.91%	-11.34%

UG/County	Historical		Projections						Annual Percent Growth	
	2010	2020	2030	2040	2050	2060	2070	2080	2010-2020	2020-2080
Fort Griffin SUD	1,087	1,117	521	554	600	637	549	549	0.27%	-1.18%
Staff WSC	1,100	1,223	95	112	135	154	178	208	1.07%	-2.91%
Stephens County Total	16,427	15,911	9,044	8,818	8,514	8,326	8,132	7,929	-0.32%	-1.15%
Stonewall County										
Aspermont	854	735	666	627	576	540	504	468	-1.49%	-0.75%
County-Other, Stonewall	-	-	462	433	391	371	349	323	-	-
Stonewall County Total	854	735	1,128	1,060	967	911	853	791	-1.49%	0.12%
Taylor County										
Abilene	109,350	120,609	134,466	145,047	153,959	162,895	172,845	184,001	0.98%	0.71%
County-Other, Taylor	-	-	1,516	836	461	247	129	63	-	-
Hawley WSC	4,817	4,760	308	342	371	404	440	480	-0.12%	-3.75%
Merkel	2,697	2,627	2,617	2,542	2,477	2,348	2,212	2,071	-0.26%	-0.40%
Potosi WSC	5,611	6,520	7,501	8,571	9,492	10,557	11,739	13,053	1.51%	1.16%
Steamboat Mountain WSC	3,741	5,286	7,215	9,053	10,634	12,558	14,683	17,030	3.52%	1.97%
Tye	1,190	1,098	1,016	904	807	665	511	344	-0.80%	-1.92%
Coleman County SUD	-	-	169	179	179	179	179	179	-	-
Hamby WSC	1,249	1,256	479	588	679	789	913	1,048	0.06%	-0.30%
Lawn	314	272	242	209	180	153	130	110	-1.43%	-1.50%
North Runnels WSC	-	-	589	668	735	813	902	998	-	-
View Caps WSC	1,643	1,772	1,963	2,115	2,245	2,380	2,532	2,703	0.76%	0.71%
S U N WSC	2,115	2,212	1,349	1,344	1,340	1,312	1,283	1,254	0.45%	-0.94%
Taylor County Total	132,727	146,412	159,430	172,398	183,559	195,300	208,498	223,334	0.99%	0.71%
Throckmorton County										
County-Other, Throckmorton	-	-	154	146	138	134	125	119	-	-
Fort Belknap WSC	3,848	3,833	90	73	53	51	51	48	-0.04%	-7.04%
Throckmorton	776	683	617	573	537	507	478	447	-1.27%	-0.70%
Stephens Regional SUD	2,677	2,788	266	246	227	214	203	189	0.41%	-4.39%
Baylor SUD	-	-	7	6	6	5	4	4	-	-
Fort Griffin SUD	1,087	1,117	159	153	152	143	133	124	0.27%	-3.60%
Throckmorton County Total	8,388	8,421	1,293	1,197	1,113	1,054	994	931	0.04%	-3.60%

UG/County	Historical		Projections						Annual Percent Growth	
	2010	2020	2030	2040	2050	2060	2070	2080	2010-2020	2020-2080
Washington County										
Brenham	15,004	16,490	17,003	17,245	17,179	17,196	17,214	17,232	0.95%	0.07%
County-Other, Washington	-	-	10,918	10,501	10,262	9,525	8,788	8,050	-	-
Lee County WSC	7,712	8,839	120	128	136	145	154	164	1.37%	-6.43%
Corix Utilities Texas Inc	10,206	10,712	3,372	3,478	3,588	3,700	3,816	3,936	0.49%	-1.65%
Central Washington County WSC	1,850	3,274	3,623	3,806	3,610	3,865	4,145	4,453	5.87%	0.51%
Chappell Hill WSC	488	487	493	495	499	491	482	472	-0.02%	-0.05%
West End WSC	-	-	329	333	332	332	331	330	-	-
Washington County Total	35,260	39,802	35,858	35,986	35,606	35,254	34,930	34,637	1.22%	-0.23%
Williamson County										
Cedar Park	60,921	83,703	92,024	92,024	92,024	92,024	92,024	92,024	3.23%	0.16%
Round Rock	105,184	123,672	145,880	180,164	214,132	221,167	227,537	233,092	1.63%	1.06%
Bartlett	1,655	1,632	975	988	1,001	1,018	1,034	1,052	-0.14%	-0.73%
Bell Milam Falls WSC	4,904	5,061	353	448	559	682	818	972	0.32%	-2.71%
Brushy Creek MUD	18,653	17,253	19,423	19,423	19,423	19,421	19,421	19,421	-0.78%	0.20%
County-Other, Williamson	-	-	53,875	100,341	128,100	158,466	192,605	230,986	-	-
Fern Bluff MUD	5,809	5,664	5,426	5,646	5,877	5,881	5,881	5,881	-0.25%	0.06%
Florence	1,242	1,319	1,416	1,520	1,638	1,773	1,921	2,085	0.60%	0.77%
Georgetown	76,135	123,177	247,802	433,143	595,264	734,394	896,686	1,041,920	4.93%	3.62%
Granger	1,512	1,296	1,234	1,329	1,431	1,540	1,658	1,785	-1.53%	0.53%
Hutto	10,998	16,813	23,452	32,559	45,199	62,749	87,113	120,937	4.34%	3.34%
Jarrell-Schwertner	5,559	6,754	65,322	70,725	73,829	77,081	80,485	84,051	1.97%	4.29%
Jonah Water SUD	9,650	19,300	30,251	43,078	58,212	74,739	93,341	114,268	7.18%	3.01%
Leander	30,790	66,009	137,045	173,735	185,078	187,376	188,909	190,010	7.92%	1.78%
Liberty Hill	1,802	3,902	6,367	9,260	12,675	16,400	20,596	25,316	8.03%	3.17%
Manville WSC	-	-	8,232	8,318	8,395	8,499	8,600	8,703	-	-
Southwest Milam WSC	7,158	8,099	1,703	2,165	2,707	3,299	3,966	4,716	1.24%	-0.90%
Taylor	15,036	15,767	27,500	39,552	53,155	65,755	79,921	95,847	0.48%	3.05%
Williamson Travis Counties MUD 1	5,190	5,255	3,832	3,851	3,870	3,889	3,909	3,928	0.12%	-0.48%
Williamson County MUD 10	3,056	3,723	3,780	3,780	3,780	3,780	3,780	3,780	1.99%	0.03%

UG/County	Historical		Projections						Annual Percent Growth	
	2010	2020	2030	2040	2050	2060	2070	2080	2010-2020	2020-2080
Williamson County MUD 11	1,807	3,734	5,921	8,483	11,505	14,805	18,522	22,700	7.53%	3.05%
Vista Oaks MUD	2,294	2,611	2,765	2,765	2,765	2,765	2,765	2,765	1.30%	0.10%
Block House MUD	6,137	5,934	5,749	5,555	5,370	5,190	5,017	4,848	-0.34%	-0.34%
Paloma Lake MUD 1	380	3,395	3,447	3,447	3,447	3,447	3,447	3,447	24.48%	0.03%
Paloma Lake MUD 2	438	2,366	2,506	2,506	2,506	2,506	2,506	2,506	18.37%	0.10%
Sonterra MUD	1,469	9,938	19,498	30,746	44,040	58,538	74,871	93,254	21.07%	3.80%
Walsh Ranch MUD	535	812	824	824	824	824	824	824	4.26%	0.02%
Williamson County WSID 3	2,961	3,836	4,546	6,001	7,716	9,592	11,701	14,071	2.62%	2.19%
Noack WSC	706	719	738	757	776	799	824	851	0.18%	0.28%
Lakeside MUD 3	-	-	17	22	28	35	44	53	-	-
Williamson County Total	381,981	541,744	921,903	1,283,155	1,585,326	1,838,434	2,130,726	2,426,093	3.56%	2.53%
Young County										
County-Other, Young	-	-	3,410	3,436	3,487	3,514	3,546	3,583	-	-
Fort Belknap WSC	3,848	3,833	3,710	3,759	3,880	3,929	3,983	4,044	-0.04%	0.09%
Graham	7,576	7,248	7,421	7,354	7,039	6,991	6,930	6,860	-0.44%	-0.09%
Baylor SUD	-	-	116	116	116	115	116	117	-	-
Young County Total	-	-	14,657	14,665	14,522	14,549	14,575	14,604	-	-
Brazos G Total	**2,157,518**	**2,579,445**	**3,032,159**	**3,649,340**	**4,183,073**	**4,682,109**	**5,160,738**	**5,660,538**	**1.80%**	**1.32%**

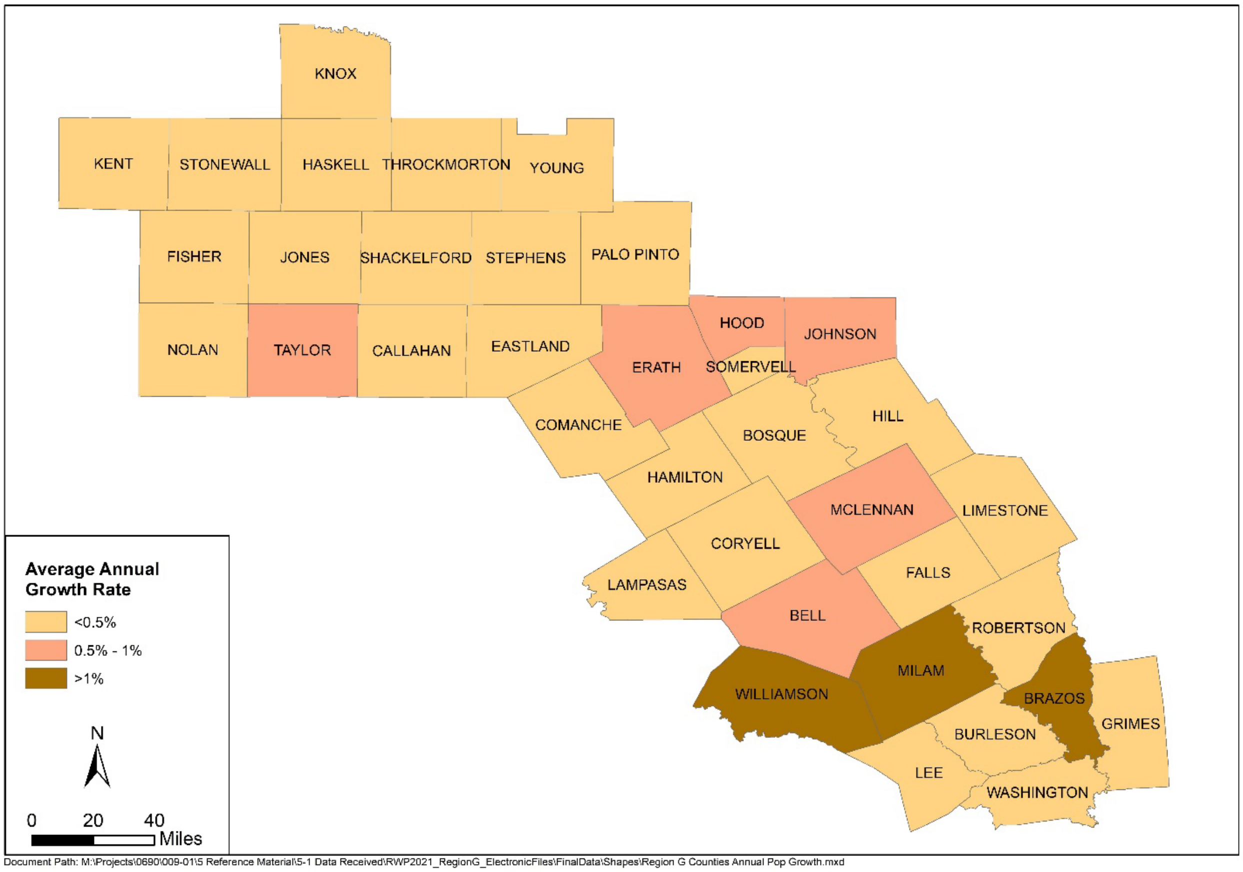


Figure 2.2 Projected Annual County Growth Rates in the Brazos G Regional Water Planning Area

2.2.1 Revisions in Municipal WUGs from the 2021 Planning Cycle

Certain WUGs that were part of the 2021 planning cycle underwent reorganization. Some of them are no longer included in the 2026 planning cycle, while others have been newly added to the 2026 planning cycle. These revisions are shown in Table 2.2.

Table 2.2 Revisions in Brazos G WUGs list from 2021 Planning Cycle

2021 PLAN	2026 PLAN
County-Other, Bell	Bell County WCID 1
County-Other, Burleson	Cade Lakes WSC
County-Other, Knox	Benjamin
County-Other, Mclennan	Hog Creek WSC
County-Other, Williamson	Noack WSC
County-Other, Taylor	S U N WSC
County-Other, Eastland	Westbound WSC
Bethany WSC	Bethany SUD
Bethany Hearne WSC	Hearne
County-Other, Burnet	Corrix Utilities Texas Inc
County-Other, Llano	Corrix Utilities Texas Inc
Mitchell County Utility	Corrix Utilities Texas Inc
Williamson County MUD 9	Vista Oaks MUD
County-Other, Ellis	Hilco United Services
County-Other, Hill	Hilco United Services
White Rock WSC	White Rock Water SUD
Parker County SUD	Not in 2026 Plan
Pflugerville	Not in 2026 Plan
Not in 2021 Plan	Lakeside MUD 3
Not in 2021 Plan	MSEC Enterprises
Not in 2021 Plan	Navarro Mills WSC
Not in 2021 Plan	Steamboat Mountain WSC

Notes:
Some customers within County-Other WUGs receive service from the WUGs indicated in the table above (Column “2026 Plan”). However, there are still customers who are located within County-Other WUGs in the 2026 Plan.
Source: Name revision information obtained from regional planning group meeting materials, accessed in January 2024 via link: *2022-07-13-Group-Materials-Update2.pdf (brazosgwater.org)*

2.2.2 Revisions to Population Projections

The Brazos G RWPG requested to revise the population projections for 354 of the 360 WUG-county splits, and the TWDB approved 333 of these requests. For 18 WUG-county splits, the TWDB recommended further revisions, and for the remaining four WUG-county splits, the TWDB did not approve the requests. The approved population projections are 12 percent higher in 2030, 20 percent higher in 2050, and 14 percent higher in 2080 compared to the draft projections that were initially developed by TWDB.

2.3 Water Demand Projections

Water demand projections have been compiled for each type of consumptive water use (municipal, manufacturing, steam-electric, mining, irrigation, and livestock); projections for non-consumptive water uses, such as navigation, hydroelectric generation, environmental flows, and recreation, are not presented. Demands are totaled for those WUGs for which the primary planning area is Brazos G and for only the portion within Brazos G. As shown in Table 2.3, total water use for the area is projected to increase from 1,119,518 acre-feet in 2030 to 1,571,453 acre-feet in 2080, a 40 percent increase. The trend in total water use is shown in Figure 2.3. The six types of water use as percentages of total water use are shown for 2030 and 2080 in Figure 2.4. The projections indicate that municipal water use as percentages of the total water use will increase from 2030 to 2080, while steam electric, irrigation, manufacturing, and livestock water use are projected to decrease as percentages of the total. Water use for mining is projected to be constant between 2030 and 2080.

2.3.1 Revisions to Municipal Demand Projections

The Brazos G RWPG requested revisions to the baseline GPCDs for 281 WUG-county splits. TWDB approved all but one WUG, because the requested GPCD did not align with the WUG's self-reported net use in the Water Use Survey. Region G requested revisions to the draft plumbing code savings for projections for 12 WUG-County splits, nine were approved and three were not approved because the supporting documentation did not clarify if the proposed revision was due to passive savings from plumbing code laws or active conservation. The approved municipal demand projections are 21 percent higher in 2030, 28 percent higher in 2050, and 22 percent higher in 2080 compared to the draft projections that were initially developed by TWDB.

2.3.2 Municipal Water Demand

Municipal water use is defined as water that is used by households (e.g., drinking, bathing, food preparation, dishwashing, laundry, flushing toilets, lawn watering and landscaping, swimming pools), commercial establishments, (e.g., restaurants, car washes, hotels, laundromats, and office buildings) and for fire protection, public recreation and sanitation. This type of water must meet safe-drinking water standards as specified by federal and state laws and regulations.

Table 2.3 Brazos G Area Total Water Demand by Type of Use (acre-feet/year)

Water Use	Historical(1)		Projections(1)					
	2010	2020	2030	2040	2050	2060	2070	2080
Municipal	326,414	383,011	552,334	654,908	746,902	832,014	915,785	1,002,767
Manufacturing	46,131	9,718	16,847	17,474	18,124	18,800	19,498	20,223
Steam-Electric	76,545	204,266	158,660	158,660	158,660	158,660	158,660	158,660
Mining	53,383	16,454	27,389	28,139	25,835	26,406	25,893	26,283
Irrigation	298,754	310,817	320,150	320,150	319,772	319,536	319,382	319,382
Livestock	51,943	44,064	44,138	44,138	44,138	44,138	44,138	44,138
Brazos G Total	**853,170**	**968,330**	**1,119,518**	**1,223,469**	**1,313,431**	**1,399,554**	**1,483,356**	**1,571,453**

Notes:
(1) 2010 demand obtained from the 2021 Plan, and the 2020 demand obtained from the TWDB Water Use Survey. Projections from Texas Water Development Board.

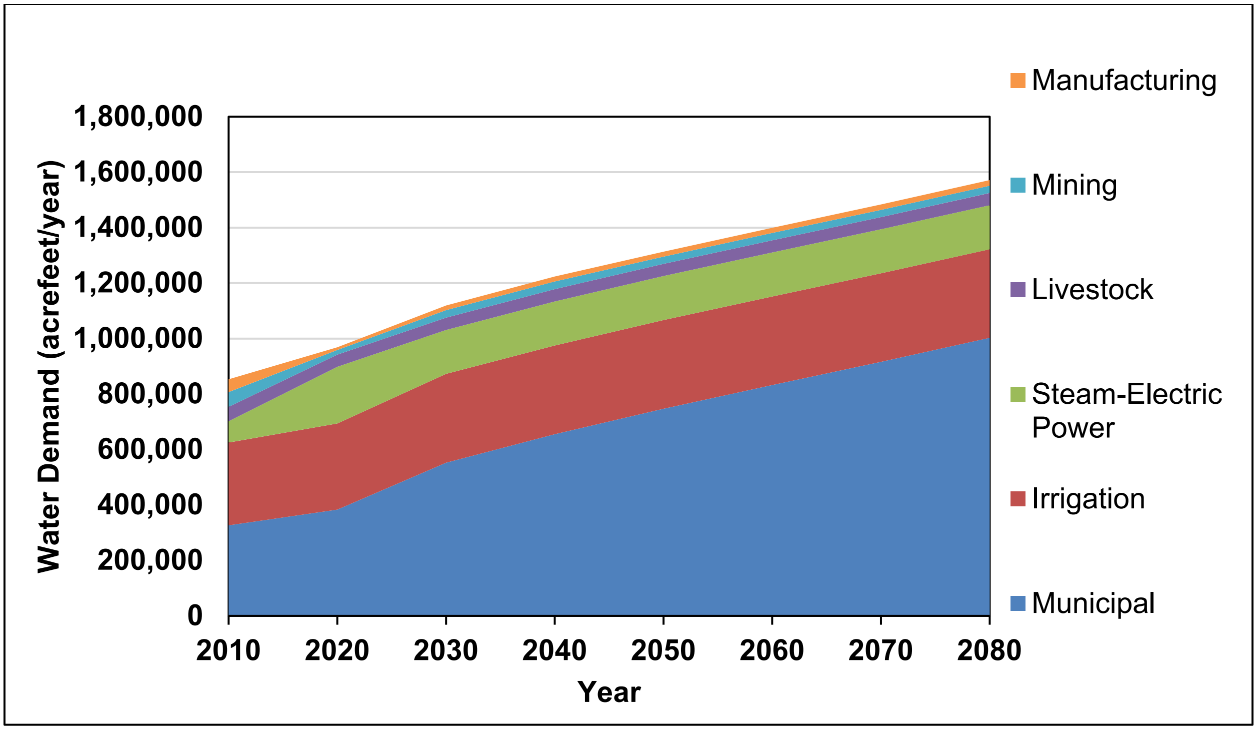


Figure 2.3 Projected Total Water Demand

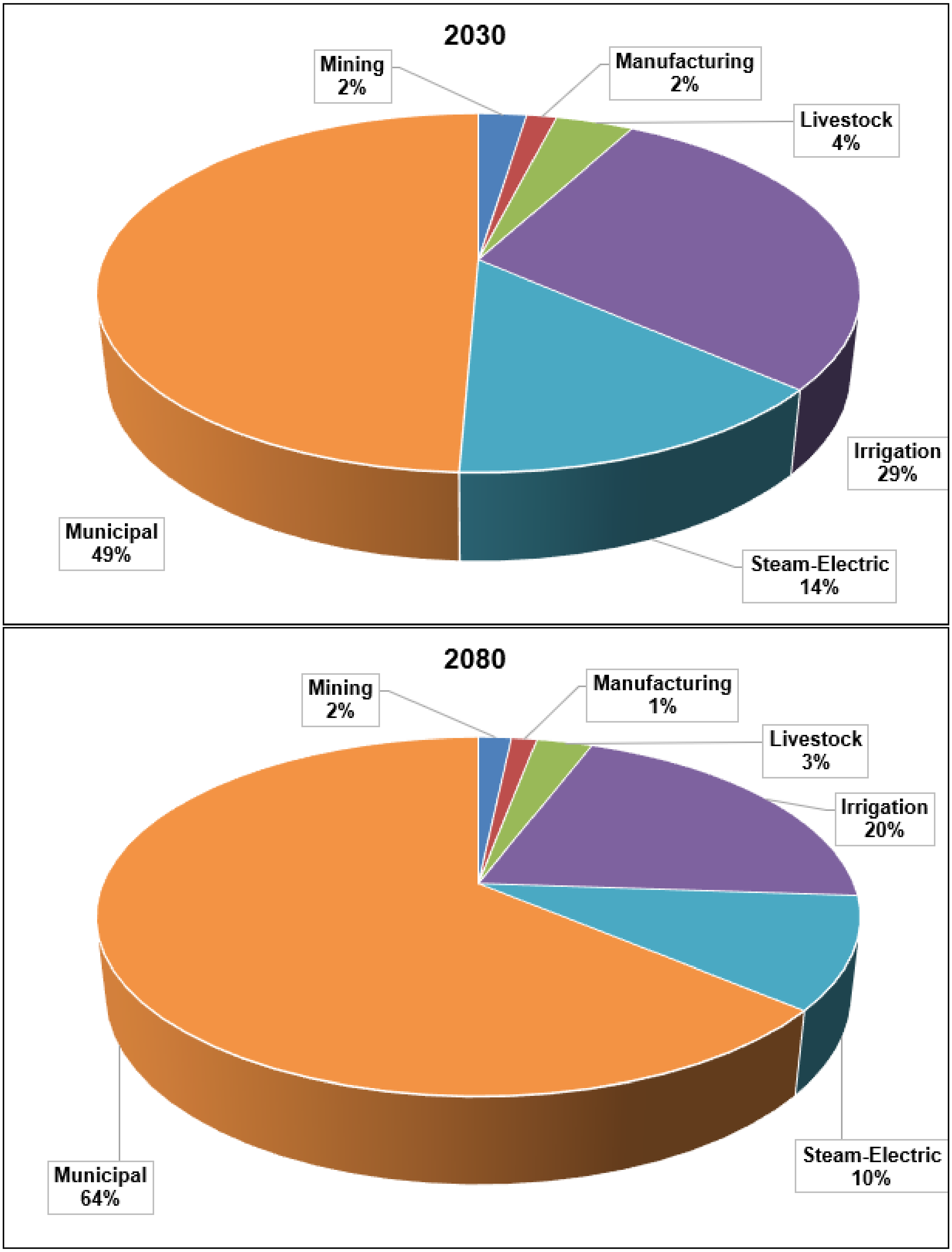


Figure 2.4 Total Water Demand by Type of Use in 2030 and 2080

Municipal water demand projections are computed by multiplying the projected population of an entity by the entity's projected per capita water use, adjusted downward for expected conservation savings due primarily to continued implementation of the 1991 State Water-Efficient Plumbing Act. Full implementation of the Act – retrofit of all existing fixtures with water-efficient fixtures and water-efficient fixtures installed in all new construction – was assumed to occur by Year 2045.

Table 2.4 presents projected per capita water use for water user groups in the Brazos G Area. These per capita water use rates reflect reductions due to implementation of the 1991 State Water-Efficient Plumbing Act. These reductions vary depending on the rural/urban nature of each WUG and projected growth, which typically range from 0 to 20 gpcd. However, in some cases revisions in gpcd were made to make the value consistent with similar WUGs. As a result, individual WUGs may have reductions well outside this typical range.

Per capita water use varies widely in the Brazos G Area and generally ranges between 60 gpcd to 472gpcd. Five WUGs within the region have per capita water use in excess of 800 gpcd. The base year average gpcd for Brazos G was 181 gpcd and the median is 159 gpcd. Lower per capita water uses are typically associated with smaller, rural water utilities where outside water use for lawns or landscaping is limited or is supplemented with individual residential wells and/or stock tanks. Larger per capita water use is typically associated with areas having large suburban residential growth and/or established urban areas having significant commercial water use, or locations with high seasonal use but smaller year-round population (e.g., Texas A&M University).

The Conservation Task Force formed by the 78th Texas Legislature had previously recommended a statewide target per capita water use of 140 gpcd.[1] While recent efforts have acknowledged the variability in the characterizations of per capita water use, for the purposes of the 2026 Brazos G RWP the RWPG has continued to use the 140 gpcd amount as a means of identifying a threshold for potential conservation activities.

Table 2.4 Per Capita Water Use for Water User Groups in the Brazos G Regional Water Planning Area (gallons per capita daily)

WUG/County	Per Capita Use Rates (GPCD)							Average Reduction Due to Plumbing Fixtures Act (2030-2080)
	Base	2030	2040	2050	2060	2070	2080	
Bell County								
439 WSC	172	168	167	167	167	167	167	5
Bartlett	183	179	177	178	177	177	177	5
Bell Milam Falls WSC	162	157	157	157	157	157	157	5
Belton	157	153	152	152	152	152	152	5
County-Other, Bell	151	147	146	147	147	147	146	4
Dog Ridge WSC	172	168	167	167	167	167	167	5
Elm Creek WSC	143	139	138	138	138	138	138	5
Fort Hood	215	210	210	210	210	210	210	5
Georgetown	173	169	168	168	168	168	168	5
Harker Heights	178	174	173	173	173	173	173	5

[1] Water Conservation Implementation Task Force, Report to the 79th Texas Legislature, Texas Water Development Board, Special Report, Austin, Texas, November 2004.

WUG/County	Per Capita Use Rates (GPCD)							Average Reduction Due to Plumbing Fixtures Act (2030-2080)
	Base	2030	2040	2050	2060	2070	2080	
Holland	105	100	100	100	100	100	100	5
Jarrell-Schwertner	125	120	120	120	120	120	120	5
Kempner WSC	176	171	171	171	171	171	171	5
Killeen	125	120	120	120	120	120	120	5
Bell County WCID 2	175	170	170	170	170	170	170	5
Moffat WSC	167	162	162	162	162	161	162	5
Pendleton WSC	169	165	164	164	164	164	164	5
Rogers	164	159	158	158	159	158	158	6
Salado WSC	296	292	291	291	291	291	291	5
Temple	227	222	222	222	222	222	222	5
Troy	119	115	114	114	114	114	114	5
West Bell County WSC	166	161	161	161	161	161	161	5
Morgans Point Resort	135	130	130	130	130	130	130	5
Armstrong WSC	159	155	154	154	154	154	154	5
East Bell WSC	155	150	150	150	150	150	150	5
Bell County WCID 3	161	157	156	156	156	156	156	5
Central Texas College District	283	280	279	279	279	279	279	4
Little Elm Valley WSC	171	167	167	166	166	166	166	5
The Grove WSC	139	135	134	135	135	134	134	5
Bell County WCID 1	338	331	331	331	331	331	331	6
Bosque County								
Childress Creek WSC	230	226	225	225	225	225	225	5
Clifton	201	196	196	196	196	196	196	5
County-Other, Bosque	125	120	120	120	120	120	120	5
Cross Country WSC	178	175	173	172	172	173	174	5
Meridian	145	140	140	139	139	140	140	5
Valley Mills	179	174	174	173	174	174	173	5
Highland Park WSC	264	259	258	260	258	258	259	5
Hilco United Services	187	182	182	182	182	182	182	5
Mustang Valley WSC	215	211	210	210	210	210	210	5
Smith Bend WSC	133	126	129	126	131	129	128	6
Hog Creek WSC	962	954	956	957	960	949	951	6
Brazos County								
Bryan	169	164	164	164	164	164	164	5
College Station	177	172	172	172	172	172	172	5
County-Other, Brazos	132	125	125	125	125	125	125	7
Wellborn SUD	188	184	184	184	184	184	184	4

WUG/County	Per Capita Use Rates (GPCD)							Average Reduction Due to Plumbing Fixtures Act (2030-2080)
	Base	2030	2040	2050	2060	2070	2080	
Wickson Creek SUD	139	135	134	134	134	134	134	5
Texas A and M University	477	472	472	472	472	472	472	5
Burleson County								
Caldwell	196	191	190	191	191	190	191	5
County-Other, Burleson	104	99	99	99	99	99	99	5
Milano WSC	167	162	162	162	162	162	162	5
Snook	318	313	312	312	312	312	312	6
Somerville	187	182	181	181	182	181	181	6
Southwest Milam WSC	190	186	184	185	185	185	185	5
Deanville WSC	175	170	169	169	169	169	169	6
Cade Lakes WSC	230	225	226	225	224	224	224	5
Callahan County								
Baird	196	191	191	191	191	191	191	6
Clyde	96	91	91	91	91	91	91	5
County-Other, Callahan	72	67	66	66	66	66	66	6
Cross Plains	210	205	204	204	205	204	205	6
Potosi WSC	139	135	135	133	134	132	135	5
Coleman County SUD	236	232	232	232	231	230	228	6
Callahan County WSC	78	74	73	73	73	73	73	5
Eula WSC	85	85	85	85	85	85	85	-
Hamby WSC	116	110	110	111	111	111	111	6
Westbound WSC	73	66	66	67	67	69	70	5
Comanche County								
Comanche	113	108	108	108	108	108	108	5
County-Other, Comanche	95	90	90	90	90	90	90	5
De Leon	99	94	93	93	94	94	93	5
Coryell County								
Copperas Cove	119	114	114	114	114	114	114	5
County-Other, Coryell	106	101	101	101	101	101	101	5
Elm Creek WSC	143	139	138	138	138	138	137	5
Fort Hood	215	210	210	210	210	210	210	5
Gatesville	246	241	241	241	241	241	241	5
Kempner WSC	176	172	171	171	171	171	171	5
Coryell City Water Supply District	163	159	159	159	159	159	159	4
Multi County WSC	93	89	88	88	88	88	88	5
Central Texas College District	283	281	278	278	278	278	278	4
Flat WSC	258	254	253	254	254	253	253	4

WUG/County	Per Capita Use Rates (GPCD)							Average Reduction Due to Plumbing Fixtures Act (2030-2080)
	Base	2030	2040	2050	2060	2070	2080	
Fort Gates WSC	187	182	182	182	182	182	182	5
Mountain WSC	157	153	152	152	152	152	152	5
Mustang Valley WSC	215	198	198	223	198	223	206	5
Oglesby	74	69	69	69	69	68	68	5
The Grove WSC	139	133	135	135	136	134	134	5
Eastland County								
Cisco	170	165	164	165	165	164	164	6
County-Other, Eastland	82	76	76	76	76	76	76	6
Eastland	160	155	154	154	154	154	154	6
Gorman	109	104	104	104	103	104	104	5
Ranger	166	161	160	160	160	160	160	6
Rising Star	171	166	165	165	165	165	165	5
Staff WSC	143	139	138	138	138	138	139	5
Westbound WSC	73	68	68	68	68	68	68	5
Erath County								
County-Other, Erath	126	121	121	121	121	121	121	5
Dublin	105	100	100	100	99	99	99	5
Stephenville	136	131	131	131	131	131	131	5
Gordon	230	298	298	298	298	298	298	6
Falls County								
Bell Milam Falls WSC	162	157	157	157	157	157	157	5
Bruceville Eddy	245	240	240	240	240	239	240	5
County-Other, Falls	114	109	108	108	108	108	108	6
Marlin	267	262	262	262	262	262	262	5
Rosebud	114	110	109	109	109	109	109	5
West Brazos WSC	159	154	155	154	154	155	154	5
East Bell WSC	155	153	150	146	150	149	150	5
Cego-Durango WSC	159	154	154	154	154	154	154	5
Levi WSC	238	234	232	233	233	233	233	5
Little Elm Valley WSC	171	175	166	169	168	169	165	5
North Milam WSC	173	198	128	149	179	223	298	5
Fisher County								
The Bitter Creek WSC	140	135	135	134	135	134	135	5
County-Other, Fisher	104	98	98	99	98	99	98	6
Roby	207	203	201	201	202	201	201	5
Rotan	165	160	160	160	160	160	160	5
S U N WSC	97	112	119	119	119	112	64	5

WUG/County	Per Capita Use Rates (GPCD)							Average Reduction Due to Plumbing Fixtures Act (2030-2080)
	Base	2030	2040	2050	2060	2070	2080	
Grimes County								
County-Other, Grimes	127	122	122	122	122	122	122	5
Navasota	183	178	178	178	178	178	178	5
Wickson Creek SUD	139	135	134	134	134	134	134	5
Dobbin Plantersville WSC	69	65	64	64	64	64	64	5
G and W WSC	60	60	60	60	60	60	60	-
MSEC Enterprises	205	200	202	202	201	201	201	4
TDCJ Luther Units	247	243	243	243	243	243	243	4
TDCJ W Pack Unit	245	240	239	239	239	239	239	6
Hamilton County								
County-Other, Hamilton	112	107	107	106	107	106	107	5
Hamilton	179	174	173	173	174	173	174	5
Hico	134	129	128	128	129	128	129	6
Coryell City Water Supply District	163	160	160	157	157	157	157	4
Multi County WSC	93	89	87	88	87	88	89	5
Haskell County								
County-Other, Haskell	120	115	114	114	115	114	114	6
Haskell	174	169	169	168	169	168	169	5
Hill County								
Brandon Irene WSC	249	244	243	243	243	243	243	6
County-Other, Hill	100	95	94	94	94	94	94	6
Files Valley WSC	179	175	175	174	175	175	174	5
Gholson WSC	127	123	122	123	122	122	122	5
Hillsboro	211	206	206	206	206	206	206	5
Hubbard	132	127	127	127	127	127	127	5
Itasca	110	105	105	105	105	105	105	5
Navarro Mills WSC	96	105	94	99	94	94	89	5
Parker WSC	147	141	140	142	142	142	143	5
Rio Vista	159	179	179	179	149	149	149	5
Double Diamond Utilities	1,023	1,020	1,019	1,019	1,019	1,019	1,019	4
Whitney	172	167	167	167	166	167	167	5
Woodrow Osceola WSC	176	172	171	171	171	171	171	5
Hill County WSC	131	127	126	126	126	126	126	5
Birome WSC	137	133	132	132	132	132	132	5
Bold Springs WSC	135	133	129	127	129	128	131	5
Chatt WSC	162	157	156	156	156	156	156	6

WUG/County	Per Capita Use Rates (GPCD)							Average Reduction Due to Plumbing Fixtures Act (2030-2080)
	Base	2030	2040	2050	2060	2070	2080	
Hilco United Services	187	182	182	182	182	182	182	5
Post Oak SUD	205	200	199	200	200	200	200	5
Hood County								
Acton MUD	185	180	180	180	180	180	180	5
County-Other, Hood	94	90	89	89	89	89	89	5
Granbury	175	170	169	169	169	169	169	6
Tolar	148	144	143	144	143	144	143	5
Lipan	143	139	138	138	138	138	138	5
Santo SUD	125	89	128	179	223	-	-	5
Johnson County								
Fort Worth	177	-	-	172	172	172	172	5
Mansfield	245	241	240	240	240	240	240	5
Acton MUD	185	176	181	172	175	175	174	5
Alvarado	125	120	120	120	120	120	120	5
Bethany SUD	127	122	122	122	122	122	122	5
Bethesda WSC	188	184	183	183	183	183	183	5
Burleson	143	139	138	138	138	138	138	5
Cleburne	192	187	187	187	187	187	187	5
County-Other, Johnson	96	91	91	91	91	91	91	5
Crowley	133	130	129	128	129	129	128	5
Godley	116	111	111	111	111	111	111	5
Grandview	153	148	148	148	148	148	148	5
Johnson County SUD	123	119	118	118	118	118	118	5
Keene	130	128	128	128	128	128	128	2
Mountain Peak SUD	281	277	277	277	277	277	277	4
Parker WSC	147	142	142	141	142	142	142	5
Rio Vista	159	154	154	154	154	154	154	5
Venus	168	163	162	162	162	162	163	6
Double Diamond Utilities	1,023	1,019	1,019	1,019	1,019	1,019	1,019	4
Jones County								
Anson	139	134	134	134	134	134	134	5
County-Other, Jones	113	108	107	107	107	107	107	6
Hamlin	187	182	182	182	181	181	181	5
Hawley WSC	109	104	104	104	104	104	104	5
Stamford	233	228	228	228	228	228	228	5
Hamby WSC	116	113	109	112	110	112	112	6
S U N WSC	97	93	92	92	92	92	92	5

WUG/County	Per Capita Use Rates (GPCD)							Average Reduction Due to Plumbing Fixtures Act (2030-2080)
	Base	2030	2040	2050	2060	2070	2080	
Kent County								
County-Other, Kent	109	106	105	103	103	105	103	6
Jayton	180	176	174	175	175	175	174	5
Knox County								
County-Other, Knox	93	88	87	88	88	87	88	6
Knox City	224	219	219	219	219	218	219	5
Munday	180	175	175	175	175	174	175	5
Red River Authority of Texas	220	207	211	219	218	223	216	5
Benjamin	277	274	273	269	273	272	271	5
Lampasas County								
Copperas Cove	119	114	114	114	114	114	114	5
County-Other, Lampasas	121	115	115	115	115	114	115	6
Kempner WSC	176	172	171	171	171	171	171	5
Lampasas	167	162	162	162	162	162	162	5
Corix Utilities Texas Inc	170	165	165	165	165	165	165	5
Multi County WSC	93	79	91	93	95	95	79	5
Lee County								
Aqua WSC	148	144	143	143	143	143	143	5
County-Other, Lee	94	89	88	88	88	88	88	6
Giddings	188	183	183	183	183	183	183	5
Lee County WSC	129	125	124	124	124	124	124	5
Lexington	177	172	172	172	172	171	172	5
Southwest Milam WSC	190	185	185	185	185	185	185	5
Limestone County								
Bistone Municipal Water Supply District	419	416	414	414	415	415	415	5
Coolidge	174	170	169	169	170	169	169	5
County-Other, Limestone	86	81	80	80	80	80	80	6
Groesbeck	167	162	161	161	161	161	161	6
Mexia	133	132	132	132	132	132	132	1
Tri County SUD	116	112	112	112	112	112	112	4
Birome WSC	137	137	129	137	131	136	129	5
Point Enterprise WSC	128	124	124	123	124	123	122	5
Post Oak SUD	205	201	202	201	202	197	204	5
Prairie Hill WSC	183	179	179	178	179	177	179	5
SLC WSC	95	90	89	89	89	89	89	6
White Rock Water SUD	101	96	96	96	96	96	96	5

WUG/County	Per Capita Use Rates (GPCD)							Average Reduction Due to Plumbing Fixtures Act (2030-2080)
	Base	2030	2040	2050	2060	2070	2080	
McLennan County								
Waco	222	217	216	217	216	217	217	6
Bellmead	120	115	115	115	115	115	115	5
Bruceville Eddy	245	240	240	240	240	240	240	5
Chalk Bluff WSC	147	143	142	142	142	142	142	5
Childress Creek WSC	230	228	219	220	223	223	223	5
County-Other, McLennan	115	110	110	110	110	110	110	5
Crawford	212	207	207	207	207	207	207	5
Cross Country WSC	178	173	173	173	173	173	173	5
Elm Creek WSC	143	139	138	138	138	138	138	5
Gholson WSC	127	123	122	122	122	122	122	5
H and H WSC	125	120	120	120	120	120	120	5
Hewitt	176	171	171	171	171	171	171	5
Lacy Lakeview	125	120	120	120	120	120	120	5
Lorena	171	167	166	166	166	166	166	5
Mart	233	228	228	227	227	228	227	5
McGregor	238	233	233	233	233	233	233	5
Moody	135	130	130	130	130	130	130	5
North Bosque WSC	279	274	274	274	274	274	274	5
Riesel	118	113	112	112	112	112	112	6
Robinson	200	195	195	195	195	195	195	5
Valley Mills	179	179	167	206	179	223	149	5
West	165	160	160	160	159	159	160	5
West Brazos WSC	159	154	154	154	154	154	154	5
Woodway	351	346	346	346	346	346	346	5
Coryell City Water Supply District	163	159	158	159	159	159	158	4
Axtell WSC	157	152	152	152	152	152	152	5
Birome WSC	137	133	132	133	132	133	132	5
Bold Springs WSC	135	131	130	130	130	130	130	5
Central Bosque WSC	161	156	156	155	155	156	155	5
East Crawford WSC	304	300	299	299	299	299	299	5
Eol WSC	113	109	108	108	108	108	108	5
Highland Park WSC	264	260	259	260	257	259	261	5
Hilltop WSC	143	138	138	138	137	137	138	6
Leroy Tours Gerald WSC	115	111	110	110	110	110	110	5
Levi WSC	238	234	233	233	233	233	233	5
McLennan County WCID 2	172	167	166	166	166	167	167	6

WUG/County	Per Capita Use Rates (GPCD)							Average Reduction Due to Plumbing Fixtures Act (2030-2080)
	Base	2030	2040	2050	2060	2070	2080	
Prairie Hill WSC	183	179	178	178	178	178	178	5
Ross WSC	140	135	135	135	135	135	135	5
Spring Valley WSC	160	155	155	155	155	155	155	5
Texas State Technical College	1,804	1,800	1,799	1,799	1,799	1,799	1,799	5
Windsor Water	148	144	143	142	143	143	143	5
Hog Creek WSC	962	956	955	955	955	955	956	6
Milam County								
Bell Milam Falls WSC	162	157	157	157	157	157	157	5
Cameron	217	212	212	212	212	212	212	5
County-Other, Milam	111	106	105	105	105	105	105	6
Milano WSC	167	162	162	162	162	162	162	5
Rockdale	198	193	193	193	193	193	193	5
Southwest Milam WSC	190	185	185	185	185	185	185	5
Thorndale	138	133	132	132	132	133	133	5
North Milam WSC	173	168	168	167	167	168	168	5
Salem Elm Ridge WSC	175	171	170	170	170	170	171	5
Nolan County								
Sweetwater	144	139	139	139	139	139	139	5
The Bitter Creek WSC	140	135	135	135	135	134	135	5
County-Other, Nolan	105	99	98	98	98	98	98	7
Roscoe	186	181	180	180	180	180	180	6
Palo Pinto County								
County-Other, Palo Pinto	84	79	78	78	78	78	78	6
Mineral Wells	180	175	175	175	175	175	175	5
Strawn	207	202	202	201	202	202	201	6
Double Diamond Utilities	1,023	1,019	1,019	1,019	1,019	1,019	1,019	4
Possum Kingdom WSC	384	379	378	378	378	378	378	6
Gordon	230	224	224	224	225	225	224	6
Lake Palo Pinto Area WSC	112	108	107	107	107	107	107	5
North Rural WSC	100	96	95	95	95	95	95	5
Palo Pinto WSC	127	122	121	121	121	122	122	6
Santo SUD	125	120	120	120	120	120	120	5
Sportsmans World MUD	890	881	881	881	881	881	881	7
Sturdivant Progress WSC	97	93	92	92	92	92	92	5
Robertson County								
Bremond	183	178	178	178	178	177	178	6
Calvert	235	230	229	230	229	229	229	5

WUG/County	Per Capita Use Rates (GPCD)							Average Reduction Due to Plumbing Fixtures Act (2030-2080)
	Base	2030	2040	2050	2060	2070	2080	
County-Other, Robertson	102	97	97	97	97	97	96	5
Franklin	133	128	128	128	127	128	128	5
Hearne	152	147	147	147	147	147	147	5
Robertson County WSC	143	138	137	137	137	137	138	6
Wellborn SUD	188	184	184	184	184	184	184	4
Wickson Creek SUD	139	134	133	135	133	135	133	5
Twin Creek WSC	223	218	217	218	218	218	218	5
Shackelford County								
Albany	276	271	271	271	270	271	271	5
County-Other, Shackelford	90	86	82	82	83	87	86	6
Hamby WSC	116	110	111	110	110	111	111	6
Fort Griffin SUD	171	167	165	166	166	166	166	5
Somervell County								
County-Other, Somervell	109	105	105	105	105	105	105	4
Glen Rose	199	194	194	193	193	193	193	6
Somervell County Water District	240	236	235	235	235	235	235	5
Stephens County								
Breckenridge	161	156	156	156	156	156	156	5
County-Other, Stephens	97	91	90	91	89	88	88	7
Fort Belknap WSC	124	118	126	124	119	117	120	5
Stephens Regional SUD	178	173	173	173	173	172	173	5
Possum Kingdom WSC	384	372	446	298	446	-	-	6
Fort Griffin SUD	171	166	166	165	165	166	166	5
Staff WSC	143	141	136	139	139	140	137	5
Stonewall County								
Aspermont	331	326	325	325	326	326	324	6
County-Other, Stonewall	107	102	101	100	101	102	102	5
Taylor County								
Abilene	183	178	178	178	178	178	178	5
County-Other, Taylor	104	97	96	97	98	97	99	8
Hawley WSC	109	104	104	103	104	103	104	5
Merkel	117	112	112	112	111	111	112	5
Potosi WSC	139	134	134	134	134	134	134	5
Steamboat Mountain WSC	123	119	118	118	118	118	118	5
Tye	143	138	136	137	137	136	138	6
Coleman County SUD	236	232	229	229	229	229	229	6
Hamby WSC	116	112	111	110	111	110	111	6

WUG/County	Per Capita Use Rates (GPCD)							Average Reduction Due to Plumbing Fixtures Act (2030-2080)
	Base	2030	2040	2050	2060	2070	2080	
Lawn	178	173	171	174	175	172	170	6
North Runnels WSC	109	105	104	104	104	104	104	5
View Caps WSC	150	145	144	144	144	145	144	6
S U N WSC	97	93	92	92	92	92	92	5
Throckmorton County								
County-Other, Throckmorton	86	81	79	78	80	79	83	5
Fort Belknap WSC	124	119	122	118	123	123	112	5
Throckmorton	216	211	210	211	210	211	210	6
Stephens Regional SUD	178	175	174	173	171	172	175	5
Baylor SUD	197	255	149	149	179	223	223	6
Fort Griffin SUD	171	168	163	164	169	168	166	5
Washington County								
Brenham	230	225	224	224	224	224	224	6
County-Other, Washington	116	111	111	111	111	111	111	5
Lee County WSC	129	126	126	125	123	122	125	5
Corix Utilities Texas Inc	170	165	165	165	165	165	165	5
Central Washington County WSC	123	118	118	118	118	118	118	5
Chappell Hill WSC	198	194	193	193	193	193	193	5
West End WSC	98	92	94	91	91	92	92	5
Williamson County								
Cedar Park	191	187	186	186	186	186	186	5
Round Rock	139	139	139	139	139	139	139	-
Bartlett	183	179	178	177	178	178	178	5
Bell Milam Falls WSC	162	157	157	157	157	157	157	5
Brushy Creek MUD	185	180	180	180	180	180	180	5
County-Other, Williamson	140	136	136	136	136	136	136	4
Fern Bluff MUD	194	190	189	189	189	189	189	5
Florence	136	131	130	131	130	131	131	5
Georgetown	173	169	168	168	168	168	168	5
Granger	145	140	140	140	140	139	140	5
Hutto	107	103	102	102	102	102	102	5
Jarrell-Schwertner	125	120	120	120	120	120	120	5
Jonah Water SUD	188	184	184	184	184	184	184	4
Leander	124	124	124	124	124	124	124	-
Liberty Hill	111	107	107	107	107	107	107	4
Manville WSC	140	135	135	135	135	135	135	5
Southwest Milam WSC	190	186	185	185	185	185	185	5

WUG/County	Per Capita Use Rates (GPCD)							Average Reduction Due to Plumbing Fixtures Act (2030-2080)
	Base	2030	2040	2050	2060	2070	2080	
Taylor	120	115	115	115	115	115	115	5
Williamson Travis Counties MUD 1	141	136	136	136	136	136	136	5
Williamson County MUD 10	139	139	139	139	139	139	139	-
Williamson County MUD 11	139	139	139	139	139	139	139	-
Vista Oaks MUD	139	139	139	139	139	139	139	-
Block House MUD	130	125	125	125	125	125	125	5
Paloma Lake MUD 1	139	139	139	139	139	139	139	-
Paloma Lake MUD 2	139	139	139	139	139	139	139	-
Sonterra MUD	108	105	105	105	105	105	105	3
Walsh Ranch MUD	139	139	139	139	139	139	139	-
Williamson County WSID 3	184	179	179	179	179	178	178	6
Noack WSC	189	184	184	184	184	184	184	5
Lakeside MUD 3	128	105	122	128	128	122	118	4
Young County								
County-Other, Young	110	105	104	104	104	104	104	6
Fort Belknap WSC	124	119	119	119	119	119	119	5
Graham	302	297	296	297	297	297	296	6
Baylor SUD	197	192	192	192	194	192	191	6

Annual municipal water demand for the area is projected to increase by 301,305 acre-feet (ac-ft) between 2030 and 2080, from 552,334 ac-ft to 1,002,767 ac-ft, an 82 percent increase. As can be seen in Figure 2.5, seven counties - Bell, Brazos, Coryell, Johnson, McLennan, Taylor, and Williamson - are projected to account for 88 percent of the total municipal water demand in 2080. Municipal water demand projections for all WUGs, with county totals, are presented in Table 2.5.

The 82 percent projected increase in municipal water demand over the 2030–2080 planning horizon is less than the projected population increase of 87 percent due to expected savings in per capita water use resulting from continued implementation of the 1991 State Water-Efficient Plumbing Fixtures Act.

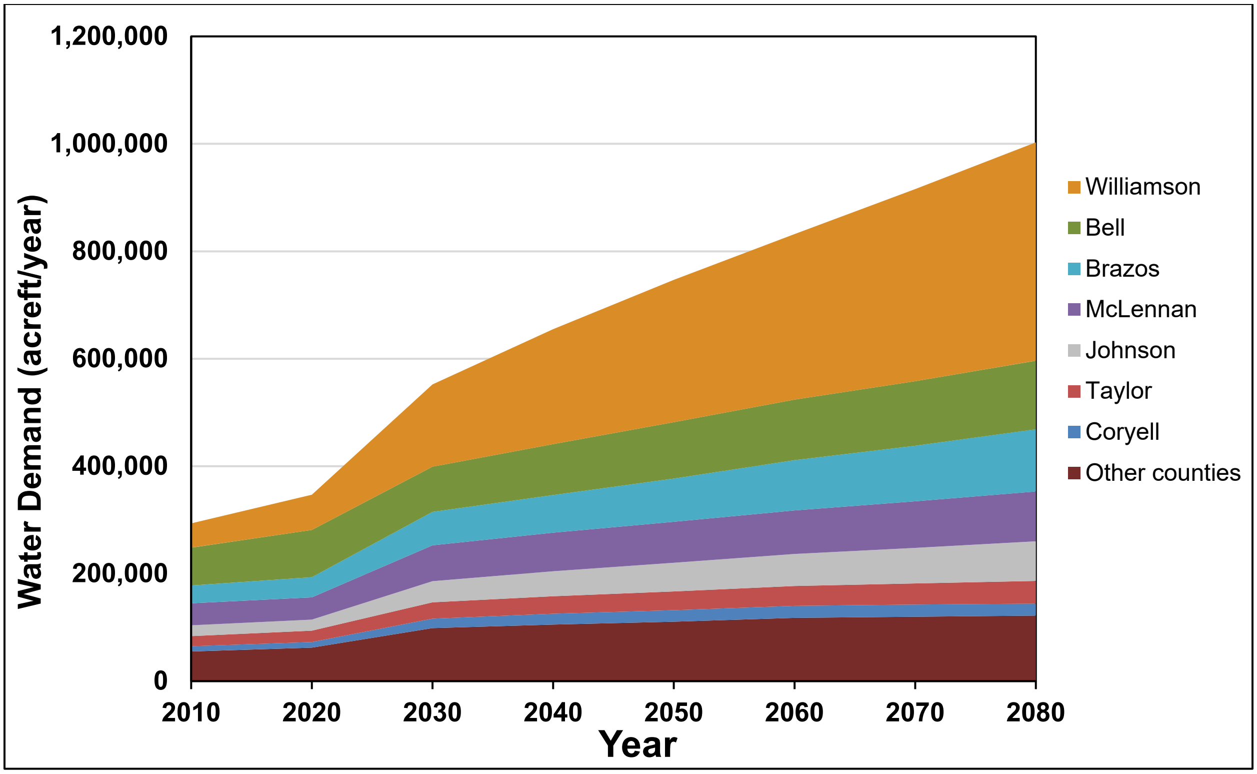


Figure 2.5 Municipal Water Demand Projections

Table 2.5 Projected Municipal Water Demand by WUG/County in the Brazos G Area (acre-feet/year)

WUG/County	Projected Demands[1]					
	2030	2040	2050	2060	2070	2080
Bell County						
439 WSC	1,517	1,769	2,007	2,207	2,355	2,435
Armstrong WSC	547	615	668	705	746	792
Bartlett	133	126	122	116	110	104
Bell County WCID 1	98	98	98	98	98	98
Bell County WCID 2	343	362	378	386	396	407
Bell County WCID 3	1,659	2,033	2,620	3,207	3,344	3,481
Bell Milam Falls WSC	399	422	441	452	464	478
Belton	4,887	5,899	6,916	7,846	8,613	9,146
Central Texas College District	172	171	171	171	171	171
County-Other, Bell	760	852	888	823	709	549
Dog Ridge WSC	942	1,057	1,147	1,209	1,279	1,356
East Bell WSC	391	365	346	326	305	281
Elm Creek WSC	397	422	447	470	493	516
Fort Hood	4,861	5,038	5,232	5,426	5,620	5,814
Georgetown	830	1,127	1,231	1,233	1,253	1,235

WUG/County	Projected Demands[1]					
	2030	2040	2050	2060	2070	2080
Harker Heights	7,173	8,252	9,348	9,693	9,693	9,693
Holland	136	138	140	142	144	146
Jarrell-Schwertner	368	404	432	451	472	495
Kempner WSC	427	467	498	519	542	567
Killeen	23,409	26,702	29,783	33,208	36,579	39,951
Little Elm Valley WSC	341	375	401	419	439	461
Moffat WSC	376	334	298	266	237	212
Morgans Point Resort	774	843	916	989	1,061	1,134
Pendleton WSC	412	443	467	481	498	517
Rogers	164	158	154	149	143	137
Salado WSC	2,459	2,753	3,086	3,459	3,878	4,349
Temple	28,782	32,127	34,751	36,542	38,551	40,803
The Grove WSC	174	206	239	272	304	337
Troy	494	527	562	597	632	667
West Bell County WSC	783	837	880	906	935	969
Bell County Total	84,208	94,922	104,667	112,768	120,064	127,301
Bosque County						
Childress Creek WSC	327	318	306	295	282	269
Clifton	772	827	890	957	1,029	1,107
County-Other, Bosque	894	799	681	565	438	298
Cross Country WSC	55	53	51	49	47	45
Highland Park WSC	102	99	96	92	88	84
Hilco United Services	267	286	307	330	354	380
Hog Creek WSC	78	76	74	71	67	65
Meridian	276	269	258	249	239	228
Mustang Valley WSC	433	421	405	391	374	356
Smith Bend WSC	18	18	17	17	16	15
Valley Mills	243	247	251	256	261	265
Bosque County Total	3,465	3,413	3,336	3,272	3,195	3,112
Brazos County						
Bryan	19,037	22,504	26,658	31,597	39,794	50,101
College Station	23,940	27,047	31,819	37,404	36,735	36,155
County-Other, Brazos	350	361	413	437	480	539
Texas A&M University	10,415	10,400	10,400	10,400	10,400	10,400
Wellborn SUD	5,744	6,526	7,718	9,195	10,853	12,715
Wickson Creek SUD	2,745	3,111	3,677	4,378	5,164	6,048
Brazos County Total	62,231	69,949	80,685	93,411	103,426	115,958

WUG/County	Projected Demands[1]					
	2030	2040	2050	2060	2070	2080
Burleson County						
Cade Lakes WSC	110	111	110	109	108	107
Caldwell	919	923	920	915	909	903
County-Other, Burleson	788	785	773	759	744	727
Deanville WSC	367	368	366	363	360	357
Milano WSC	240	242	245	249	252	255
Snook	410	412	410	406	403	400
Somerville	268	269	267	266	263	261
Southwest Milam WSC	165	172	181	190	200	210
Burleson County Total	3,267	3,282	3,272	3,257	3,239	3,220
Callahan County						
Baird	329	328	325	322	318	314
Callahan County WSC	190	192	195	199	202	205
Clyde	407	407	410	413	416	419
Coleman County SUD	44	46	48	50	52	54
County-Other, Callahan	159	144	124	101	76	50
Cross Plains	211	210	208	206	203	200
Eula WSC	250	258	266	275	283	292
Hamby WSC	30	31	32	33	34	35
Potosi WSC	35	35	34	34	33	33
Westbound WSC	13	13	13	13	13	13
Callahan County Total	1,668	1,664	1,655	1,646	1,630	1,615
Comanche County						
Comanche	522	514	505	502	499	497
County-Other, Comanche	719	687	647	630	611	589
De Leon	235	239	247	252	258	265
Comanche County Total	1,476	1,440	1,399	1,384	1,368	1,351
Coryell County						
Central Texas College District	108	107	107	107	107	107
Copperas Cove	6,204	8,169	9,399	10,188	10,432	10,077
Coryell City Water Supply District	888	906	917	911	906	900
County-Other, Coryell	401	421	413	375	330	278
Elm Creek WSC	76	76	76	76	75	73
Flat WSC	194	198	201	199	197	196
Fort Gates WSC	479	489	495	491	488	484
Fort Hood	3,667	3,801	3,947	4,094	4,240	4,386
Gatesville	4,228	4,301	4,372	4,378	4,390	4,408
Kempner WSC	828	834	825	804	781	755

WUG/County	Projected Demands[1]					
	2030	2040	2050	2060	2070	2080
Mountain WSC	334	341	345	343	340	337
Multi County WSC	328	334	337	335	332	330
Mustang Valley WSC	6	6	7	6	7	6
Oglesby	40	41	41	41	40	40
The Grove WSC	25	30	35	40	44	49
Coryell County Total	17,806	20,054	21,517	22,388	22,709	22,426
Eastland County						
Cisco	730	742	762	769	778	791
County-Other, Eastland	255	244	213	198	174	139
Eastland	610	550	502	463	432	407
Gorman	111	103	93	86	80	72
Ranger	410	385	366	352	341	335
Rising Star	130	122	116	111	108	106
Staff WSC	180	195	216	227	240	256
Westbound WSC	170	173	177	178	180	182
Eastland County Total	2,596	2,514	2,445	2,384	2,333	2,288
Erath County						
County-Other, Erath	2,475	2,671	2,915	3,203	3,526	3,890
Dublin	323	288	259	225	196	171
Gordon	2	2	2	2	2	2
Stephenville	3,936	4,305	4,765	5,387	6,075	6,838
Erath County Total	6,736	7,266	7,941	8,817	9,799	10,901
Falls County						
Bell Milam Falls WSC	221	205	190	175	158	140
Bruceville Eddy	337	444	474	506	540	610
Cego-Durango WSC	203	232	263	289	323	372
County-Other, Falls	842	758	666	579	462	305
East Bell WSC	20	20	20	21	22	24
Levi WSC	103	134	166	187	209	230
Little Elm Valley WSC	9	13	18	22	27	33
Marlin	1,343	1,266	1,204	1,151	1,126	1,141
North Milam WSC	2	1	1	1	1	1
Rosebud	146	135	126	116	109	104
West Brazos WSC	133	128	123	120	120	123
Falls County Total	3,359	3,336	3,251	3,167	3,097	3,083
Fisher County						
County-Other, Fisher	100	96	94	92	91	89
Roby	121	116	112	111	109	107

WUG/County	Projected Demands[1]					
	2030	2040	2050	2060	2070	2080
Rotan	258	248	241	238	234	230
S U N WSC	2	2	2	2	2	1
The Bitter Creek WSC	101	97	94	93	91	90
Fisher County Total	582	559	543	536	527	517
Grimes County						
County-Other, Grimes	1,434	1,499	1,548	1,569	1,577	1,563
Dobbin Plantersville WSC	332	365	394	419	448	480
G & W WSC	94	101	106	111	117	123
MSEC Enterprises	44	69	107	166	257	400
Navasota	1,581	1,641	1,695	1,737	1,784	1,835
TDCJ Luther Units	319	318	318	318	318	318
TDCJ W Pack Unit	451	449	449	449	449	449
Wickson Creek SUD	719	783	837	885	940	1,001
Grimes County Total	4,974	5,225	5,454	5,654	5,890	6,169
Hamilton County						
Coryell City Water Supply District	46	47	48	48	48	48
County-Other, Hamilton	415	410	404	400	393	386
Hamilton	527	523	523	516	507	498
Hico	177	172	168	165	161	158
Multi County WSC	62	55	46	45	45	45
Hamilton County Total	1,227	1,207	1,189	1,174	1,154	1,135
Haskell County						
County-Other, Haskell	286	279	268	264	259	254
Haskell	602	589	574	571	566	562
Haskell County Total	888	868	842	835	825	816
Hill County						
Birome WSC	101	103	105	107	109	112
Bold Springs WSC	19	19	19	20	20	21
Brandon Irene WSC	532	546	557	568	580	594
Chatt WSC	220	225	229	233	238	244
County-Other, Hill	470	481	490	499	510	521
Double Diamond Utilities	1,533	1,576	1,606	1,637	1,670	1,709
Files Valley WSC	706	725	738	752	768	785
Gholson WSC	155	159	162	164	168	172
Hilco United Services	950	976	994	1,013	1,034	1,058
Hill County WSC	427	438	446	454	464	475
Hillsboro	3,465	3,558	3,623	3,693	3,770	3,858
Hubbard	211	216	220	224	229	234

WUG/County	Projected Demands[1]					
	2030	2040	2050	2060	2070	2080
Itasca	200	205	209	213	218	223
Navarro Mills WSC	2	2	2	2	2	2
Parker WSC	41	42	43	44	45	46
Post Oak SUD	197	202	206	210	214	219
Rio Vista	1	1	1	1	1	1
Whitney	454	466	474	483	494	505
Woodrow Osceola WSC	546	561	571	582	594	608
Hill County Total	10,230	10,501	10,695	10,899	11,128	11,387
Hood County						
Acton MUD	2,320	2,511	2,728	2,963	3,218	3,495
County-Other, Hood	4,127	4,623	5,138	5,692	6,320	7,031
Granbury	3,178	3,601	4,041	4,522	5,062	5,670
Lipan	146	158	171	184	199	216
Santo SUD	1	1	1	1	-	-
Tolar	186	214	244	276	313	354
Hood County Total	9,958	11,108	12,323	13,638	15,112	16,766
Johnson County						
Acton MUD	14	13	11	10	9	8
Alvarado	673	770	871	961	1,063	1,177
Bethany SUD	478	526	575	619	668	722
Bethesda WSC	7,272	8,384	9,523	10,556	11,715	13,017
Burleson	6,647	7,781	8,946	10,007	11,199	12,536
Cleburne	7,557	8,493	9,453	10,310	11,273	12,355
County-Other, Johnson	1,310	1,330	938	659	438	344
Crowley	26	38	50	62	75	89
Double Diamond Utilities	628	841	1,057	1,259	1,485	1,739
Fort Worth	-	-	978	1,553	1,925	1,909
Godley	170	194	219	241	266	294
Grandview	291	330	370	406	447	492
Johnson County SUD	9,290	11,697	13,041	14,236	15,582	17,097
Keene	870	912	953	986	1,022	1,064
Mansfield	1,755	2,488	3,233	3,935	4,721	5,600
Mountain Peak SUD	1,461	1,813	2,252	2,799	3,477	4,321
Parker WSC	267	263	259	254	248	241
Rio Vista	184	209	238	271	309	352
Venus	442	412	386	358	332	308
Johnson County Total	39,335	46,494	53,353	59,482	66,254	73,665

WUG/County	Projected Demands[1]					
	2030	2040	2050	2060	2070	2080
Jones County						
Anson	345	329	314	297	279	259
County-Other, Jones	857	814	767	713	651	579
Hamby WSC	26	23	21	18	15	11
Hamlin	315	275	241	211	188	170
Hawley WSC	530	529	531	534	536	538
S U N WSC	102	119	139	161	188	224
Stamford	728	671	610	545	470	380
Jones County Total	2,903	2,760	2,623	2,479	2,327	2,161
Kent County						
County-Other, Kent	29	29	28	29	31	32
Jayton	97	96	100	103	106	109
Kent County Total	126	125	128	132	137	141
Knox County						
Benjamin	57	56	51	48	43	38
County-Other, Knox	89	85	80	75	68	59
Knox City	246	245	244	243	241	241
Munday	228	231	235	237	242	253
Red River Authority of Texas	13	13	12	11	10	8
Knox County Total	633	630	622	614	604	599
Lampasas County						
Copperas Cove	183	288	361	436	469	464
Corix Utilities Texas Inc	1,028	1,062	1,067	1,054	1,041	1,025
County-Other, Lampasas	95	98	99	98	96	95
Kempner WSC	2,015	2,081	2,090	2,066	2,039	2,008
Lampasas	1,562	1,720	1,881	2,019	2,076	2,045
Multi County WSC	4	5	5	5	5	4
Lampasas County Total	4,887	5,254	5,503	5,678	5,726	5,641
Lee County						
Aqua WSC	264	273	284	295	306	318
County-Other, Lee	271	267	250	232	211	189
Giddings	1,129	1,141	1,124	1,103	1,080	1,053
Lee County WSC	965	975	961	942	922	898
Lexington	376	381	375	368	359	351
Southwest Milam WSC	107	113	119	126	133	141
Lee County Total	3,112	3,150	3,113	3,066	3,011	2,950

WUG/County	Projected Demands[1]					
	2030	2040	2050	2060	2070	2080
Limestone County						
Birome WSC	14	13	13	12	12	11
Bistone Municipal Water Supply District	243	235	226	217	207	197
Coolidge	140	135	130	125	119	113
County-Other, Limestone	251	242	234	226	218	210
Groesbeck	585	569	551	534	517	499
Mexia	1,026	997	960	926	890	852
Point Enterprise WSC	65	63	60	58	55	52
Post Oak SUD	29	28	27	26	24	24
Prairie Hill WSC	138	134	128	123	117	112
SLC WSC	101	97	93	89	85	81
Tri County SUD	442	427	409	393	376	358
White Rock Water SUD	217	210	201	193	185	176
Limestone County Total	3,251	3,150	3,032	2,922	2,805	2,685
McLennan County						
Axtell WSC	303	345	387	430	473	515
Bellmead	1,441	1,482	1,525	1,556	1,593	1,636
Birome WSC	81	90	99	108	119	130
Bold Springs WSC	252	264	275	286	298	312
Bruceville Eddy	1,438	1,446	1,544	1,648	1,759	1,844
Central Bosque WSC	146	151	155	158	163	167
Chalk Bluff WSC	576	653	732	812	891	971
Childress Creek WSC	11	14	17	21	25	30
Coryell City Water Supply District	187	194	201	206	212	219
County-Other, McLennan	734	953	1,003	1,026	1,073	1,175
Crawford	202	229	253	280	310	343
Cross Country WSC	588	669	739	819	909	1,008
East Crawford WSC	331	348	363	377	394	412
Elm Creek WSC	220	231	244	260	276	294
EOL WSC	228	248	269	290	311	332
Gholson WSC	472	542	603	674	752	840
H & H WSC	199	205	210	213	217	222
Hewitt	3,289	3,278	3,278	3,278	3,278	3,278
Highland Park WSC	48	49	50	50	51	52
Hilltop WSC	118	122	126	128	131	135
Hog Creek WSC	318	321	324	321	320	319
Lacy Lakeview	1,022	1,095	1,162	1,231	1,309	1,397
Leroy Tours Gerald WSC	193	204	217	230	242	243

WUG/County	Projected Demands[1]					
	2030	2040	2050	2060	2070	2080
Levi WSC	471	492	512	529	548	571
Lorena	534	557	580	600	624	651
Mart	460	432	409	372	333	290
McGregor	2,602	2,741	2,867	2,985	3,121	3,276
McLennan County WCID 2	222	204	190	168	145	119
Moody	273	308	344	380	417	453
North Bosque WSC	638	714	801	898	1,006	1,129
Prairie Hill WSC	139	161	180	203	228	255
Riesel	156	165	175	186	196	207
Robinson	2,970	3,380	3,857	4,401	5,023	5,733
Ross WSC	375	412	446	482	524	570
Spring Valley WSC	436	496	547	607	673	746
Texas State Technical College	2,016	2,015	2,015	2,015	2,015	2,015
Valley Mills	4	3	3	2	2	1
Waco	38,126	41,590	44,657	47,967	51,680	55,842
West	509	523	540	557	575	594
West Brazos WSC	263	290	313	339	368	400
Windsor Water	104	109	114	120	126	133
Woodway	3,973	3,967	3,967	3,967	3,967	3,967
McLennan County Total	66,668	71,692	76,293	81,180	86,677	92,826
Milam County						
Bell Milam Falls WSC	251	246	237	229	220	211
Cameron	1,265	1,242	1,200	1,161	1,121	1,079
County-Other, Milam	853	5,575	9,120	14,437	14,437	14,437
Milano WSC	271	266	256	247	238	228
North Milam WSC	184	180	173	167	161	154
Rockdale	1,609	1,616	1,627	1,639	1,650	1,662
Salem Elm Ridge WSC	168	164	158	153	147	142
Southwest Milam WSC	1,161	1,137	1,097	1,059	1,019	978
Thorndale	265	280	298	317	338	359
Milam County Total	6,027	10,706	14,166	19,409	19,331	19,250
Nolan County						
County-Other, Nolan	135	122	105	87	64	36
Roscoe	222	214	207	202	199	198
Sweetwater	1,808	1,786	1,762	1,733	1,703	1,672
The Bitter Creek WSC	146	157	170	183	198	218
Nolan County Total	2,311	2,279	2,244	2,205	2,164	2,124

WUG/County	Projected Demands[1]					
	2030	2040	2050	2060	2070	2080
Palo Pinto County						
County-Other, Palo Pinto	272	271	268	266	265	263
Double Diamond Utilities	1,079	1,081	1,069	1,064	1,057	1,051
Gordon	164	164	162	162	161	159
Lake Palo Pinto Area WSC	128	127	126	125	124	123
Mineral Wells	3,321	3,493	3,675	3,860	3,860	3,860
North Rural WSC	177	176	174	173	172	171
Palo Pinto WSC	102	102	101	101	101	101
Possum Kingdom WSC	594	594	587	584	581	577
Santo SUD	269	268	265	264	262	260
Sportsmans World MUD	75	75	74	74	73	73
Strawn	124	124	122	122	121	120
Sturdivant Progress WSC	237	236	234	232	231	229
Palo Pinto County Total	6,542	6,711	6,857	7,027	7,008	6,987
Robertson County						
Bremond	156	152	147	141	135	129
Calvert	269	261	253	242	231	220
County-Other, Robertson	210	192	172	150	127	103
Franklin	281	274	266	255	245	235
Hearne	867	841	813	779	744	706
Robertson County WSC	522	508	501	495	493	497
Twin Creek WSC	225	219	212	203	194	184
Wellborn SUD	373	362	350	336	321	305
Wickson Creek SUD	59	57	56	53	51	48
Robertson County Total	2,962	2,866	2,770	2,654	2,541	2,427
Shackelford County						
Albany	541	487	432	394	351	301
County-Other, Shackelford	22	16	12	9	7	5
Fort Griffin SUD	86	86	87	86	85	84
Hamby WSC	60	65	69	70	72	74
Shackelford County Total	709	654	600	559	515	464
Somervell County						
County-Other, Somervell	166	171	173	172	171	169
Glen Rose	603	621	629	626	622	618
Somervell County Water District	1,487	1,534	1,554	1,542	1,529	1,515
Somervell County Total	2,256	2,326	2,356	2,340	2,322	2,302

WUG/County	Projected Demands[1]					
	2030	2040	2050	2060	2070	2080
Stephens County						
Breckenridge	960	905	831	780	732	662
County-Other, Stephens	32	26	22	18	15	13
Fort Belknap WSC	7	9	11	12	14	17
Fort Griffin SUD	97	103	111	118	102	102
Possum Kingdom WSC	5	3	1	1	-	-
Staff WSC	15	17	21	24	28	32
Stephens Regional SUD	498	510	525	540	569	602
Stephens County Total	1,614	1,573	1,522	1,493	1,460	1,428
Stonewall County						
Aspermont	243	228	210	197	184	170
County-Other, Stonewall	53	49	44	42	40	37
Stonewall County Total	296	277	254	239	224	207
Taylor County						
Abilene	26,848	28,860	30,633	32,411	34,391	36,611
Coleman County SUD	44	46	46	46	46	46
County-Other, Taylor	165	90	50	27	14	7
Hamby WSC	60	73	84	98	113	130
Hawley WSC	36	40	43	47	51	56
Lawn	47	40	35	30	25	21
Merkel	329	318	310	293	276	259
North Runnels WSC	69	78	86	95	105	116
Potosi WSC	1,129	1,284	1,422	1,582	1,759	1,956
S U N WSC	140	138	138	135	132	129
Steamboat Mountain WSC	960	1,200	1,410	1,665	1,947	2,258
Tye	157	138	124	102	78	53
View Caps WSC	319	342	363	385	410	437
Taylor County Total	30,303	32,647	34,744	36,916	39,347	42,079
Throckmorton County						
Baylor SUD	2	1	1	1	1	1
County-Other, Throckmorton	14	13	12	12	11	11
Fort Belknap WSC	12	10	7	7	7	6
Fort Griffin SUD	30	28	28	27	25	23
Stephens Regional SUD	52	48	44	41	39	37
Throckmorton	146	135	127	119	113	105
Throckmorton County Total	256	235	219	207	196	183

WUG/County	Projected Demands[1]					
	2030	2040	2050	2060	2070	2080
Washington County						
Brenham	4,284	4,332	4,315	4,319	4,324	4,328
Central Washington County WSC	480	502	476	510	547	588
Chappell Hill WSC	107	107	108	106	104	102
Corix Utilities Texas Inc	624	642	662	683	704	726
County-Other, Washington	1,362	1,302	1,272	1,181	1,090	998
Lee County WSC	17	18	19	20	21	23
West End WSC	34	35	34	34	34	34
Washington County Total	6,908	6,938	6,886	6,853	6,824	6,799
Williamson County						
Bartlett	195	197	199	203	206	210
Bell Milam Falls WSC	62	79	98	120	144	171
Block House MUD	808	777	751	726	702	678
Brushy Creek MUD	3,927	3,913	3,913	3,913	3,913	3,913
Cedar Park	19,246	19,186	19,186	19,186	19,186	19,186
County-Other, Williamson	8,194	15,232	19,446	24,055	29,238	35,064
Fern Bluff MUD	1,152	1,195	1,244	1,245	1,245	1,245
Florence	208	222	240	259	281	305
Georgetown	46,824	81,637	112,193	138,415	169,003	196,376
Granger	194	208	224	241	259	279
Hutto	2,703	3,731	5,180	7,191	9,983	13,860
Jarrell-Schwertner	8,816	9,504	9,921	10,358	10,816	11,295
Jonah Water SUD	6,238	8,863	11,977	15,377	19,205	23,510
Lakeside MUD 3	2	3	4	5	6	7
Leander	19,035	24,131	25,707	26,026	26,239	26,392
Liberty Hill	763	1,105	1,513	1,957	2,458	3,021
Manville WSC	1,248	1,255	1,266	1,282	1,297	1,313
Noack WSC	152	156	160	165	170	175
Paloma Lake MUD 1	537	537	537	537	537	537
Paloma Lake MUD 2	390	390	390	390	390	390
Round Rock	22,714	28,052	33,340	34,436	35,428	36,292
Sonterra MUD	2,294	3,607	5,166	6,867	8,783	10,940
Southwest Milam WSC	354	448	561	683	821	977
Taylor	3,550	5,083	6,831	8,450	10,270	12,317
Vista Oaks MUD	431	431	431	431	431	431
Walsh Ranch MUD	128	128	128	128	128	128
Williamson County MUD 10	589	589	589	589	589	589
Williamson County MUD 11	922	1,321	1,791	2,305	2,884	3,534

WUG/County	Projected Demands[1]					
	2030	2040	2050	2060	2070	2080
Williamson County WSID 3	912	1,200	1,543	1,918	2,339	2,813
Williamson Travis Counties MUD 1	584	585	588	591	594	597
Williamson County Total	153,172	213,765	265,117	308,049	357,545	406,545
Young County						
Baylor SUD	25	25	25	25	25	25
County-Other, Young	401	401	407	410	414	418
Fort Belknap WSC	496	500	516	523	530	538
Graham	2,470	2,442	2,338	2,322	2,302	2,278
Young County Total	3,392	3,368	3,286	3,280	3,271	3,259
Brazos G Total	**552,334**	**654,908**	**746,902**	**832,014**	**915,785**	**1,002,767**

2.3.3 Manufacturing Water Demand

Manufacturing is an integral part of the economy of the Brazos G Area, and water is critical to the manufacturing process for many industries. It can be used in a variety of ways, including as a component of the final product, as a cooling agent during the manufacturing process, or for cleaning/wash-down of parts and/or products. In the Brazos G Area, industries that are major water users include food and kindred products, apparel, fabricated metal, machinery, stone and concrete production, and micro-chip production.

Manufacturing water demand was projected by the TWDB by taking industry-specific water demand coefficients, adjusted for water-use efficiencies (recycling/reuse), and applying them to growth trends for each industry. These growth trends assume expansion of existing capacity and building of new facilities, continuation of historical trends of interaction between oil price changes and industrial activity, and that the makeup of each county's manufacturing base remains constant throughout the 60-year planning horizon.

Manufacturing use is projected to increase 20 percent, from 16,847 ac-ft in 2030 to 20,223 ac-ft in 2080 (Table 2.6). The trend in manufacturing use by county is shown in Figure 2.6. McLennan, Johnson, Brazos, Williamson and Bell Counties account for 79 percent of the total use in 2080.

Table 2.6 Projected Manufacturing Water Demand in the Brazos G Area (acre-feet/year)

County	Projections					
	2030	2040	2050	2060	2070	2080
Bell	966	1,002	1,039	1,078	1,118	1,160
Bosque	5	5	5	5	5	5
Brazos	2,139	2,219	2,302	2,388	2,477	2,569
Burleson	139	144	149	155	161	167
Comanche	20	21	22	23	24	25
Coryell	5	5	5	5	5	5
Eastland	60	62	64	66	68	71
Erath	90	93	96	100	104	108
Fisher	196	203	211	219	227	235
Grimes	398	413	428	444	461	478
Hamilton	20	21	22	23	24	25
Haskell	2	2	2	2	2	2
Hill	7	7	7	7	7	7
Hood	19	20	21	22	23	24
Johnson	2,440	2,531	2,625	2,723	2,824	2,929
Lampasas	234	243	252	261	271	281
Lee	11	11	11	11	11	11
Limestone	253	262	272	282	292	303
McLennan	5,745	5,959	6,181	6,411	6,649	6,896
Nolan	539	559	580	602	624	647
Palo Pinto	28	29	30	31	32	33
Robertson	60	62	64	66	68	71
Somervell	5	5	5	5	5	5
Stephens	8	8	8	8	8	8
Taylor	720	747	775	804	834	865
Washington	696	722	749	777	806	836
Williamson	1,944	2,017	2,093	2,172	2,254	2,339
Young	98	102	106	110	114	118
Brazos G Total	**16,847**	**17,474**	**18,124**	**18,800**	**19,498**	**20,223**

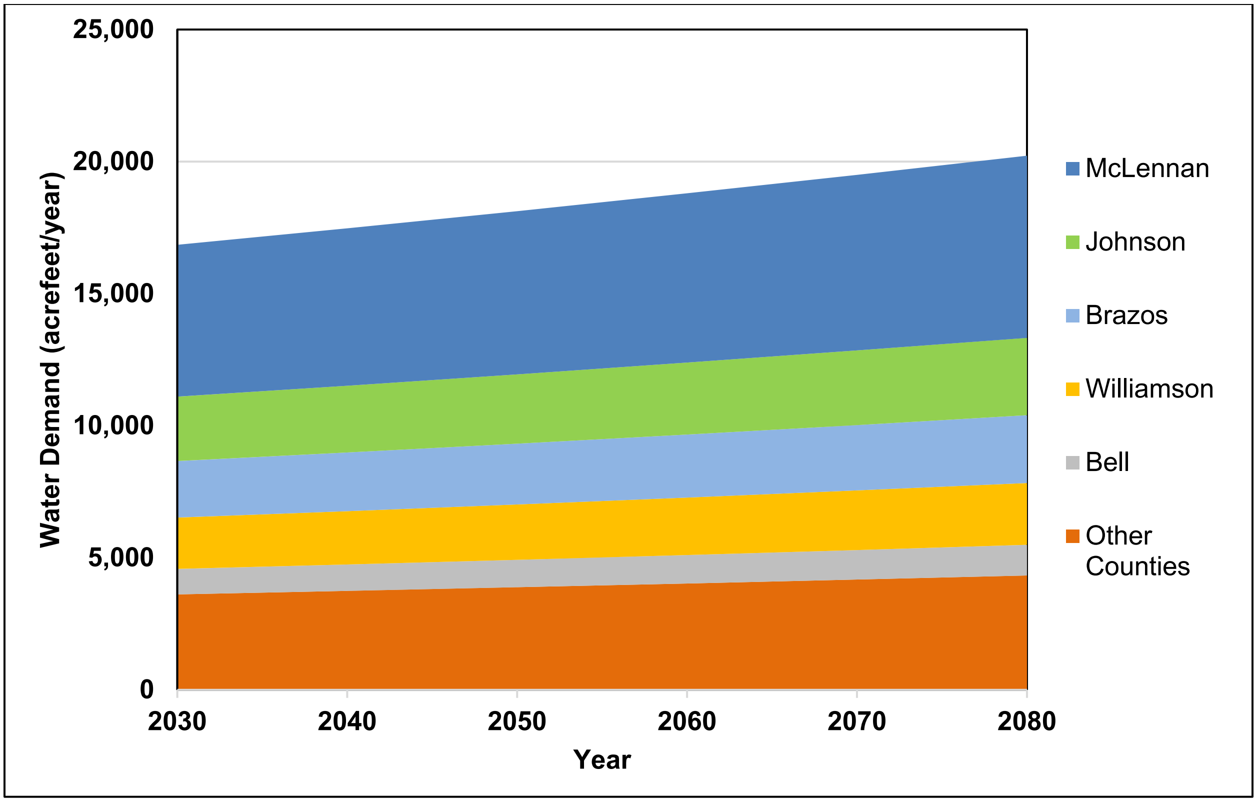


Figure 2.6 Manufacturing Water Demand Projections

2.3.4 Steam-Electric Water Demand

The steam-electric generation process uses water in boilers and for cooling. The projections for steam-electric water demand were developed by the TWDB and are based on power generation projections—determined by population and manufacturing growth—and on power generation capacity and fresh water use for that projected capacity. Somervell, Robertson, Limestone, Bell, and Grimes counties account for 94 percent of total steam-electric water use in 2080. Steam-Electric water use is projected to remain constant at 158,860 ac-ft from 2030 to 2080 (Table 2.7 and Figure 2.7).

Table 2.7 Projected Steam-Electric Water Demand in the Brazos G Area (acre-feet/year)

County	Projected Demands (1)					
	2030	2040	2050	2060	2070	2080
Bell	4,714	4,714	4,714	4,714	4714	4,714
Bosque	2,880	2,880	2,880	2,880	2,880	2,880
Brazos	600	600	600	600	600	600
Burleson	0	0	0	0	0	0
Callahan	0	0	0	0	0	0
Comanche	0	0	0	0	0	0
Coryell	0	0	0	0	0	0
Eastland	0	0	0	0	0	0
Erath	0	0	0	0	0	0
Falls	0	0	0	0	0	0
Fisher	0	0	0	0	0	0
Grimes	4,703	4,703	4,703	4,703	4,703	4,703
Hamilton	0	0	0	0	0	0
Haskell	0	0	0	0	0	0
Hill						
Hood	3,151	3,151	3,151	3,151	3,151	3,151
Johnson	1,915	1,915	1,915	1,915	1915	1,915
Jones	0	0	0	0	0	0
Kent	0	0	0	0	0	0
Knox	0	0	0	0	0	0
Lampasas	0	0	0	0	0	0
Lee	0	0	0	0	0	0
Limestone	22,936	22,936	22,936	22,936	22936	22,936
McLennan	15	15	15	15	15	15
Milam	0	0	0	0	0	0
Nolan	0	0	0	0	0	0
Palo Pinto	677	677	677	677	677	677
Robertson	45,867	45,867	45,867	45,867	45867	45,867
Shackelford	0	0	0	0	0	0
Somervell	70,362	70,362	70,362	70,362	70362	70,362
Stephens	0	0	0	0	0	0
Stonewall	0	0	0	0	0	0
Taylor	0	0	0	0	0	0
Throckmorton	0	0	0	0	0	0
Washington	0	0	0	0	0	0
Williamson	0	0	0	0	0	0
Young	840	840	840	840	840	840
Brazos G Total	**158,660**	**158,660**	**158,660**	**158,660**	**158,660**	**158,660**

Notes:
(1) Projections adopted by the Texas Water Development Board, as requested by the BGRWPG (Appendix Q).

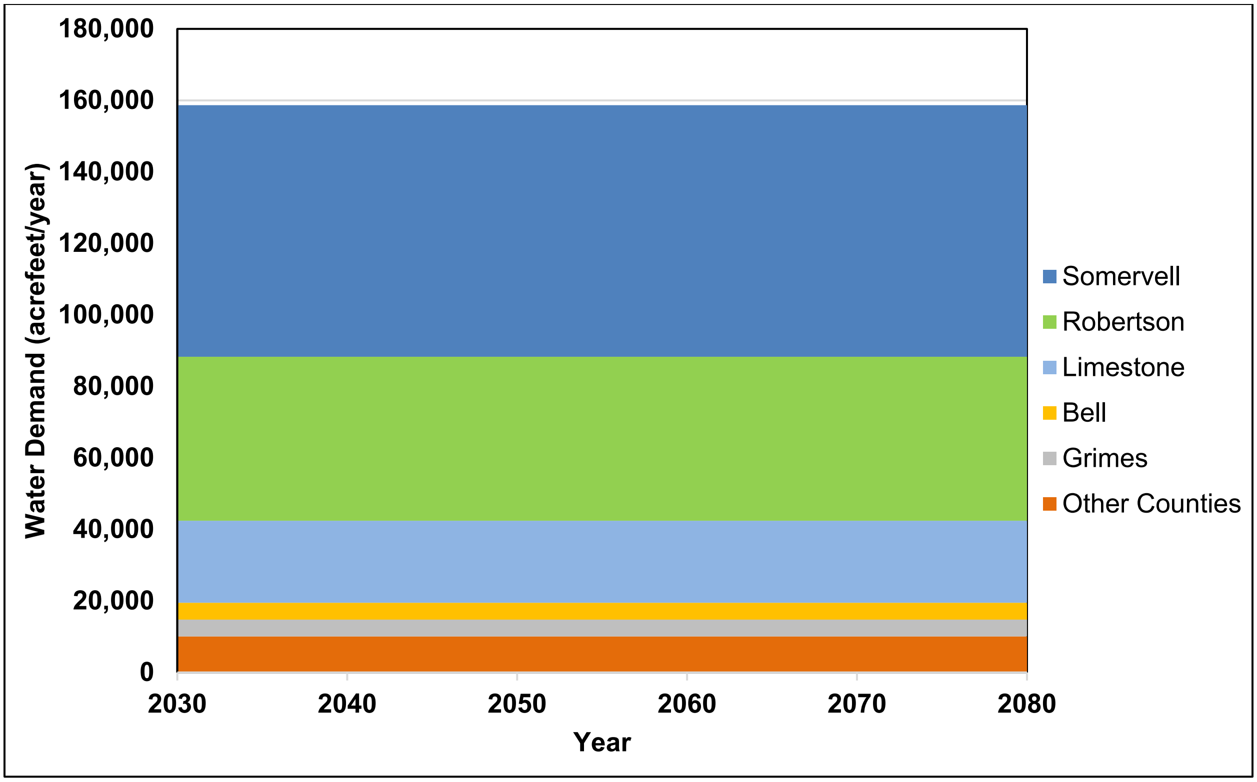


Figure 2.7 Steam-Electric Water Demand Projections

2.3.5 Mining Water Demand

Projections for mining water demand were developed by the TWDB and are based on projected production of mineral commodities, and historic rates of water use, moderated by water requirements of technological processes used in mining.

Mining use in the Brazos G Area is expected to decrease 4 percent between 2030 and 2080, from 27,389 ac-ft to 26,283 ac-ft. Hood, Burleson, Limestone, Brazos, and Somervell counties account for 71 percent of total mining water use in 2080 (Table 2.8 and Figure 2.8).

Table 2.8 Projected Mining Water Demand in the Brazos G Area (acre-feet/year)

County	Projected Demands (1)					
	2030	2040	2030	2060	2030	2080
Bell	393	444	493	544	594	642
Bosque	884	921	944	959	968	971
Brazos	2,670	2,698	2,725	2,741	2,765	2,799
Burleson	5,569	5,569	5,569	5,569	5,569	5,569
Callahan	2	2	2	2	2	2
Comanche	94	96	99	102	104	107
Coryell	3	4	4	4	5	5
Eastland	321	322	322	322	322	322
Erath	15	16	17	18	19	20
Falls	30	30	29	30	31	32
Fisher	106	106	106	106	106	106
Grimes	228	228	228	228	228	228
Haskell	4	4	4	4	4	4
Hill	99	103	107	110	112	114
Hood	4,356	4,746	5,086	5,351	5,557	5,694
Johnson	193	185	206	229	254	279
Jones	9	9	9	9	9	9
Kent	15	15	15	15	15	15
Knox	0	0	0	0	0	0
Lampasas	3	3	3	3	3	3
Lee	1,236	1,236	1,236	1,236	1,236	1,236
Limestone	3,519	3,624	3,738	3,831	2,914	2,985
McLennan	363	385	407	429	451	472
Milam	832	833	835	836	837	838
Nolan	70	70	70	70	70	70
Palo Pinto	26	27	28	29	29	30
Robertson	3,600	3,600	600	600	600	600
Shackelford	0	0	0	0	0	0
Somervell	1,362	1,458	1,533	1,597	1,649	1,686
Stephens	10	10	10	10	10	10
Stonewall	20	20	20	20	20	20
Taylor	514	532	547	558	566	571
Throckmorton	112	112	112	112	112	112
Washington	728	728	728	728	728	728
Williamson	2	2	2	3	3	3
Young	1	1	1	1	1	1
Brazos G Total	**27,389**	**28,139**	**25,835**	**26,406**	**25,893**	**26,283**

Notes:
(1) Projections from Texas Water Development Board.

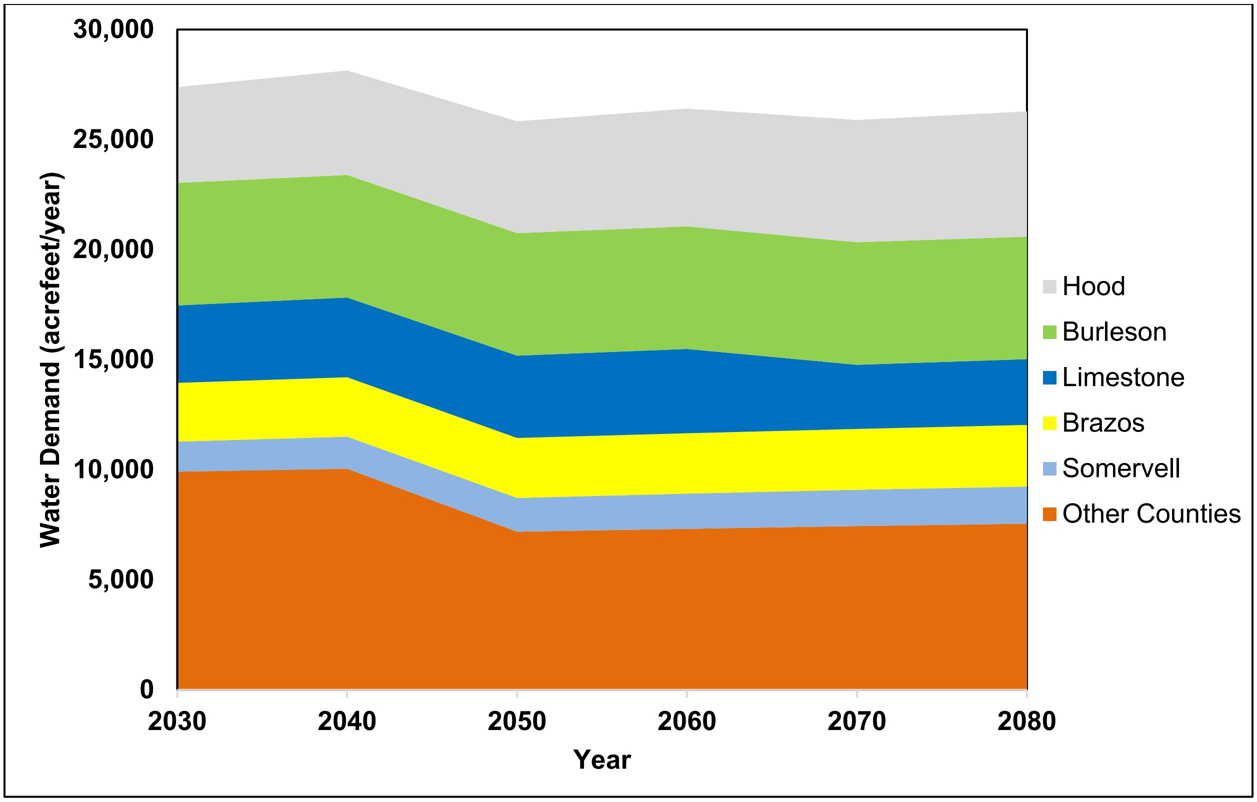


Figure 2.8 Mining Water Demand Projections

2.3.6 Irrigation Water Demand

The irrigation water demand projections were developed by the TWDB and are based on specific assumptions regarding resource constraints, crop prices, crop yields, agricultural policy, and technological advances in irrigation systems.

Major crops grown in the region include feed grains, small grains, cotton, pecans, and peanuts. Table 2.9 shows that irrigation water demand will decrease 0.24 percent from 2030 to 2080, mostly attributable to technological advances in irrigation techniques as well as projected reductions in irrigated acreage.

Figure 2.9 shows the trend in irrigation use, with Robertson, Haskell, Knox, Brazos, and Comanche counties accounting for 69 percent of total irrigation water use in 2080.

Table 2.9 Projected Irrigation Water Demand in the Brazos G Area (acre-feet/year)

County	Projected Demands (1)					
	2030	2040	2050	2060	2070	2080
Bell	3,108	3,108	3,108	3,108	3,108	3,108
Bosque	2,995	2,995	2,995	2,995	2,995	2,995
Brazos	35,818	35,818	35,818	35,818	35,818	35,818
Burleson	22,118	22,118	22,118	22,118	22,118	22,118
Callahan	522	522	522	522	522	522
Comanche	26,274	26,274	26,274	26,274	26,274	26,274
Coryell	343	343	343	343	343	343
Eastland	4,393	4,393	4,393	4,393	4,393	4,393
Erath	6,985	6,985	6,985	6,985	6,985	6,985
Falls	6,944	6,944	6,950	6,956	6,963	6,963
Fisher	4,289	4,289	4,289	4,289	4,289	4,289
Grimes	707	707	707	707	707	707
Hamilton	1,148	1,148	1,148	1,148	1,148	1,148
Haskell	49,755	49,755	49,755	49,755	49,755	49,755
Hill	1,374	1,374	1,374	1,374	1,374	1,374
Hood	7,800	7,800	7,800	7,800	7,800	7,800
Johnson	542	542	542	542	542	542
Jones	2,702	2,702	2,702	2,702	2,702	2,702
Kent	927	927	927	927	927	927
Knox	37,031	37,031	37,031	37,031	37,031	37,031
Lampasas	521	521	521	521	521	521
Lee	939	939	939	939	939	939
Limestone	8	8	8	8	8	8
McLennan	5,122	5,122	5,122	5,122	5,122	5,122
Milam	5,812	5,812	5,812	5,812	5,812	5,812
Nolan	12,961	12,961	12,577	12,335	12,174	12,174
Palo Pinto	2,168	2,168	2,168	2,168	2,168	2,168
Robertson	73,272	73,272	73,272	73,272	73,272	73,272
Shackelford	194	194	194	194	194	194
Somervell	335	335	335	335	335	335
Stephens	153	153	153	153	153	153
Stonewall	95	95	95	95	95	95
Taylor	1,426	1,426	1,426	1,426	1,426	1,426
Throckmorton	71	71	71	71	71	71
Washington	251	251	251	251	251	251
Williamson	399	399	399	399	399	399
Young	648	648	648	648	648	648
Brazos G Total	**320,150**	**320,150**	**319,722**	**319,536**	**319,382**	**319,382**

Notes:
(1) Projections from Texas Water Development Board.

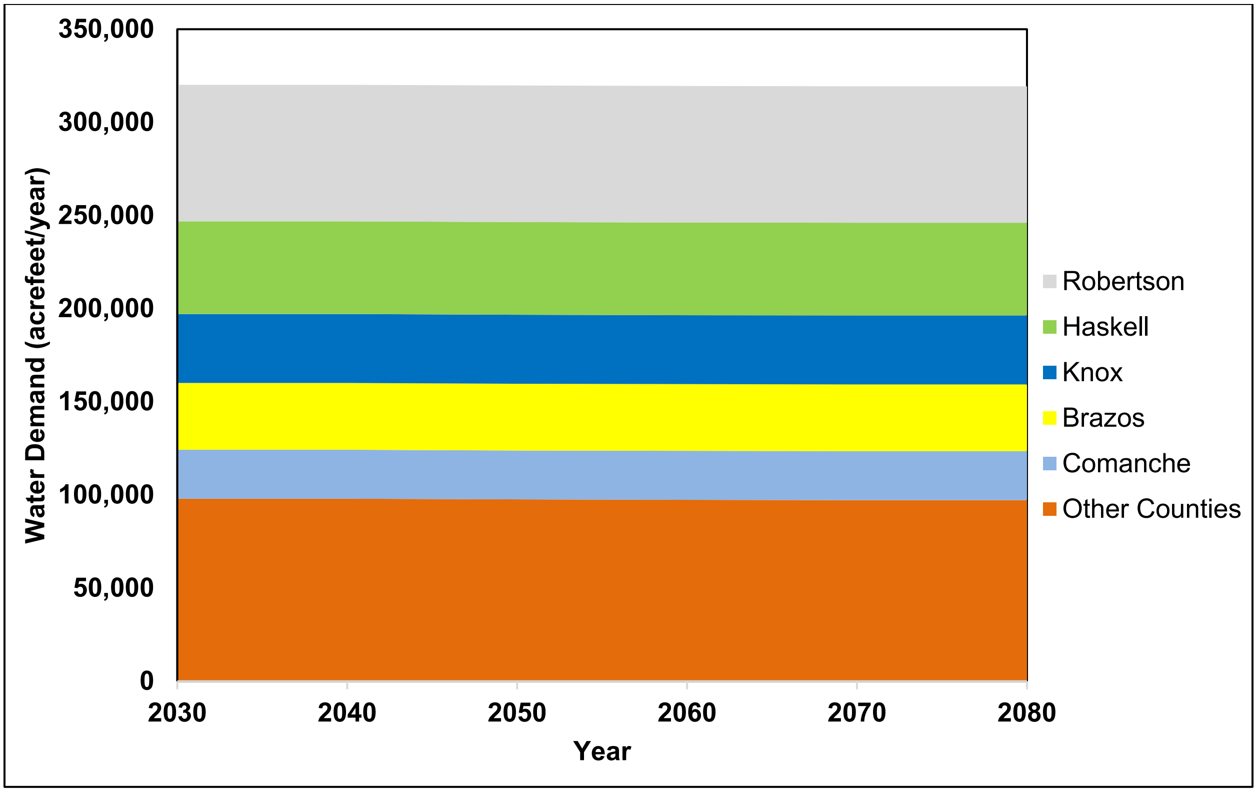


Figure 2.9 Irrigation Water Demand Projections

2.3.7 Livestock Water Demand

In the 37-county Brazos G Area, the principal livestock type is dairy, with some beef cattle. The Brazos G Area contains widespread cow-calf operators, with concentrated dairy production in Comanche and Erath counties. The livestock water demand projections developed by the TWDB are based upon estimates of the maximum carrying capacity of the rangeland of the area and the estimated number of gallons of water per head of livestock per day. Additionally, economics of milk production and environmental impacts of the operations are major factors in the projections of the water demands for this category of livestock.

Livestock drinking water is obtained from wells, stock watering ponds, and streams. As can be seen in Table 2.10, it is projected that the annual livestock water demand will remain constant at 44,138 ac-ft between 2030 and 2080. Figure 2.10 shows the trend in livestock use, with Erath, Comanche, Robertson, Falls and Palo Pinto counties accounting for 34 percent of total livestock water use in 2080.

Table 2.10 Projected Livestock Water Demand in the Brazos G Area (acre-feet/year)

County	Projected Demands [(1)]					
	2030	2040	2050	2060	2070	2080
Bell	977	977	977	977	977	977
Bosque	936	936	936	936	936	936
Brazos	1,098	1,098	1,098	1,098	1,098	1,098
Burleson	1,259	1,259	1,259	1,259	1,259	1,259
Callahan	861	861	861	861	861	861
Comanche	3,436	3,436	3,436	3,436	3,436	3,436
Coryell	1,109	1,109	1,109	1,109	1,109	1,109
Eastland	962	962	962	962	962	962
Erath	5,984	5,984	5,984	5,984	5,984	5,984
Falls	1,904	1,904	1,904	1,904	1,904	1,904
Fisher	484	484	484	484	484	484
Grimes	1,447	1,447	1,447	1,447	1,447	1,447
Hamilton	1,505	1,505	1,505	1,505	1,505	1,505
Haskell	424	424	424	424	424	424
Hill	1,276	1,276	1,276	1,276	1,276	1,276
Hood	486	486	486	486	486	486
Johnson	1,488	1,488	1,488	1,488	1,488	1,488
Jones	515	515	515	515	515	515
Kent	276	276	276	276	276	276
Knox	534	534	534	534	534	534
Lampasas	585	585	585	585	585	585
Lee	1,242	1,242	1,242	1,242	1,242	1,242
Limestone	1,495	1,495	1,495	1,495	1,495	1,495
McLennan	1,642	1,642	1,642	1,642	1,642	1,642
Milam	1,524	1,524	1,524	1,524	1,524	1,524
Nolan	275	275	275	275	275	275
Palo Pinto	1,830	1,830	1,830	1,830	1,830	1,830
Robertson	2,036	2,036	2,036	2,036	2,036	2,036
Shackelford	546	546	546	546	546	546
Somervell	151	151	151	151	151	151
Stephens	429	429	429	429	429	429
Stonewall	383	383	383	383	383	383
Taylor	761	761	761	761	761	761
Throckmorton	614	614	614	614	614	614
Washington	1,544	1,544	1,544	1,544	1,544	1,544
Williamson	1,532	1,532	1,532	1,532	1,532	1,532
Young	588	588	588	588	588	588
Brazos G Total	44,138	44,138	44,138	44,138	44,138	44,138

Notes:
(1) Projections from Texas Water Development Board.

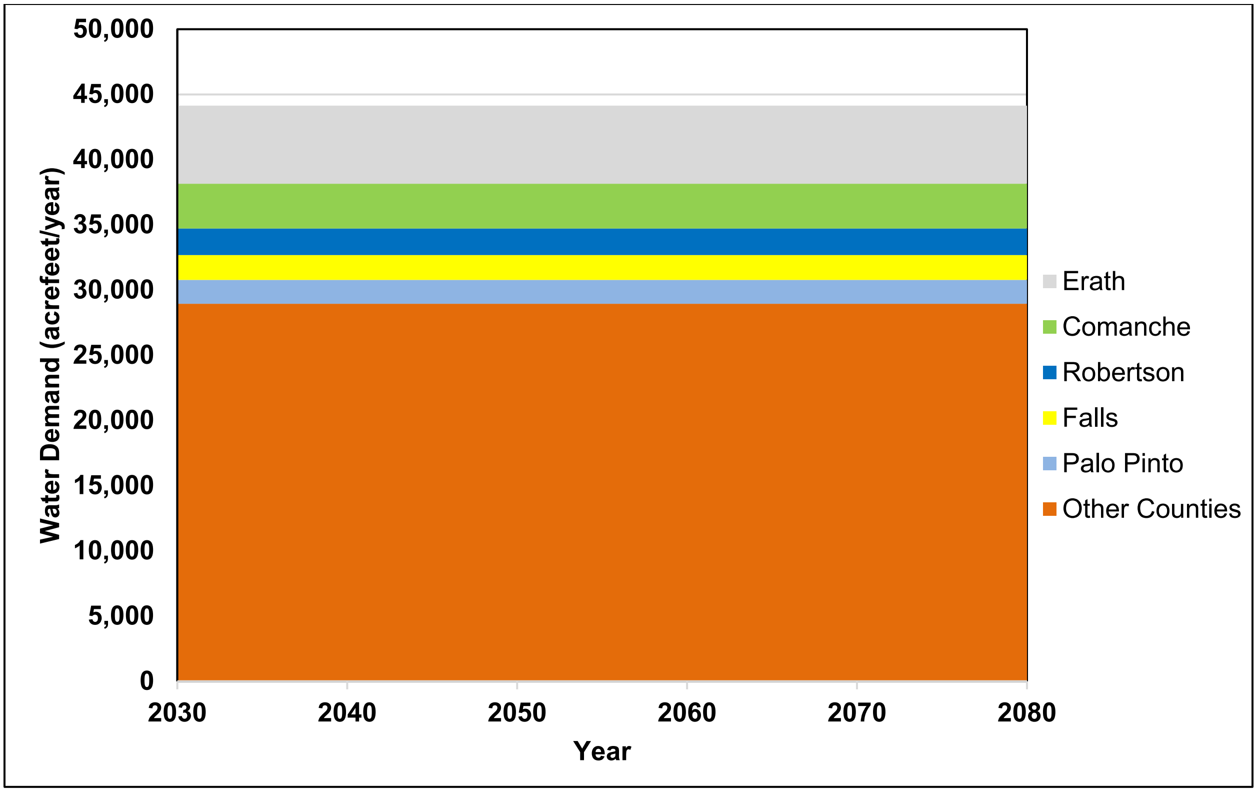


Figure 2.10 Livestock Water Demand Projections

2.3.8 Wholesale Water Providers

A wholesale water provider (WWP) in the 2026 Brazos G Plan is any entity that delivers or sells water wholesale, whether treated or raw, or that the Brazos G RWPG expects to sell water during the planning period. Seventy-three WUGs are also WWPs in the Brazos G Area, e.g., they sell wholesale water to neighboring water systems in addition to meeting their own municipal demands. In addition,12 WWPs provide only wholesale water to entities in the Brazos G Area. The total contractual demands in Brazos G for those 12 WWPs are shown in Table 2.11.

Table 2.11 Brazos G Related Contractual Demands for non-WUG Wholesale Water Providers (acre-feet/year)

Wholesale Water Provider	2030	2040	2050	2060	2070	2080
AQUILLA WSD	5,952	5,952	5,952	5,952	5,952	
BELL COUNTY WCID #1	44,069	47,447	50,736	54,014	57,279	
BLUEBONNET WSC	7,125	7,125	7,125	7,125	7,125	
BRAZOS RIVER AUTHORITY[1]	493,010	493,255	493,548	493,908	494,176	
CENTRAL TEXAS WSC	10,537	10,537	10,537	10,537	10,537	
COLORADO RIVER MWD	4,850	4,679	4,509	4,338	4168	
EASTLAND COUNTY WSD	5,395	5,395	5,395	5,395	5,395	
LOWER COLORADO RIVER AUTHORITY[2]	70,640	70,640	70,640	70,640	70,640	
NORTH CENTRAL TEXAS MUNICIPAL WATER AUTHORITY	1,650	1,650	1,650	1,650	1,650	
PALO PINTO COUNTY MWD #1	9,651	9,706	9,777	9,848	9,906	
UPPER LEON MWD	4,572	4,572	4,572	4,572	4,572	
WEST CENTRAL TEXAS MWD	15,620	13,260	10,900	8,540	6,200	

Notes:
(1) Includes contractual demands for Region C portion of Parker County SUD located in both Brazos G and Region C.
(2) Includes contractual demands for Region K portion of Pflugerville located both Brazos G and Region K.

2.3.9 Major Water Providers

Projected retail and wholesale demands by category of use for the major water providers (MWPs) identified by the Brazos G RWPG are shown in Appendix O.

CHAPTER 3 EVALUATION OF CURRENT WATER SUPPLIES

3.1 Surface Water Supplies

Streamflow in the Brazos River and its tributaries, along with reservoirs in the Brazos River Basin, comprise a vast supply of surface water in the Brazos G Area. Diversion and use of this surface water occurs throughout the entire region with over 1,000 water rights currently issued. These water rights provide authorization for an owner to divert, store, and use the water; however, they do not guarantee that a dependable supply will be available from the water source. The availability of water to a water right is dependent on several factors, including hydrologic conditions (i.e., rainfall, runoff, spring flow), priority date of the water right, quantity of authorized storage, and any special conditions associated with the water right (i.e., instream flow requirements, maximum diversion rate).

3.1.1 Texas Water Right System

The State of Texas owns the surface water within the state's watercourses and is responsible for the appropriation of these waters. Surface water is currently allocated by the Texas Commission on Environmental Quality (TCEQ) for the use and benefit of all people of the state. Historically, Texas water law is based on a combination of the riparian and prior appropriation doctrines. The riparian doctrine extends from the Spanish and Mexican governments that ruled Texas prior to 1836. After 1840, the riparian doctrine provided landowners the right to make reasonable use of water for irrigation or for other consumptive uses. In 1889, the prior appropriation doctrine was first adopted by Texas, which is based on the concept of "first in time is first in right." Over the years, the combination of riparian and prior appropriation doctrines resulted in an essentially unmanageable system. Various types of water rights existed simultaneously, and many rights were unrecorded.

In 1967, the Texas Legislature passed the Water Rights Adjudication Act to merge the riparian water rights into the prior appropriation system, creating a unified water rights system. The adjudication process has taken many years and is essentially complete. In the end, Certificates of Adjudication have been issued for entities recognized as having legitimate water rights. Today, individuals or groups seeking a new water right must submit an application to the TCEQ. The TCEQ determines if the water right will be issued and under what conditions. The water rights grant a certain quantity of water to be diverted and/or stored, a priority date, and often come with some restrictions on when and how the right may be used. Restrictions may include a maximum diversion rate and/or an instream flow restriction to protect existing water rights and environmental resources.

The priority date of a water right is essential to the operation of the water rights system. Each right is issued a priority date based on the date of first capture, or the appropriation date. The established priority system must be adhered to by all water right holders when diverting or storing water for use. A right holder must pass all water to downstream senior water rights when conditions are such that the senior water rights would not be satisfied otherwise.

3.1.2 Types of Water Rights

There are various types of water rights: Certificates of Adjudication, permits, term permits, and temporary permits. Certificates of Adjudication were issued in perpetuity for approved claims during the adjudication process. This type of water right was issued based on historical use rather than water availability. Therefore, the amount of water to which rights exist exceeds the amount of water available during a drought for some streams. The TCEQ issues new permits only where drought flows are sufficient to meet the requested amount. Permits, like Certificates of Adjudication, are issued in perpetuity and may be bought and sold like other property interests. Term permits may be issued by the TCEQ in areas where waters are fully appropriated, but not yet fully used. Term permits are usually issued for 10 years and may be renewed if, after 10 years, other water right holders are still not fully using the water in the basin. Temporary permits are issued for up to 3 years. Temporary permits are issued mainly for road construction projects, where water is used to suppress dust, to compact soils, and to start the growth of new vegetation. As term and temporary permits are not permanent water rights, they are not considered in the process of determining available water supplies.

Water rights can include the right to divert and/or store the appropriated water. A run-of-the-river water right provides for the diversion of streamflow and does not include storage of water for use during dry periods. These rights have no authorization to store water, only the right to take water from the stream. Availability of water to a run-of-the-river right may be limited by streamflow, pumping rate, or diversion location.

Water rights that include provisions for storage of water allow a water right holder to impound streamflows for use at a later time. The storage provides water for use during dry periods, when water may not be available due to hydrologic conditions or because existing flows are required to be passed to downstream senior water rights.

While most water rights are diverted and used within the river basin of origin, water rights that divert from one river basin to another basin require an interbasin transfer authorization. Several types of transfers that receive special consideration include emergency transfers, transfers of water from a river basin for use in an adjoining coastal basin (such as from the Brazos River Basin to the San Jacinto-Brazos Coastal Basin), diversions of less than 3,000 acre-feet per year (ac-ft/yr), and diversions within any city or county that has any portion in the basin of origin.

3.1.3 Water Rights in the Brazos River Basin

The TCEQ maintains a database of all active water rights, which is available for download from the TCEQ's website. The July 2024 version of this database indicates that the TCEQ has issued 1,134 active water rights totaling 3,854,018 ac-ft/yr of authorized diversions for the Brazos River Basin. Since 2020, three permanent water rights totaling 52,976 ac-ft/yr have been issued. The summary statistics referenced herein are based on the information reflected in this July 2024 version of the database.

It is important to note that a small percentage of the water rights represent a large percentage of the total authorized diversion volume in the Brazos River Basin. The BRA System Operation Permit alone makes up 11 percent of the total authorized diversion volume. Forty-six other major water rights make up 3,148,642 ac-ft/yr (82 percent) of the authorized diversion volume. The BRA, Gulf Coast Water Authority, and Dow Chemical Company are the three largest water right holders and own approximately 71 percent of the total authorized diversion amount in the basin. The remaining 1,090 water rights primarily consist of small irrigation rights distributed throughout the river basin. Figure 3.1 shows a comparison of significant water rights in the Brazos River Basin by number of rights and diversion volume.

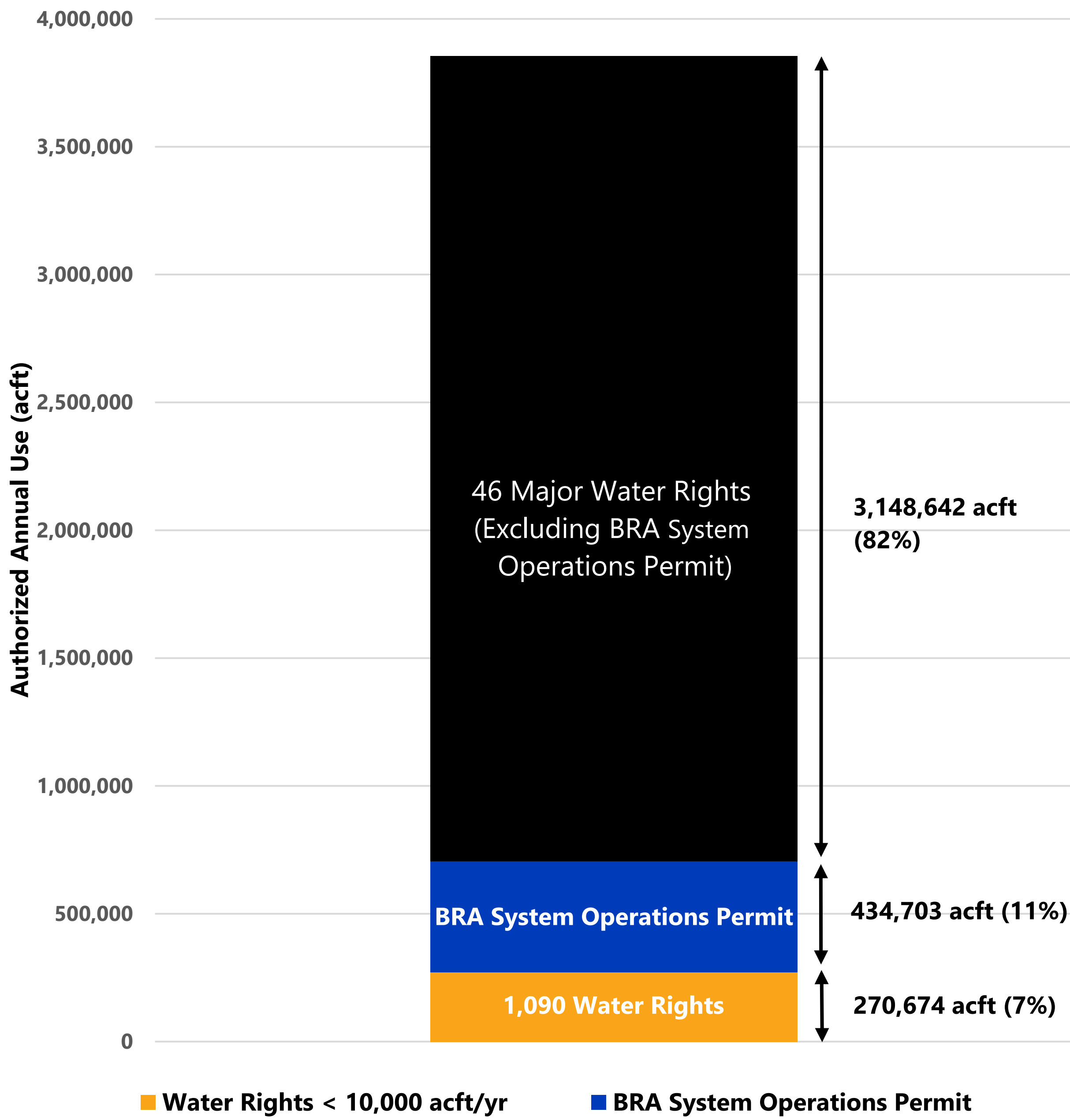


Figure 3.1 Distribution of Water Rights in the Brazos River Basin

The Brazos G Area includes the majority of the water rights in the Brazos River Basin. A total of 987 water rights exist in the Brazos G portion of the Brazos River Basin, with a total authorized diversion of 1,457,202 ac-ft/yr. In the Brazos G portion of the Brazos River Basin, 31 water rights (3.1 percent) make up 1,225,975 ac-ft/yr (84.1 percent) of the authorized diversion volume. The remaining 956 water rights primarily consist of small irrigation rights distributed throughout the area.

Region H, located downstream of the Brazos G Area, has a total of only 43 water rights (3.8 percent) in the Brazos River Basin, but these include some very large rights comprising 1,838,937 ac-ft/yr (47.7 percent) of the total authorized diversions in the basin. Other planning areas make up a small percentage of the remaining water rights and total authorized diversions in the basin, and six water rights contain diversion points in multiple planning areas. Water rights by planning area are summarized in Figure 3.2 and Figure 3.3.

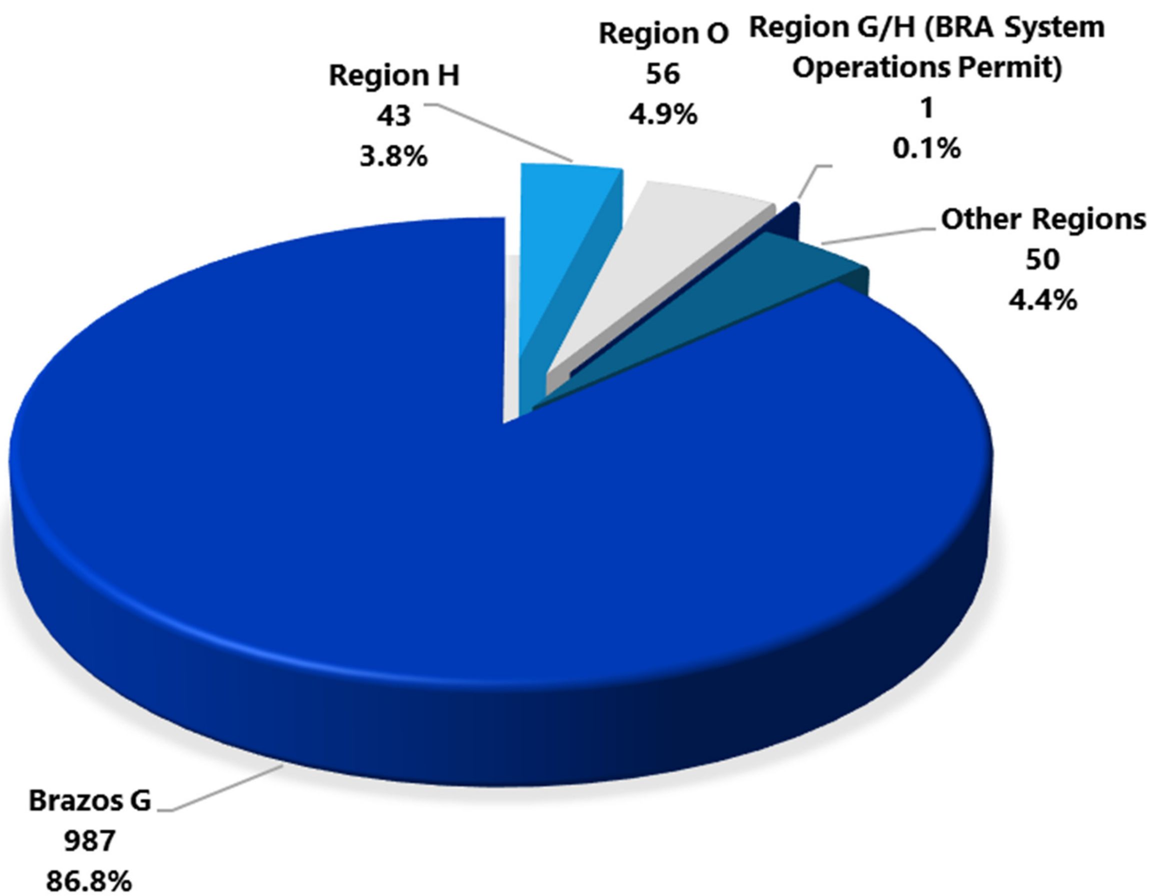


Figure 3.2 Comparison of Number of Water Rights in the Brazos River Basin by Planning Area

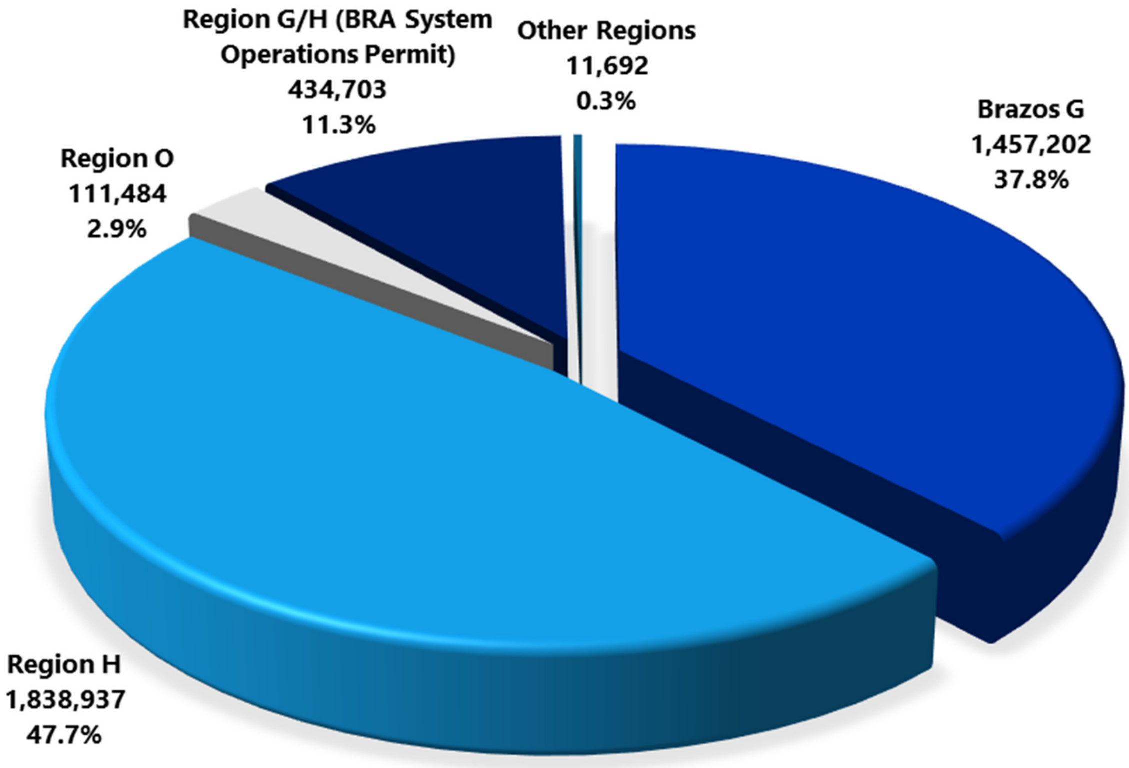


Figure 3.3 Comparison of Authorized Diversion Volume (acre-feet/year) in the Brazos River Basin by Planning Area

The authorized diversions in Region H generally consist of very large, senior priority, run-of-the-river water rights. In comparison, water rights in the Brazos G Area are larger in number and diversion volume; however, the water rights are generally junior in priority to those downstream in Region H. Therefore, in times of drought, when streamflows are low, diversions of water from streams in the Brazos G Area may be restricted for several of the water right holders. A comparison of the quantity of authorized diversions relative to the priority date of the water rights in Brazos G and Region H is presented in Figure 3.4. Major water rights are defined as having an authorized diversion greater than 10,000 ac-ft/yr and/or 5,000 ac-ft of authorized storage. Figure 3.6 shows the location of major water rights in the Brazos River Basin. A list of all water rights, summarized from the TCEQ water right database for all rights in the Brazos G Area, is provided in Appendix F.

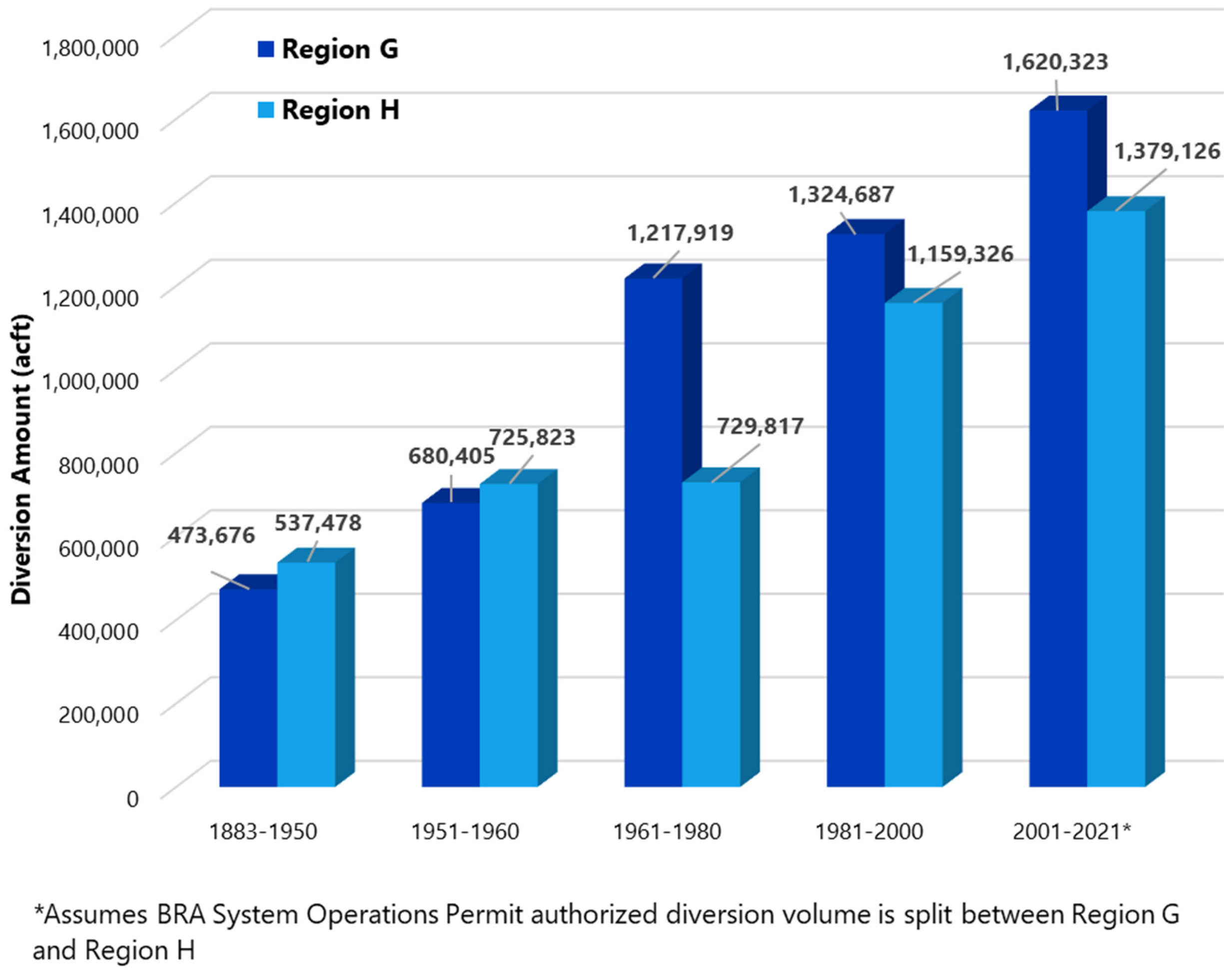
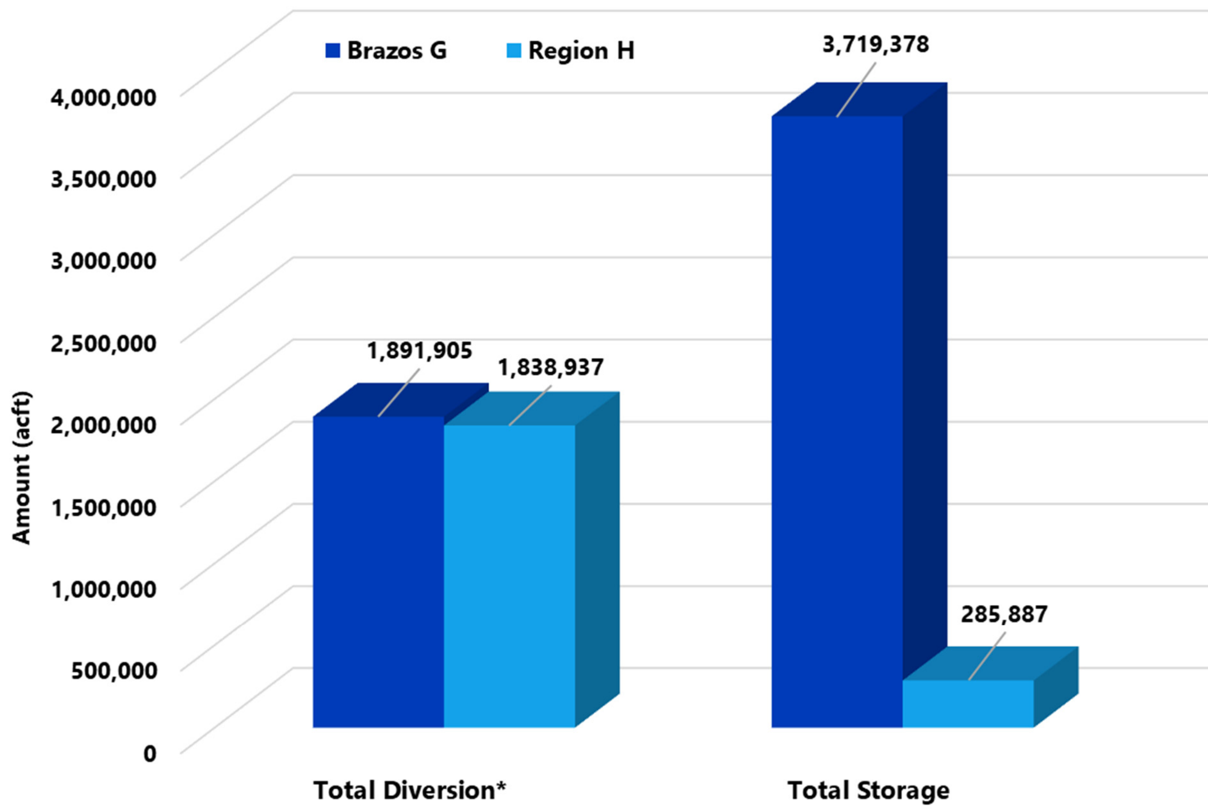


Figure 3.4 Comparison of Cumulative Diversion Volume and Priority Date for the Brazos G Area and Region H

While Region H includes a large quantity of senior priority water rights, most of these water rights have very little storage associated with them and, therefore, may be described primarily as run-of-the-river water rights. The water rights in Brazos G are generally junior to those water rights in Region H; however, there is a substantial volume of reservoir storage associated with the water rights in Brazos G to provide a firm supply. The total authorized storage in the Brazos River Basin is approximately 4,287,065 ac-ft, with 3,719,378 ac-ft (87 percent) located in Brazos G. In Region H, the quantity of reservoir storage is 285,887 ac-ft (6.7 percent) of the total authorized storage volume in the river basin. Since the development of the 2021 Brazos G Plan, 20,816 ac-ft of new storage has been permitted in Brazos G and Region H, the majority of which is a permit for the City of Lubbock to store 20,708 ac-ft.

The large quantity of reservoir storage in Brazos G provides for a firm supply of water during drought conditions, when streamflows are low. Figure 3.5 presents a comparison of the total authorized storage and annual diversion volume for the Brazos G Area and Region H.



**Assumes BRA System Operations Permit authorized diversion volume is split between Region G and Region H*

Figure 3.5 Comparison of Storage and Diversion Volumes for Brazos G and Region H

A total of 48 major reservoirs, defined as authorized storage capacities greater than 5,000 ac-ft, exist in the Brazos River Basin. The U.S. Army Corps of Engineers (USACE) owns several of these reservoirs, including Lake Georgetown, Lake Aquilla, Lake Granger, Lake Proctor, Lake Somerville, Lake Waco, Lake Belton, Lake Stillhouse Hollow, and Lake Whitney. These reservoirs were built for the primary purpose of flood control; however, they also included other benefits such as water supply and recreation. For purposes of water supply, the USACE has contracted conservation storage in each reservoir to the BRA. The BRA owns the water right for each reservoir and manages the water supply conservation storage in each reservoir, except for Lake Waco, which is controlled by the City of Waco. Other major reservoirs in the basin that provide municipal, industrial, and irrigation water supply are owned by the BRA, City of Abilene, City of Mineral Wells, Palo Pinto County Municipal Water District (MWD) No. 1, West Central Texas MWD, City of Cisco, City of Breckenridge, City of Sweetwater, City of Cleburne, and City of Stamford. A summary of major reservoirs in the Brazos River Basin is presented in Table 3.1a and the locations of the reservoirs are shown in Figure 3.6 and Table 3.1b.

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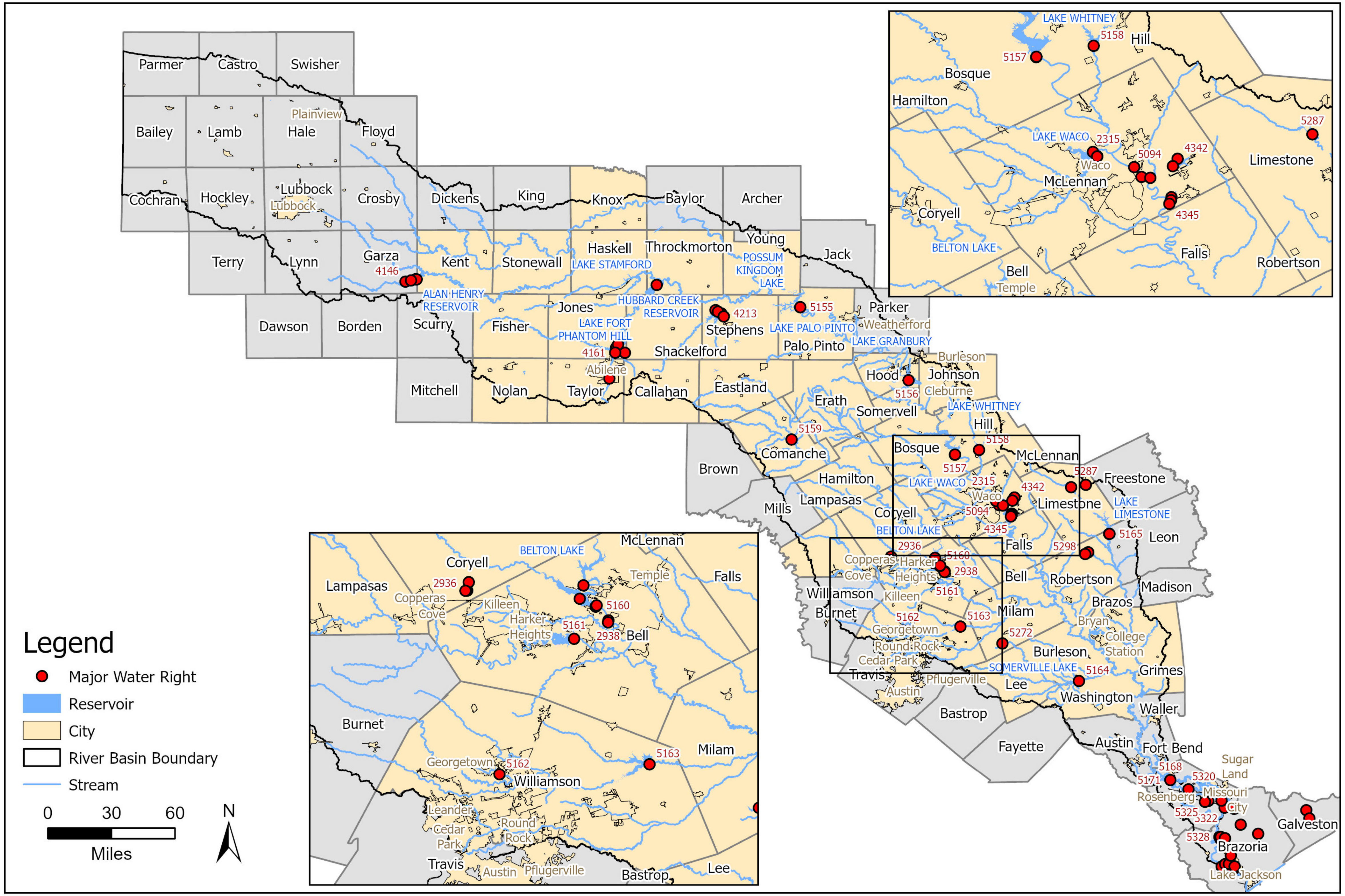

Figure 3.6 Major Water Rights and Reservoirs in the Brazos River Basin

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Table 3.1a Major Reservoirs(1) of the Brazos River Basin

Reservoir	Water Right Owner	Authorized Storage (ac-ft)	Authorized Diversion (ac-ft)	Priority Date	County	Planning Region
Abilene	City of Abilene	11,868	1,675	1/23/1918	Taylor	G
Alcoa Lake	Aluminum Company of America	15,650	14,000	12/12/1951	Milam	G
Alan Henry	City of Lubbock	115,937	35,200	10/5/1981	Garza	O
Allens Creek	Brazos River Authority/City of Houston	145,553	202,000	9/1/1999	Austin	H
Aquilla	Brazos River Authority	52,400	13,896	10/25/1976	Hill	G
Belton	Brazos River Authority	457,600	100,257	12/16/1963	Bell	G
Belton	U.S. Dept. of the Army[2]	12,000	10,000 2,000	8/24/1953 8/23/1954	Bell	G
Dow - Brazoria Reservoir	Dow Chemical[3]	21,973	--	4/7/1952	Brazoria	H
Dow - Harris Reservoir	Dow Chemical[3]	10,200	--	2/14/1942	Brazoria	H
Cisco	City of Cisco	45,110	1,971 1,000	4/16/1920 11/8/1954	Eastland	G
Daniel	City of Breckenridge	11,400	2,100	4/26/1946	Stephens	G
Dansby Power Plant	City of Bryan	15,227	850	5/30/1972	Brazos	G
Eagle Nest Lake	U.S. Dept. of the Interior	11,315	1,800	1/15/1948	Brazoria	H
Fort Phantom Hill	City of Abilene	73,960	30,690	3/25/1937	Jones	G
Georgetown	Brazos River Authority	37,100	13,610	2/12/1968	Williamson	G
Gibbons Creek Power	Texas Municipal Power Agency	26,824 5,260	9,740	2/22/1977 3/9/1989	Grimes	G
Graham/Eddleman	City of Graham	4,503 39,000 8,883	5,000 15,000	11/21/1927 11/15/1954 9/16/1957	Young	G
Granbury	Brazos River Authority	155,000	64,712	2/13/1964	Hood	G
Granger	Brazos River Authority	65,500	19,840	2/12/1968	Williamson	G
Hubbard Creek Lake	West Central Texas MWD	317,750	52,800 3,200	5/28/1957 8/14/1972	Stephens	G
Leon	Eastland Co WSD	28,000	1,265 2,438 2,597	5/17/1931 3/21/1952 3/25/1986		

Reservoir	Water Right Owner	Authorized Storage (ac-ft)	Authorized Diversion (ac-ft)	Priority Date	County	Planning Region
Limestone	Brazos River Authority	217,494 225,400	65,074	5/6/1974 9/4/1979	Robertson	G
Miller's Creek	North Central Texas MWA	30,696	5,000	10/1/1958	Baylor	B
Palo Pinto	Palo Pinto County MWD No. 1	44,100 24	16,000 2,500	7/3/1962 9/8/1964	Palo Pinto	G
Pat Cleburne Reservoir	City of Cleburne	25,600	5,760 240	8/6/1962 3/29/1976	Johnson	G
Possum Kingdom	Brazos River Authority	724,739	230,750	4/6/1938	Palo Pinto	G
Proctor	Brazos River Authority	59,400	19,658	12/16/1963	Comanche	G
Smithers Lake	Houston L&P	18,750	28,711	12/16/1955	Fort Bend	H
Somerville	Brazos River Authority	160,110	48,000	12/16/1963	Washington	G
Squaw Creek Reservoir	Luminant	151,500	23,180	4/25/1973	Somervell	G
Stamford	City of Stamford	60,000	10,000	6/8/1949	Haskell	G
Stillhouse Hollow	Brazos River Authority	235,700	67,768	12/16/1963	Bell	G
Sweetwater	City of Sweetwater	10,000	3,740	10/17/1927	Nolan	G
Tradinghouse Steam	Luminant	37,800	12,000 15,000	8/21/1926 9/16/1966	McLennan	G
Twin Oak Steam Electric	Luminant	30,319	13,200	7/1/1974	Robertson	G
Waco	City of Waco	104,100 87,962	39,100 19,100 900 20,770	1/10/1929 4/16/1985 2/21/1979 9/12/1986	McLennan	G
Whitney	Brazos River Authority	50,000	18,336	8/30/1982	Hill	G
White River Reservoir	White River MWD	33,160 5,072 6,665	6,000	9/22/1958 11/21/1960 8/16/1971	Crosby	O

Notes:
Abbreviations: MWD = municipal water district; WSD = water supply district.
(1) A major reservoir is defined as one with an authorized capacity equal to or greater than 5,000 ac-ft.
(2) The Dept. of the Army (Fort Hood) owns water rights in Lake Belton alongside the BRA.
(3) The Dow Chemical Company holds diversion rights from the Brazos River totaling 238,156 ac-ft/yr with priority dates ranging from 1929 to 1976, which are used in conjunction with the two off-channel reservoirs.

Table 3.2b Major Water Rights and Reservoirs in the Brazos River Basin

WRID	Owner	Priority Date	Diversion Amount (ac-ft)	Storage Amount (ac-ft)
ADJ2315	City of Waco	1/10/1929	55,902	104,100
ADJ2315	City of Waco	4/16/1958	19,100	
ADJ2315	City of Waco	2/21/1979	900	
ADJ2936	U.S. Department of the Army	8/24/1953	10,300	12,033
ADJ2936	U.S. Department of the Army	8/23/1954	2,000	
ADJ2938	City of Temple	10/30/1915	15,804	500
ADJ2938	City of Temple	1/11/1957	20,000	
ADJ3440	Joe O. Bishop	5/17/1965		1,750
ADJ3440	Joe O. Bishop	5/15/1972		334
ADJ3440	Lago Grande LP	6/13/1958	2,000	4,477
ADJ3440	Lago Grande LP	5/15/1972	31	918
ADJ3444	North Central Texas Municipal Water Authority	10/1/1958	5,000	30,696
ADJ3458	City of Graham	11/21/1927	5,000	4,503
ADJ3458	City of Graham	11/15/1954	15,000	39,000
ADJ3458	City of Graham	9/16/1957		8,883
ADJ3458	City of Graham	2/8/1982		40
ADJ3470	Eastland County Water Supply District	3/21/1952	2,438	28,000
ADJ3470	Eastland County Water Supply District	12/20/1985	1,265	
ADJ3470	Eastland County Water Supply District	3/25/1986	2,598	
ADJ3693	White River Municipal Water District	9/22/1958	6,000	33,160
ADJ3693	White River Municipal Water District	11/21/1960		5,072
ADJ3693	White River Municipal Water District	8/16/1971		6,665
ADJ3711	White River Municipal Water District	1/20/1970	10,600	57,420
ADJ3758	SLR Property I, LP	12/12/1951	18,000	
ADJ4031	Palo Pinto County Municipal Water District 1	7/3/1962	16,000	44,100
ADJ4031	Palo Pinto County Municipal Water District 1	9/8/1964	2,500	24
ADJ4031	Palo Pinto County Municipal Water District 1	11/25/2009		5,692
ADJ4039	City of Mineral Wells	11/15/1920	1,680	7,065
ADJ4039	City of Mineral Wells	3/22/1943	840	
ADJ4097	Texas Utilities Electric Company, Inc.	4/25/1973	23,180	151,500
ADJ4106	City of Cleburne	8/6/1962	5,760	25,600
ADJ4106	City of Cleburne	3/29/1976	240	
ADJ4106	City of Cleburne	8/30/2004		
ADJ4106	City of Cleburne	2/9/2017	6,739	
ADJ4130	City of Sweetwater	10/17/1927	3,740	10,000
ADJ4139	City of Abilene	8/3/1949	30,000	60

WRID	Owner	Priority Date	Diversion Amount (ac-ft)	Storage Amount (ac-ft)
ADJ4139	City of Abilene	8/22/1955		548
ADJ4139	City of Abilene	12/8/1967		
ADJ4142	City of Abilene	1/23/1918	1,675	11,868
ADJ4150	City of Abilene	10/10/1927	3,880	8,500
ADJ4151	City of Clyde	10/12/1928	2,500	6,500
ADJ4161	City of Abilene	3/25/1937	55,330	73,960
ADJ4179	City of Stamford	6/8/1949	10,000	60,000
ADJ4179	City of Stamford	4/4/2000		705
ADJ4211	City of Cisco	4/16/1920	1,971	9,363
ADJ4211	City of Cisco	5/2/1929		35,637
ADJ4211	City of Cisco	9/5/1978	56	
ADJ4213	West Central Texas Municipal Water District	5/28/1957	56,000	317,750
ADJ4214	City Of Breckenridge	4/26/1946	2,100	11,400
ADJ4342	Tradinghouse Power Company LLC	8/21/1926	12,000	37,800
ADJ4342	Tradinghouse Power Company LLC	9/16/1966	15,000	
ADJ4345	BASF Corporation	3/6/1951	10,000	8,500
ADJ4355	City of Marlin	4/9/1948	4,000	3,135
ADJ4355	City of Marlin	11/27/1956	4,000	
ADJ4355	City of Marlin	11/1/1976		791
ADJ4355	City of Marlin	12/31/1990		6,560
ADJ5155	Brazos River Authority	4/6/1938	230,750	724,739
ADJ5156	Brazos River Authority	2/13/1964	64,712	155,000
ADJ5157	Brazos River Authority	8/30/1982	18,336	50,000
ADJ5158	Brazos River Authority	10/25/1976	13,896	52,400
ADJ5159	Brazos River Authority	12/16/1963	19,658	59,400
ADJ5160	Brazos River Authority	12/16/1963	100,257	457,600
ADJ5161	Brazos River Authority	12/16/1963	67,768	235,700
ADJ5162	Brazos River Authority	2/12/1968	13,610	37,100
ADJ5163	Brazos River Authority	2/12/1968	19,840	65,500
ADJ5164	Brazos River Authority	12/16/1963	48,000	160,110
ADJ5165	Brazos River Authority	5/6/1974	65,074	217,494
ADJ5165	Brazos River Authority	9/4/1979		225,400
ADJ5166	Brazos River Authority		650,000	
ADJ5168	Gulf Coast Water Authority	1/15/1926	99,932	
ADJ5168	Gulf Coast Water Authority	3/17/1947		7,308
ADJ5168	Gulf Coast Water Authority	4/29/1999		65
ADJ5171	Gulf Coast Water Authority	2/1/1939	75,000	

WRID	Owner	Priority Date	Diversion Amount (ac-ft)	Storage Amount (ac-ft)
ADJ5171	Gulf Coast Water Authority	12/12/1950	50,000	
ADJ5268	City of Bryan	5/30/1972	161,300	15,227
ADJ5272	SLR Property I, LP	12/12/1951	14,000	15,650
ADJ5272	SLR Property I, LP			
ADJ5287	Bi-Stone Municipal Water Supply District	4/15/1957	2,952	9,600
ADJ5298	Texas Utilities Electric Company, Inc.	7/1/1974	1,378,000	30,319
ADJ5301	Camp Creek Water Company	6/14/1948		8,400
ADJ5311	Gibbons Tract 1, LP	2/22/1977	9,740	32,084
ADJ5320	NRG Texas Power LLC	10/23/1926	40,000	
ADJ5322	Gulf Coast Water Authority	2/8/1929	40,000	864
ADJ5322	Gulf Coast Water Authority	3/14/1955	40,000	
ADJ5322	Gulf Coast Water Authority	7/25/1983	75,000	
ADJ5325	NRG Texas Power LLC	12/16/1955	28,711	18,750
ADJ5328	The Dow Chemical Company	2/28/1929	20,000	
ADJ5328	The Dow Chemical Company	2/14/1942	210,000	10,230
ADJ5328	The Dow Chemical Company	4/3/1951	7,500	600
ADJ5328	The Dow Chemical Company	4/7/1952		21,973
ADJ5328	The Dow Chemical Company	12/31/1954	20	
ADJ5328	The Dow Chemical Company	4/4/1960	65,000	
ADJ5328	The Dow Chemical Company	3/8/1976	3,136	
ADJ5328	The Dow Chemical Company			56,760
ADJ5332	United States Department of Energy	6/25/1979	135	
ADJ5332	United States Department of Energy	4/27/1981	4	
ADJ5332	United States Department of Energy	7/14/2000	52,000	
ADJ5366	Brazosport Water Authority	4/4/1960	45,000	
ADJ5492	U.S. Department of the Interior Fish and Wildlife Service	1/15/1948	1,800	11,315
WRPERM12190	SLR Property I, LP	9/4/2007		7,237
WRPERM2925	Brazos River Authority	9/1/1999	301,650	145,533
WRPERM3985	City of Lubbock	3/7/1983	32,991	
WRPERM3985	City of Lubbock		13,825	
WRPERM4146	City of Lubbock	10/5/1981	35,000	115,937
WRPERM5085	City of Robinson	8/14/1986	13,100	8,037
WRPERM5094	City of Waco	9/12/1986	20,081	87,962
WRPERM5094	City of Waco	1/21/1988	688	
WRPERM5540	SLR Property I, LP	10/9/1995		7,529
WRPERM5803	SLR Property I, LP	7/24/2003	650	17,359

WRID	Owner	Priority Date	Diversion Amount (ac-ft)	Storage Amount (ac-ft)
WRPERM5803	SLR Property I, LP		50,000	50,000
WRPERM5851	Brazos River Authority	10/15/2004	434,703	
WRPERM5912	City of Bryan		14,282	
WRPERM5913	City of College Station		12,881	
WRPERM5921	City of Lubbock	4/17/2006	50,000	20,708

A number of interbasin transfer permits exist in the Brazos River Basin. These permits include both authorizations for diversions from the Brazos River Basin to adjacent river basins and from adjacent river basins to the Brazos River Basin. Most of the interbasin transfer permits are obviously located near the basin divide. Examples of interbasin transfers that authorize diversions from an adjacent river basin to the Brazos River Basin include Lake Meredith (Canadian River Basin) to the Lubbock and Plainview areas in Lubbock and Hale County; Oak Creek Reservoir (Colorado River Basin) to the City of Sweetwater in Nolan County; and Lake Travis (Colorado River Basin) to the City of Cedar Park in Williamson County. Interbasin transfers authorized for diversion from the Brazos River Basin to other river basins include Lake Mexia in Limestone County to part of the City of Mexia that lies in the Trinity River Basin; Teague City Lake in Freestone County to part of the City of Teague that lies in the Trinity River Basin; and Lake Granbury in Hood County to part of Johnson County that lies in the Trinity River Basin. A summary of interbasin transfers (excluding transfers authorized to adjacent coastal basins) associated with the Brazos River Basin is presented in Table 3.3.

Table 3.3 Interbasin Transfers Associated with the Brazos River Basin[1]

River Basin of Origin	Location of Use			Description	Authority Diversion (ac-ft/yr)	Priority Date
	River Basin	Planning Region	County			
Brazos	Trinity	G	Johnson	Lake Granbury to Johnson County	20,000	11/7/1986
Brazos	Trinity	G	Limestone	Lake Mexia to part of Mexia	N/A	N/A
Brazos	Trinity	C	Freestone	Teague City Lake to part of Teague	N/A	N/A
Brazos	Colorado	G	Lampasas	Brazos River to City of Lampasas	180	6/23/2014
Brazos	Trinity	C	Multiple	Lake Possum Kingdom to Trinity Basin	5,240	11/7/1986
Canadian	Brazos	O	Lubbock	Lake Meredith to Lubbock Co. Area	151,200	1/30/1956
Colorado	Brazos	G	Fisher	Lake J B Thomas to Fisher Co.	N/A	N/A
Colorado	Brazos	G	Nolan	Oak Creek Res. to Lake Trammel/Sweetwater	3,000	N/A
Colorado	Brazos	G	Callahan	Lake Clyde to Clyde	200	2/2/1965

River Basin of Origin	Location of Use			Description	Authority Diversion (ac-ft/yr)	Priority Date
	River Basin	Planning Region	County			
Colorado	Brazos	G	Callahan, Fisher, Jones, Nolan, Schackelford, Taylor	Lake O. H. Ivie to Abilene	15,000	2/2/1978
Colorado	Brazos	G	Williamson	Lake Austin to Williamson Co.	N/A	N/A
Colorado	Brazos	G	Williamson	Lake Travis to Cedar Park	16,500	N/A
Colorado	Brazos	G	Williamson	Lake Travis to Leander	6,400	N/A
Colorado	Brazos	F	Fisher	Snyder to City of Rotan	N/A	N/A
Red	Brazos	B	Archer	Small Lakes to Megargel	N/A	N/A
Red	Brazos	B	Archer	Lake Cooper & Olney to Olney	35	8/11/1980
Red	Brazos	O	Floyd	Lake MacKenzie to Floydada & Lockney	N/A	N/A
Trinity	Brazos	G	Grimes	Lake Livingston to Grimes County SE	N/A	6/27/1998
Trinity	Brazos	C	Parker	Lake Weatherford to part of Weatherford	N/A	N/A

Notes:
(1) Excludes transfers authorized to adjacent coastal basins.

3.1.4 Water Supply Contracts

Many entities within Brazos G obtain surface water through water supply contracts. These supplies are usually obtained from entities that own surface water rights, and the contracts specify the quantity of water each year to a buyer for an established unit price. The BRA is the largest provider of water supply contracts in Brazos G, and has contracted to sell 750,220 ac-ft/yr in Regions G and H from its system of reservoirs in the Brazos River Basin. The BRA contracts raw water to various entities for long-term, firm supply as well as shorter-term interruptible supply for municipal, industrial, irrigation, and mining uses. Other water right holders that contract large quantities of raw water supply to other entities include the West Central Texas MWD and the Palo Pinto County MWD No. 1. The West Central Texas MWD contracts raw water from Hubbard Creek Reservoir for municipal use to the cities of Abilene, Albany, Anson, and Breckenridge. The City of Abilene provides water to several other surrounding cities and water supply corporations. The Palo Pinto County MWD No. 1 contracts raw water from Lake Palo Pinto for industrial use to Brazos Electric Co-op as well as for municipal use for the City of Mineral Wells and several smaller water supply corporations.

Table 3.4 summarizes water supply contracts and other current demands held by the identified wholesale water providers (WWPs) and water user groups (WUGs) within Brazos G, and includes other demands that those entities meet currently, such as a portion of county-aggregated manufacturing demands, etc. Note that some of the supplies shown change between decades. These changes reflect either anticipated changes in contracted amounts (through cancellation or amendment) or "meets" contracts where a WWP agrees to meet the water supply needs of the customer without a fixed annual contractual amount. The contracts shown make up the bulk of the water contracts in the planning area; however, there are numerous smaller entities which often contract with each other for emergency supplies or various other reasons which are not summarized here. Certain WUGs and WWPs may be located within multiple planning areas. All WUGs and WWPs listed are identified by their primary planning area. The contract and WUG municipal demands shown are not split by primary and secondary planning areas. Contract demands assigned to municipal WUGS supply to portion of both primary and other region.

Table 3.4 Water Supply Contracts and Other Current Demands Supplied by Water User Groups (WUGs) and Wholesale Water Providers (WWPs) (acre-feet/year)

Water User Group/Wholesale Water Supplier	Contract Demand Year					
	2030	2040	2050	2060	2070	2080
BRA (LAKE AQUILLA)						
Aquilla WSD	5,953	5,953	5,953	5,953	5,953	5,953
City of Cleburne	5,300	5,300	5,300	5,300	5,300	5,300
Hilco United Services	150	150	150	150	150	150
Total Contracts and WUG Demands	**11,403**	**11,403**	**11,403**	**11,403**	**11,403**	**11,403**
BRA (LITTLE RIVER SYSTEM)						
439 WSC	1,409	1,409	1,409	1,409	1,409	1,409
Milam County, Other (ALCOA - SLR)	5,000	5,000	5,000	5,000	5,000	5,000
Bell County WCID #1	62,509	62,509	62,509	62,509	62,509	62,509
Bluebonnet WSC	8,301	8,301	8,301	8,301	8,301	8,301
Brushy Creek MUD	4,000	4,000	4,000	4,000	4,000	4,000
Central Texas WSC	12,045	12,045	12,045	12,045	12,045	12,045
City of Belton	2,500	2,500	2,500	2,500	2,500	2,500
City of Gatesville	5,898	5,898	5,898	5,898	5,898	5,898
City of Georgetown	46,907	46,907	46,907	46,907	46,907	46,907
City of Harker Heights	3,535	3,535	3,535	3,535	3,535	3,535
City of Lampasas	3,500	3,500	3,500	3,500	3,500	3,500
City of McGregor	810	810	810	810	810	810
City of Round Rock	24,854	24,854	24,854	24,854	24,854	24,854
City of Temple	30,453	30,453	30,453	30,453	30,453	30,453
Coryell City WSD	300	300	300	300	300	300
Bell County, Irrigation (Country Harvest)	8	8	8	8	8	8
Dog Ridge WSC	1,500	1,500	1,500	1,500	1,500	1,500
East Williamson Co Water (City of Taylor, Lone Star {Jarrell-Schwertner WSC, Sonterra MUD}, and Jonah Water SUD)	13,000	13,000	13,000	13,000	13,000	13,000
Fort Gates WSC	200	200	200	200	200	200
Williamson County-Other (High Gabriel WSC)	310	310	310	310	310	310
Jarrell-Schwertner WSC	1,000	1,000	1,000	1,000	1,000	1,000

Water User Group/Wholesale Water Supplier	Contract Demand Year					
	2030	2040	2050	2060	2070	2080
Bell County, Irrigation (Jerry Glaze)	100	100	100	100	100	100
Kempner WSC	8,900	8,900	8,900	8,900	8,900	8,900
Comanche County, Irrigation (Lake Proctor Irrigation Authority)	3,743	3,743	3,743	3,743	3,743	3,743
Comanche County, Irrigation (North Leon River Irrigation Corporation)	2,909	2,909	2,909	2,909	2,909	2,909
Salado WSC	1,600	1,600	1,600	1,600	1,600	1,600
Williamson County, Irrigation (Sun City Georgetown)	15	15	15	15	15	15
The Grove WSC	400	400	400	400	400	400
Upper Leon River MWD	6,437	6,437	6,437	6,437	6,437	6,437
Bell County, Irrigation (Wildflower County Club)	200	200	200	200	200	200
Total Contracts and WUG Demands	**252,343**	**252,343**	**252,343**	**252,343**	**252,343**	**252,343**
BRA (MAIN STEM)						
Acton MUD (WUG + Decordova Bend States Owners)	7,400	7,400	7,400	7,400	7,400	7,400
Stephens County, Mining (Basa Resources)	560	560	560	560	560	560
Bosque County, Steam Electric (Bosque Generating, L.P.)	6,500	6,500	6,500	6,500	6,500	6,500
Palo Pinto County, Irrigation (Carr-Thomas Ranch)	50	50	50	50	50	50
City of Abilene	19,418	19,418	19,418	19,418	19,418	19,418
City of Brenham	4,974	4,974	4,974	4,974	4,974	4,974
City of Cleburne	9,700	9,700	9,700	9,700	9,700	9,700
City of Graham	1,000	1,000	1,000	1,000	1,000	1,000
City of Granbury	10,800	10,800	10,800	10,800	10,800	10,800
City of Lorena	2,500	2,500	2,500	2,500	2,500	2,500
City of Lubbock(1) (Region O)	961	961	961	961	961	961
City of Marlin	1,200	1,200	1,200	1,200	1,200	1,200
City of Richmond (Region H)	2,932	2,932	2,932	2,932	2,932	2,932
City of Robinson	2,323	2,323	2,323	2,323	2,323	2,323
City of Rosebud	100	100	100	100	100	100
City of Rosenberg (Region H)	4,500	4,500	4,500	4,500	4,500	4,500
City of Sugarland (Region H)	6,388	6,388	6,388	6,388	6,388	6,388
City of Stamford (1)	1,820	1,820	1,820	1,820	1,820	1,820
City of Whitney	750	750	750	750	750	750
Double Diamond, Inc.	1,619	1,619	1,619	1,619	1,619	1,619
Hood County, Manufacturing (Exelon Generating)	10,000	10,000	10,000	10,000	10,000	10,000
Fort Griffin SUD	353	353	353	353	353	353
Gulf Coast Water Authority (Region H)(includes South Texas Water Company contract)	46,780	46,780	46,780	46,780	46,780	46,780
Hood County, Irrigation (Granbury Recreational Association)	50	50	50	50	50	50

Water User Group/Wholesale Water Supplier	Contract Demand Year					
	2030	2040	2050	2060	2070	2080
Palo Pinto County, Irrigation (Hill Country Harbor Village)	250	250	250	250	250	250
Brazos County, Irrigation (Horizon Turf Grass)	698	698	698	698	698	698
Johnson County SUD	9,210	9,210	9,210	9,210	9,210	9,210
Hood County, Irrigation (King Ranch Turfgrass)	1,300	1,300	1,300	1,300	1,300	1,300
Hood County, Irrigation (Lenmo Inc.)	2,774	2,774	2,774	2,774	2,774	2,774
Hood County-Other (Lakes at Timber Cove POA)	90	90	90	90	90	90
Hood County-Other (Texas Water Utilities, L.P.)	600	600	600	600	600	600
Palo Pinto County, Irrigation (MM Terry Ranch, Ltd.)	125	125	125	125	125	125
Hood County, Irrigation (Mt Lakes Ranch)	200	200	200	200	200	200
NRG Texas, LLC (Region H)	83,000	83,000	83,000	83,000	83,000	83,000
Limestone County, Steam Electric (NRG Texas, LLC)	21,837	21,837	21,837	21,837	21,837	21,837
Parker County SUD (Region C)	1,874	1,874	1,874	1,874	1,874	1,874
Pecan Grove MUD 1 (Region H)	700	700	700	700	700	700
Hood County, Irrigation (Pecan Plantation Owners Association)	750	750	750	750	750	750
Possum Kingdom WSC	2,684	2,684	2,684	2,684	2,684	2,684
Palo Pinto County, Irrigation (Ranch Owner's Association)	250	250	250	250	250	250
SLC Water Supply Company	200	200	200	200	200	200
Sportsmans World MUD	415	415	415	415	415	415
Stephens Regional SUD (Stephens County RWSC)	800	800	800	800	800	800
Somervell County, Steam Electric (TXU Electric)	14,000	14,000	14,000	14,000	14,000	14,000
Parker County, Irrigation (Sugar Tree, Inc, ZRT Land and Cattle, Arnold Caraway Acres.-Region C)	430	430	430	430	430	430
Robertson County, Steam Electric (Texas Municipal Power Agency)	3,600	3,600	3,600	3,600	3,600	3,600
Palo Pinto County, Livestock (TPWD)	1,200	1,200	1,200	1,200	1,200	1,200
Parker County, Mining (Vulcan Construction Materials)	1,387	1,387	1,387	1,387	1,387	1,387
Wellborn SUD	4,000	4,000	4,000	4,000	4,000	4,000
West Central Texas MWD	930	930	930	930	930	930
Hill County, Irrigation (White Bluff Property Owners)	1,000	1,000	1,000	1,000	1,000	1,000
Somervell County, Mining (Lowell Underwood)	54	54	54	54	54	54
Somervell County, Irrigation (County of Somervell)	350	350	350	350	350	350
Palo Pinto County-Other (TPWD)	15	15	15	15	15	15

Water User Group/Wholesale Water Supplier	Contract Demand Year					
	2030	2040	2050	2060	2070	2080
DOW Chemical USA (DOW Pipeline Company-Region H)	16,000	16,000	16,000	16,000	16,000	16,000
Waller County, Irrigation (All Seasons Turf Grass- Region H)	50	50	50	50	50	50
Total Contracts and WUG Demands	**313,451**	**313,451**	**313,451**	**313,451**	**313,451**	**313,451**
BRA (PURCHASED FROM LOWER COLORADO RIVER AUTHORITY)						
Liberty Hill	2,572	2,572	2,572	2,572	2,572	2,572
Round Rock	20,928	20,928	20,928	20,928	20,928	20,928
Total Contracts and WUG Demands	**23,500**	**23,500**	**23,500**	**23,500**	**23,500**	**23,500**
BRA (SYSTEM OPERATIONS)						
Falls County, Irrigation (Neuhaus Trust Partnership)	309	309	309	309	309	309
FHLM WSC						
Robertson County, Steam-Electric (Oak Grove Management)	3,838	3,838	3,838	3,838	3,838	3,838
Robertson County, Steam Electric (TXU Electric)	25,000	25,000	25,000	25,000	25,000	25,000
Somervell County, Steam Electric (TXU Electric)	39,000	39,000	39,000	39,000	39,000	39,000
Total Brazos G	68,147	68,147	68,147	68,147	68,147	68,147
All Seasons Turfgrass, Inc.	90	90	90	90	90	90
City of Sugar Land	10,279	10,279	10,279	10,279	10,279	10,279
City of Richmond	2,773	2,773	2,773	2,773	2,773	2,773
City of Manvel	3,731	3,731	3,731	3,731	3,731	3,731
Dow	15,473	15,473	15,473	15,473	15,473	15,473
Brazoria County, Manufacturing (BASF)	3,868	3,868	3,868	3,868	3,868	3,868
Galveston County, Manufacturing (Marathon-GBR)	5,700	5,700	5,700	5,700	5,700	5,700
GCWA	39,462	39,462	39,462	39,462	39,462	39,462
Total Region H	**81,376**	**81,376**	**81,376**	**81,376**	**81,376**	**81,376**
Total Contract (Region H)	**81,376**	**81,376**	**81,376**	**81,376**	**81,376**	**81,376**
Total Contract (Region G)	**68,147**	**68,147**	**68,147**	**68,147**	**68,147**	**68,147**
Total Contracts and Other Demands	**149,523**	**149,523**	**149,523**	**149,523**	**149,523**	**149,523**
AQUILLA WATER SUPPLY DISTRICT						
Brandon-Irene WSC	287	287	287	287	287	287
Chatt WSC	86	86	86	86	86	86
Files Valley WSC	1,709	1,709	1,709	1,709	1,709	1,709
Hill County WSC	230	230	230	230	230	230
Hillsboro	3,640	3,640	3,640	3,640	3,640	3,640
Total Contracts and WUG Demands	**5,952**	**5,952**	**5,952**	**5,952**	**5,952**	**5,952**
BELL COUNTY WCID #1						
439 Water Supply Corp	750	750	750	750	750	750
Bell County WCID 3	1,490	1,490	1,490	1,490	1,490	1,490
City of Belton	5,966	5,966	5,966	5,966	5,966	5,966

Water User Group/Wholesale Water Supplier	Contract Demand Year					
	2030	2040	2050	2060	2070	2080
City of Copperas Cove	8,824	8,824	8,824	8,824	8,824	8,824
City of Harker Heights	5,265	5,265	5,265	5,265	5,265	5,265
City of Killeen	39,964	39,964	39,964	39,964	39,964	39,964
Total Contracts and WUG Demands	**62,259**	**62,259**	**62,259**	**62,259**	**62,259**	**62,259**
BLUEBONNET WSC						
City of Bruceville-Eddy	938	938	938	938	938	938
Elm Creek WSC	654	654	654	654	654	654
City of McGregor	2,139	2,139	2,139	2,139	2,139	2,139
Moffat WSC	869	869	869	869	869	869
City of Moody	401	401	401	401	401	401
Pendleton WSC	461	461	461	461	461	461
Spring Valley WSC	301	301	301	301	301	301
City of Woodway	1,362	1,362	1,362	1,362	1,362	1,362
Total Contracts and WUG Demands	**7,125**	**7,125**	**7,125**	**7,125**	**7,125**	**7,125**
CENTRAL TEXAS WSC						
Armstrong WSC	783	783	783	783	783	783
Bell County-Other	702	702	702	702	702	702
Bell-Milam-Falls WSC	2,327	2,327	2,327	2,327	2,327	2,327
City of Belton	100	100	100	100	100	100
Dog Ridge WSC	840	840	840	840	840	840
EAST BELL WSC	847	847	847	847	847	847
City of Holland	331	331	331	331	331	331
Jarrell-Schwertner WSC	1,000	1,000	1,000	1,000	1,000	1,000
Little Elm Valley WSC	547	547	547	547	547	547
City of Rogers	486	486	486	486	486	486
City of Rosebud	525	525	525	525	525	525
Salem-Elm Ridge WSC	297	297	297	297	297	297
West Bell County WSC	1,660	1,660	1,660	1,660	1,660	1,660
Falls County- Other	92	92	92	92	92	92
Total Contracts and WUG Demands	**10,537**	**10,537**	**10,537**	**10,537**	**10,537**	**10,537**
EASTLAND COUNTY WSD						
City of Eastland	3,314	3,314	3,314	3,314	3,314	3,314
City of Ranger	2,025	2,025	2,025	2,025	2,025	2,025
Eastland County, Manufacturing	56	56	56	56	56	56
Total Contracts and WUG Demands	**5,395**	**5,395**	**5,395**	**5,395**	**5,395**	**5,395**
NORTH CENTRAL TEXAS MWA						
City of Aspermont	118	118	118	118	118	118
Baylor SUD (Region B)	147	147	119	89	60	28
Haskell County-Other	236	236	236	236	236	236
City of Benjamin	57	56	51	48	43	38
Knox County-Other	131	131	131	131	131	131
City of Haskell	637	637	637	637	637	637
City of Knox City	260	260	260	260	260	260

Water User Group/Wholesale Water Supplier	Contract Demand Year					
	2030	2040	2050	2060	2070	2080
City of Munday	268	268	268	268	268	268
Total Contracts and WUG Demands	**1,854**	**1,853**	**1,820**	**1,787**	**1,753**	**1,716**
PALO PINTO CO MWD No. 1						
City of Mineral Wells(3)	5,656	5,656	5,656	5,656	5,656	5,656
Lake Palo Pinto Area WSC	250	250	250	250	250	250
Palo Pinto County, Steam-Electric	4,000	4,000	4,000	4,000	4,000	4,000
Total Contracts and WUG Demands	**9,906**	**9,906**	**9,906**	**9,906**	**9,906**	**9,906**
UPPER LEON MWD						
City of Comanche	706	706	706	706	706	706
Comanche County-Other	9	9	9	9	9	9
City of De Leon	307	307	307	307	307	307
City of Dublin	598	598	598	598	598	598
City of Gorman	169	169	169	169	169	169
City of Hamilton	921	921	921	921	921	921
City of Stephenville	1,862	1,862	1,862	1,862	1,862	1,862
Total Contracts and WUG Demands	**4,572**	**4,572**	**4,572**	**4,572**	**4,572**	**4,572**
WEST CENTRAL TEXAS MWD						
City of Abilene	10,720	8,360	6,000	3,640	1,300	1,300
City of Albany	1,400	1,400	1,400	1,400	1,400	1,400
City of Anson	1,600	1,600	1,600	1,600	1,600	1,600
City of Breckenridge	1,900	1,900	1,900	1,900	1,900	1,900
Total Contracts and WUG Demands	**15,620**	**13,260**	**10,900**	**8,540**	**6,200**	**6,200**
ABILENE						
City of Abilene (municipal WUG demands)	26,848	28,860	30,633	32,411	34,391	36,611
City of Baird	77	77	77	77	77	77
City of Clyde	12,144	12,144	12,144	12,144	12,144	12,144
Taylor County-Other	552	552	552	552	552	552
Ballinger	1,250	1,250	1,250	1,250	1,250	1,250
Eula WSC	61	61	61	61	61	61
Hamby WSC	308	308	308	308	308	308
Hawley WSC	307	307	307	307	307	307
City of Lawn	153	153	153	153	153	153
Taylor County, Manufacturing	671	671	671	671	671	671
City of Merke	353	353	353	353	353	353
Potosi WSC	307	307	307	307	307	307
Steamboat Mountain WSC	307	307	307	307	307	307
City of Tye	184	184	184	184	184	184
View Caps WSC	199	199	199	199	199	199
S U N WSC	244	259	279	298	322	354
Total Contracts and WUG Demands	**43,965**	**45,992**	**47,785**	**49,582**	**51,586**	**53,838**
ACTON MUD						
Acton MUD (municipal WUG demands)	2,334	2,524	2,739	2,973	3,227	3,503
Hood County-Other	782	801	844	888	1,496	2,077

Water User Group/Wholesale Water Supplier	Contract Demand Year					
	2030	2040	2050	2060	2070	2080
Total Contracts and WUG Demands	**3,116**	**3,325**	**3,583**	**3,861**	**4,723**	**5,580**
ALBANY						
City of Albany (municipal WUG demands)	541	487	432	394	351	301
Fort Griffin SUD	219	219	216	215	215	215
Total Contracts and WUG Demands	**760**	**706**	**648**	**609**	**566**	**516**
ANSON						
City of Anson (municipal WUG demands)	345	329	314	297	279	259
Hawley WSC	221	221	221	221	221	221
City of Hamlin	534	526	523	513	505	497
Total Contracts and WUG Demands	**1,100**	**1,076**	**1,058**	**1,031**	**1,005**	**977**
BISTONE MUNICIPAL WATER SUPPLY DISTRICT						
Bistone Municipal Water Supply District (municipal WUG demands)	243	235	226	217	207	197
City of Mexia	2,067	2,047	1,941	1,830	1,721	1,615
Limestone County-Other (Mexia State School)	280	280	280	280	280	280
City of Coolidge	225	225	225	225	225	225
Whiterock WSC	274	274	274	274	274	274
Total Contracts and WUG Demands	**3,089**	**3,061**	**2,946**	**2,826**	**2,707**	**2,591**
BRANDON IRENE WSC						
Brandon Irene WSC (municipal WUG demands)	553	571	584	598	613	631
Hill County-Other	31	32	33	34	35	35
Total Contracts and WUG Demands	**584**	**603**	**617**	**632**	**648**	**666**
BRECKENRIDGE						
City of Breckenridge (municipal WUG demands)	960	905	831	780	732	662
Stephens County, Manufacturing	8	8	8	8	8	8
Total Contracts and WUG Demands	**968**	**913**	**839**	**788**	**740**	**670**
BRENHAM						
City of Brenham (municipal WUG demands)	4,284	4,332	4,315	4,319	4,324	4,328
Washington County, Manufacturing	208	208	208	208	208	208
Total Contracts and WUG Demands	**4,492**	**4,540**	**4,523**	**4,527**	**4,532**	**4,536**
BRUSHY CREEK MUD						
Brushy Creek MUD (municipal WUG demands)	3,986	3,972	3,972	3,972	3,972	3,972
Williamson County-Other	518	518	518	518	518	518
Total Contracts and WUG Demands	**4,504**	**4,490**	**4,490**	**4,490**	**4,490**	**4,490**
BRYAN						
City of Bryan (municipal WUG demands)	19,037	22,504	26,658	31,597	39,794	50,101
Wellborn SUD	3,360	3,360	3,360	3,360	3,360	3,360
Wickson Creek SUD	939	771	646	534	446	446
Brazos County, Manufacturing	95	95	95	95	95	95
Brazos County, Steam Electric	1	1	1	1	1	1
Total Contracts and WUG Demands	**23,432**	**26,731**	**30,760**	**35,587**	**43,696**	**54,003**

Water User Group/Wholesale Water Supplier	Contract Demand Year					
	2030	2040	2050	2060	2070	2080
BURLESON						
City of Burleson (municipal WUG demands)	8,163	9,476	10,793	11,974	13,298	14,781
Johnson County, Manufacturing	2	2	2	2	2	2
Total Contracts and WUG Demands	**8,165**	**9,478**	**10,795**	**11,976**	**13,300**	**14,783**
CAMERON						
City of Cameron (municipal WUG demands)	1,265	1,242	1,200	1,161	1,121	1,079
Milam County, Manufacturing						
North Milam WSC	38	38	38	38	38	38
Salem Elm Ridge WSC	125	125	125	125	125	125
Total Contracts and WUG Demands	**1,428**	**1,405**	**1,363**	**1,324**	**1,284**	**1,242**
CEDAR PARK						
City of Cedar Park (municipal WUG demands)	21,451	21,679	21,797	21,797	21,797	21,797
Block House MUD	1,098	1,098	1,098	1,098	1,098	1,098
Williamson County-Other (Indian Springs Subdivision)	13	13	13	13	13	13
Williamson County, Manufacturing	347	347	347	347	347	347
Williamson Travis County MUD 1	989	989	989	989	989	989
Total Contracts and WUG Demands	**23,898**	**24,126**	**24,244**	**24,244**	**24,244**	**24,244**
CHATT WSC						
Chatt WSC (municipal WUG demands)	186	190	194	197	201	206
Hill County, Manufacturing	45	50	55	60	65	70
Total Contracts and WUG Demands	**231**	**240**	**249**	**257**	**266**	**276**
CHILDRESS CREEK WSC						
Childress Creek WSC (municipal WUG demands)	11	14	17	21	25	30
Bosque County, Manufacturing	1	1	1	1	1	1
Total Contracts and WUG Demands	**12**	**15**	**18**	**22**	**26**	**31**
CISCO						
City of Cisco (municipal WUG demands)	730	742	762	769	778	791
Eastland County-Other	147	147	147	147	147	147
Total Contracts and WUG Demands	**877**	**889**	**909**	**916**	**925**	**938**
CLEBURNE						
City of Cleburne (municipal WUG demands)	7,557	8,493	9,453	10,310	11,273	12,355
Johnson County, Steam Electric	1,344	1,344	1,344	1,344	1,344	1,344
Johnson County, Manufacturing	2,714	3,105	3,455	3,801	4,182	4,182
Total Contracts and WUG Demands	**11,615**	**12,942**	**14,252**	**15,455**	**16,799**	**17,881**
CLIFTON						
City of Clifton (municipal WUG demands)	772	827	890	957	1,029	1,107
Bosque County, Manufacturing	1	1	1	1	1	1
City of Meridian	112	112	105	88	70	53
Total Contracts and WUG Demands	**885**	**940**	**996**	**1,046**	**1,100**	**1,161**
CLYDE						
City of Clyde (municipal WUG demands)	320	320	323	325	327	330
Callahan County WSC	190	192	195	199	202	205

Water User Group/Wholesale Water Supplier	Contract Demand Year					
	2030	2040	2050	2060	2070	2080
Eula WSC	221	221	221	221	221	221
Total Contracts and WUG Demands	**731**	**733**	**739**	**745**	**750**	**756**
COLLEGE STATION						
City of College Station (municipal WUG demands)	23,940	27,047	31,819	37,404	36,735	36,155
Brazos County, Manufacturing	6	6	6	6	6	6
Total Contracts and WUG Demands	**23,946**	**27,053**	**31,825**	**37,410**	**36,741**	**36,161**
COMANCHE						
City of Comanche (municipal WUG demands)	522	514	505	502	499	497
Comanche County, Manufacturing	20	20	20	20	20	20
Total Contracts and WUG Demands	**542**	**534**	**525**	**522**	**519**	**517**
COOLIDGE						
City of Coolidge (municipal WUG demands)	87	84	81	78	74	70
Limestone County, Manufacturing	19	19	19	19	19	19
Total Contracts and WUG Demands	**106**	**103**	**100**	**97**	**93**	**89**
COPPERAS COVE						
City of Copperas Cove (municipal WUG demands)	6,204	8,169	9,399	10,188	10,432	10,077
Central Texas College District	132	129	126	125	125	125
Total Contracts and WUG Demands	**6,336**	**8,298**	**9,525**	**10,313**	**10,557**	**10,202**
ERATH COUNTY-OTHER						
Erath County-Other (municipal WUG demands)	2,475	2,671	2,915	3,203	3,526	3,890
Erath County, Manufacturing	1	1	1	1	2	2
Total Contracts and WUG Demands	**2,476**	**2,672**	**2,916**	**3,204**	**3,528**	**3,892**
LIMESTONE COUNTY-OTHER						
Limestone County-Other (municipal WUG demands)	251	242	234	226	218	210
Limestone County, Irrigation	14	14	14	14	14	14
Limestone County, Mining	7	7	7	7	7	7
Total Contracts and WUG Demands	**272**	**263**	**255**	**247**	**239**	**231**
MCLENNAN COUNTY-OTHER						
Mclennan County-Other (municipal WUG demands)	734	953	1,003	1,026	1,073	1,175
Mclennan County, Manufacturing	3	3	3	3	3	3
City of Riesel (from RMS WSC)	125	125	125	125	125	125
Mclennan County, Steam Electric	1	1	1	1	1	1
Total Contracts and WUG Demands	**863**	**1,082**	**1,132**	**1,155**	**1,202**	**1,304**
NOLAN COUNTY-OTHER						
Nolan County-Other (municipal WUG demands)	49	44	38	31	23	13
Nolan County, Manufacturing	1	1	1	1	1	1
Total Contracts and WUG Demands	**50**	**45**	**39**	**32**	**24**	**14**

Water User Group/Wholesale Water Supplier	Contract Demand Year					
	2030	2040	2050	2060	2070	2080
PALO PINTO COUNTY-OTHER						
Palo Pinto County-Other (municipal WUG demands)	272	271	268	266	265	263
Palo Pinto County, Mining	1	1	1	1	1	1
Palo Pinto County, Steam Electric	1	1	1	1	1	1
Total Contracts and WUG Demands	**274**	**273**	**270**	**268**	**267**	**265**
YOUNG COUNTY-OTHER						
Young County-Other (municipal WUG demands)	401	401	407	410	414	418
Young County, Manufacturing	62	67	70	77	85	85
Total Contracts and WUG Demands	**463**	**468**	**477**	**487**	**499**	**503**
CRAWFORD						
City of Crawford (municipal WUG demands)	202	229	253	280	310	343
McLennan County, Mining	3	3	3	3	3	3
Total Contracts and WUG Demands	**205**	**232**	**256**	**283**	**313**	**346**
DUBLIN						
City of Dublin (municipal WUG demands)	323	288	259	225	196	171
Erath County-Other	72	72	72	72	72	72
Erath County, Manufacturing	5	7	8	9	10	12
Total Contracts and WUG Demands	**400**	**367**	**339**	**306**	**278**	**255**
EASTLAND						
City of Eastland (municipal WUG demands)	610	550	502	463	432	407
Eastland County-Other	120	120	120	120	120	120
Staff WSC	30	30	30	30	30	30
Total Contracts and WUG Demands	**760**	**700**	**652**	**613**	**582**	**557**
FILES VALLEY WSC						
Files Valley WSC (municipal WUG demands)	215	221	225	229	234	239
Ellis County-Other (Region C)	84	84	84	84	84	84
Parker WSC	336	336	336	336	336	336
Total Contracts and WUG Demands	**635**	**641**	**645**	**649**	**654**	**659**
FORT GRIFFIN SUD						
Fort Griffin SUD (municipal WUG demands)						
Shackelford County, Mining						
Total Contracts and WUG Demands						
GATESVILLE						
City of Gatesville (municipal WUG demands)	4,228	4,301	4,372	4,378	4,390	4,408
Coryell City Water Supply District	1,044	1,171	1,287	1,413	1,542	1,542
Fort Gates WSC	120	120	120	120	120	120
Mountain WSC	280	280	280	280	280	280
Flat WSC	102	102	102	102	102	102
Coryell County, Manufacturing	4	4	4	4	4	4
The Grove WSC	203	211	239	269	299	330
Total Contracts and WUG Demands	**5,981**	**6,189**	**6,404**	**6,566**	**6,737**	**6,786**

Water User Group/Wholesale Water Supplier	Contract Demand Year					
	2030	2040	2050	2060	2070	2080
GEORGETOWN						
City of Georgetown (municipal WUG demands)	46,824	81,637	112,193	138,415	169,003	196,376
Jonah Water SUD	4,052	5,008	6,062	7,281	8,485	8,485
City of Liberty Hill	72	134	203	283	365	365
Williamson County, Manufacturing	163	163	163	163	163	163
Total Contracts and WUG Demands	**51,111**	**86,942**	**118,621**	**146,142**	**178,016**	**205,389**
GIDDINGS						
City of Giddings (municipal WUG demands)	553	559	551	540	529	516
Lee County, Manufacturing	13	14	15	16	17	18
Total Contracts and WUG Demands	**566**	**573**	**566**	**556**	**546**	**534**
GORDON						
City of Gordon (municipal WUG demands)	164	164	162	162	161	159
Erath County-Other	50	50	50	50	50	50
Total Contracts and WUG Demands	**214**	**214**	**212**	**212**	**211**	**209**
GRAHAM						
City of Graham (municipal WUG demands)	2,470	2,442	2,338	2,322	2,302	2,278
Jack County-Other (Region C)	545	560	566	568	574	580
Young County-Other	134	131	130	130	131	132
Fort Belknap WSC	419	419	419	419	419	419
Young County, Manufacturing	2	2	2	2	2	2
Young County, Steam Electric	248	248	248	248	248	248
Total Contracts and WUG Demands	**3,818**	**3,802**	**3,703**	**3,689**	**3,676**	**3,659**
H & H WSC						
H & H WSC (municipal WUG demands)	199	205	210	213	217	222
McLennan County-Other	84	87	92	97	102	102
Total Contracts and WUG Demands	283	292	302	310	319	324
HAMILTON						
City of Hamilton (municipal WUG demands)	527	523	523	516	507	498
Bosque County, Manufacturing	5	5	5	5	5	5
Hamilton County, Manufacturing	1	1	1	1	1	1
Multi County WSC	245	245	245	245	245	245
Total Contracts and WUG Demands	**778**	**774**	**774**	**767**	**758**	**749**
HAMLIN						
City of Hamlin (municipal WUG demands)	315	275	241	211	188	170
Fisher County, Manufacturing	2	2	2	2	2	2
Total Contracts and WUG Demands	**317**	**277**	**243**	**213**	**190**	**172**
HEARNE						
City of Hearne (municipal WUG demands)	867	841	813	779	744	706
Bethany Hearne WSC						
Robertson County, Manufacturing	1	1	1	1	1	1
Total Contracts and WUG Demands	**868**	**842**	**814**	**780**	**745**	**707**
HILLSBORO						
City of Hillsboro (municipal WUG demands)	3,465	3,558	3,623	3,693	3,770	3,858

Water User Group/Wholesale Water Supplier	Contract Demand Year					
	2030	2040	2050	2060	2070	2080
Johnson County, Manufacturing	7	9	10	11	12	12
Total Contracts and WUG Demands	**3,472**	**3,567**	**3,633**	**3,704**	**3,782**	**3,870**
JARRELL-SCHWERTNER						
Jarrell-Schwertner (municipal WUG demands)	8,816	9,504	9,921	10,358	10,816	11,295
Williamson County-Other	560	560	560	560	560	560
Total Contracts and WUG Demands	**9,376**	**10,064**	**10,481**	**10,918**	**11,376**	**11,855**
JOHNSON COUNTY SUD						
Johnson County SUD (municipal WUG demands)	3,645	4,590	5,117	5,586	6,114	6,709
City of Alvarado	2,241	2,241	2,241	2,241	2,241	2,241
Bethany WSC	1,120	1,120	1,120	1,120	1,120	1,120
Johnson County-Other (City of Joshua)						
Johnson County-Other (Monarch Utilities)						
Johnson County-Other (Sundance)						
Johnson County-Other (Blue Water Oaks)						
Johnson County-Other (Walnut Creek MHP)						
City of Keene	1,120	1,120	1,120	1,120	1,120	1,120
Johnson County, Mining	20	20	20	20	20	20
Total Contracts and WUG Demands	**8,146**	**9,091**	**9,618**	**10,087**	**10,615**	**11,210**
KEMPNER WSC						
Kempner WSC (municipal WUG demands)	2,015	2,081	2,090	2,066	2,039	2,008
Lampasas County-Other	209	225	240	254	267	267
City of Lampasas	1,281	1,281	1,281	1,281	1,281	1,281
Lampasas County, Mining	25	25	25	25	25	25
Salado WSC	183	183	183	183	183	183
Total Contracts and WUG Demands	**3,713**	**3,795**	**3,819**	**3,809**	**3,795**	**3,764**
KILLEEN						
City of Killeen (municipal WUG demands)	23,409	26,702	29,783	33,208	36,579	39,951
Bell County, Manufacturing	7	7	7	7	7	7
Total Contracts and WUG Demands	**23,416**	**26,709**	**29,790**	**33,215**	**36,586**	**39,958**
LAMPASAS						
City of Lampasas (municipal WUG demands)	1,562	1,720	1,881	2,019	2,076	2,045
Lampasas County, Manufacturing	137	151	165	178	195	213
Total Contracts and WUG Demands	**1,699**	**1,871**	**2,046**	**2,197**	**2,271**	**2,258**
MCGREGOR						
City of McGregor (municipal WUG demands)	2,602	2,741	2,867	2,985	3,121	3,276
Central Bosque WSC	135	140	147	156	164	164
McLennan County, Manufacturing	4	4	4	4	4	4
Total Contracts and WUG Demands	**2,741**	**2,885**	**3,018**	**3,145**	**3,289**	**3,444**
MEXIA						
City of Mexia (municipal WUG demands)	527	512	493	476	457	438
City of Wortham (Region C)	157	157	157	157	157	157
Bistone Municipal Water Supply District	28	28	28	28	28	28

Water User Group/Wholesale Water Supplier	Contract Demand Year					
	2030	2040	2050	2060	2070	2080
Limestone County-Other	254	254	254	254	254	254
Limestone County, Manufacturing	43	44	44	44	45	45
Whiterock WSC	487	487	487	487	487	487
Total Contracts and WUG Demands	**1,496**	**1,482**	**1,463**	**1,446**	**1,428**	**1,409**
MINERAL WELLS						
City of Mineral Wells (municipal WUG demands)	3,321	3,493	3,675	3,860	3,860	3,860
Parker County-Other (Region C)	663	663	663	663	663	663
Parker County Manufacturing (Region C)	25	25	25	25	25	25
Parker County SUD (Region C)	448	448	448	448	448	448
Palo Pinto County-Other (City of Graford)	92	92	92	92	92	92
Palo Pinto County, Manufacturing	10	10	10	10	10	10
North Rural WSC	324	324	324	324	324	324
Palo Pinto WSC	179	179	179	179	179	179
Santo SUD	331	331	331	331	331	331
Sturdivant Progress WSC	307	307	307	307	307	307
Total Contracts and WUG Demands	**5,700**	**5,872**	**6,054**	**6,239**	**6,239**	**6,239**
NAVASOTA						
City of Navasota (municipal WUG demands)	1,581	1,641	1,695	1,737	1,784	1,835
Grimes County, Manufacturing	114	114	114	114	138	183
Total Contracts and WUG Demands	**1,695**	**1,755**	**1,809**	**1,851**	**1,922**	**2,018**
POST OAK SUD						
Post Oak SUD (municipal WUG demands)	25	25	26	26	27	28
Birome WSC	184	189	195	200	205	211
City of Coolidge	191	202	217	230	239	239
City of Hubbard	156	157	157	162	167	169
Total Contracts and WUG Demands	**556**	**573**	**595**	**618**	**638**	**647**
RANGER						
City of Ranger (municipal WUG demands)	410	385	366	352	341	335
Staff WSC	232	232	232	232	232	232
Total Contracts and WUG Demands	**642**	**617**	**598**	**584**	**573**	**567**
ROBERTSON COUNTY WSC						
Robertson County WSC (municipal WUG demands)	522	508	501	495	493	497
Robertson County, Steam-Electric	6	6	6	6	6	6
Total Contracts and WUG Demands	**528**	**514**	**507**	**501**	**499**	**503**
ROBINSON						
City of Robinson (municipal WUG demands)	2,970	3,380	3,857	4,401	5,023	5,733
City of Lorena	560	560	560	560	560	560
Total Contracts and WUG Demands	**3,530**	**3,940**	**4,417**	**4,961**	**5,583**	**6,293**
ROTAN						
City of Rotan (municipal WUG demands)	258	248	241	238	234	230
Fisher County, Manufacturing	4	4	4	4	4	4
Total Contracts and WUG Demands	**262**	**252**	**245**	**242**	**238**	**234**

Water User Group/Wholesale Water Supplier	Contract Demand Year					
	2030	2040	2050	2060	2070	2080
ROUND ROCK						
City of Round Rock (municipal WUG demands)	21,721	26,826	31,883	32,931	33,880	34,706
Williamson County, Other (Paloma Lake MUD)						
Williamson County, Other (Round Rock Ranch PUD)						
Williamson County, Other (Williamson County)						
Williamson County, Other (Blessing MHP)						
Williamson County, Other (Tal Tex)						
Fern Bluff MUD	1,175	1,168	1,163	1,161	1,161	1,161
Williamson County, Manufacturing	642	674	674	674	674	674
Williamson County, Mining	6	6	6	6	6	6
Paloma Lake MUD 1	409	403	400	399	399	399
Paloma Lake MUD 2	287	282	280	279	279	279
Walsh Ranch MUD	196	195	195	194	194	194
Williamson County MUD 10	722	721	720	719	718	718
Williamson County MUD 11	816	816	817	818	820	820
Williamson County MUD 9 - Vista oaks MUD	548	541	538	536	536	536
Total Contracts and WUG Demands	**26,522**	**31,632**	**36,676**	**37,717**	**38,667**	**39,493**
SALADO WSC						
Salado WSC (municipal WUG demands)	2,459	2,753	3,086	3,459	3,878	4,349
Jarrell-Schwertner	55	55	55	55	55	55
Total Contracts and WUG Demands	**2,514**	**2,808**	**3,141**	**3,514**	**3,933**	**4,404**
SOUTHWEST MILAM WSC						
Southwest Milam WSC (municipal WUG demands)	165	172	181	190	200	210
City of Thorndale	202	202	202	202	202	202
Total Contracts and WUG Demands	**367**	**374**	**383**	**392**	**402**	**412**
STAMFORD						
City of Stamford (municipal WUG demands)	728	671	610	545	470	380
Jones County-Other (City of Leuders)						
Jones County-Other (Ericksdahl WSC)						
Haskell County-Other (Paint Creek WSC)						
Haskell County-Other (Sagerton WSC)						
Total Contracts and WUG Demands	**728**	**671**	**610**	**545**	**470**	**380**
STEAMBOAT MOUNTAIN WSC						
Steamboat Mountain WSC (municipal WUG demands)	787	983	1,155	1,364	1,596	1,850
Taylor County-Other	79	79	79	79	79	79
Total Contracts and WUG Demands	**866**	**1062**	**1234**	**1443**	**1675**	**1929**
STEPHENS REGIONAL SUD						
Stephens Regional SUD (municipal WUG demands)	52	48	44	41	39	37
Throckmorton County-Other	99	99	99	99	99	99
Total Contracts and WUG Demands	**151**	**147**	**143**	**140**	**138**	**136**

Water User Group/Wholesale Water Supplier	Contract Demand Year					
	2030	2040	2050	2060	2070	2080
STEPHENVILLE						
City of Stephenville (municipal WUG demands)	3,936	4,305	4,765	5,387	6,075	6,838
Erath County, Manufacturing	29	35	42	48	55	64
Total Contracts and WUG Demands	**3,965**	**4,340**	**4,807**	**5,435**	**6,130**	**6,902**
STRAWN						
City of Strawn (municipal WUG demands)	124	124	122	122	121	120
City of Gordon	50	50	50	50	50	50
Total Contracts and WUG Demands	**174**	**174**	**172**	**172**	**171**	**170**
SWEETWATER						
City of Sweetwater (municipal WUG demands)	1,808	1,786	1,762	1,733	1,703	1,672
City of Bronte (Region F)	0	0	0	0	0	0
Taylor County-Other	187	187	187	187	187	187
Nolan County, Manufacturing	358	356	354	354	354	354
City of Roby	1,074	1,074	1,074	1,074	1,074	1,074
Total Contracts and WUG Demands	**3,427**	**3,403**	**3,377**	**3,348**	**3,318**	**3,287**
TAYLOR						
City of Taylor (municipal WUG demands)	3,550	5,083	6,831	8,450	10,270	12,317
Williamson County-Other	101	111	122	136	151	151
City of Hutto	336	336	336	336	336	336
Williamson County, Manufacturing	5	5	5	5	5	5
Total Contracts and WUG Demands	**3,992**	**5,535**	**7,294**	**8,927**	**10,762**	**12,809**
TEMPLE						
City of Temple (municipal WUG demands)	28,782	32,127	34,751	36,542	38,551	40,803
Bell County WCID 2	323	323	323	323	323	323
Bell County-Other (Arrowhead Hill)	26	26	26	26	26	26
Bell County, Manufacturing	481	481	481	481	481	481
Morgans Point Resort	1,935	1,935	1,935	1,935	1,935	1,935
City of Troy	968	968	968	968	968	968
Total Contracts and WUG Demands	**32,515**	**35,860**	**38,484**	**40,275**	**42,284**	**44,536**
TROY						
City of Troy (municipal WUG demands)	494	527	562	597	632	667
Bell County, Manufacturing	9	9	9	9	9	9
Total Contracts and WUG Demands	**503**	**536**	**571**	**606**	**641**	**676**
WACO						
City of Waco (municipal WUG demands)	38,126	41,590	44,657	47,967	51,680	55,842
City of Bellmead	1,344	1,344	1,344	1,344	1,344	1,344
Bold Springs WSC	560	560	560	560	560	560
Central Bosqque WSC	359	359	359	359	359	359
City of Hewitt	1,120	1,120	1,120	1,120	1,120	1,120
Hilltop WSC	101	101	101	101	101	101
City of Lacy Lakeview	1,120	1,120	1,120	1,120	1,120	1,120
Leroy Tours Gerard WSC						
McLennan County, Manufacturing	2,888	3,249	3,618	3,948	4,403	4,403

Water User Group/Wholesale Water Supplier	Contract Demand Year					
	2030	2040	2050	2060	2070	2080
City of Robinson	560	560	560	560	560	560
Ross WSC	280	280	280	280	280	280
Mclennan County, Steam Electric	15,000	15,000	15,000	15,000	15,000	15,000
Texas State Technical College	954	1013	1,073	1,132	1,193	1,193
City of West	1,120	1,120	1,120	1,120	1,120	1,120
City of Woodway	4	219	478	728	989	989
Total Contracts and WUG Demands	**63,536**	**67,635**	**71,390**	**75,339**	**79,829**	**83,991**
WICKSON CREEK SUD						
Wickson Creek SUD (municipal WUG demands)	59	57	56	53	51	48
Brazos County, Manufacturing	5	5	5	5	5	5
Grimes County, Manufacturing	3	3	3	3	4	5
Total Contracts and WUG Demands	**67**	**65**	**64**	**61**	**60**	**58**
WOODWAY						
City of Woodway (municipal WUG demands)	3,973	3,967	3,967	3,967	3,967	3,967
McLennan County, Manufacturing	2	2	2	2	2	2
Total Contracts and WUG Demands	**3,975**	**3,969**	**3,969**	**3,969**	**3,969**	**3,969**
OLNEY (REGION B)(4)						
Young County, Manufacturing	68	68	68	68	68	68
Total Contracts and WUG Demands	**68**	**68**	**68**	**68**	**68**	**68**
ARLINGTON (REGION C)(4)						
Bethesda WSC	1,670	2,043	2,425	2,771	3,159	3,595
Total Contracts and WUG Demands	**1,670**	**2,043**	**2,425**	**2,771**	**3,159**	**3,595**
ARLINGTON (REGION C)1						
Bethesda WSC	1,670	2,043	2,425	2,771	3,159	3,595
Total Contracts and WUG Demands	**1,670**	**2,043**	**2,425**	**2,771**	**3,159**	**3,595**
CORSICANA (REGION C)(4)						
Hill County-Other	235	241	245	250	255	261
Post Oak SUD	870	884	902	919	931	935
Total Contracts and WUG Demands	**1,105**	**1,125**	**1,147**	**1,169**	**1,186**	**1,196**
FORTWORTH (REGION C)(4)						
Bethesda WSC	3,341	4,087	4,851	5,542	6,319	7,191
City of Burleson	8,163	9,476	10,793	11,974	13,298	14,781
Total Contracts and WUG Demands	**11,504**	**13,563**	**15,644**	**17,516**	**19,617**	**21,972**
GRAND PRAIRIE (REGION C)(4)						
Johnson County-Other	673	1,345	1,345	1,345	1,345	1,345
Johnson County SUD						
Total Contracts and WUG Demands	**673**	**1,345**	**1,345**	**1,345**	**1,345**	**1,345**
MIDLOTHIAN (REGION C)(4)						
City of Venus	2242	2242	2242	2242	2242	2,242
Total Contracts and WUG Demands	**2242**	**2242**	**2242**	**2242**	**2242**	**2,242**

Water User Group/Wholesale Water Supplier	Contract Demand Year					
	2030	2040	2050	2060	2070	2080
WAXAHACHIE (REGION C)(4)						
Files Valley WSC						
Total Contracts and WUG Demands						
COLORADO RIVER MWD (REGION F)1						
City of Abilene(4)	4,721	4,588	4,456	4,324	4,191	4,059
Total Contracts and WUG Demands	**4,721**	**4,588**	**4,456**	**4,324**	**4,191**	**4,059**
SNYDER (REGION F)(4)						
City of Rotan	258	248	241	238	234	230
Total Contracts and WUG Demands	**258**	**248**	**241**	**238**	**234**	**230**
HUNTSVILLE (REGION H)(4)						
Grimes County, Steam Electric	6,720	6,720	6,720	6,720	6,720	6,720
Total Contracts and WUG Demands	**6,720**	**6,720**	**6,720**	**6,720**	**6,720**	**6,720**
AUSTIN (REGION K)(4)						
Williamson County-Other	0	369	90	206	735	2101
Total Contracts and WUG Demands	**0**	**369**	**90**	**206**	**735**	**2101**
LOWER COLORADO RIVER AUTHORITY (REGION K)(4)						
Brazos River Authority	25,000	25,000	25,000	25,000	25,000	25,000
City of Cedar Park	23,000	23,000	23,000	23,000	23,000	23,000
Corix Utilities Texas Inc.	1,140	1,140	1,140	1,140	1,140	1,140
City of Leander	31,000	31,000	31,000	31,000	31,000	31,000
Total Contracts and WUG Demands	**80,140**	**80,140**	**80,140**	**80,140**	**80,140**	**80,140**
MANVILLE WSC (REGION K)(4)						
City of Hutto	462	462	462	462	462	462
Williamson County WSID 3	884	884	884	884	884	884
Total Contracts and WUG Demands	**1,346**	**1,346**	**1,346**	**1,346**	**1,346**	**1,346**
SAN ANTONIO WATER SYSTEM (REGION L)(4)						
Williamson County-Other						
Total Contracts and WUG Demands						

Notes:
(1) Contract represents a priority calls commitment.
(2) Includes municipal supply to portion of Mineral Wells located in Region C.
(3) Only listing Entity's contracts with Region G. Does not list Entity's other contract demands and Entity Demand.
(4) Values represent supplies assigned to Abilene by Region F based on available yield from O.H. Ivie Reservoir, not actual contractual volume.

3.2 Determination of Surface Water Availability

3.2.1 Modified TCEQ Water Availability Model of the Brazos River Basin (Brazos G WAM)

Determination of water availability for existing water rights is based on a rather complex function of location, hydrologic conditions, diversion volume, reservoir storage, and priority date. Computer models that are capable of analyzing these complex inter-relationships are typically employed to determine water availability for water rights. Water availability estimates for the Brazos G Area were developed using a computer model of the Brazos River Basin. The Water Rights Analysis Package (WRAP) computer model was developed at Texas A&M University for use as a water resources management tool. The model can be used to evaluate the reliability of existing water rights and to determine unappropriated streamflow potentially available for new water right permits. WRAP simulates the management and use of streamflow and reservoirs over a historical period of record, adhering to the prior appropriation doctrine governing water rights in Texas.

The TCEQ maintains a Water Availability Model (TCEQ WAM) for the Brazos River Basin that contains information on all water rights in the basin. The TCEQ WAM is the fundamental tool used to determine surface water availability throughout the Brazos River Basin for water rights permitting. Embedded within this model are certain assumptions that the TCEQ specifies when analyzing water right reliabilities. These assumptions are not necessarily the most appropriate to apply to the regional water planning process. For example, the TCEQ WAM uses permitted storage capacities for all reservoirs, whereas water supply planning should be based upon current and future sedimentation conditions in the reservoirs.

The Brazos G RWPG has approved (and the TWDB has authorized) several assumptions to be incorporated into the TCEQ WAM for purposes of determining surface water availability. With these modifications, the TCEQ WAM is hereinafter referred to as the "Brazos G WAM." These assumptions include the following items.

- Inclusion of a certain level of current and future return flows by entities located throughout the basin. These return flows are based on historical return flow information as well as projected future rates assuming an aggressive plan for future reuse. Table 3.5 lists the entities and the annual amount of return flows approved for use in the Brazos G WAM. Multiple entries for the same entity indicate multiple discharge locations. Entities operating wastewater treatment plants in the Brazos Basin not shown in the table are excluded for one of two reasons. One, is the entity requested during the development of the 2021 Plan that zero effluent be made available in the WAM because they plan to reuse all future effluent. These same entities are assumed to fully use all future effluent in the 2026 Plan unless otherwise notified by the entity. Two, return flows are included only for those facilities currently permitted to discharge 0.9 million gallons per day (MGD) or greater.
- Inclusion of BRA current contractual demand amounts and locations as provided by the BRA.
- For modeling of the BRA’s water sources, the BRA’s Little River reservoirs’ (i.e., Belton, Georgetown, Granger, Proctor, and Stillhouse) modeled source availabilities have been aggregated and reported as the “Brazos River Authority Little River System.” Additionally, the BRA’s main stem reservoirs’ (i.e., Granbury, Possum Kingdom, and Whitney) modeled source availabilities as well as the modeled source availabilities of Limestone and Somerville have been aggregated and reported as the “Brazos River Authority Main Stem System.” Lastly, Aquilla Lake has been modeled and reported as the “Brazos River Authority Aquilla System.”

- Modeling of the BRA System Operations permit is reported as the "BRA System Operations Permit Supply." Source availabilities have been modeled and analyzed in a manner consistent with the terms of the water right for both existing supplies and potential water management strategies.
- Incorporation of reservoir system operations rules provided by the BRA to more accurately reflect current operations of BRA reservoirs to meet contract demands.
- For all reservoirs authorized for greater than 5,000 ac-ft storage capacity with available volumetric survey information and an estimated sedimentation rate, the Brazos G WAM uses an estimated Year 2030 and Year 2080 elevation-area-capacity curve.
- The Brazos G WAM includes five subordination agreements, listed below, as approved by the Texas Water Development Board (TWDB).
  - Possum Kingdom Reservoir water rights are subordinate to Lake Alan Henry.
  - Possum Kingdom Reservoir water rights are subordinate to the City of Stamford's California Creek pump-back operation into Lake Stamford.
  - Lake Waco is subordinated to the City of Clifton's 1996 priority date water right.
  - Possum Kingdom Reservoir water rights are subordinated to rights held by the West Central Texas Municipal Water District in Hubbard Creek Reservoir.
  - Possum Kingdom Reservoir water rights are subordinated to rights held by the City of Abilene to divert flows from the Clear Fork of the Brazos River into Lake Fort Phantom Hill.
- Available source supply for reservoirs are evaluated using a firm yield or safe yield determination, depending upon the location of the reservoir and the preference of the reservoir owner. For reservoirs in which a safe yield is utilized as the basis for supply, Brazos G has also determined and reported the firm yield, as required by TWDB guidance.

These assumptions were used in the analyses to determine surface water availability for existing surface water supply sources. Different assumptions will be used, per TWDB requirements, for determining surface water availability for new water management strategies.

Table 3.5 Return Flows included in the Brazos G WAM (millions of gallons per day [MGD])

Entity (1)	County	Current 2030 Discharge (2)	Estimated 2080 Discharge (3)
Bell County WCID No. 1	Bell	9.032	4.734
Bell County WCID No. 1	Bell	0.359	0.189
Bell County WCID No. 1	Bell	2.724	1.426
City of Bellville	Austin	0.312	0.093
City of Breckenridge	Stephens	0.350	0.088
City of Brenham	Washington	1.739	0.435
City of Cameron	Milam	0.487	0.986
City of Copperas Cove	Coryell	0.449	0.186
City of Copperas Cove	Coryell	0.567	0.235
City of Copperas Cove	Coryell	1.328	0.548
City of Eastland	Eastland	0.208	0.052
City of Freeport	Brazoria	0.611	0.208
City of Freeport	Brazoria	0.005	0.003

Entity (1)	County	Current 2030 Discharge (2)	Estimated 2080 Discharge (3)
City of Gatesville	Coryell	1.287	0.531
City of Gatesville	Coryell	0.709	0.293
City of Georgetown	Williamson	1.284	1.369
City of Georgetown	Williamson	1.344	1.432
City of Georgetown	Williamson	0.706	0.753
City of Georgetown	Williamson	0.203	0.216
City of Graham	Young	0.589	0.148
City of Granbury	Hood	0.394	0.235
City of Harker Heights	Bell	1.670	0.873
City of Hearne	Robertson	0.419	0.104
City of Hillsboro	Hood	0.901	0.277
City of Hutto	Williamson	0.515	0.550
City of Hutto	Williamson	0.408	0.435
City of Lampasas	Lampasas	0.427	0.145
City of Leander	Williamson	1.038	1.106
City of Marlin	Falls	0.539	0.134
City of McGregor	McLennan	0.000	0.000
City of Mineral Wells	Parker	0.830	0.238
City of Mineral Wells	Palo Pinto	0.107	0.164
City of Navasota	Grimes	0.482	0.183
City of Richmond	Fort Bend	1.336	0.890
City of Richmond	Fort Bend	0.266	0.178
City of Richmond	Fort Bend	0.110	0.074
City of Rosenberg	Fort Bend	1.665	1.109
City of Rosenberg	Fort Bend	1.021	0.679
City of Rosenberg	Fort Bend	0.003	0.000
City of Round Rock, City of Cedar Park, and City of Austin	Williamson	15.587	16.613
City of Stephenville	Erath	1.218	0.676
City of Sugarland	Fort Bend	3.923	2.617
City of Sugarland	Fort Bend	4.134	2.757
City of Sugarland	Fort Bend	0.827	0.550
City of Sugarland	Fort Bend	0.997	0.665
City of Taylor	Williamson	1.123	1.196
City of Temple	Bell	1.799	0.942
City of Temple and City of Belton	Bell	6.084	3.187
City of West Columbia	Brazoria	0.430	0.148

Entity (1)	County	Current 2030 Discharge (2)	Estimated 2080 Discharge (3)
Pecan Grove MUD	Fort Bend	0.821	0.548
Prairie View A&M University	Waller	0.430	0.370
Texas A&M University	Brazos	0.041	0.030
Texas A&M University	Brazos	0.022	0.016
Texas A&M University	Brazos	1.385	1.027
Total:		**75**	**53**
Total (ac-ft/yr):		**84,271**	**58,961**

Notes:
(1) Entities operating WWTPs but are not shown are assumed to have zero effluent made available because they plan to reuse all future effluent, or are permitted to discharge less than 0.9 MGD.
(2) Current return flow estimates are based on the minimum annual discharge during 2017-2022 period.
(3) Future estimates assume 25% of Year 2030 discharges will continue and 50% of any growth in wastewater volume will be discharged.

The Brazos G WAM contains 77 primary control points that contain naturalized flow information, and 67 evaporation data sets used to calculate evaporation for the 650 reservoirs included in the model. The period of record for the Brazos G WAM is 1940-2018. Water availability computations are performed at over 3,800 control points located throughout the river basin in the process of analyzing more than 1,700 water right records. The Brazos G WAM contains water right data available from the TCEQ for all water rights in the Brazos Basin as of October 2023. Water right applications submitted or approved after this date are not reflected in the model. A summary of yield data for major reservoirs analyzed in the Brazos G WAM is presented in Section 3.2.3.

3.2.2 Reliability of Surface Water Supplies and New Upper Basin Drought of Record

Hydrologic conditions are a primary factor that affects the reliability of water rights. Severe drought periods have been experienced in all areas of the Brazos River Basin. The drought of record for most areas of Brazos G occurred in the 1950s with other less severe drought periods occurring in the 1960s, 1970s, 1980s, and even recently in the 1990s. In some parts of the upper Brazos Basin, the recent drought of the 1990s has continued past the turn of the century, and in many places streamflow data indicate that its severity is greater than that of the drought that occurred in the 1950s. The region of Texas near Abilene has experienced drought conditions in almost all years from the early 1990s until 2016. Streamflows in the Clear Fork of the Brazos River (Clear Fork) during this period were substantially less compared to the previous drought of record which occurred from 1943 through 1956.

Figure 3.7 illustrates this with a comparison of cumulative gaged flows at the Clear Fork at Nugent gage during the drought of the 1950s and the drought beginning in the summer of 1997 and ending in the spring of 2016. When the recent drought cumulative streamflows are compared to the 1950s droughts at the 14 years mark from the beginning of the drought, total streamflow is 53 percent of the total streamflow for the 1950s. Additionally, the duration of the recent drought is more than 4 years longer than the 1950s drought. The comparison shows that the current drought was much more severe in the Clear Fork watershed. Additional information and comparisons of historic droughts in the Brazos River Basin are included in Chapter 7.

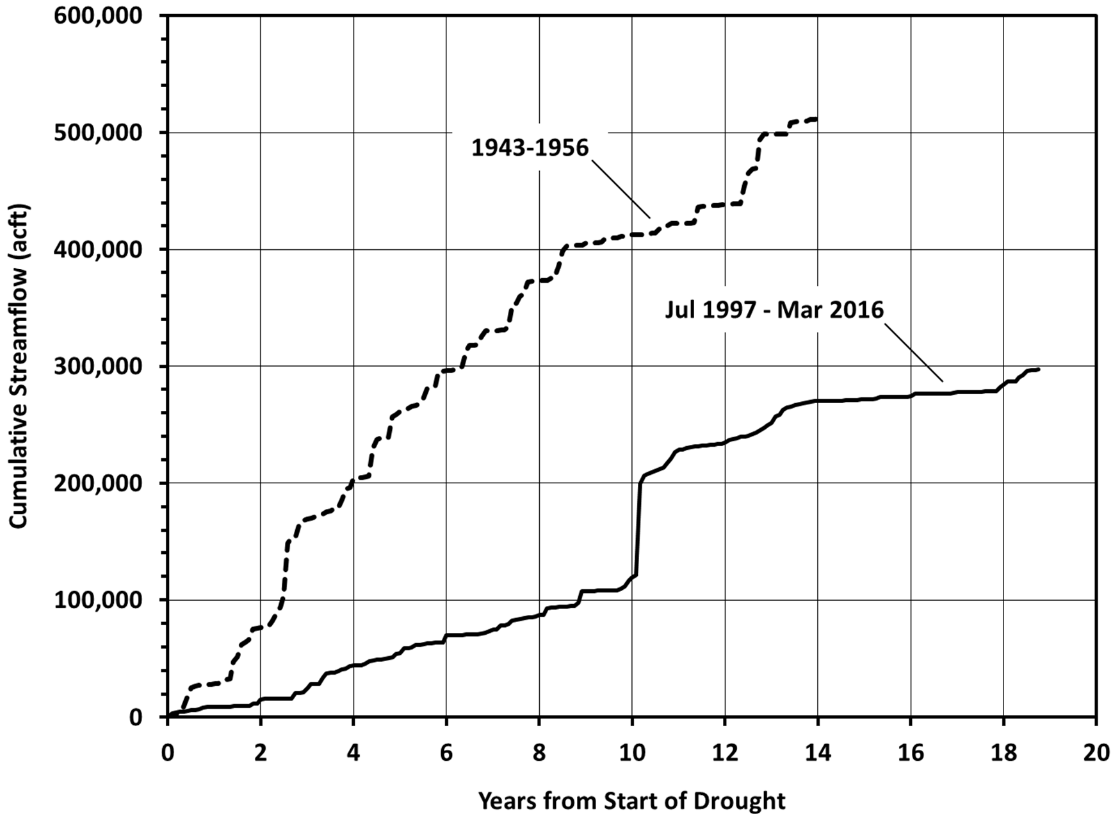

Figure 3.7 Comparison of Cumulative Streamflows for Two Drought Periods for the Clear Fork at Nugent, TX Streamgage (08084000)

3.2.3 Yield Analysis for Large Reservoirs

Water availability estimates for reservoirs were determined using the Brazos G WAM. For each reservoir greater than 5,000 ac-ft yield estimates were determined using the updated 2030 (current) and 2080 (future) elevation-area-capacity information based on projected reservoir sedimentation. For reservoirs with less than 5,000 ac-ft of storage, as-permitted capacities were used to estimate yields. Future reservoir sediment conditions were estimated using available reservoir sedimentation data. Summary of current (2030) and future (2080) sediment estimates for reservoirs with recent surveys are summarized in Table 3.6. Summary of current (2030) and future (2080) sediment estimates for reservoirs without recent surveys are summarized in Table 3.7.

Table 3.6 Summary of Current and Future Sediment Estimates for Reservoirs with Recent Surveys (available as of December 1, 2023)

Reservoir	Year of New Survey	Sedimentation Rate (ac-ft/yr)	2026 Plan Conservation Storage Capacity (ac-ft)	
			2030	2080
Lake Aquilla(1)	2013	209	39,656	29,153
Lake Belton(1)	2013	336	427,675	410,790
Dansby Power Plant/Bryan Utilities Lake	2016	26	13,802	12,892
Fort Phantom Hill Reservoir	1993	78	67,228	63,346
Lake Georgetown(1)	2016	21	37,869	36,708
Gibbons Creek Reservoir	2008	35	38,429	36,372
Graham/Eddleman Reservoir	1998	233	37,913	26,277
Lake Granbury(1)	2015	278	132,112	118,134
Lake Granger(1)	2013	152	49,187	41,549
Hubbard Creek Reservoir	2018	554	311,526	283,826
Lake Limestone(1)	2015	481	196,044	172,353
Mexia Reservoir	2008	22	4,208	3,108
Millers Creek Reservoir	1993	102	25,426	20,343
Palo Pinto Reservoir	2007	42	23,728	19,695
Pat Cleburne Reservoir(4)	2008	NA	NA	NA
Lake Proctor(1)	2014	161	52,173	44,082
Lake Somerville(1)	2012	379	143,377	145,935
Squaw Creek Reservoir	2007	125	148,512	142,262
Stamford Reservoir	1998	125	47,646	41,396
Lake Stillhouse Hollow(1)	2015	119	228,146	222,166
Possum Kingdom Reservoir(1)	2016	298	552,293	537,318
Waco Lake	2011	334	183,536	166,837
Lake Whitney	2019	565	610,786	582,378
Lake Leon(3)	2015	NA	NA	NA
Lake Mineral Wells (Region C)(4)	2015	6	5,376	5,076

Notes:
(1) Sedimentation rate provided by Brazos River Authority.
(2) Sedimentation rate calculated using 2017 Draft TWDB survey.
(3) Due to differences in survey methodologies, the 2015 survey was not comparable to previous surveys and cannot be used to determine a new sedimentation rate. Therefore, the 2026 Plan sedimentation rate was maintained at the same level as that used in the 2021 Plan to estimate current and future sediment conditions.
(4) Volumetric surveys and sedimentation rates were inconclusive

Table 3.7 Summary of Current and Future Sediment Estimates for Reservoirs without Recent

Reservoir	Year of Impoundment	Sed. Rate (ac-ft/yr)	2026 Plan Conservation Storage Capacity (ac-ft)	
			2030	2080
Abilene	1923	78	3,601	0
Alcoa	1953	5	15,266	15,011
Cisco	1974	22	27,158	26,053
Daniel	1948	29	9,076	7,648
Kirby	1928	40	4,215	2,400
Lake Creek	1953	14	7,375	6,794
Lake Davis	1959	33	3,139	1,503
Sweetwater	1974	45	10,654	8,436
Tradinghouse	1968	33	35,759	34,101
Twin Oak	1982	38	28,855	27,006

Yields were limited to authorized diversions. Yields also were determined for smaller reservoirs that serve as the sole water supply for a municipal entity. Yield estimates for BRA reservoirs were estimated as a stand-alone yield without system operations. The stand-alone yields for the BRA reservoirs assume all diversions from BRA reservoirs are made lakeside.

Firm yield estimates were determined for all reservoirs and safe yield estimates were also determined for reservoirs located upstream of Possum Kingdom Reservoir and for Lake Palo Pinto. Utilization of safe yield in lieu of firm yield is a common practice in west Texas where droughts are frequent and severe, and water managers are acutely aware that a drought more severe than recent recorded history could occur. Safe yield provides additional assurance of supply in an area where water resource alternatives are limited. All reservoirs upstream of Possum Kingdom Reservoir (Upper Basin Reservoirs) were evaluated on a 1-year safe yield basis. A 1-year safe yield is defined as the amount of water that can be diverted from a reservoir during a repeat of the worst drought of record while still maintaining a reserve storage equal to a 1-year supply volume. Two-year safe yields were calculated for Hubbard Creek Reservoir as approved by the TWDB. A 2-year safe yield is used to provide a greater assurance to reservoir owners that supplies are not over-estimated when considering droughts worse than the drought of record. A 6-month safe yield is used for Lake Palo Pinto and is the only reservoir located in a watershed downstream of Possum Kingdom Reservoir for which a safe yield is used.

A summary of firm and safe yield estimates for major reservoirs and minor reservoirs used for municipal supply is presented in Table 3.8.

Table 3.8 Yields for Reservoirs in the Brazos G Area (acre-feet/year)

Water Right ID	Reservoir Name	Firm Yield		Safe Yield	
		2030	2080	2030	2080
BRA Reservoirs					
C5155	Possum Kingdom	151,330	147,010		
C5156	Granbury	58,822	53,942		
C5157	Whitney	18,336	18,336		
C5158	Aquilla	12,856	10,396		
C5159	Proctor	14,468	11,698		
C5160	Belton(1)	100,257	100,257		

Water Right ID	Reservoir Name	Firm Yield		Safe Yield	
		2030	2080	2030	2080
C5161	Stillhouse Hollow	65,568	64,138		
C5162	Georgetown	11,610	11,490		
C5163	Granger	17,400	15,140		
C5164	Somerville	42,000	40,080		
C5165	Limestone	65,074	65,074		
Large Non-BRA Reservoirs					
C3758, C5272	Alcoa	14,000	14,000		
P5551	Clifton	400	340		
C5268	Dansbury (Bryan Utilities)	85	85		
C5311, C5307	Gibbons Creek	9,740	9,740		
C4345	Lake Creek	9,786	8,900		
C34403	Davis	0	0		
C3470	Leon	4,160	4,080		
C4039	Mineral Wells (Region C)	1,940	1,940		
C5287	Mexia	1,002	502		
C4031	Palo Pinto(2)	8,880	7,710	6,236	5,318
C4106	Pat Cleburne	5,590	5,590		
C4097	Squaw Creek	8,050	7,720		
C4342	Tradinghouse	4,900	4,840		
C5298	Twin Oaks	2,860	2,700		
P5551, P5899	Waco	74,630	71,520		
C3693	White River	80	80		
Minor Reservoirs					
P4135	Crawford	0	0		
C3465	Eastland	510	500		
C4024	Gordon	0	0		
C4355	Marlin	1,760	1,700		
P5000	Mart	0	0		
P5085	Robinson	3,621	3,421		
P5744	Wheeler Branch	1,848	1,838		
C4019	Strawn	160	160		
C3450	Throckmorton	50	50		
Upper Basin Reservoirs					
C4142	Abilene(3)	725	0	374	0
C4211	Cisco	1,227	1,227	997	926
C4214	Daniel	50	0	21	0
C4151, C4161, C4139, C4165	Fort Phantom Hill(6)	7,833	7,833	5,339	5,310

Water Right ID	Reservoir Name	Firm Yield		Safe Yield	
		2030	2080	2030	2080
C3458	Graham-Eddleman	1,800	1,420	789	366
C4213	Hubbard Creek(4)	26,380	24,810	16,879	15,196
C4150	Kirby(5)	270	260	95	77
C4179	Stamford	3,900	3,440	2,060	1,569
C4130	Sweetwater(3)	680	610	488	417
C4128	Sweetwater_Trammel_RC4128(3)	300	300	200	200
C4152	Lytle Lake	230	230	230	230
C4180	City of Hamlin Lake	40	40	24	24
C4181	Anson North	32	32	22	21
C4194	Woodson	0	0	0	0
C4202	Baird	30	30	20	20
C4208	McCarty	110	110	80	80
C4207	Moran	90	90	57	57
C3462	Bryson	0	0	0	0
C3444	Millers Creek Reservoir	400	180	227	93

Notes:
(1) BRA portion of Lake Belton stand-alone yield excludes 12,000 ac-ft/yr of water rights held by the Department of the Army.
(2) Safe yield estimates for Lake Palo Pinto are based on 6-month safe yield calculation.
(3) Reservoir not used for supply by owning entity or is not considered a reliable supply.
(4) Safe yield estimates for Hubbard Creek Reservoir are based on a two-year safe yield calculation.
(5) Lake Kirby is utilized as part of the City's reuse system and not for raw water supply. Yield estimates for Lake Kirby do not include effluent inflows.
(6) Safe yield estimate for Fort Phantom Hill Reservoir is based on a 2-year safe yield calculation. The City of Abilene plans to manage current and future supplies from Fort Phantom Hill Reservoir using the minimum of 1) the 2-year safe yield estimates, and 2) the yield estimates included in the purpose and need analysis of the Abilene water system as part of the 404 permitting process for the Cedar Ridge Reservoir project.

3.2.4 Reliability of Run-of-the-River and Small Reservoir Water Rights

The results of the Brazos G WAM simulations include water availability estimates for each water right located in the Brazos Basin. Summaries of water available to run-of-the-river water rights (including rights with small reservoirs) are presented in Appendix F. If the supply for a water right was determined by a firm or safe yield analysis, then this number is shown in the appendix. Water availability for other rights is expressed in terms of the minimum annual supply, which is defined as the water available during the most severe drought year over the 76-year simulation period of 1940 to 2018. Water right reliabilities were calculated simulating both current and future reservoir sedimentation conditions. The minimum annual supplies for run-of-river water rights (based on minimum monthly diversions) were used to determine the supplies available by type of use and county for comparison with demands.

3.2.5 Reliability of BRA System Operations Permit

The BRA has been granted water right permit No. 12-5851 authorizing the additional appropriation of water made available through system operation of the BRA's existing water rights and reservoirs. The system operations permit authorizes a new supply of water in addition to the authorized diversions of BRA's existing reservoir water rights. This new supply is used in conjunction with water stored in BRA reservoirs to meet future customer needs.

The Brazos G WAM prioritizes meeting the demands of the existing BRA contracts from the BRA system of reservoirs (BRA System) before making any system operations water available to meet future demands. The remaining water available from the BRA System is then determined at the Brazos River near Rosharon control point, at the lower end of the Brazos Basin. Under this hypothetical operation (diverting all additional "system" supply from the lowest reach of the Brazos Basin), unregulated flows originating downstream of the BRA reservoirs are diverted during wet times and firmed up by releases from storage in the upstream BRA reservoirs during dry times. In this fashion, a total "system" yield can be developed in addition to the sum of the individual reservoir firm yields.

For this analysis, the system yield was determined to be the sum of the minimum annual volume of water delivered to the existing contracts and remaining available water near the Rosharon control point. The difference between the system yield and the sum of the individual reservoir firm yields is considered to be the additional system operations reliable supply. Table 3.9 summarizes the BRA reservoir firm yields, system yield and system operations reliable supply.

The BRA currently holds multiple contracts to supply water to cities, districts, irrigators and industry throughout the Brazos River Basin. Many of these contracts are supplied proximate to the BRA's reservoirs, or through lakeside diversions. Because the additional System supply is dependent upon unregulated flows below the existing BRA reservoirs, the additional supply from system operations is considered to be available for diversion only at locations along the main stem of the Brazos River.

Table 3.9 Summary of BRA Reservoir Firm Yields and System Operations Reliable Supply

BRA Reservoir	Stand-Alone Firm Yield (ac-ft/yr)	
	2030	2080
Possum Kingdom	151,330	147,010
Granbury	58,822	53,942
Whitney	18,336	18,336
Aquilla	12,856	10,396
Proctor	14,468	11,698
Belton(1)	100,257	100,257
Stillhouse Hollow	65,568	64,138
Georgetown	11,610	11,490
Granger	17,400	15,140
Somerville	42,000	40,080
Limestone	65,074	65,074
Total Reservoir Firm Yields	**557,721**	**537,561**
System Yield	**689,105**	**617,393**
System Operations Reliable Supply(2)	**131,384**	**79,832**

Notes:
(1) BRA portion of Lake Belton stand-alone yield excludes 12,000 ac-ft/yr of water rights held by the Department of the Army.
(2) The system operations reliable supply is assumed to be available to meet demands located on the main-stem of the Brazos River as infrastructure does not exist to transport the supply to the demands located in the Little River or Aquilla sub-systems.

BRA reports a total system yield of 744,942 ac-ft per year, based on the BRA's modeling of its system, operations, and contractual obligations. This amount is 55,837 ac-ft per year more than the results developed utilizing the Brazos G WAM, from which an estimated system yield for 2030 is estimated as 55,837 ac-ft per year lower, and by 2080 projects a lower yield by approximately 127,549 ac-ft per year. A comparison of these modeled system yield results is presented in Table 3.8.

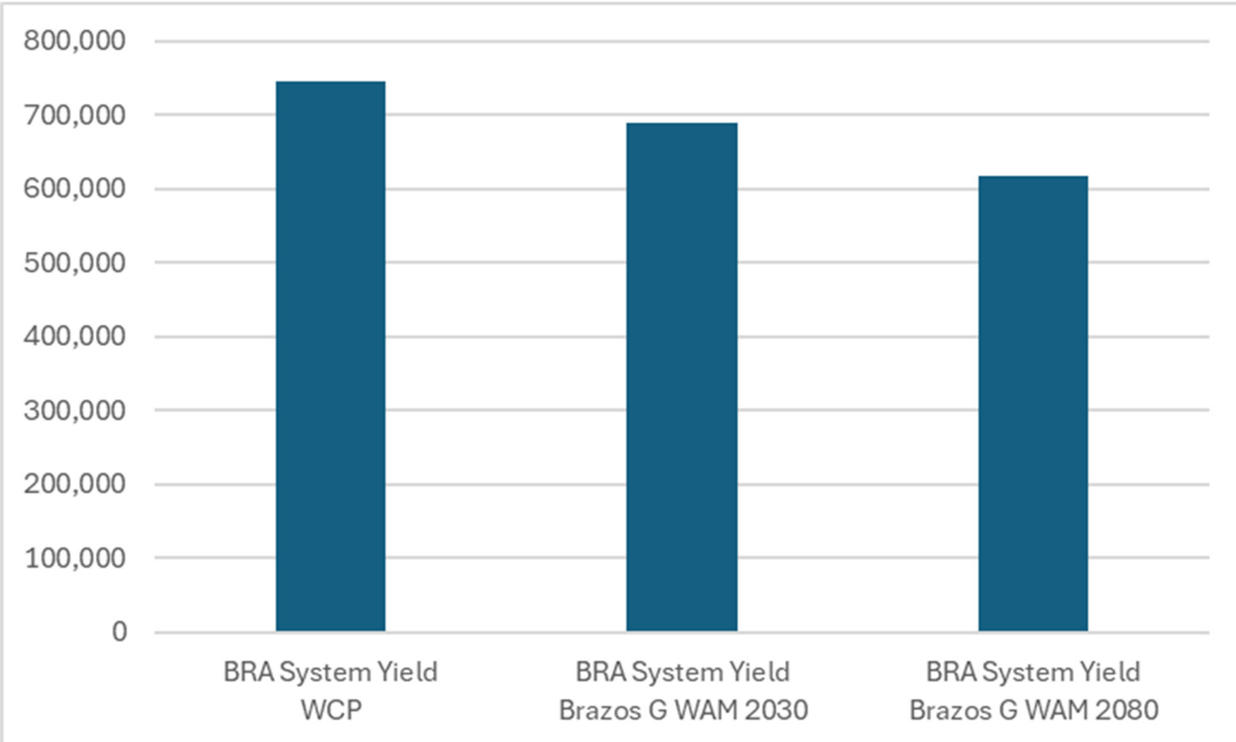

Figure 3.8 Comparison of modeled BRA System Yield from BRA Water Conservation Plan and from Brazos G WAM Projections

The BRA's reported system yield is based on a very specific model of the BRA reservoir system that accounts for their specific operational rules to meet the needs of their customers. For the development of the Brazos G Regional Water Plan, as noted elsewhere in the report (see Hydrologic Variance Request Appendix N), the Brazos G RWPG must use the state's official model for determining water availability, a model that has its own built-in assumptions for conservatively calculating water availability over a modeled hydrologic period that includes the drought of record for watersheds throughout the Brazos River Basin. Such assumptions relate to quantifying the amount of firm water supply that would be available if there were a repeat of the drought of record, assuming full implementation of all existing water rights and very limited scenarios reflecting the presence of return flows, if at all, for certain modeled water management strategies. Further, the Brazos G model does not include the detailed operational decisions and factors considered every day by water providers, like BRA, that affect source availability for their customers. Additionally, the modeling performed for the purposes of the 2026 Brazos G Regional Water Plan include quantified projections of the impacts of sedimentation on reservoirs, further differentiating present source availability from the projections of future source availability presented herein.

3.2.6 Unappropriated Flows in the Brazos River Basin

The Brazos G WAM calculates unappropriated flow each month for the 1940 - 2018 period at each modeled location in the basin. Unappropriated flow is the excess flow that is not used by existing water rights and instream flow restrictions in the model simulation. This unappropriated flow is computed assuming SB3 instream flow restrictions and full use of all existing water rights. The quantity of unappropriated flow varies throughout the river basin depending on location. Summaries of unappropriated flows from the Brazos G WAM were developed at the following locations:

- Brazos River at South Bend (BRSB23).
- Brazos River near Glen Rose (BRGR30).
- Brazos River near Aquilla (BRAQ33).
- Bosque River near Waco (BOWA40).
- Little River at Cameron (LRCA58).
- Brazos River near Bryan (BRBR59).
- Brazos River near Hempstead (BRHE68).
- Brazos River at Richmond (BRRI70).

These locations effectively summarize flow conditions throughout the river basin and are located at current or discontinued U.S. Geological Survey (USGS streamflow gaging stations, which are also primary control points in the Brazos G WAM. Table 3.10 summarizes the monthly and annual unappropriated flows at these selected locations as represented by WAM Run 3.

Table 3.10 Summary of Unappropriated Flow at Selected Brazos G WAM Locations

Control Point	Unappropriated Flow Estimates								Max. No. of Consecutive Months with Zero Unappropriated Flow
	Monthly Unappropriated Flows (ac-ft)				Annual Unappropriated Flows (ac-ft)				
	Maximum	Minimum	Mean	Median	Maximum	Minimum	Mean	Median	
BRSB23	1,211,125	0	14,038	0	2,193,800	0	168,453	11,161	70
BRGR30	2,433,663	0	26,485	0	2,986,473	0	317,814	98,216	51
BRAQ33	2,545,437	0	40,413	0	3,432,170	0	484,959	153,117	36
BOWA40	525,042	0	18,896	0	947,531	0	226,746	124,441	35
LRCA58	1,366,894	0	64,652	0	3,867,515	0	775,829	557,698	43
BRBR59	3,961,707	0	160,470	0	9,099,618	0	1,925,644	1,292,516	33
BRHE68	4,620,571	0	208,906	0	11,056,133	0	2,506,874	1,930,394	33
BRRI70	4,975,936	0	235,123	0	11,918,357	0	2,821,479	2,135,995	33

Figure 3.9 provides a comparison of median annual unappropriated flows at the selected location to those calculated in the 2021 Brazos G Plan. The comparison shows that the median unappropriated flow at the selected locations has decreased at five of the eight selected locations since the 2021 Plan. These changes in unappropriated flow are largely attributable to the update to the official Brazos WAM extending the modeled hydrologic period through 2018.

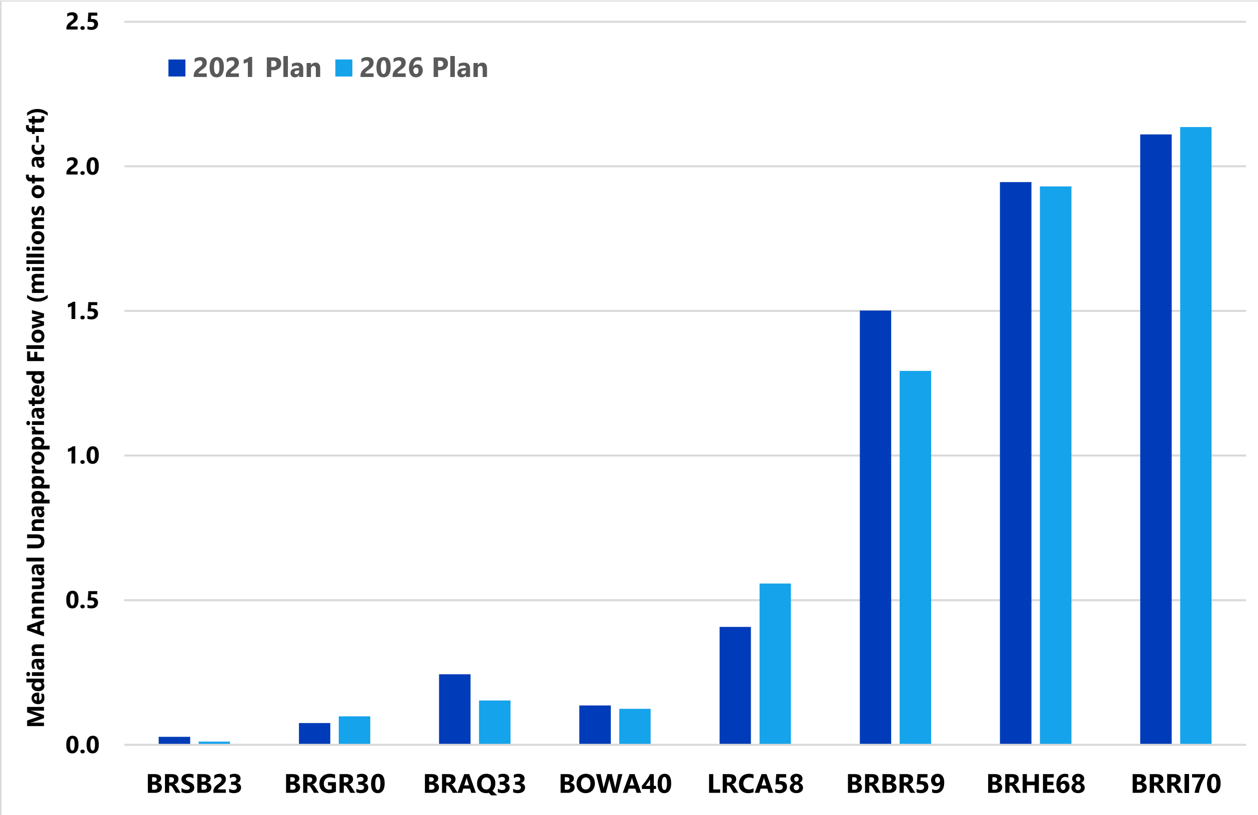

Figure 3.9 Comparison of Simulated Median Annual Unappropriated Flow to 2026 Brazos G Plan

Figure 3.10 through Figure 3.17 illustrate the annual time series of unappropriated flows at each location. As Table 3.10 and Figure 3.10 through Figure 3.17 demonstrate, locations further downstream on major streams tend to have more unappropriated flow than those upstream with less contributing drainage area. As shown in these figures, unappropriated flow is present at the South Bend gage location in 46 out of 79 years of the model simulation. Conversely, unappropriated flow is present in all but 10 years at Richmond in the lower basin, and often in large quantities. Unappropriated flow is not available at Richmond for four years during the severe drought of the 1950s, which is the lowest flow period during the 1940 to 2018 simulation period at this gage.

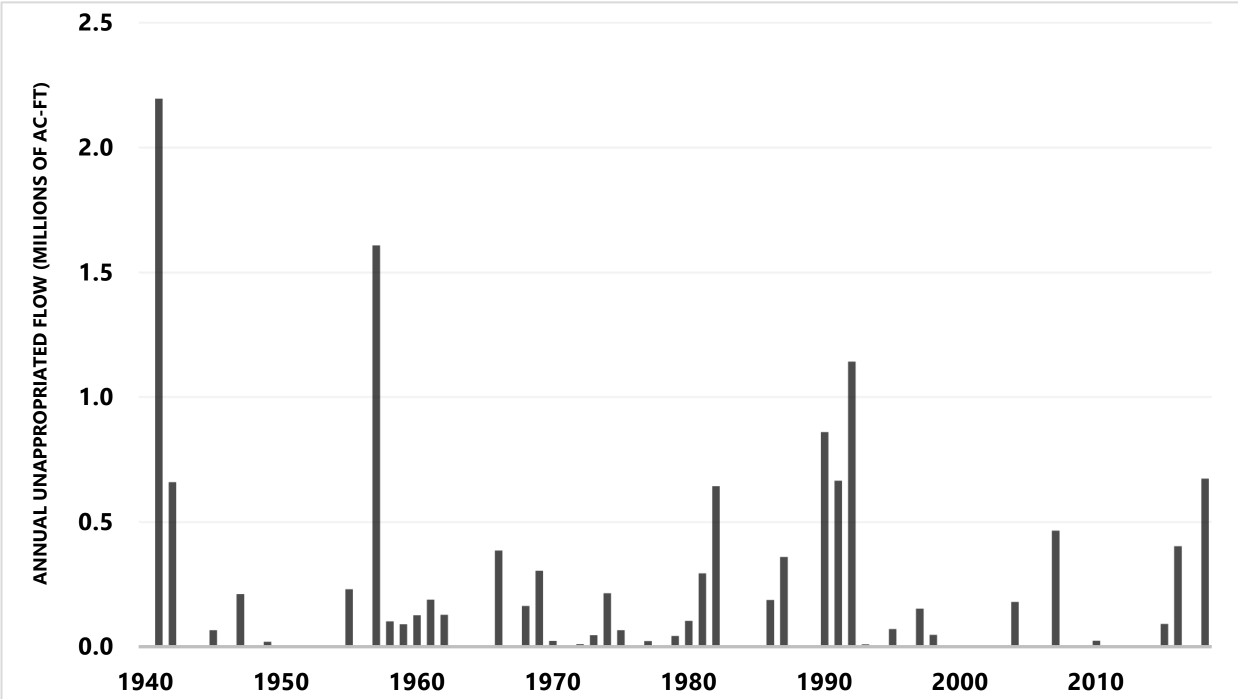

Figure 3.10 Simulated Annual Unappropriated Flow at Brazos River at South Bend (BRSB23)

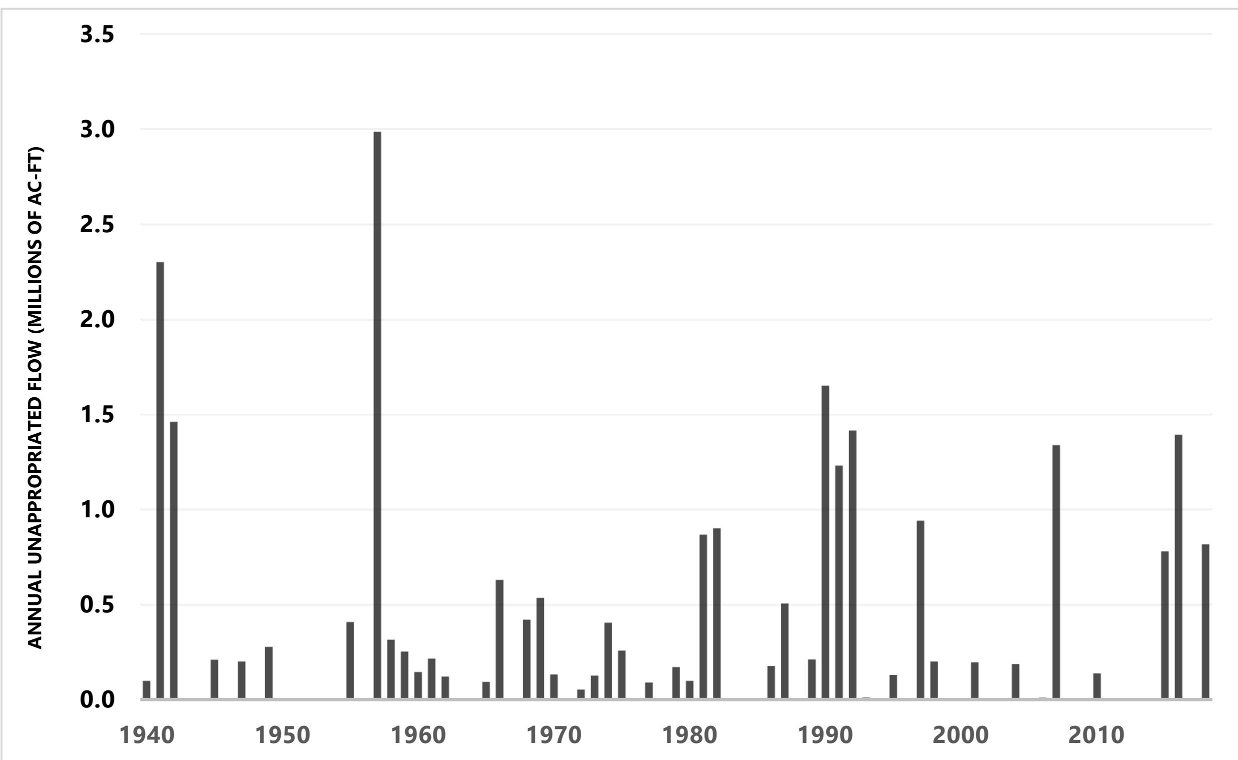

Figure 3.11 Simulated Annual Unappropriated Flow at Brazos River near Glen Rose (BRGR30)

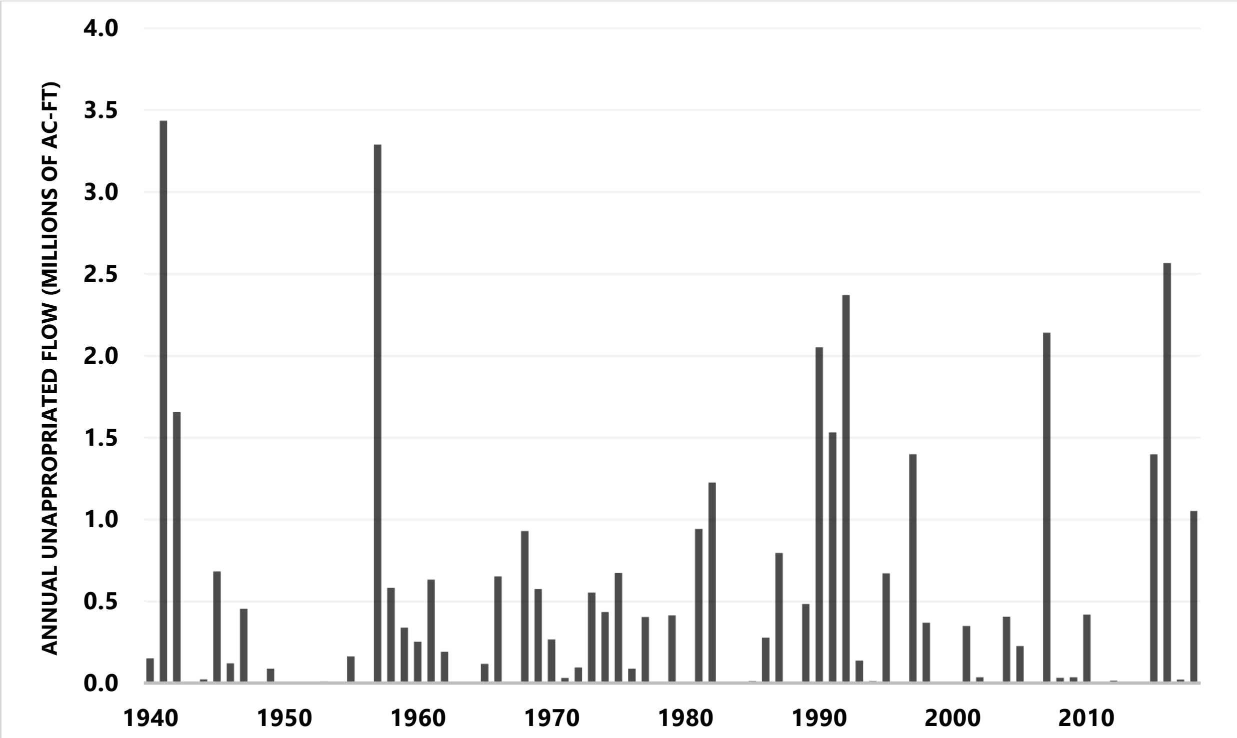

Figure 3.12 Simulated Annual Unappropriated Flow at Brazos River near Aquilla (BRAQ33)

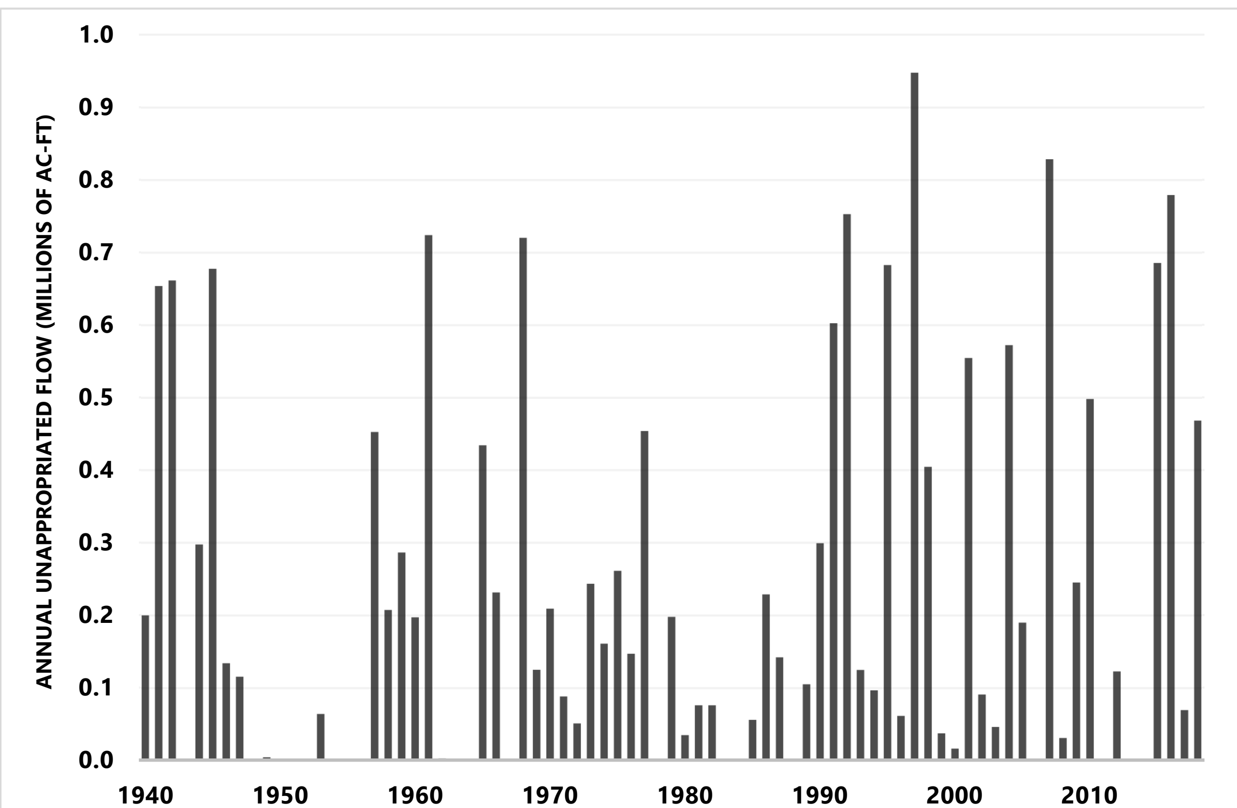

Figure 3.13 Simulated Annual Unappropriated Flow at Brazos River near Waco (BOWA40)

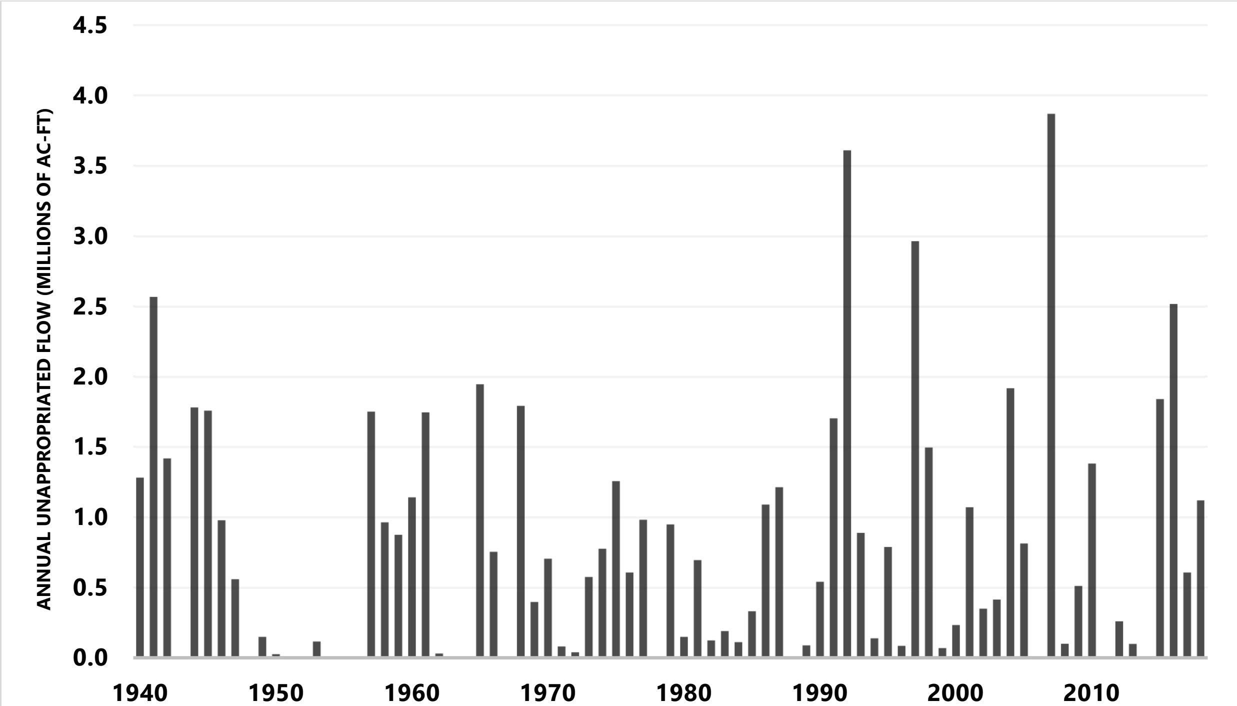

Figure 3.14 Simulated Annual Unappropriated Flow at Little River at Cameron (LRCA58)

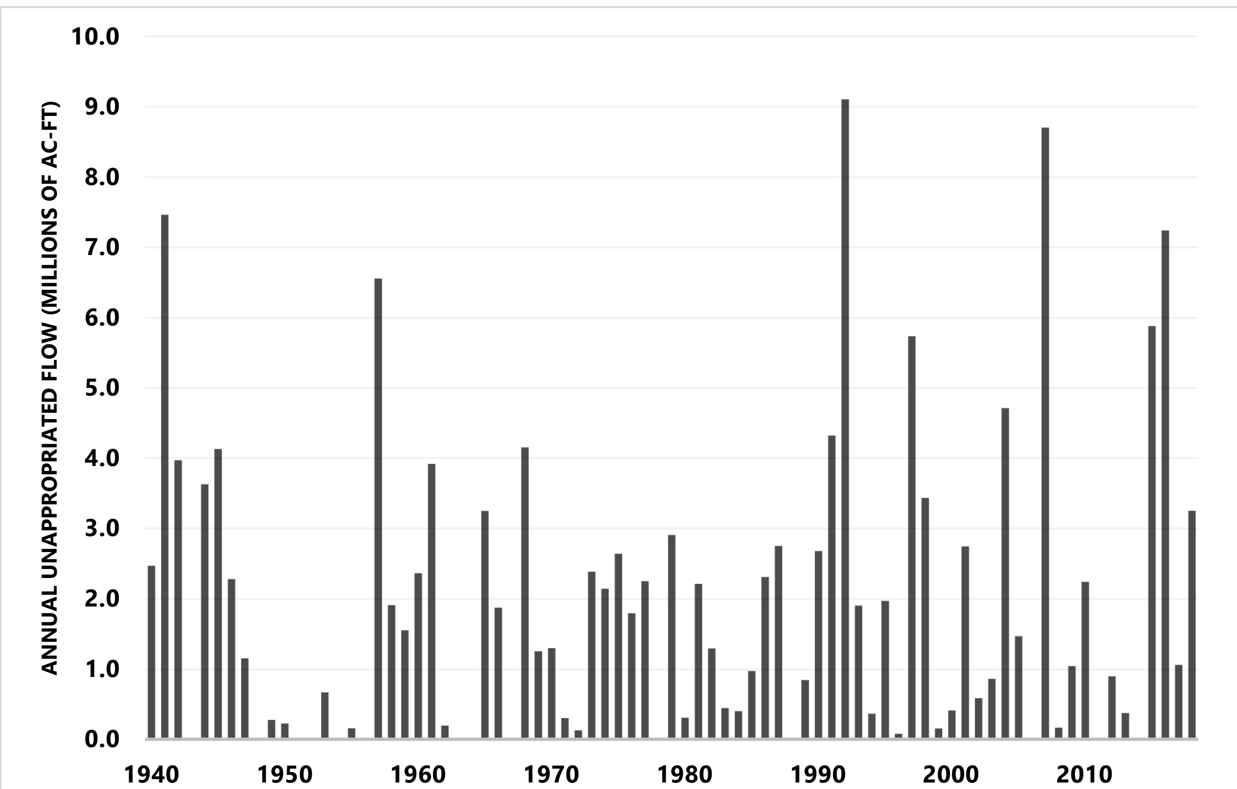

Figure 3.15 Simulated Annual Unappropriated Flow at Brazos River near Bryan (BRBR59)

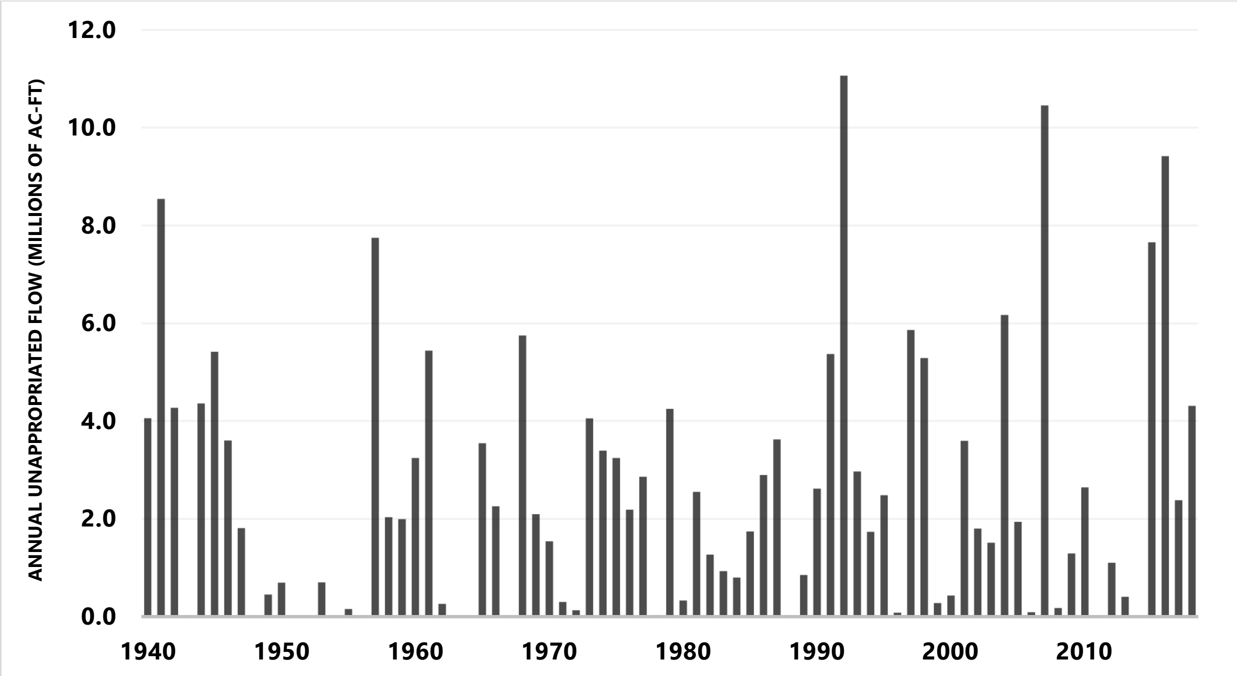

Figure 3.16 Simulated Annual Unappropriated Flow at Brazos River near Hempstead (BRHE68)

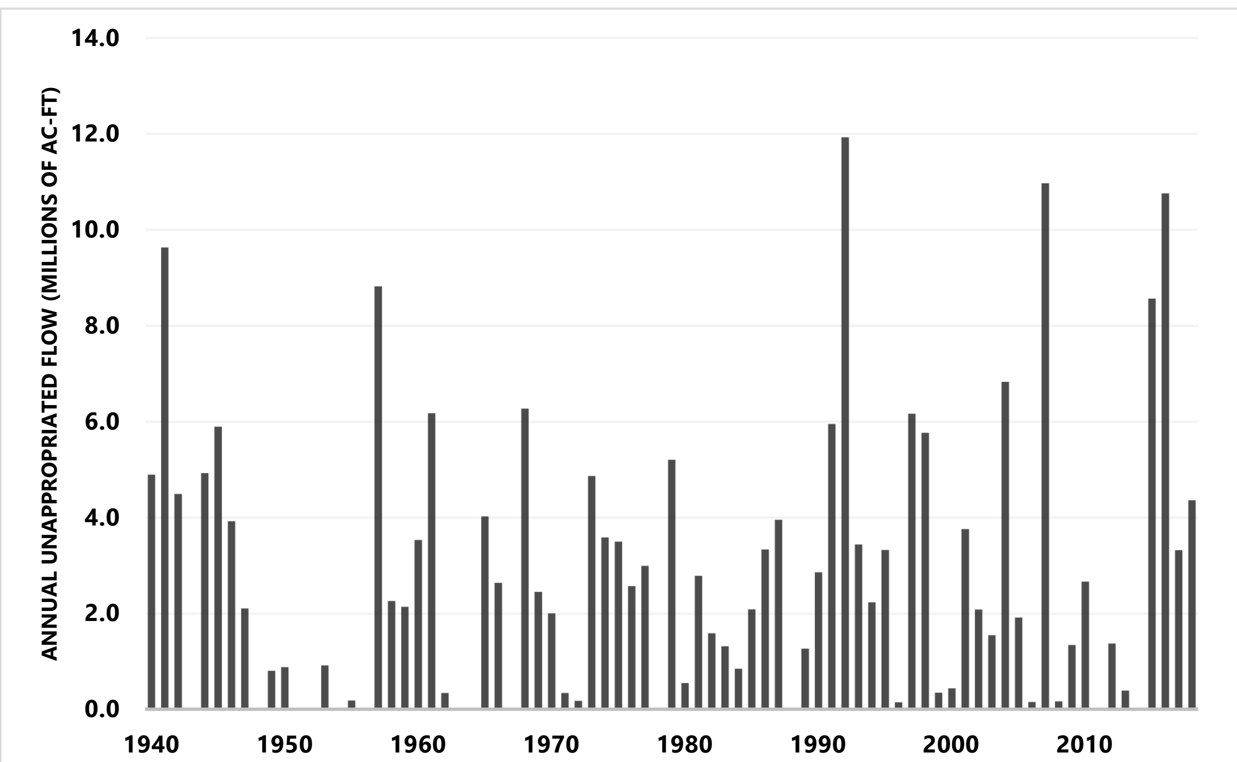

Figure 3.17 Simulated Annual Unappropriated Flow at Brazos River at Richmond (BRRI70)

3.2.7 Local Surface Water Supplies

The local surface water supplies are used for livestock supplies in the Brazos G area. These supplies are firm and would be available through a drought of record given that they are reflected in the State's water availability models through the underlying streamflow gage data upon which the naturalized streamflows are based.

3.3 Water Quality Considerations Affecting Supply

The Brazos G WAM addresses the quantity of water available to existing water rights. However, water quality from some sources of water for existing water rights and contracts may limit the availability of water for certain beneficial uses. Water quality that does not meet criteria for designated uses such as public water supply, contact recreation, and aquatic life support is important to water supply considerations.

3.3.1 Point and Non-Point Source Pollution Water Quality

A number of stream segments and lakes in the Brazos G Area do not meet water quality standards due to point and/or nonpoint source pollution. The total maximum daily loads (TMDL) and individual water quality-based effluent limitations defined in 40 CFR 130.7 give TCEQ and U.S. Environmental Protection Agency (USEPA) the responsibility to identify water bodies that do not meet or are not expected to meet applicable water quality standards for designated uses.

As required under Sections 303(d) and 304(a) of the federal Clean Water Act, the 303(d) list identifies the water bodies in or bordering Texas for which effluent limitations are not stringent enough to implement water quality standards, and for which the associated pollutants are suitable for measurement by maximum daily load. Texas' 303(d) list is included as part of the Texas Integrated Report of Surface Water Quality[1].

One of three subcategories is assigned to each impaired parameter to provide information about water quality status and management activities on that water body. The categories are defined as:

- **Category 5**: The water body does not meet applicable water quality standards or is threatened for one or more designated uses by one or more pollutants.
- **Category 5a:** TMDLs are underway, scheduled, or will be scheduled for one or more parameters.
- **Category 5b:** A review of the standards for one or more parameters will be conducted before a management strategy is selected, including the possible revision to the water quality standards.
- **Category 5c:** Additional data or information will be collected and/or evaluated for one or more parameters before a management strategy is selected.

The Brazos G Area stream segments and lakes identified in Texas' 303(d) list are summarized in Table 3.11[2].

[1] 2018, TCEQ. 2018 Draft Texas Integrated Report of Surface Water Quality

[2] Texas Commission on Environmental Quality, 2024 Texas 303(d) List (June 26, 2024).

Table 3.11 2024 Draft Texas 303(d) List (June 26, 2024) Brazos G Regional Planning Area

Segment Number	Segment Name	County	Category	Parameter of Concern	Year First Listed
1204A	Camp Creek	Johnson	5c	Bacteria in water (Recreation Use)	2010
1208	Brazos River Above Possum Kingdom Lake	Young / Stonewall	5c	Bacteria in water (Recreation Use)	2008
1209A	Country Club Lake	Brazos	5c	Toxicity in sediment	1999
1209B	Fin Feather Lake	Brazos	5c	Toxicity in sediment	2000
1209E	Wickson Creek	Brazos	5b	Bacteria in water (Recreation Use)	2006
1209H	Duck Creek	Robertson	5r	Bacteria in water (Recreation Use)	2006
1209H	Duck Creek	Robertson	5r	Depressed dissolved oxygen in water	2012
1209I	Gibbons Creek	Grimes	5b	Bacteria in water (Recreation Use)	2002
1209I	Gibbons Creek	Grimes	5r	Depressed dissolved oxygen in water	2016
1209K	Steele Creek	Limestone	5b	Bacteria in water (Recreation Use)	2002
1210A	Navasota River Above Lake Mexia	Hill	5c	Bacteria in water (Recreation Use)	2002
1211A	Davidson Creek	Burleson	5c	Bacteria in water (Recreation Use)	2002
1211A	Davidson Creek	Burleson	5c	Depressed dissolved oxygen in water	2010
1212	Somerville Lake	Burleson / Washington	5c	pH	2002
1212A	Middle Yegua Creek	Lee / Williamson	5r	Bacteria in water (Recreation Use)	2010
1213A	Big Elm Creek	Milam	5r	Bacteria in water (Recreation Use)	2010
1217	Lampasas River Above Stillhouse Hollow Lake	Bell / Hamilton / Lampasas	5r	Bacteria in water (Recreation Use)	2002
1218	Nolan Creek/ South Nolan Creek	Bell	5r	Bacteria in water (Recreation Use)	1996
1218C	Little Nolan Creek	Bell	5r	Bacteria in water (Recreation Use)	2010
1221	Leon River Below Proctor Lake	Comanche / Coryell	5r	Bacteria in water (Recreation Use)	1996
1221A	Resley Creek	Comanche	5b	Bacteria in water (Recreation Use)	2004
1221A	Resley Creek	Comanche	5r	Depressed dissolved oxygen in water	2006

Segment Number	Segment Name	County	Category	Parameter of Concern	Year First Listed
1221B	South Leon River	Comanche	5b	Bacteria in water (Recreation Use)	2006
1221C	Pecan Creek	Hamilton	5b	Bacteria in water (Recreation Use)	2006
1221D	Indian Creek	Comanche	5b	Bacteria in water (Recreation Use)	2006
1221G	Coryell Creek	Coryell	5r	Bacteria in water (Recreation Use)	2020
1222A	Duncan Creek	Comanche	5c	Bacteria in water (Recreation Use)	1999
1222B	Rush-Copperas Creek	Comanche	5c	Bacteria in water (Recreation Use)	2006
1222C	Sabana River	Comanche / Eastland	5c	Bacteria in water (Recreation Use)	2006
1222E	Sweetwater Creek	Comanche	5c	Bacteria in water (Recreation Use)	2006
1223	Leon River Below Leon Reservoir	Comanche / Eastland	5c	Bacteria in water (Recreation Use)	2006
1223	Leon River Below Leon Reservoir	Comanche / Eastland	5c	Depressed dissolved oxygen in water	2008
1226B	Green Creek	Erath	5c	Depressed dissolved oxygen in water	2006
1226G	Spring Creek	Hamilton	5b	Bacteria in water (Recreation Use)	2018
1226K	Little Duffau Creek	Erath	5c	Bacteria in water (Recreation Use)	2006
1227	Nolan River	Hill / Johnson	5c	Bacteria in water (Recreation Use)	2018
1227	Nolan River	Hill / Johnson	5b	Chloride in water	2006
1227	Nolan River	Hill / Johnson	5b	Sulfate in water	2002
1227	Nolan River	Hill / Johnson	5b	Total dissolved solids in water	2006
1228	Lake Pat Cleburne	Johnson	5c	Excessive algal growth in water	2022
1231	Lake Graham	Young	5c	Excessive algal growth in water	2022
1232	Clear Fork Brazos River	Fisher	5c	Bacteria in water (Recreation Use)	2018
1232A	California Creek	Haskell / Jones	5c	Bacteria in water (Recreation Use)	2010
1232A	California Creek	Haskell / Jones	5c	Impaired fish community in water	2016
1237	Lake Sweetwater	Nolan	5c	Chloride in water	2022

Segment Number	Segment Name	County	Category	Parameter of Concern	Year First Listed
1237	Lake Sweetwater	Nolan	5c	Sulfate in water	2022
1237	Lake Sweetwater	Nolan	5c	Total dissolved solids in water	2022
1238	Salt Fork Brazos River	Kent / Crosby	5c	Bacteria in water (Recreation Use)	2020
1238	Salt Fork Brazos River	Kent / Crosby	5c	Chloride in water	2002
1241	Double Mountain Fork Brazos River	Stonewall / Kent	5c	Bacteria in water (Recreation Use)	2010
1241B	Lake Alan Henry	Garza / Kent	5c	Mercury in edible tissue	2010
1242B	Cottonwood Branch	Brazos	5r	Bacteria in water (Recreation Use)	2006
1242C	Still Creek	Brazos	5r	Bacteria in water (Recreation Use)	2006
1242D	Thompsons Creek	Brazos	5b	Bacteria in water (Recreation Use)	2002
1242D	Thompsons Creek	Brazos	5b	Depressed dissolved oxygen in water	2006
1242F	Pond Creek	Falls	5c	Bacteria in water (Recreation Use)	2010
1242I	Campbells Creek	Falls	5c	Bacteria in water (Recreation Use)	2002
1242J	Deer Creek	Falls	5c	Bacteria in water (Recreation Use)	2006
1242K	Mud Creek	Robertson	5b	Bacteria in water (Recreation Use)	2002
1242L	Pin Oak Creek	Robertson	5b	Bacteria in water (Recreation Use)	2002
1242M	Spring Creek	Robertson	5b	Bacteria in water (Recreation Use)	2002
1242N	Tehuacana Creek	Hill / McLennan	5b	Bacteria in water (Recreation Use)	2002
1242O	Walnut Creek	Robertson	5b	Bacteria in water (Recreation Use)	2006
1242P	Big Creek	Falls	5b	Bacteria in water (Recreation Use)	2002
1244	Brushy Creek	Milam / Williamson	5r	Bacteria in water (Recreation Use)	2006
1246E	Wasp Creek	Coryell / McLennan	5b	Bacteria in water (Recreation Use)	2002
1247A	Willis Creek	Williamson	5c	Bacteria in water (Recreation Use)	2002
1248	San Gabriel/North Fork San Gabriel River	Williamson	5c	Chloride in water	2010

Segment Number	Segment Name	County	Category	Parameter of Concern	Year First Listed
1248C	Mankins Branch	Williamson	5c	Bacteria in water (Recreation Use)	2004
1250	South Fork San Gabriel River	Burnet / Williamson	5c	Total dissolved solids in water	2024
1255	Upper North Bosque River	Erath	5c	Bacteria in water (Recreation Use)	1996
1255	Upper North Bosque River	Erath	5c	Depressed dissolved oxygen in water	2008
1255A	Goose Branch	Erath	5c	Bacteria in water (Recreation Use)	2002
1255C	Scarborough Creek	Erath	5c	Bacteria in water (Recreation Use)	2002
1255D	South Fork Upper North Bosque River	Erath	5c	Bacteria in water (Recreation Use)	2010
1255E	Unnamed Tributary of Goose Branch	Erath	5c	Bacteria in water (Recreation Use)	2002
1255G	Woodhollow Branch	Erath	5c	Bacteria in water (Recreation Use)	2002

The TCEQ has the responsibility to identify and prioritize water bodies that may require a TMDL allocation to address the cause and source of water quality impairment.

These water quality issues are beyond the scope of regional water planning activities. The Brazos G RWPG encourages TCEQ and USEPA to take responsibility and pursue their obligation to restore water quality to meet intended uses.

A substantial part of the salt load in the Brazos River is contributed by Croton Creek and Salt Croton Creek. The natural salt pollution producing area is a semi-arid region of salt and gypsum encrusted hills and canyon-like stream valleys. The area is studded with salt springs and seeps. Wherever there is a joint or fracture in the stream bedrock material, the highly mineralized water seeps to the surface under artesian pressure. Massive salt flats, often 400 to 500 acres in size, are formed by this process. Salt and other minerals are also leached out of the adjacent floodplain material that surrounds the salt flats and streams. The Brazos River receives a tremendous salt load when local rainfall is sufficient to dissolve the deposited salt and wash it out of the salt flats. Naturally occurring salinity, commonly measured as total dissolved solids (TDS), has long been recognized as an issue in the Brazos Basin.

The TCEQ has issued a secondary standard for TDS of 1,000 milligrams per liter (mg/L). Water sources with TDS concentrations exceeding this standard are generally considered as low quality and may require higher cost advanced treatment methods for use as a municipal or industrial supply. This concentration is routinely exceeded in the upper Brazos Basin, but tributary inflows of relatively low TDS water gradually reduces TDS concentrations in a downstream direction. TDS concentrations at the Seymour gage equal or exceed the TDS limit in 99.7 percent of the period of record, with a mean concentration of 3,356 mg/L. Further downstream, TDS concentrations average 1,512 mg/L at Possum Kingdom Lake and 928 mg/L at Lake Whitney, exceeding the secondary standard in 93.6 percent of the months and in 40.0 percent of the months, respectively. At College Station, concentrations equal or exceed the TDS limit in 2.2 percent of the months, with an average concentration of 438 mg/L.

Finally, at the Richmond gage, the downstream-most gage with available data (92 river miles above the Gulf of Mexico), TDS concentrations do not exceed the secondary standard and have an average concentration of 339 mg/L.

3.3.2 Comparison of Supplies with Water Quality Standards

Numerous stream segments within the Brazos G Area are listed on the State's 303(d) list for bacteria levels that exceed the standards for contact recreation; however, bacteria, unlike salts, are easily managed through required conventional water treatment to meet drinking water standards.

3.3.3 Special Water Quality Studies and Activities in the Brazos River Basin

There are several special water quality studies that are on-going in the Brazos River Basin as described in the Brazos River Authority's 2022 Basin Summary Report. A list of special studies by basin is provided below.

3.3.3.1 Upper Basin Region

- Biological Assessments of California Creek.

3.3.3.2 Upper Central Basin Activity Region

- Reservoir Fisheries Habitat Improvement Project, a partnership initiated in 2016 between BRA and the Texas Parks and Wildlife Department (TPWD) to perform habitat improvement projects on Possum Kingdom Lake, Lake Granbury, Lake Proctor, Lake Aquilla, Lake Whitney, Lake Belton, Stillhouse Hollow Lake, Lake Georgetown, Lake Granger, Lake Limestone, and Lake Somerville.
- Brazos Basin Instream Flow Monitoring Program to Inform on Environmental Flow Standards, initiated by the BRA in 2012 to perform extensive environmental studies at select locations in the Brazos River basin to gather data related to the Texas Commission on Environmental Quality's adopted Senate Bill 3 environmental flow baseline.
- A Total Maximum Daily Load for Atrazine in Aquilla Reservoir.
- Two Total Maximum Daily Loads for Phosphorus in the North Bosque River.
- Biological Assessments initiated by BRA for long-term aquatic life monitoring on the North Bosque River at Cooper's Crossing in 2008.
- A Watershed Protection Plan for the Leon River developed by stakeholders and approved by the Environmental Protection Agency (EPA) in early 2015 and presently in the implementation phase.
- A Watershed Protection Plan for Nolan Creek/South Nolan Creek developed by the Nolan Creek Watershed Partnership and accepted by the EPA in February 2019.
- Belton Lake, Proctor Lake, and Stillhouse Hollow Lake are part of a Reservoir Fisheries Habitat Improvement project.
- Biological Assessments in Resley Creek (an unclassified tributary of the Leon River) and the Leon River above Belton Lake.
- The Lampasas River Watershed Protection Plan to address bacteria issues in the watershed was approved by the EPA in May 2013 and by a Steering Committee in September 2013 and is in the implementation phase.

3.3.3.3 Lower Central Basin Activity Region

- Big Elm Watershed Protection Plan.
- Candidate Conservation Agreement with Assurances for the Balcones Spike and Texas Fawnsfoot in the Brazos River Basin.
- The U.S. Army Corps of Engineers (USACE) Sustainable Rivers Program presently underway to bring projects to the Little River System which will evaluate reservoir release strategies using the lower fraction of the USACE controlled reservoir flood pools, including Lake Georgetown, Lake Granger, Stillhouse Hollow Lake, and Lake Belton.
- Reservoir Fisheries Habitat Improvement Project
- Characterization of Middle Yegua, Davidson, and Deer Creeks project.
- Watershed Characterization of the Thompsons Creek Watershed.
- TPWD Tehuacana Creek water quality reporting.
- Navasota River Below Lake Limestone Watershed Protection Plan.
- Three Total Maximum Daily Loads for Indicator Bacteria in the Carters Creek Watershed.
- Brazos Basin Instream Flow Monitoring Program to Inform on Environmental Flow Standards.
- Biological Assessments on Duck Creek.

3.3.3.4 Lower Basin Activity Region

- Characterization of Middle Yegua, Davidson, and Deer Creeks.
- Reservoir Fisheries Habitat Improvement.

3.4 Groundwater Availability

Seventeen aquifers underlie parts of the Brazos G Area, including six of the major and eleven of the minor aquifers in Texas[3]. The locations of the major and minor aquifers are shown in Chapter 1 of this report.

3.4.1 Method of Determination

When available, the amount of groundwater available for development is based on the TWDB's determination of modeled available groundwater (MAG), which is based on desired future conditions (DFC), as established by members of Groundwater Conservation Districts within a Groundwater Management Area (GMA). If a groundwater availability model (GAM) is available for an aquifer, it is to be used by the TWDB in making the MAG determination. Otherwise, the TWDB uses analytical methods.

In the Brazos G Area, an official MAG has been determined by the TWDB at the county and river basin level for each of the delineated aquifers. The GMAs are shown in Figure 3.18.

In general terms, the MAG represents the annual volume of groundwater available which may be developed and, according to modeling, will still maintain aquifer parameters within the criteria established in the aquifer DFCs. When evaluating proposed pumping for regulatory approval, the MAG serves as a guideline and may be one of multiple guidelines referenced. However, for planning purposes, the MAGs are considered hard caps of which annual groundwater production cannot exceed.

[3] Texas Water Development Board, Water for Texas, 2019.

The MAG determination is based upon drought-of-record conditions which would occur simultaneously with increased, dry-year demands.

For aquifers without an adopted MAG, the TWDB provided "total availability" estimates that are based on results from groundwater modeling during the development of the MAGs for other aquifers. For other aquifers, Brazos G utilized the groundwater availability estimate carried forward from the 2021 Brazos G Regional Water Plan; these were determined based on a variety of sources, predominately information from historical TWDB groundwater reports and the TWDB groundwater database.

Table 3.12 summarizes groundwater availability by county and aquifer. The sources of the estimates are described in Appendix B. The distribution of groundwater availability is summarized into western, central and southeastern areas. As tabulated in Table 3.13 and shown in Figure 3.18, the groundwater in the Brazos G Area is not uniformly distributed, with about 15 percent occurring in the western area, about 33 percent in the central area, and about 52 percent in the eastern area.

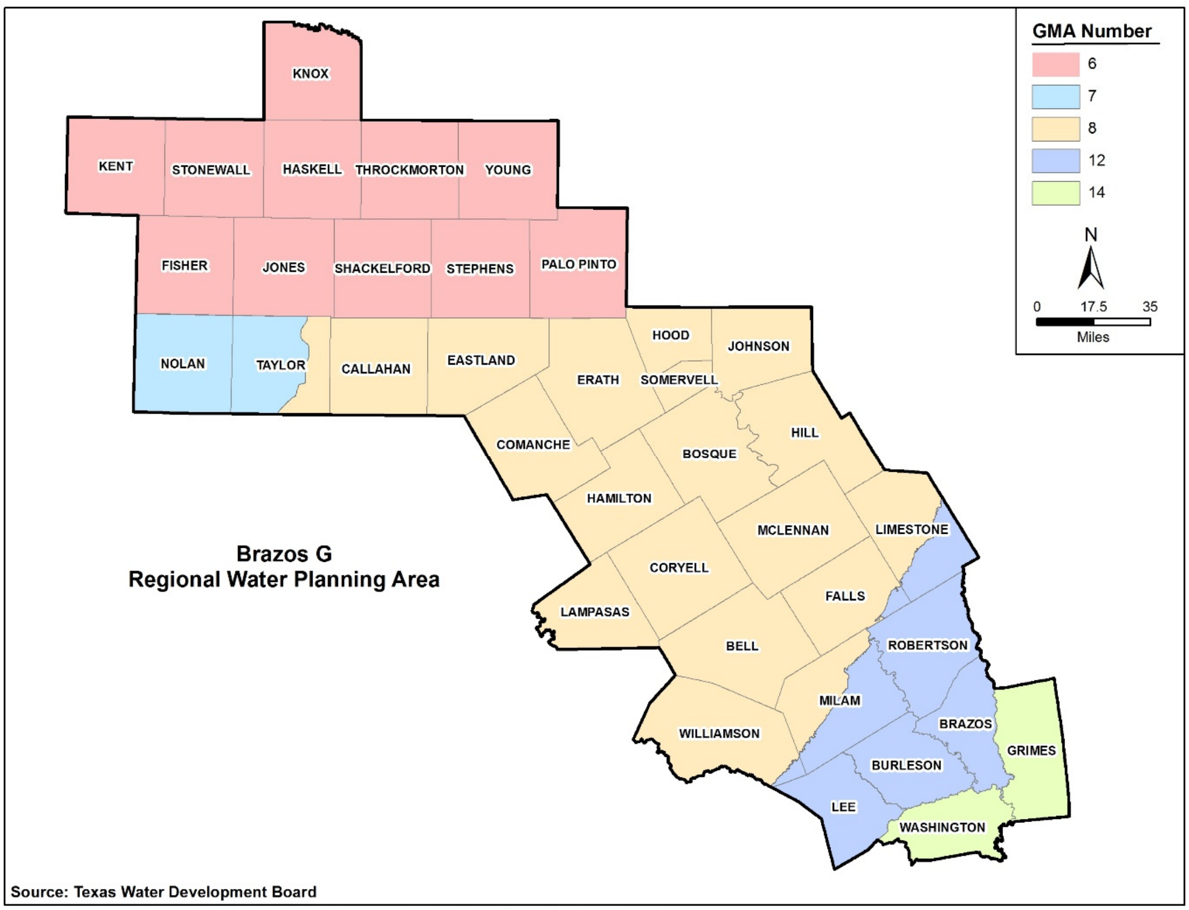

Figure 3.18 Groundwater Management Areas in Brazos G

Table 3.12 Groundwater Availability Used in the 2026 Brazos G Regional Water Plan

County	Aquifer	Availability (acre-feet/year)					
		2030	2040	2050	2060	2070	2080
Bell	Edwards-BFZ (N. Segment)	6,469	6,469	6,469	6,469	6,469	6,469
Bell	Trinity	9,275	9,275	9,275	9,275	9,275	9,275
Bell	**Subtotal**	**15,744**	**15,744**	**15,744**	**15,744**	**15,744**	**15,744**
Bosque	Brazos River Alluvium A	830	830	830	830	830	830
Bosque	Trinity	8,769	8,769	8,769	8,769	8,769	8,769
Bosque	**Subtotal**	**9,599**	**9,599**	**9,599**	**9,599**	**9,599**	**9,599**
Brazos	Brazos River Alluvium	76,978	76,393	76,195	76,100	76,039	76,039
Brazos	Carrizo-Wilcox	44,153	50,160	56,168	62,176	68,184	68,184
Brazos	Gulf Coast(1)	1,189	1,189	1,189	1,189	1,189	1,189
Brazos	Queen City	245	357	469	582	694	694
Brazos	Sparta	6,014	7,545	9,076	10,607	12,138	12,138
Brazos	Yegua-Jackson	6,270	7,092	7,091	7,091	7,091	7,091
Brazos	**Subtotal(2)**	**134,849**	**142,736**	**150,188**	**157,745**	**165,335**	**165,335**
Burleson	Brazos River Alluvium	32,207	32,207	32,206	32,206	32,206	32,206
Burleson	Carrizo-Wilcox	56,468	65,638	69,407	69,579	69,750	69,750
Burleson	Queen City	3,090	3,467	3,883	4,344	4,863	4,863
Burleson	Sparta	2,840	3,131	3,437	3,760	4,105	4,105
Burleson	Yegua-Jackson	5,315	7,004	7,004	7,000	6,058	6,058
Burleson	**Subtotal**	**99,920**	**111,447**	**115,937**	**116,889**	**116,982**	**116,982**
Callahan	Trinity	1,726	1,726	1,726	1,726	1,726	1,726
Callahan	**Subtotal**	**1,726**	**1,726**	**1,726**	**1,726**	**1,726**	**1,726**
Comanche	Trinity	12,047	12,047	12,047	12,047	12,047	12,047
Comanche	**Subtotal**	**12,047**	**12,047**	**12,047**	**12,047**	**12,047**	**12,047**
Coryell	Trinity	4,494	4,494	4,494	4,494	4,494	4,494
Coryell	**Subtotal**	**4,494**	**4,494**	**4,494**	**4,494**	**4,494**	**4,494**
Eastland	Trinity	5,736	5,736	5,736	5,736	5,736	5,736
Eastland	**Subtotal**	**5,736**	**5,736**	**5,736**	**5,736**	**5,736**	**5,736**
Erath	Trinity	20,607	20,607	20,607	20,607	20,607	20,607
Erath	**Subtotal**	**20,607**	**20,607**	**20,607**	**20,607**	**20,607**	**20,607**
Falls	Brazos River Alluvium A	16,684	16,684	16,684	16,684	16,684	16,684
Falls	Carrizo-Wilcox	46	50	56	62	69	69
Falls	Trinity	1,435	1,435	1,435	1,435	1,435	1,435
Falls	**Subtotal**	**18,165**	**18,169**	**18,175**	**18,181**	**18,188**	**18,188**
Fisher	Blaine	12,820	12,820	12,820	12,820	12,820	12,820
Fisher	Dockum	79	79	79	79	79	79

County	Aquifer	Availability (acre-feet/year)					
		2030	2040	2050	2060	2070	2080
Fisher	Seymour	6,132	6,132	6,472	6,473	6,131	5,900
Fisher	**Subtotal**	**19,031**	**19,031**	**19,371**	**19,372**	**19,030**	**18,799**
Grimes	Brazos River Alluvium(1)	5,112	5,112	5,112	5,112	5,112	5,112
Grimes	Carrizo-Wilcox(1)	4	4	4	4	12	4
Grimes	Gulf Coast	51,487	51,487	51,487	51,487	51,487	51,487
Grimes	Navasota River Alluvium(1)	2,216	2,216	2,216	2,216	2,216	2,216
Grimes	Queen City(1)	0	0	0	0	0	0
Grimes	Sparta(1)	0	0	0	0	0	0
Grimes	Yegua-Jackson(1)	787	787	787	787	787	787
Grimes	**Subtotal**	**59,606**	**59,606**	**59,606**	**59,606**	**59,614**	**59,606**
Hamilton	Trinity	2,427	2,427	2,427	2,427	2,427	2,427
Hamilton	**Subtotal**	**2,427**	**2,427**	**2,427**	**2,427**	**2,427**	**2,427**
Haskell	Seymour	41,638	41,752	41,638	41,752	41,638	41,752
Haskell	**Subtotal**	**41,638**	**41,752**	**41,638**	**41,752**	**41,638**	**41,752**
Hill	Brazos River Alluvium(1)	632	632	632	632	632	632
Hill	Trinity	5,152	5,152	5,152	5,152	5,152	5,152
Hill	Woodbine	586	586	586	586	586	586
Hill	**Subtotal**	**6,370**	**6,370**	**6,370**	**6,370**	**6,370**	**6,370**
Hood	Trinity	16,839	16,839	16,839	16,839	16,839	16,839
Hood	**Subtotal**	**16,839**	**16,839**	**16,839**	**16,839**	**16,839**	**16,839**
Johnson	Trinity	8,825	8,825	8,825	8,825	8,825	8,825
Johnson	Woodbine	1,981	1,981	1,981	1,981	1,981	1,981
Johnson	**Subtotal**	**10,806**	**10,806**	**10,806**	**10,806**	**10,806**	**10,806**
Jones	Seymour(1)	3,552	3,554	3,554	3,557	3,560	3,563
Jones	**Subtotal**	**3,552**	**3,554**	**3,554**	**3,557**	**3,560**	**3,563**
Kent	Dockum(1)	6,250	6,250	6,250	6,250	6,250	6,250
Kent	Seymour(1)	1,180	1,180	1,179	1,179	1,179	1,179
Kent	**Subtotal**	**7,430**	**7,430**	**7,429**	**7,429**	**7,429**	**7,429**
Knox	Blaine(1)	700	700	700	700	700	700
Knox	Seymour	26,640	26,222	26,530	29,157	26,973	26,807
Knox	**Subtotal**	**27,340**	**26,922**	**27,230**	**29,857**	**27,673**	**27,507**
Lampasas	Ellenburger-San Saba	2,595	2,595	2,595	2,595	2,595	2,595
Lampasas	Hickory	113	113	113	113	113	113
Lampasas	Marble Falls	2,839	2,839	2,839	2,839	2,839	2,839
Lampasas	Trinity	1,661	1,661	1,661	1,661	1,661	1,661
Lampasas	**Subtotal**	**7,208**	**7,208**	**7,208**	**7,208**	**7,208**	**7,208**

County	Aquifer	Availability (acre-feet/year)					
		2030	2040	2050	2060	2070	2080
Lee	Carrizo-Wilcox	29,283	30,948	32,683	34,517	36,187	36,187
Lee	Queen City	700	767	839	917	1,000	1,000
Lee	Sparta	809	975	1,181	1,434	1,751	1,751
Lee	Trinity	0	0	0	0	0	0
Lee	Yegua-Jackson(1)	662	662	662	662	662	662
Lee	**Subtotal**	**31,454**	**33,352**	**35,365**	**37,530**	**39,600**	**39,600**
Limestone	Carrizo-Wilcox	960	1,059	1,168	1,288	1,422	1,422
Limestone	Trinity	0	0	0	0	0	0
Limestone	**Subtotal**	**960**	**1,059**	**1,168**	**1,288**	**1,422**	**1,422**
McLennan	Brazos River Alluvium(1)	15,023	15,023	15,023	15,023	15,023	15,023
McLennan	Trinity	20,649	20,649	20,649	20,649	20,649	20,649
McLennan	Woodbine	0	0	0	0	0	0
McLennan	**Subtotal**	**35,672**	**35,672**	**35,672**	**35,672**	**35,672**	**35,672**
Milam	Brazos River Alluvium	31,375	31,366	31,362	31,359	31,358	31,358
Milam	Carrizo-Wilcox	31,300	32,246	33,283	34,431	35,710	35,710
Milam	Queen City	1,348	1,643	2,003	2,441	2,976	2,976
Milam	Trinity	0	0	0	0	0	0
Milam	**Subtotal**	**64,023**	**65,255**	**66,648**	**68,231**	**70,044**	**70,044**
Nolan	Blaine(1)	100	100	100	100	100	100
Nolan	Dockum(1)	5,750	5,750	5,750	5,750	5,750	5,750
Nolan	Edwards-Trinity (Plateau) (1)	693	693	693	693	693	693
Nolan	**Subtotal**	**6,543**	**6,543**	**6,543**	**6,543**	**6,543**	**6,543**
Palo Pinto	Trinity(1)	1	1	1	1	1	1
Palo Pinto	**Subtotal**	**1**	**1**	**1**	**1**	**1**	**1**
Robertson	Brazos River Alluvium	55,424	55,157	54,839	54,723	54,618	54,618
Robertson	Carrizo-Wilcox	49,164	58,979	68,795	78,609	88,424	88,424
Robertson	Queen City	144	252	359	467	575	575
Robertson	Sparta	338	509	680	851	1,022	1,022
Robertson	**Subtotal**	**105,070**	**114,897**	**124,673**	**134,650**	**144,639**	**144,639**
Shackelford	Cross Timbers(1)	712	712	712	712	712	712
Shackelford	Other (Local) Aquifer(1)	97	97	97	97	97	97
Shackelford	**Subtotal**	**809**	**809**	**809**	**809**	**809**	**809**
Somervell	Trinity	1,988	1,988	1,988	1,988	1,988	1,988
Somervell	**Subtotal**	**1,988**	**1,988**	**1,988**	**1,988**	**1,988**	**1,988**

County	Aquifer	Availability (acre-feet/year)					
		2030	2040	2050	2060	2070	2080
Stephens	Cross Timbers(1)	620	620	620	620	620	620
Stephens	Other (Local) Aquifer(1)	85	85	85	85	85	85
Stephens	**Subtotal**	**705**	**705**	**705**	**705**	**705**	**705**
Stonewall	Blaine(1)	8,700	8,700	8,700	8,700	8,700	8,700
Stonewall	Seymour(1)	254	254	253	254	253	254
Stonewall	**Subtotal**	**8,954**	**8,954**	**8,953**	**8,954**	**8,953**	**8,954**
Taylor	Edwards-Trinity (Plateau)(1)	489	489	489	489	489	489
Taylor	Trinity	14	14	14	14	14	14
Taylor	**Subtotal**	**503**	**503**	**503**	**503**	**503**	**503**
Throckmorton	Seymour(1)	115	115	115	115	115	115
Throckmorton	Cross Timbers(1)	364	364	364	364	364	364
Throckmorton	**Subtotal**	**479**	**479**	**479**	**479**	**479**	**479**
Washington	Brazos River Alluvium(1)	5,770	5,770	5,770	5,770	5,770	5,770
Washington	Gulf Coast	40,397	40,397	40,397	40,397	40,397	40,397
Washington	Yegua-Jackson(1)	157	157	157	157	157	157
Washington	**Subtotal**	**46,324**	**46,324**	**46,324**	**46,324**	**46,324**	**46,324**
Williamson	Carrizo-Wilcox	140	155	171	189	208	208
Williamson	Edwards-BFZ	3,462	3,462	3,462	3,462	3,462	3,462
Williamson	Hickory	0	0	0	0	0	0
Williamson	Trinity	3,698	3,698	3,698	3,698	3,698	3,698
Williamson	Other (Local) Aquifer(1)	665	665	665	665	665	665
Williamson	**Subtotal**	**7,965**	**7,980**	**7,996**	**8,014**	**8,033**	**8,033**
Young	Seymour(1)	258	258	258	258	258	258
Young	Cross Timbers(1)	1,718	1,718	1,718	1,718	1,718	1,718
Young	**Subtotal**	**1,976**	**1,976**	**1,976**	**1,976**	**1,976**	**1,976**

Notes:
Abbreviations: BFZ = Balcones Fault Zone.
(1) Indicates Non-MAG availability estimate.
(2) Values calculated using MAG Peak Factor for the Carrizo-Wilcox Aquifer in Brazos County.

Table 3.13 Groundwater Availability from the Brazos G Area Aquifers

Aquifer	2080 Groundwater Availability (acft/yr)	Typical Range in Well Yields (gpm)
Western Area		
Blaine	22,320	less than 25
Cross Timbers	3,414	5 to 300
Dockum	12,079	100 to 400
Other (Local) Aquifers	182	5 to 300
Edwards-Trinity-Plateau(1)	1,182	5 to 300
Seymour	79,828	100 to 1,000
Subtotal: 119,005		
Central Area		
Edwards-BFZ(2)	9,931	200 to 2,000
Ellenburger-San Saba	2,595	Unknown
Hickory	113	Unknown
Marble Falls	2,839	less than 100
Trinity	125,343	50 to 500
Woodbine	2,567	50 to 150
Subtotal: 143,388		
Southeastern Area		
Brazos River Alluvium	238,272	250 to 500
Carrizo-Wilcox	299,958	100 to 3,000
Gulf Coast	93,073	300 to 800
Navasota River Alluvium	2,216	Unknown
Other (Local) Aquifers	665	5 to 300
Queen City	10,108	200 to 500
Sparta	19,016	200 to 600
Yegua-Jackson	14,755	50 to 300
Subtotal: 678,063		
Total: 940,456		

Notes:
(1) Includes supply from Pecos Valley Aquifer and part of Trinity Aquifer.
(2) BFZ = Balcones Fault Zone.

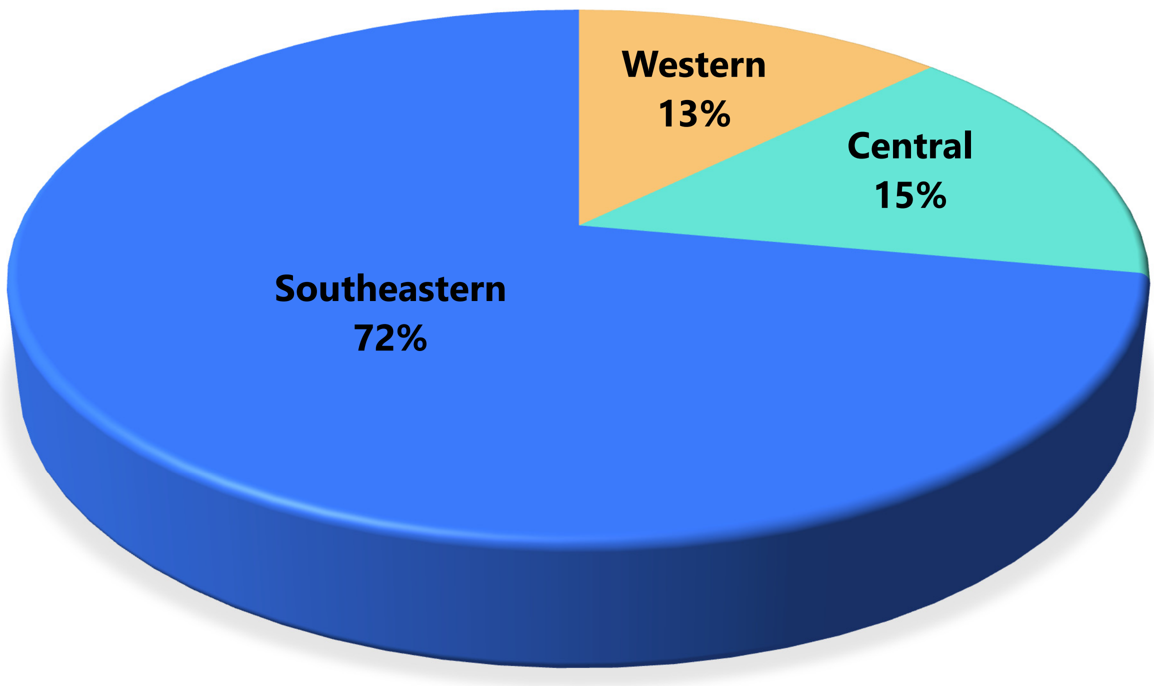

Figure 3.19 Distribution of Groundwater by Area within Brazos G

3.4.2 Western Area

As shown in Figure 3.20 and Figure 3.21, the aquifers underlaying the Western Area of the Brazos G Planning Region are Blaine, Cross Timbers, Dockum, Edwards-Trinity (Plateau), and Seymour. Together, the five aquifers, as well as other (local) aquifers, can supply up to 119,005 ac-ft/yr. Of the five aquifers, the Seymour Aquifer has about 67 percent (Figure 3.22) of the supplies and is scattered in nine counties; however, about 86 percent of the supply is in Knox and Haskell counties. The Blaine aquifer contributes the second-most amount of supplies in the area, or 19 percent. The Dockum Aquifer exists only on the western fringe and can contribute about 10 percent of the groundwater supply in the area. The Cross Timbers and Edwards-Trinity-Plateau aquifers contribute 3 and 1 percent of the groundwater supply in the area, respectively. Undifferentiated aquifers underlie some of the area, including in Shackelford and Stephens counties. At best, the undifferentiated aquifers can provide only meager supplies for livestock and domestic uses.

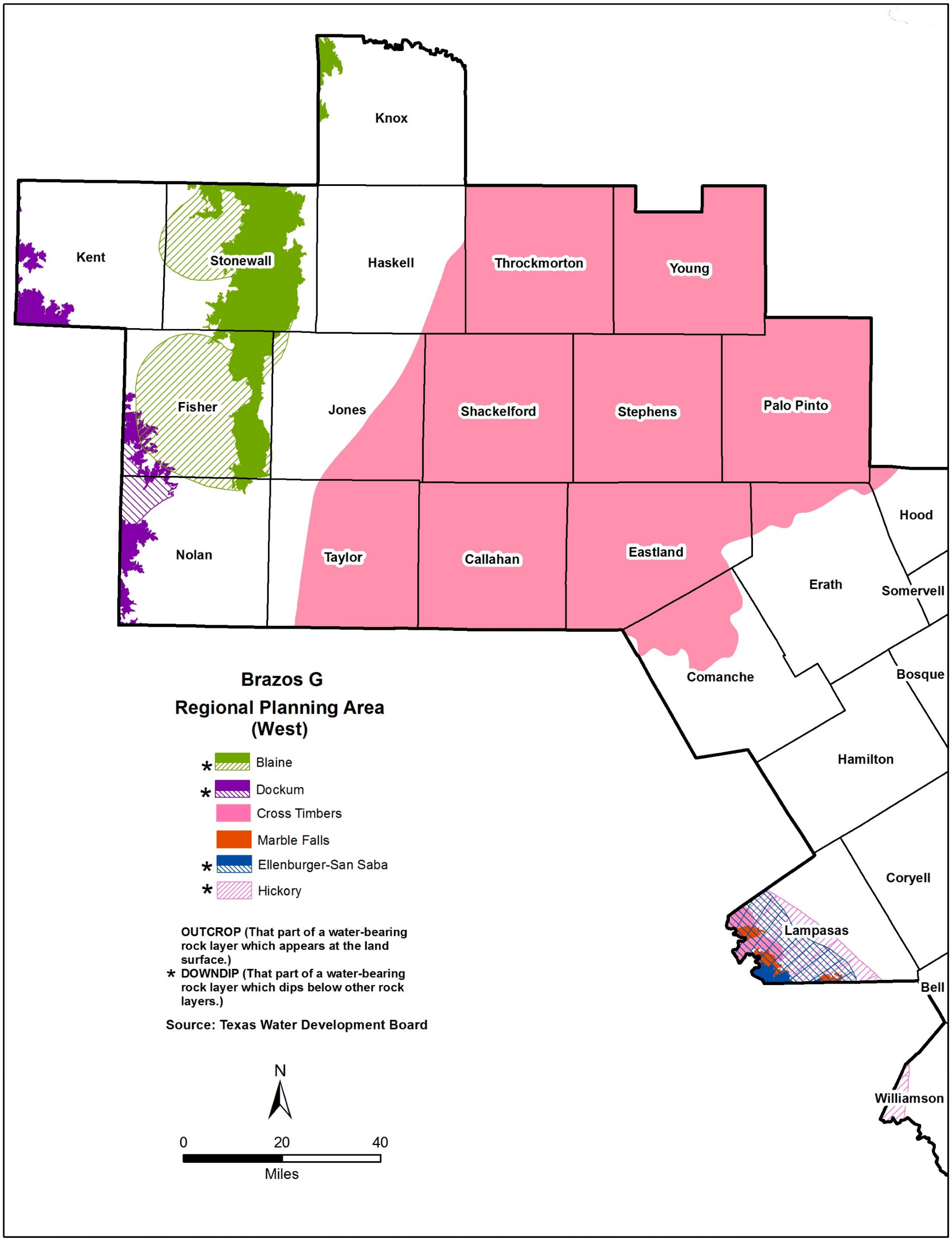

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Figure 3.20 Major Aquifers in the Western Area

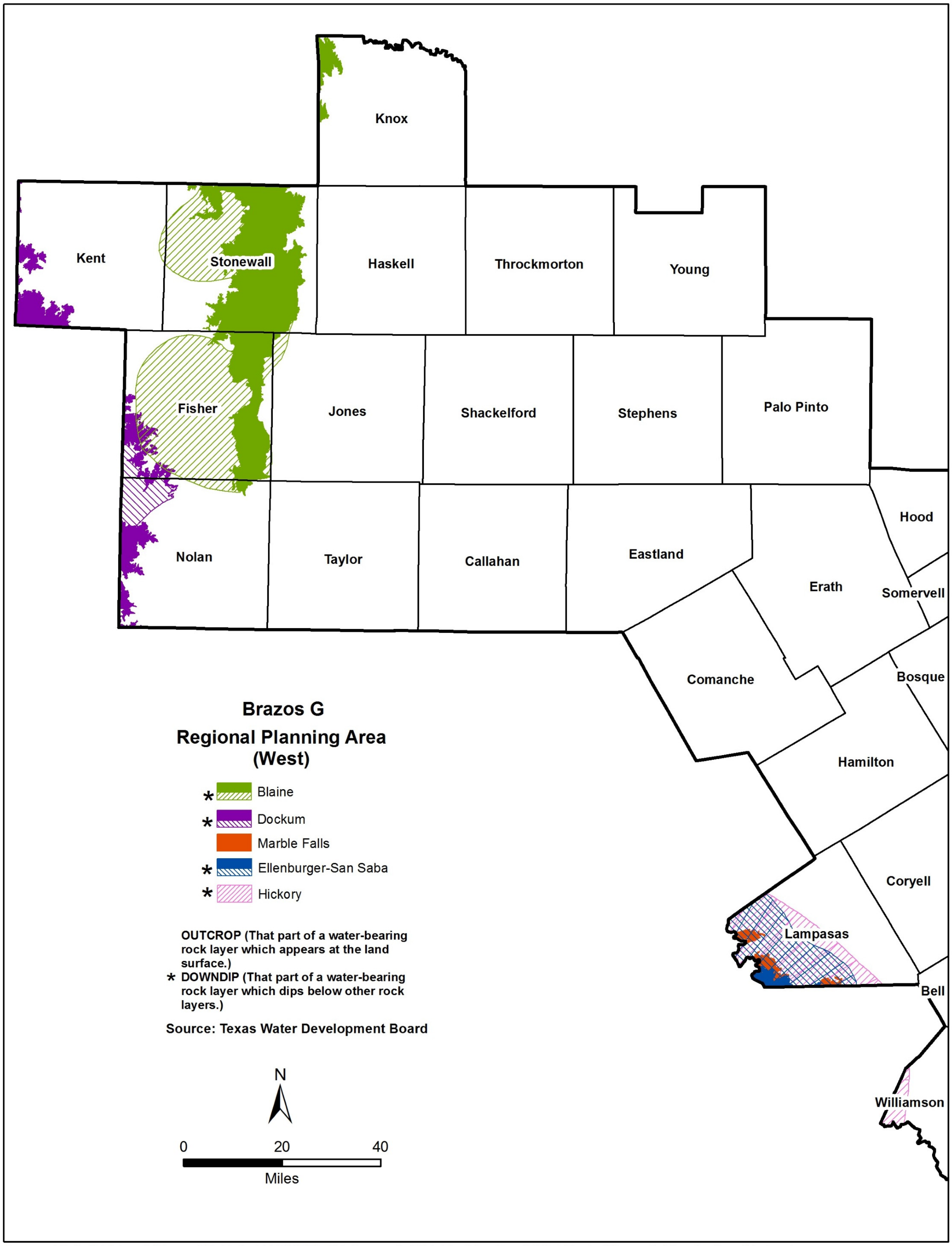

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Figure 3.21 Minor Aquifers in the Western Area

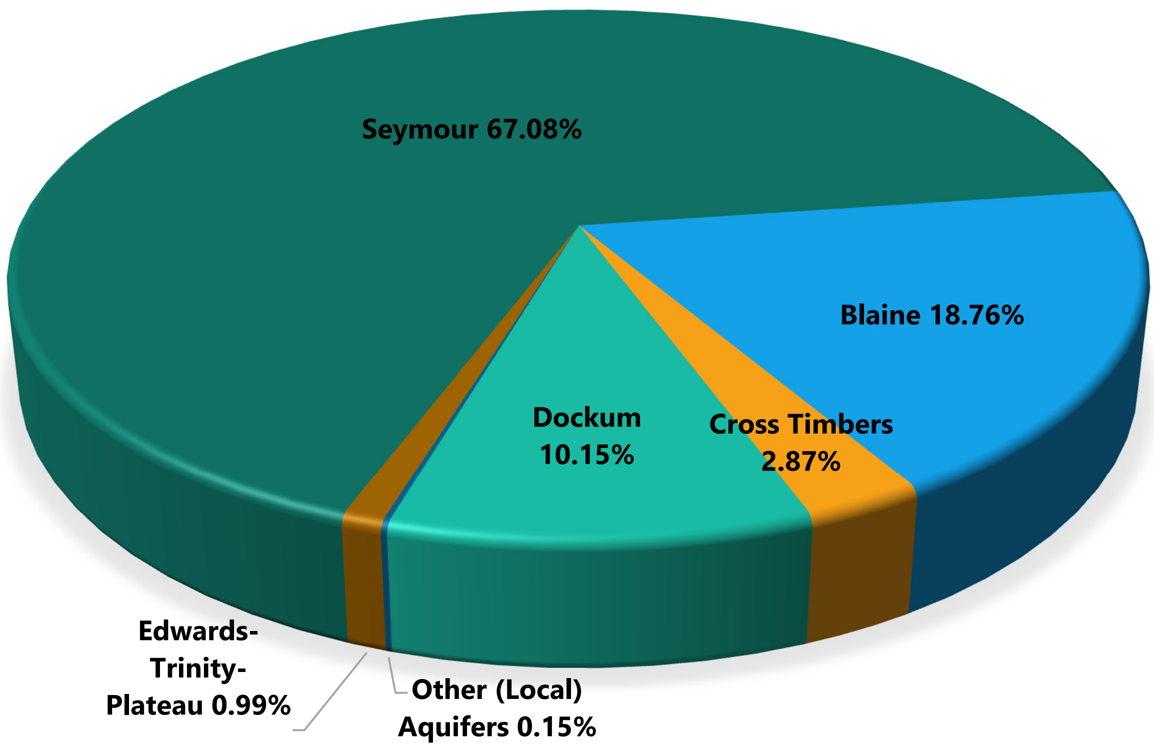

Figure 3.22 Groundwater Availability in the Western Area

3.4.3 Central Area

As seen in Figure 3.23 and Figure 3.24, major and minor aquifers exist the central area of the Brazos G Planning Region. Together, the six aquifers (Edwards-BFZ, Ellenburger-San Saba, Hickory, Marble Falls, Trinity, and Woodbine) can provide up to 143,388 ac-ft/yr. Of these aquifers, the Trinity Aquifer is most extensive and has about 87 percent of the supplies (Figure 3.25). Although the Trinity Aquifer as a whole can provide 125,343 ac-ft/yr, local areas have experienced very substantial drawdowns and probably will require many wells to be replaced with larger and deeper ones. The Edwards-BFZ exists only in parts of Bell and Williamson counties and has about 7 percent of the area's groundwater supply.

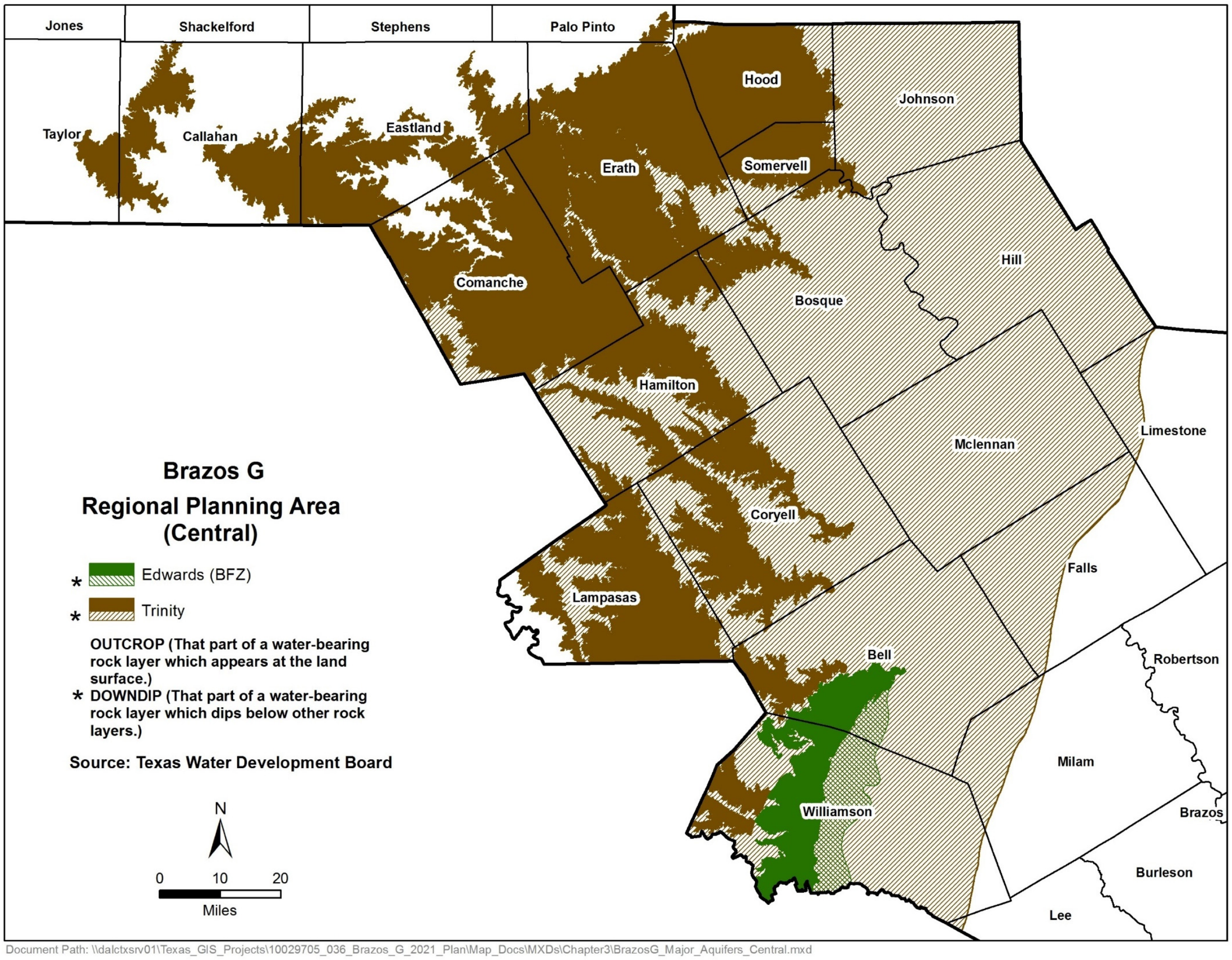

Figure 3.23 Major Aquifers in the Central Area

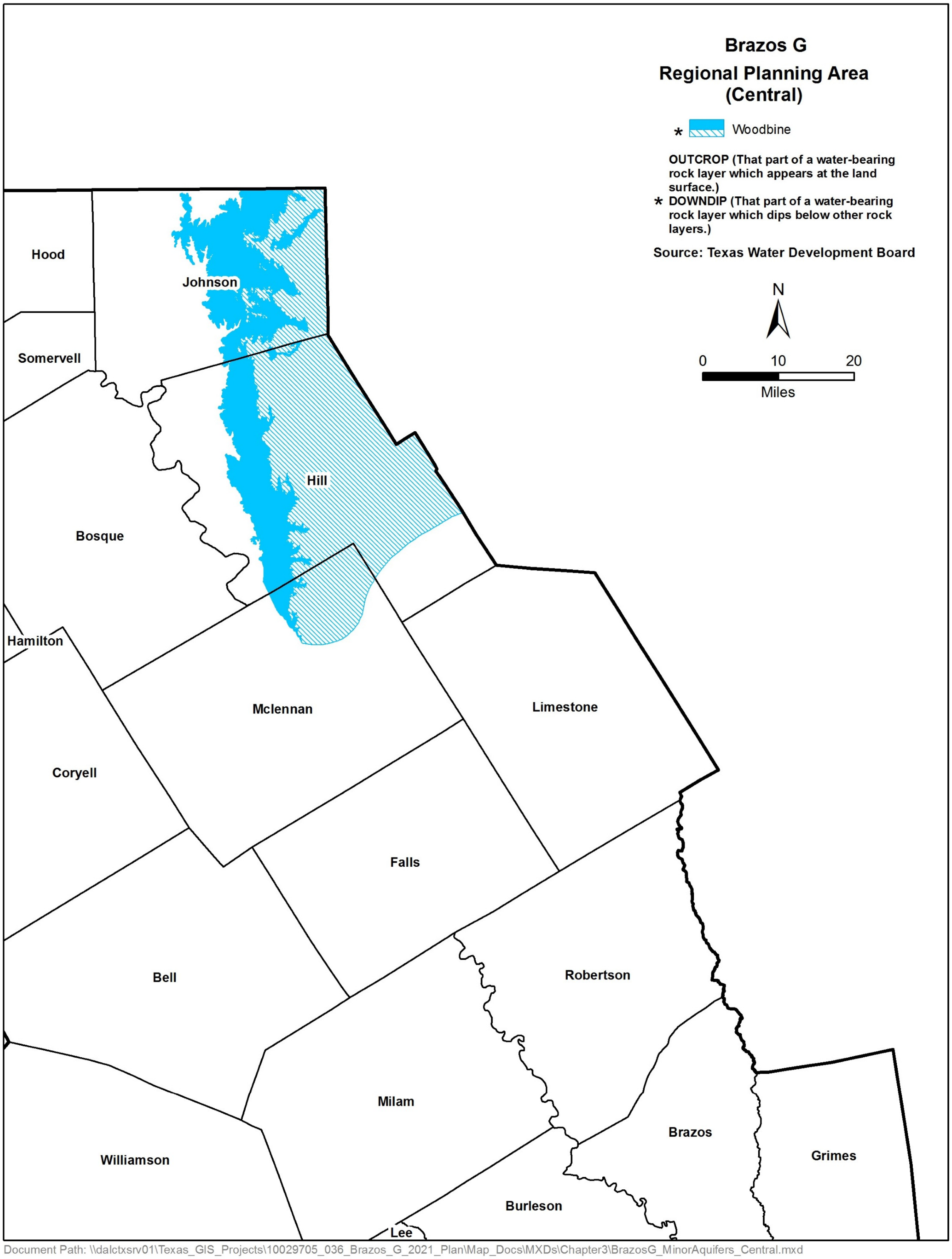

Figure 3.24 Minor Aquifers in the Central Area

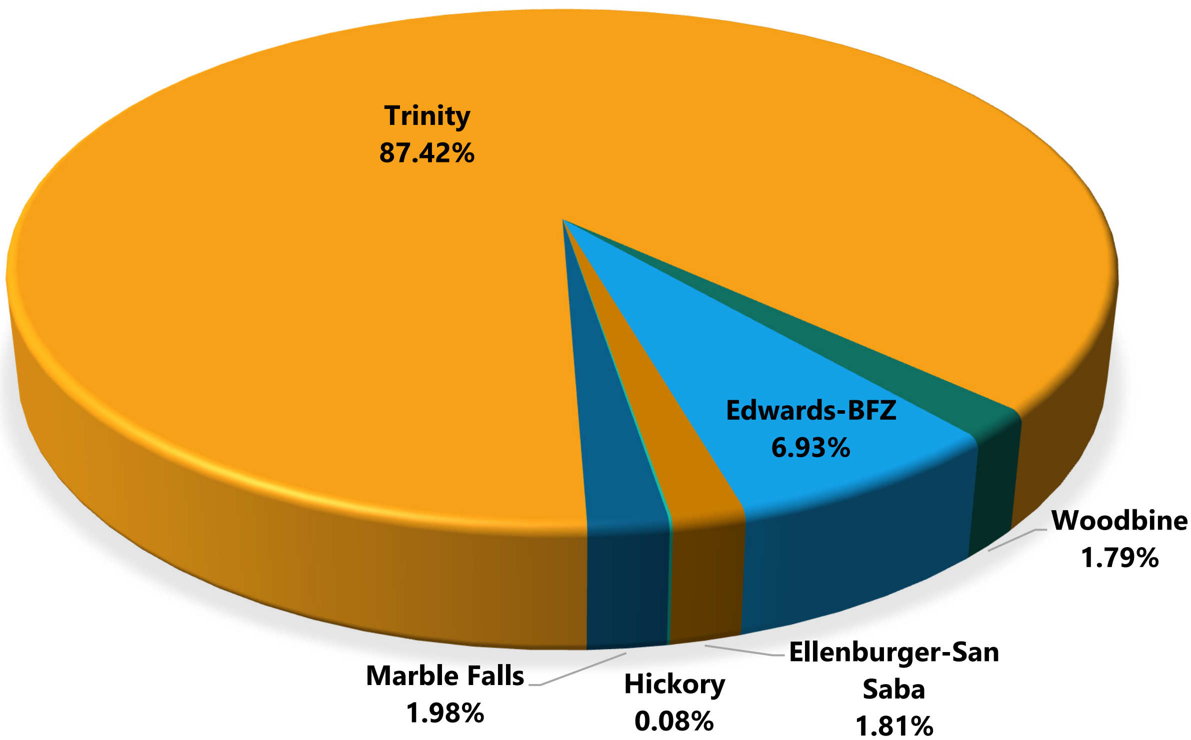

Figure 3.25 Groundwater Availability in the Central Area

3.4.4 Southeastern Area

As seen in Figure 3.26 and Figure 3.27, major and minor aquifers exist throughout the southeastern area in the Brazos G Planning Region. Together, the seven aquifers (Brazos River Alluvium, Carrizo-Wilcox, Gulf Coast, Navasota River Alluvium, Queen City, Sparta, and Yegua-Jackson), as well as other (local) aquifers, can provide up to 678,063 ac-ft/yr. Of these aquifers, the Carrizo-Wilcox Aquifer and Brazos River Alluvium Aquifers are most extensive and represents 44 and 35 percent of the supplies, respectively (Figure 3.28).

3.5 Supplies from Other Regions

Multiple entities within the Brazos G Area obtain water from sources owned by entities located outside of the region. These other sources include the Edwards Trinity Plateau Aquifer, Lake Benbrook, Brownwood Reservoir, Navarro Mills Reservoir, the Colorado River MWD System, Lake Livingston (Trinity River Authority), Lake Corsicana, Halbert Lake, OH Ivie Lake, the Cross Timbers Aquifer, Richland Chambers and/or Cedar Creek Reservoirs (TRWD), and the Highland Lakes System (LCRA). Table 3.14 summarizes the current supplies from other regions to the Brazos G Area.

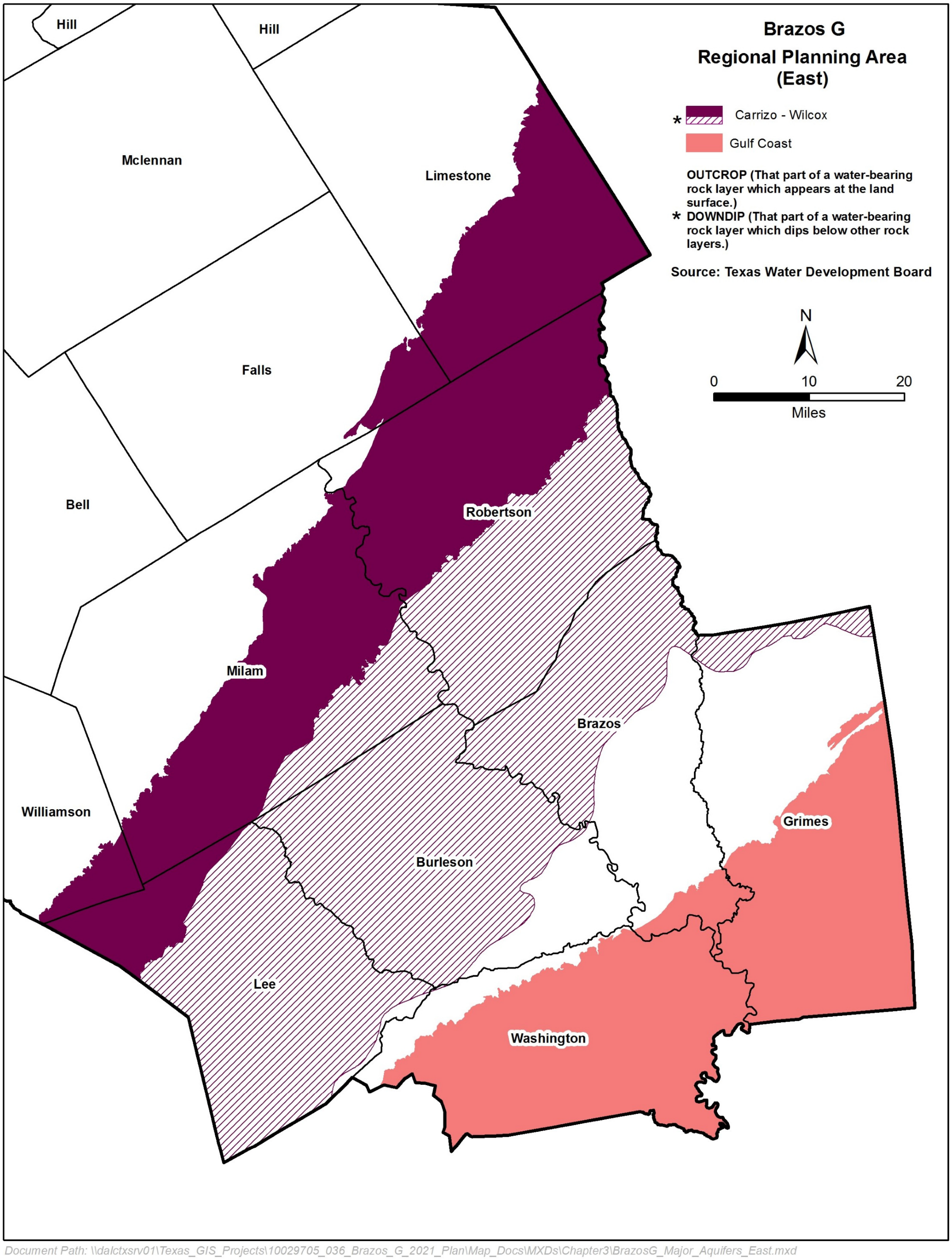

Figure 3.26 Major Aquifers in the Eastern Area

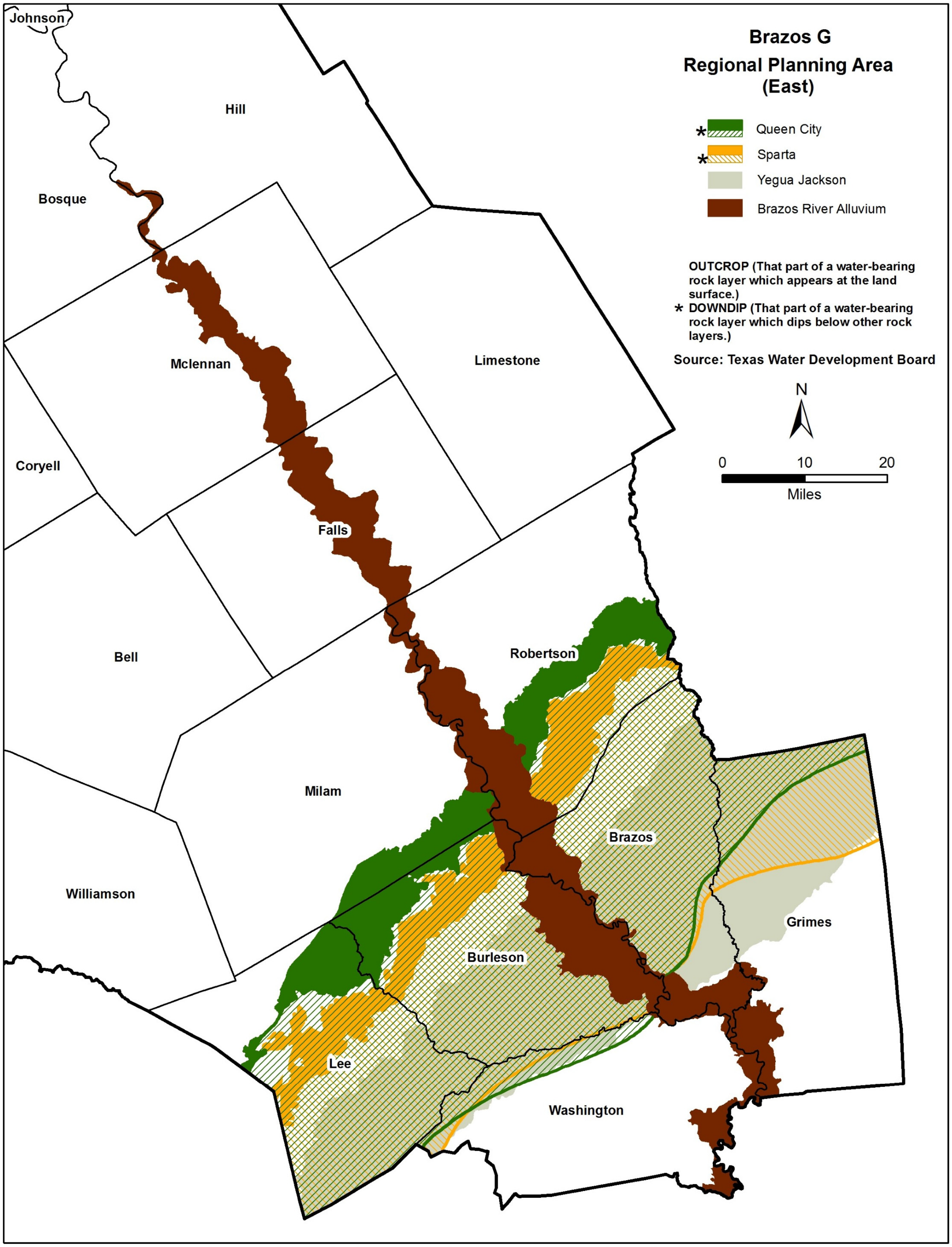

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Figure 3.27 Minor Aquifers in the Eastern Area

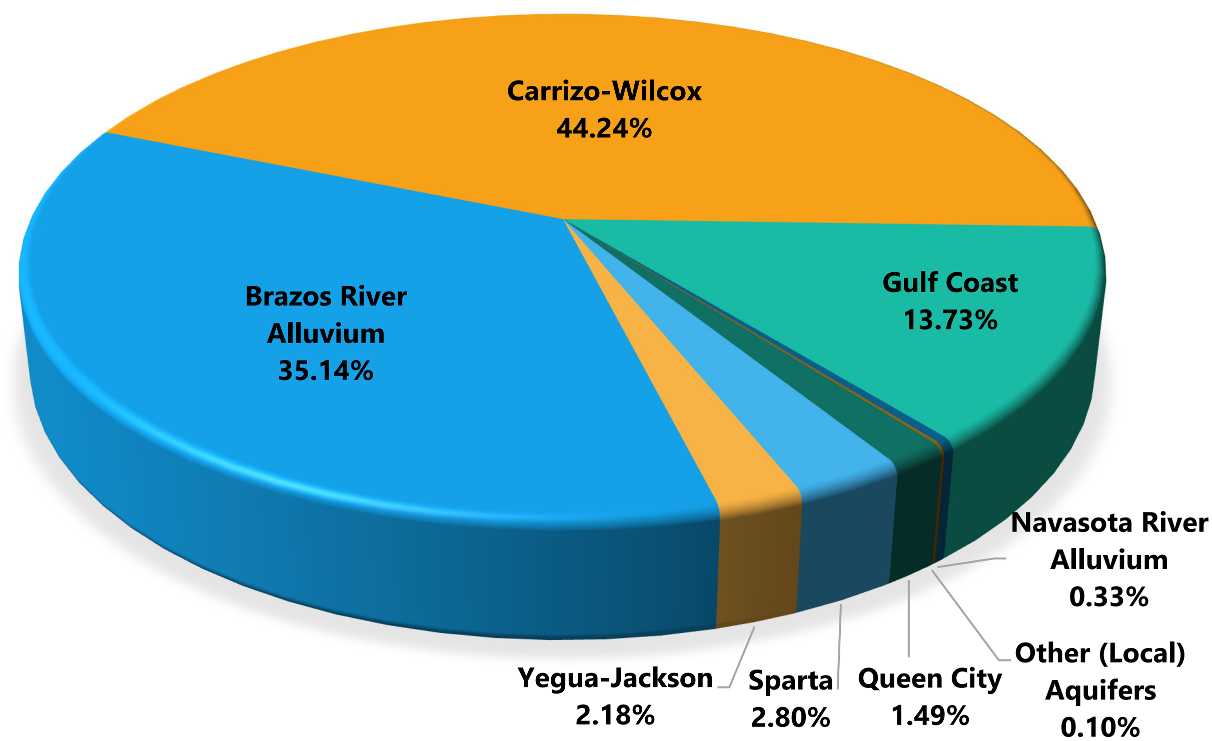

Figure 3.28 Groundwater Availability in the Southeastern Area

Table 3.14 Water Supplies from Other Regions

Receiving Entity	Supplier	Source(1)	Source Region	Contract Amount or Amount Supplied in 2030 (ac-ft)
Abilene	Colorado River MWD	OH Ivie Lake/Reservoir Non-System Portion	F	4721
Baird	Abilene (from CRMWD)	OH Ivie Lake/Reservoir Non-System Portion	F	77
Baylor SUD	Self-supplied	Seymour Aquifer | Baylor County	B	28
Bethesda WSC	Arlington	TRWD Lake/Reservoir System	C	1362
Bethesda WSC	Fort Worth	TRWD Lake/Reservoir System	C	2896
Bethesda WSC	Self-supplied	Trinity Aquifer | Tarrant County	C	1736
Birome WSC	Post Oak SUD	Corsicana Richland Chambers-Halbert Lake/Reservoir System & Navarro Mills lake	C	147
Block House MUD	Cedar Park	Highland Lakes Lake/Reservoir System	K	1098
Burleson	Fort Worth	TRWD Lake/Reservoir System	C	7076
Cedar Park	Lower Colorado River Authority	Highland Lakes Lake/Reservoir System	K	21451
Clyde	Abilene (from CRMWD)	OH Ivie Lake/Reservoir Non-System Portion	F	407
Coleman County SUD	Brookesmith SUD	Brownwood Lake/Reservoir	F	718

Receiving Entity	Supplier	Source(1)	Source Region	Contract Amount or Amount Supplied in 2030 (ac-ft)
Coleman County SUD	Coleman	Coleman Lake/Reservoir & Hords Creek Lake	F	0
Coolidge	Post Oak SUD	Corsicana Richland Chambers-Halbert Lake/Reservoir System & Navarro Mills Lake	C	183
County-Other, Hill	Corsicana	Corsicana Richland Chambers-Halbert Lake/Reservoir System & Navarro Mills Lake	C	235
County-Other, Johnson	Grand Prairie	Fork Lake/Reservoir, Ray Hubbard Lake, Ray Roberts-Lewisville-Grapevine Lake/Reservoir System, Tawakoni Lake	D & C	628
County-Other, Johnson	Johnson County SUD	TRWD Lake/Reservoir System	C	2290
County-Other, Taylor	Abilene (from CRMWD)	OH Ivie Lake/Reservoir Non-System Portion	F	165
County-Other, Williamson	Cedar Park	Highland Lakes Lake/Reservoir System	K	13
County-Other, Young	Self-supplied	Cross Timbers Aquifer	B	41
Crowley	Fort Worth	TRWD Lake/Reservoir System	C	2798
Eula WSC	Abilene (from CRMWD)	OH Ivie Lake/Reservoir Non-System Portion	F	61
Fort Worth	Tarrant Regional WD	TRWD Lake/Reservoir System	C	254652
Hamby WSC	Abilene (from CRMWD)	OH Ivie Lake/Reservoir Non-System Portion	F	176
Hawley WSC	Abilene (from CRMWD)	OH Ivie Lake/Reservoir Non-System Portion	F	307
Hubbard	Post Oak SUD	Corsicana Richland Chambers-Halbert Lake/Reservoir System & Navarro Mills lake	C	149
Hutto	Manville WSC	Colorado River Alluvium Aquifer & Edwards-BFZ Aquifer	K	462
Johnson County SUD	Mansfield	TRWD Lake/Reservoir System	C	6255
Lakeside MUD 3	Manville WSC	Highland Lakes Lake/Reservoir System	K	345
Lawn	Abilene (from CRMWD)	OH Ivie Lake/Reservoir Non-System Portion	F	47
Leander	Lower Colorado River Authority	Highland Lakes Lake/Reservoir System	K	24000
Mansfield	Tarrant Regional WD	TRWD Lake/Reservoir System	C	39544
Manufacturing, Fisher	Rotan	Edwards-Trinity-Plateau and Pecos Valley Aquifers	F	4
Manufacturing, Johnson	Burleson	TRWD Lake/Reservoir System	C	2
Manufacturing, Taylor	Abilene (from CRMWD)	OH Ivie Lake/Reservoir Non-System Portion	F	671
Manufacturing, Williamson	Cedar Park	Highland Lakes Lake/Reservoir System	K	347

Receiving Entity	Supplier	Source(1)	Source Region	Contract Amount or Amount Supplied in 2030 (ac-ft)
Manufacturing, Young	Olney	Olney-Cooper Lake/Reservoir System	B	68
Manville WSC	Self-supplied	Trinity Aquifer	K	280
Merkel	Abilene (from CRMWD)	OH Ivie Lake/Reservoir Non-System Portion	F	329
MSEC Enterprises	Self-supplied	Gulf Coast Aquifer System	H	44
Navarro Mills WSC	Corsicana	Navarro Mills Lake/Reservoir	C	240
North Runnels WSC	Winters	Winters Lake/Reservoir	F	0
Point Enterprise WSC	Self-supplied	Carrizo-Wilcox Aquifer	C	65
Post Oak SUD	Corsicana	Corsicana Richland Chambers-Halbert Lake/Reservoir System & Navarro Mills lake	C	870
Potosi WSC	Abilene (from CRMWD)	OH Ivie Lake/Reservoir Non-System Portion	F	307
Rotan	Snyder	Colorado River MWD Lake/Reservoir System, Edwards-Trinity-Plateau and Pecos Valley Aquifers & Ogallala and Edwards-Trinity-High Plains Aquifers	F	258
Georgetown, Liberty Hill, and Round Rock	Brazos River Authority	Highland Lakes Lake/Reservoir System	K	20928
Steamboat Mountain WSC	Abilene	OH Ivie Lake/Reservoir Non-System Portion	F	307
Steam-Electric Power, Grimes	Huntsville	Livingston-Wallisville Lake/Reservoir System	H	6720
Tye	Abilene (from CRMWD)	OH Ivie Lake/Reservoir Non-System Portion	F	157
Venus	Midlothian	TRWD Lake/Reservoir System	C	1944
View Caps WSC	Abilene (from CRMWD)	OH Ivie Lake/Reservoir Non-System Portion	F	199
West End WSC	Self-supplied	Gulf Coast Aquifer System	H	34
Williamson County WSID 3	Manville WSC	Edwards-BFZ Aquifer	K	884
Williamson Travis Counties MUD 1	Cedar Park	Highland Lakes Lake/Reservoir System	K	989

Notes:
(1) Supplies available from out-of-region sources are as input into DB27 by the source planning area.
(2) The current contract allows 16.54% of the one-year safe yield of O.H. Ivie Reservoir. Supply shown is 2030 supply available.

3.6 Methods to Estimate Available Water Supplies in the Brazos G Area

3.6.1 Surface Water Supplies

Surface water in the region available to meet projected demands consists of firm yield of reservoirs, dependable supply of run-of-river water rights through drought of record conditions, and other local sources. Contracts and/or rights to reservoir yields and supplies from run-of-river rights were allocated as supplies to their stated type of use: municipal, industrial (manufacturing, steam-electric, and mining), and irrigation. Additionally, municipal supply was further allocated among cities and other municipal water supply entities. This allocation was done by obtaining water seller information (i.e., which contract/right holders - a wholesaler - are reselling water to other water supply entities) and water purchase contract limits between buyers and sellers. This information was obtained from TWDB files and follow-up queries to water supply entities. All water supply contracts were assumed to be renewed at their existing levels unless otherwise directed by local entities.

It was assumed that all livestock demands would be met from local water sources (e.g., shallow groundwater, stock ponds and riparian use of streams by livestock). These supplies are firm and would be available through a drought of record given that they are supported by local, shallow groundwater sources when groundwater- based, and when surface water-based are reflected in the State's water availability models through the underlying streamflow gage data upon which the naturalized streamflows are based.

In certain instances, the entity's available water supply is constrained by lack of infrastructure. For example, an entity may hold a contract to divert water from a reservoir; however, the required pipeline has not been built. In this instance, the contract amount would not be included in the entity's available water supply or would be identified as a constrained supply.

In some instances, specific operational, contractual, or legal constraints required modifications to the general surface water allocation procedure.

3.6.2 Groundwater Allocation

For each county, total available groundwater was allocated among the six user groups-municipal, manufacturing, steam-electric, mining, irrigation, and livestock-as described below. In some specific instances, these general procedures were modified to more accurately reflect the interactions between water demands, supplies, and needs.

3.6.2.1 Municipal Allocation

Municipal supplies were allocated to users from each aquifer as follows:

- Municipal supply is based upon well capacities. For cases in which the total demand on that portion (i.e., county and river basin) of the aquifer exceeds the total modeled available groundwater (MAG), the supply is prorated downward for every entity using that source.

3.6.2.2 Industrial (Steam-Electric and Manufacturing) Allocation

Industrial supply from groundwater sources is associated with aquifers underlying the river basin portion of the county. The industrial supply is generally calculated as 125 percent of the year 2020 use from each particular aquifer. For cases in which the total demand on that portion (i.e., county and river basin) of the aquifer exceeds the MAG, supply is prorated downwards for every entity using that source.

3.6.2.3 Irrigation Allocation

Irrigation supply from groundwater sources is associated with aquifers underlying the river basin portion of the county. The irrigation supply is calculated as being equal to the projected demand in each decade. For cases in which the total demand on that portion (i.e., county and river basin) of the aquifer exceeds the MAG, supply is prorated downward for every entity using that source.

3.6.2.4 Mining Allocation

Mining supply from groundwater sources is associated with aquifers underlying the river basin portion of the county. The mining supply is calculated as being equal to the projected demand in each decade. For cases in which the total demand on that portion (i.e., county and river basin) of the aquifer exceeds the MAG, supply is prorated downward for every entity using that source.

3.6.3 Constraints on Surface Water Supplies

In determining needs (shortages), an emphasis has been placed not only on a water user group's (WUG's) total raw water supply availability, but also on their infrastructure available to deliver and treat this supply.

Based on Texas Commission on Environmental Quality (TCEQ) records, the normal-rated design (NRD) of each surface water treatment plant of public water suppliers located in the Brazos G Area was used to determine the existing peaking capacities to treat and deliver surface water supplies. The average annual capacity (AAC) for the water treatment plant (WTP) was calculated as 50 percent of the NRD to account for peaking. For each WUG for which these data were available in the TCEQ database, the AAC was used to constrain the supply available from surface water sources and was incorporated into the needs analysis for each WUG by using a term referred to as "constrained supply." Constrained supply is defined as the amount of water available to a WUG considering the limiting effects of existing infrastructure. This methodology allows for water management strategies to be identified and developed that specifically address these constraints caused by limited infrastructure capacity. These strategies could include pipelines to existing reservoirs, treatment plant expansions, or other infrastructure required to deliver and treat water for the end user of the WUG. Generally, the only infrastructure constraint data that will be considered for the 2026 Plan is treatment capacity, as data on other types of infrastructure constraints are not readily available. Other constraints may have been added where the planning group was made aware of infrastructure capacity or lack of infrastructure. These infrastructure constraints were applied to the supply available for the WUG and to any contractual demands using that supply. Five municipal WUGs have presently indicated their available supply is constrained by treatment capacity, resulting in supply shortages.

3.6.4 Constraints on Groundwater Supplies

Like surface water availability, the groundwater supplies assume that the wells will be able to continue producing the supply into the foreseeable future. However, some of the MAGs adopted for use would allow substantial drawdown of aquifer levels, which would require that well pumps be lowered or, in some cases, that deeper replacement wells be drilled to continue to use the assumed supply available from the aquifer. This has been identified as a potential issue in the Trinity Aquifer but supplies to WUGs were not adjusted to account for this potential limitation.

3.7 Existing Supplies Allocated to Water User Groups

A table summarizing the final allocation of existing supplies to WUGs is shown in the Executive Summary Appendix as "Region G Water User Group (WUG) Existing Water Supply."

3.8 Existing Supplies for Major Water Providers

Existing supplies summarized for Major Water Providers by decade and category of use are shown in Appendix O.

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CHAPTER 4 COMPARISON OF WATER DEMANDS WITH WATER SUPPLIES TO DETERMINE NEEDS

4.1 Introduction

In this section, the demand projections from Chapter 2 and the supply projections from Chapter 3 are brought together to estimate projected water needs in the Brazos G Area through year 2080.

4.2 Water Needs Projected for Water User Groups

If projected demands exceed projected supplies for a water user group, the difference or shortage, is identified as a “water need.” This section contains a summary of the water needs (shortages) for WUGs located in the Brazos G Area. A table in the Executive Summary Appendix presents the water needs for each WUG by county as “Region G Water User Group (WUG) Needs/Surplus.”

Secondary, or Second-Tier, water needs are those water needs that would remain after implementation of recommended water conservation and reuse strategies. Secondary water needs are presented in the Executive Summary Appendix as “Region G Water User Group (WUG) Second-Tier Identified Water Needs” and “Region G Water User Group (WUG) Second-Tier Identified Water Needs Summary.”

4.2.1 Projected Municipal Needs

Municipal WUGs with projected water shortages are listed in Table 4.1, along with the projected year 2050 and 2080 surplus/shortage volume, and the approximate decade that shortages are expected to begin. Within the table, projected shortages are represented as a negative number. WUGs located in multiple counties are indicated with (P) in Table 4.1, and the shortages identified are for the portion of the WUG located in the county identified. Shortages for portions of WUGs in counties outside of Brazos G for which Brazos G is the primary planning area are shown. For municipal WUGs that are also wholesale water providers (WWPs), supplies are first assigned to contractual customers and remaining supplies are then assigned to the WUGs’ own municipal demands. The shortages shown are for the WUGs’ internal municipal demands and not shortages for any wholesale customers. Additional contractual demands associated with strategies recommended for WUGs and WWPs that are recommended to purchase additional water are shown in Chapter 5.

All 37 counties in the Brazos G Area are projected to have at least one municipal WUG shortage. The County-Other category includes water supply corporations, water districts, privately owned utilities, and small towns that generally supply less than 100 ac-ft of water, in addition to private domestic water use that is not served by a water utility. The County-Other category is projected to experience shortages in 17 counties: Brazos, Comanche, Erath, Falls, Fisher, Grimes, Hill, Hood, Jones, Kent, Lee, McLennan, Milam, Palo Pinto, Robertson, Williamson, and Young.

Table 4.1 Municipal WUGs with Projected Water Needs (acre-feet/year)

WUG	County	Projected Surplus/ Shortages (ac-ft/yr)		Decade of Need
		Year 2050	Year 2080	
439 WSC	BELL	-383	-811	2040
BELL COUNTY WCID 1	BELL	-98	-98	2030
BELTON	BELL	483	-3,394	2060
CENTRAL TEXAS COLLEGE DISTRICT (P)	BELL	-160	-160	2030
ELM CREEK WSC (P)	BELL	-114	-181	2030
GEORGETOWN (P)	BELL	-951	-1,053	2030
HARKER HEIGHTS	BELL	-1,203	-1,587	2040
KEMPNER WSC (P)	BELL	-214	-281	2030
KILLEEN	BELL	-3,154	-7,352	2030
SALADO WSC	BELL	-900	-2,163	2030
TEMPLE	BELL	-15,188	-21,240	2030
THE GROVE WSC (P)	BELL	-4	-49	2050
CORIX UTILITIES TEXAS INC (P)	BLANCO	-33	-35	2030
CLIFTON	BOSQUE	-98	-380	2040
HIGHLAND PARK WSC (P)	BOSQUE	-36	-24	2030
HILCO UNITED SERVICES (P)	BOSQUE	-257	-331	2030
HOG CREEK WSC (P)	BOSQUE	-74	-65	2030
BRYAN	BRAZOS	-12,507	-35,740	2030
COLLEGE STATION	BRAZOS	-14,816	-19,152	2030
COUNTY-OTHER, BRAZOS	BRAZOS	17	-109	2030
TEXAS A&M UNIVERSITY	BRAZOS	-3,988	-3,988	2030
WELLBORN SUD (P)	BRAZOS	-1,140	-6,016	2040
WICKSON CREEK SUD (P)	BRAZOS	-326	-2,718	2050
CADE LAKES WSC	BURLESON	-110	-107	2030
SOUTHWEST MILAM WSC (P)	BURLESON	-73	-102	2030
CORIX UTILITIES TEXAS INC (P)	BURNET	-283	-520	2030
GEORGETOWN (P)	BURNET	-43	-54	2030
BAIRD	CALLAHAN	-269	-294	2030
CALLAHAN COUNTY WSC	CALLAHAN	-195	-205	2030
CLYDE	CALLAHAN	-220	-419	2050
EULA WSC	CALLAHAN	-238	-292	2030
HAMBY WSC (P)	CALLAHAN	-17	-35	2050
POTOSI WSC (P)	CALLAHAN	-31	-33	2030
WESTBOUND WSC (P)	CALLAHAN	-13	-13	2030
CORIX UTILITIES TEXAS INC (P)	COLORADO	-11	0	2030
COUNTY-OTHER, COMANCHE	COMANCHE	-292	-234	2030
COPPERAS COVE (P)	CORYELL	-1,023	-5,267	2050

WUG	County	Projected Surplus/ Shortages (ac-ft/yr)		Decade of Need
		Year 2050	Year 2080	
ELM CREEK WSC (P)	CORYELL	-24	-22	2030
FLAT WSC	CORYELL	-99	-94	2030
FORT GATES WSC	CORYELL	-375	-364	2030
GATESVILLE	CORYELL	-1,629	-2,046	2030
KEMPNER WSC (P)	CORYELL	-307	-233	2030
MULTI COUNTY WSC (P)	CORYELL	-128	-116	2030
THE GROVE WSC	CORYELL	-1	-7	2050
STAFF WSC (P)	EASTLAND	0	-1	2080
WESTBOUND WSC	EASTLAND	-177	-182	2030
HILCO UNITED SERVICES (P)	ELLIS	-112	-144	2030
COUNTY-OTHER, ERATH	ERATH	417	-559	2070
GORDON (P)	ERATH	-2	-2	2030
STEPHENVILLE	ERATH	829	-1,260	2070
BRUCEVILLE EDDY (P)	FALLS	29	-109	2060
CEGO-DURANGO WSC	FALLS	-58	-167	2040
COUNTY-OTHER, FALLS	FALLS	-366	4	2030
LEVI WSC (P)	FALLS	-166	-230	2030
LITTLE ELM VALLEY WSC	FALLS	12	-2	2080
COUNTY-OTHER, FISHER	FISHER	-18	-13	2030
ROTAN	FISHER	-98	-118	2030
S U N WSC (P)	FISHER	-2	-1	2030
THE BITTER CREEK WSC (P)	FISHER	-53	-50	2030
COUNTY-OTHER, GRIMES	GRIMES	-297	-312	2030
NAVASOTA	GRIMES	-1,564	-1,773	2030
WICKSON CREEK SUD (P)	GRIMES	150	-177	2070
CORYELL CITY WATER SUPPLY DISTRICT (P)	HAMILTON	-48	-48	2030
MULTI COUNTY WSC (P)	HAMILTON	-10	-14	2030
HASKELL	HASKELL	-564	-562	2030
BRANDON IRENE WSC (P)	HILL	-120	-180	2030
CHATT WSC	HILL	-143	-162	2030
COUNTY-OTHER, HILL	HILL	-331	-390	2030
DOUBLE DIAMOND UTILITIES (P)	HILL	-1,606	-1,709	2030
FILES VALLEY WSC	HILL	106	-93	2070
HILCO UNITED SERVICES	HILL	-853	-923	2030
HILLSBORO	HILL	7	-390	2060
ITASCA	HILL	-40	-54	2030
PARKER WSC (P)	HILL	-8	-17	2040
POST OAK SUD (P)	HILL	-147	-205	2030

WUG	County	Projected Surplus/ Shortages (ac-ft/yr)		Decade of Need
		Year 2050	Year 2080	
RIO VISTA (P)	HILL	-1	-1	2030
WHITNEY	HILL	-21	-35	2040
WOODROW OSCEOLA WSC	HILL	-469	-506	2030
ACTON MUD (P)	HOOD	1,501	-439	2070
COUNTY-OTHER, HOOD	HOOD	-4,234	-4,938	2030
GRANBURY	HOOD	-1,630	-3,259	2030
LIPAN	HOOD	2	-43	2060
TOLAR	HOOD	-20	-130	2050
BETHESDA WSC (P)	JOHNSON	-3,213	-6,353	2030
CLEBURNE	JOHNSON	-2,729	-6,735	2040
DOUBLE DIAMOND UTILITIES (P)	JOHNSON	-1,057	-1,739	2030
GODLEY	JOHNSON	-91	-166	2030
GRANDVIEW	JOHNSON	-6	-128	2050
JOHNSON COUNTY SUD (P)	JOHNSON	-5,997	-10,456	2030
RIO VISTA	JOHNSON	37	-77	2070
VENUS	JOHNSON	76	210	2030
COUNTY-OTHER, JONES	JONES	-477	-289	2030
HAMBY WSC (P)	JONES	-11	-11	2050
HAWLEY WSC (P)	JONES	-203	-342	2030
S U N WSC (P)	JONES	-139	-224	2030
COUNTY-OTHER, KENT	KENT	-13	-17	2030
JAYTON	KENT	-100	-109	2030
BENJAMIN	KNOX	-51	-38	2030
KNOX CITY	KNOX	-240	-241	2030
MUNDAY	KNOX	-231	-253	2030
COPPERAS COVE	LAMPASAS	-39	-243	2050
CORIX UTILITIES TEXAS INC (P)	LAMPASAS	-613	-633	2030
KEMPNER WSC	LAMPASAS	-827	-803	2030
LAMPASAS	LAMPASAS	-778	-977	2030
MULTI COUNTY WSC	LAMPASAS	-5	-4	2030
COUNTY-OTHER, LEE	LEE	-94	-33	2030
SOUTHWEST MILAM WSC (P)	LEE	-78	-98	2030
BISTONE MUNICIPAL WATER SUPPLY DISTRICT	LIMESTONE	-208	-192	2030
GROESBECK	LIMESTONE	-551	-499	2030
MEXIA	LIMESTONE	-792	-697	2030
POST OAK SUD (P)	LIMESTONE	-17	-22	2030
PRAIRIE HILL WSC (P)	LIMESTONE	-83	-57	2030
SLC WSC	LIMESTONE	-93	-81	2030

WUG	County	Projected Surplus/ Shortages (ac-ft/yr)		Decade of Need
		Year 2050	Year 2080	
CORIX UTILITIES TEXAS INC (P)	LLANO	-290	-340	2030
AXTELL WSC	MCLENNAN	-151	-228	2030
BRUCEVILLE EDDY	MCLENNAN	-602	-912	2030
CHALK BLUFF WSC	MCLENNAN	-31	-270	2050
CHILDRESS CREEK WSC	MCLENNAN	-17	-30	2030
COUNTY-OTHER, MCLENNAN	MCLENNAN	54	-108	2070
CRAWFORD	MCLENNAN	-130	-220	2030
CROSS COUNTRY WSC	MCLENNAN	-182	-443	2030
EAST CRAWFORD WSC	MCLENNAN	-148	-197	2030
ELM CREEK WSC	MCLENNAN	-8	-68	2050
GHOLSON WSC	MCLENNAN	-49	-287	2050
HEWITT	MCLENNAN	-729	-729	2030
HIGHLAND PARK WSC	MCLENNAN	-26	-28	2030
HOG CREEK WSC	MCLENNAN	-324	-319	2030
LACY LAKEVIEW	MCLENNAN	-42	-277	2050
LEVI WSC	MCLENNAN	-14	-73	2050
MART	MCLENNAN	-217	-98	2030
MCGREGOR	MCLENNAN	-558	-1,011	2030
NORTH BOSQUE WSC	MCLENNAN	-196	-524	2030
PRAIRIE HILL WSC	MCLENNAN	-147	-215	2030
ROBINSON	MCLENNAN	-2,756	-4,632	2030
SPRING VALLEY WSC	MCLENNAN	-95	-298	2040
TEXAS STATE TECHNICAL COLLEGE	MCLENNAN	-942	-822	2030
WACO	MCLENNAN	-13,987	-26,900	2030
WOODWAY	MCLENNAN	-82	411	2030
COUNTY-OTHER, MILAM	MILAM	-8,960	-14,277	2030
ROCKDALE	MILAM	-473	-508	2030
SOUTHWEST MILAM WSC (P)	MILAM	-247	-139	2030
THORNDALE	MILAM	-97	-158	2030
CORIX UTILITIES TEXAS INC (P)	MILLS	-53	-43	2030
POST OAK SUD	NAVARRO	-63	-65	2030
ROSCOE	NOLAN	-92	-83	2030
SWEETWATER	NOLAN	-91	-1	2030
THE BITTER CREEK WSC	NOLAN	-102	-149	2030
COUNTY-OTHER, PALO PINTO	PALO PINTO	-178	-173	2030
DOUBLE DIAMOND UTILITIES	PALO PINTO	-1,069	-1,051	2030
GORDON	PALO PINTO	-162	-159	2030
MINERAL WELLS (P)	PALO PINTO	-1,431	-2,030	2030

WUG	County	Projected Surplus/ Shortages (ac-ft/yr)		Decade of Need
		Year 2050	Year 2080	
STRAWN	PALO PINTO	-12	-10	2030
MINERAL WELLS	PARKER	-152	-216	2030
NORTH RURAL WSC	PARKER	-110	-234	2030
SANTO SUD	PARKER	-16	-32	2030
STURDIVANT PROGRESS WSC	PARKER	-2	-1	2030
COUNTY-OTHER, ROBERTSON	ROBERTSON	-17	52	2030
CORIX UTILITIES TEXAS INC (P)	SAN SABA	-9	-7	2030
HAMBY WSC (P)	SHACKELFORD	-37	-74	2050
GLEN ROSE	SOMERVELL	-237	-226	2030
FORT BELKNAP WSC (P)	STEPHENS	-5	-9	2030
FORT GRIFFIN SUD (P)	STEPHENS	-11	-2	2040
STAFF WSC	STEPHENS	25	-25	2070
STEPHENS REGIONAL SUD (P)	STEPHENS	-123	-199	2030
ASPERMONT	STONEWALL	-19	18	2030
BETHESDA WSC	TARRANT	-29	-50	2030
JOHNSON COUNTY SUD	TARRANT	-85	-160	2030
ABILENE	TAYLOR	0	-10,721	2060
HAMBY WSC	TAYLOR	-45	-130	2050
HAWLEY WSC	TAYLOR	-7	-31	2040
LAWN	TAYLOR	-19	-21	2050
MERKEL	TAYLOR	-167	-259	2050
POTOSI WSC	TAYLOR	-1,282	-1,956	2030
S U N WSC	TAYLOR	-138	-129	2030
STEAMBOAT MOUNTAIN WSC	TAYLOR	-1,267	-2,258	2030
TYE	TAYLOR	-66	-53	2050
VIEW CAPS WSC	TAYLOR	-271	-437	2030
FORT BELKNAP WSC (P)	THROCKMORTON	-2	-3	2030
FORT GRIFFIN SUD	THROCKMORTON	-9	-4	2030
STEPHENS REGIONAL SUD	THROCKMORTON	-20	-13	2030
THROCKMORTON	THROCKMORTON	-107	-105	2030
CEDAR PARK (P)	TRAVIS	-723	-724	2030
LEANDER (P)	TRAVIS	-4,260	-3,919	2030
ROUND ROCK (P)	TRAVIS	-45	-173	2040
BRENHAM	WASHINGTON	-614	-627	2030
CENTRAL WASHINGTON COUNTY WSC	WASHINGTON	-24	-136	2030
LEE COUNTY WSC	WASHINGTON	-19	-23	2030
BARTLETT	WILLIAMSON	-33	-50	2030
BRUSHY CREEK MUD	WILLIAMSON	-845	-899	2030

WUG	County	Projected Surplus/ Shortages (ac-ft/yr)		Decade of Need
		Year 2050	Year 2080	
CEDAR PARK	WILLIAMSON	-5,521	-5,520	2030
COUNTY-OTHER, WILLIAMSON	WILLIAMSON	-13,968	-31,043	2030
FERN BLUFF MUD	WILLIAMSON	-107	-111	2030
FLORENCE	WILLIAMSON	-144	-209	2030
GEORGETOWN	WILLIAMSON	-98,862	-185,479	2030
GRANGER	WILLIAMSON	29	-26	2070
HUTTO	WILLIAMSON	-3,771	-12,465	2030
JARRELL-SCHWERTNER	WILLIAMSON	-7,787	-9,245	2030
JONAH WATER SUD	WILLIAMSON	-4,953	-14,089	2030
LEANDER	WILLIAMSON	-20,576	-20,933	2030
LIBERTY HILL	WILLIAMSON	-1,205	-2,551	2030
NOACK WSC	WILLIAMSON	-160	-175	2030
PALOMA LAKE MUD 1	WILLIAMSON	-137	-138	2030
PALOMA LAKE MUD 2	WILLIAMSON	-110	-111	2030
ROUND ROCK	WILLIAMSON	-12,526	-16,083	2030
SONTERRA MUD	WILLIAMSON	-2,197	-7,977	2040
SOUTHWEST MILAM WSC	WILLIAMSON	-122	-455	2030
TAYLOR	WILLIAMSON	-3,304	-8,080	2030
WILLIAMSON COUNTY MUD 11	WILLIAMSON	-974	-2,714	2030
WILLIAMSON COUNTY WSID 3	WILLIAMSON	-507	-1,768	2040
COUNTY-OTHER, YOUNG	YOUNG	-172	-203	2030
FORT BELKNAP WSC	YOUNG	-180	-263	2030
GRAHAM	YOUNG	-1,338	-1,450	2030

Notes:
(P) Indicates WUG is in multiple counties.

4.2.2 Projected Manufacturing Needs

16 of the 37 counties in the Brazos G Area are projected to have manufacturing shortages. Table 4.2 lists the counties projected to have shortages in the Manufacturing Use category, projected year 2050 and 2080 shortages, and the approximate decade shortages are projected to begin.

Table 4.2 Counties with Projected Water Needs for Manufacturing Use (acre-feet per year)

WUG	Projected Shortages (ac-ft/yr)		Decade of Need
	Year 2050	Year 2080	
BELL	-540	-661	2030
BURLESON	-38	-56	2030
COMANCHE	2	-1	2080
CORYELL	-1	-1	2030
EASTLAND	490	-15	2080
ERATH	-9	6	2030
HAMILTON	-19	-22	2030
HASKELL	-2	-2	2030
LAMPASAS	-68	-68	2030
LIMESTONE	-245	-273	2030
MCLENNAN	-817	-747	2030
NOLAN	-87	-154	2030
TAYLOR	-775	-865	2030
WASHINGTON	-172	-259	2030
WILLIAMSON	-995	-1,239	2030
YOUNG	-9	-6	2030

4.2.3 Projected Steam-Electric Needs

Table 4.3 lists the seven counties projected to have shortages in the Steam-Electric Use category, projected year 2050 and 2080 shortages, and the approximate decade shortages are projected begin.

Table 4.3 Counties with Projected Water Needs for Steam-Electric Use (acre-feet per year)

WUG	Projected Shortages (ac-ft/yr)		Decade of Need
	Year 2050	Year 2080	
BRAZOS	-269	-269	2030
GRIMES	-369	-369	2030
JOHNSON	-571	-571	2030
LIMESTONE	-960	-928	2030
ROBERTSON	-1,430	-5,619	2030
SOMERVELL	-37,839	-39,701	2030
YOUNG	-204	-185	2030

4.2.4 Projected Mining Needs

Shortages are projected for mining use in most of the counties. Table 4.4 lists the 14 counties projected to have shortages in the Mining Use category, projected year 2050 and 2080 shortages, and the approximate decade shortages are projected to begin.

Table 4.4 Counties with Projected Water Needs for Mining Use (acre-feet per year)

WUG	Projected Shortages (ac-ft/yr)		Decade of Need
	Year 2050	Year 2080	
BRAZOS	-1,085	-1,159	2030
BURLESON	-3,551	-3,551	2030
EASTLAND	-314	-314	2030
GRIMES	-124	-125	2030
HASKELL	-4	-4	2030
HOOD	-3,685	-4,293	2030
LIMESTONE	-3,120	-2,228	2030
MILAM	-767	-767	2030
NOLAN	-4	-5	2030
PALO PINTO	-27	-29	2030
SOMERVELL	-1,091	-1,244	2030
TAYLOR	-413	-437	2030
THROCKMORTON	-8	-8	2030
WASHINGTON	-650	-650	2030

4.2.5 Projected Irrigation Needs

Table 4.5 lists the 18 counties projected to have shortages in the Irrigation Use category, projected year 2050 and 2080 shortages, and the approximate decade shortages are projected to begin.

Table 4.5 Counties with Projected Water Needs for Irrigation Use (acre-feet per year)

WUG	Projected Shortages (ac-ft/yr)		Decade of Need
	Year 2050	Year 2080	
BELL	-949	-965	2030
COMANCHE	-9,377	-9,449	2030
GRIMES	-190	-190	2030
HAMILTON	-281	-286	2030
HASKELL	-8,309	-8,309	2030
JOHNSON	-245	-245	2030
JONES	-64	-64	2030
KNOX	-10,441	-10,204	2030
LAMPASAS	-219	-225	2030
MCLENNAN	-182	-211	2030
NOLAN	-9,250	-8,847	2030
PALO PINTO	-1,492	-1,492	2030
ROBERTSON	-13,404	-13,886	2030
STEPHENS	-122	-122	2030
TAYLOR	-1,057	-1,057	2030
THROCKMORTON	-71	-71	2030
WILLIAMSON	-224	-224	2030
YOUNG	-614	-614	2030

4.2.6 Projected Livestock Needs

Table 4.6 lists the 11 counties projected to have shortages in the Livestock Use category, projected year 2050 and 2080 shortages, and the approximate decade shortages are projected to begin.

Table 4.6 Counties with Projected Water Needs for Livestock Use (acre-feet per year)

WUG	Projected Shortages (ac-ft/yr)		Decade of Need
	Year 2050	Year 2080	
COMANCHE	-193	-193	2030
ERATH	-245	-245	2030
FALLS	-71	-71	2030
HAMILTON	-112	-112	2030
JOHNSON	-36	-36	2030
KENT	-16	-16	2030
KNOX	-25	-25	2030
LEE	-26	-26	2030
STONEWALL	-47	-47	2030
THROCKMORTON	-121	-121	2030
WASHINGTON	-196	-196	2030

4.3 Water Needs Projected for Wholesale Water Providers

Needs projected for WWPs that are not also WUGs are shown in Table 4.7. The needs shown are for existing contractual commitments, regardless if the customers' water demands are different from the stated contractual supply. In the case of "needs met" contracts, the contractual demand is assumed to be the customer's water demands, less any other supplies the customer may have available. Additional contractual demands associated with strategies recommended for WUGs and WWPs are shown in Chapter 5.

Table 4.7 Water Needs Projected for Wholesale Water Providers

WWP	Projected Surpluses / (Shortages) (ac-ft/yr)		Decade of Need
	Year 2050	Year 2080	
AQUILLA WSD	0	-262	2070
BELL COUNTY WCID 1	0	-5,045	2060
BLUEBONNET WSC	-317	-454	2030
BRAZOS RIVER AUTHORITY			
Lake Aquilla System	*0*	*-350*	*2070*
Little River System	*-44,788*	*-48,313*	*2030*
Main Stem/Lower Basin System(1)	*-362*	*-13,235*	*2030*
Highland Lakes Supply (HB 1437)(2)	*2,872*	*2,872*	*none*
System Operations Water Right(3)	*0*	*-19,350*	*2060*
CENTRAL TEXAS WSC	-180	-196	2030
EASTLAND COUNTY WSD	-1,080	-1,170	2030

WWP	Projected Surpluses / (Shortages) (ac-ft/yr)		Decade of Need
	Year 2050	Year 2080	
FHLM WSC	0	0	*none*
NORTH CENTRAL TEXAS MUNICIPAL WATER AUTHORITY	-1,724	-1,678	2030
PALO PINTO COUNTY MWD 1	-4,199	-4,880	2030
SALT FORK WATER QUALITY CORPORATION	0	0	*none*
UPPER LEON MWD	0	0	*none*
WEST CENTRAL TEXAS MWD	0	0	2030

Notes:
(1) Includes contract demands in both Brazos G and Region H.
(2) 25,000 ac-ft/yr is available per HB 1437, of which BRA has contracted 1,200 ac-ft/yr (Liberty Hill) and 20,928 ac-ft/yr (Round Rock). Surplus shown represents the remaining uncontracted supply.
(3) Assumes all current and pending contracts for sales of System Operations Supply are firm.

4.4 Water Needs Projected for Major Water Providers

Water needs for MWPs summarized by decade and category of use and secondary water needs are presented in Appendix O. MWP sales to WUGs from all regions are accounted therein. For WWPs which are also WUGs, demands, needs, and surpluses as shown represent their contractual commitments in addition to their own projected uses. A further description of the methods used to calculate secondary needs is included in Chapter 5.

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CHAPTER 5 COUNTY AND WWP PLANS

5.1 Bell County Water Supply Plan

Table 5.1-1 lists each water user group in Bell County and their corresponding surplus or shortage in years 2030 and 2080. A brief summary of the water user groups and the plan for the selected water user are presented in the following subsections. Bell County WCID 1 and additional WUGs within the county are seeking to form a new Regional Water Authority, at this time it is unknown who the members of the proposed water authority will be.

Table 5.1-1 Bell County Surplus (Shortage)

Water User Group	Surplus (Shortage)		Comment
	2030(acft/yr)	2080(acft/yr)	
439 WSC	304	(672)	Projected shortage - see plan below.
Armstrong WSC	282	32	Projected surplus
City of Bartlett			See Williamson County
Bell County WCID 1			See WWP (Chapter 5.38)
Bell County WCID 2	110	46	Projected surplus
Bell County WCID 3	(374)	(2,237)	Projected shortage – see plan below.
Bell-Milam-Falls WSC	768	703	Projected surplus
City of Belton	1,690	(2,731)	Projected shortage - see plan below.
Central Texas College District			See Coryell County
Dog Ridge WSC	696	282	Projected surplus
East Bell WSC	747	888	Projected surplus
Elm Creek WSC	(73)	(181)	Projected shortage - see plan below.
Fort Cavazos (Hood)	1,748	810	Projected surplus
City of Georgetown			See Williamson County
City of Harker Heights	(313)	(2,443)	Projected shortage - see plan below.
City of Holland	195	185	Projected surplus
Jarrell-Schwertner WSC			See Williamson County
Kempner WSC			See Lampasas County
City of Killeen	11,349	(6,217)	Projected shortage – see plan below.
Little Elm Valley WSC	267	145	Projected surplus
Moffat WSC	722	871	Projected surplus
Morgan's Point Resort	1,161	801	Projected surplus
Pendleton WSC	177	61	Projected surplus
City of Rogers	322	349	Projected surplus
Salado WSC	(273)	(2,163)	Projected shortage - see plan below.
City of Temple	6,576	(10,887)	Projected shortage - see plan below.
The Grove WSC	10	(49)	Projected shortage – see plan below.

Water User Group	Surplus (Shortage)		Comment
	2030(acft/yr)	2080(acft/yr)	
City of Troy	547	374	Projected surplus
West Bell County WSC	877	691	Projected surplus
County-Other	(32)	179	Projected shortage - see plan below.
Manufacturing	(467)	(661)	Projected shortage - see plan below.
Steam-Electric	5,366	5,366	Projected surplus
Mining	772	523	Projected surplus
Irrigation	(934)	(964)	Projected shortage - see plan below.
Livestock	719	719	Projected surplus

5.1.1 439 WSC

5.1.1.1 Description of Supply

The 439 WSC holds a contract for 1,409 acft/yr of surface water supplies from the Brazos River Authority. However, under the constraints of RWP supply modeling, this contract can provide 1,174 acft/yr in 2030 and 1,137 acft/yr in 2080, as determined by water availability analyses prescribed by water planning guidelines. Additionally, 439 WSC contracts with Bell County WCID No. 1 for 750 acft/yr, which supplies 647 acft/yr in 2030 and 626 acft/yr in 2080. This contract allows Bell County WCID No. 1 to divert, treat, and deliver raw water purchased under the agreement with the Brazos River Authority. The treated water supply available to 439 WSC is further limited based on the proportionate availability of source supplies from wholesale water providers.

5.1.1.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended for 439 WSC. The entities' water usage utilized for demand projections is 172 gpcd. The RWPG recommends conservation to reduce usage to a goal of 140 gpcd.

1. Conservation:
   a. Cost Source: Volume II.
   b. Date to be Implemented: 2030
   c. Capital Cost: maximum of $268,812 in 2080
   d. Unit Cost: $684/acft
2. Purchase Additional Diversion, Treatment, and Delivery of Supply from Bell County WCID No. 1.:
   a. Cost Source: Volume II.
   b. Date to be Implemented: by 2030.
   c. Annual Cost: $1,161,000.
   d. Unit Cost: $1,000/acft.
3. Purchase Raw Water Supply from Fort Cavazos via Bell County WCID No. 1:
   a. Cost Source: Volume II.
   b. Date to be Implemented: before 2050.
   c. Annual Cost: maximum of $642,276.
   d. Unit Cost: $100/acft.

4. Reuse from Bell County WCID No. 1 – South:
    a. Cost Source: Volume II.
    b. Date to be Implemented: 2030
    c. Annual Cost: maximum of $5,480
    d. Unit Cost: $2,282/acft
5. Alternative: Lake Granger Augmentation – Ph 2 (Groundwater):
    a. Cost Source: Volume II
    b. Date to be Implemented: before 2030.
    c. Project Cost: Costs borne by BRA.
    d. Unit Cost: Costs borne by BRA.

Table 5.1-2 Bell County Surplus (Shortage)

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*304*	*41*	*(209)*	*(421)*	*(580)*	*(672)*
Conservation						
Supply From Plan Element (acft/yr)	113	286	324	356	381	393
Annual Cost ($/yr)	$77,292	$195,624	$221,616	$243,504	$260,604	$268,812
Projected Surplus/(Shortage) after Conservation (acft/yr)	*417*	*327*	*115*	*(65)*	*(199)*	*(279)*
Purchase Additional Diversion, Treatment, and Delivery from Bell County WCID No. 1						
Supply From Plan Element (acft/yr)	248	247	245	243	242	240
Annual Cost ($/yr)	$248,000	$247,000	$245,000	$243,000	$242,000	$240,000
Unit Cost ($/acft)	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000
Purchase Raw Water Supply from Fort Cavazos						
Supply From Plan Element (acft/yr)	0	0	0	0	0	626
Annual Cost ($/yr)	—	—	—	—	—	$62,600
Unit Cost ($/acft)	—	—	—	—	—	$100
Reuse from Bell County WCID No. 1 - South						
Supply From Plan Element (acft/yr)	32	185	185	0	20	20
Annual Cost ($/yr)	$73,000	$422,000	$71,000	$0	$7,700	$7,700
Unit Cost ($/acft)	$2,282	$2,282	$382	$382	$382	$382
Projected Surplus/(Shortage) after Recommended WMS (acft/yr)	*697*	*759*	*545*	*178*	*63*	*607*

5.1.2 Armstrong WSC

5.1.2.1 Description of Supply

Armstrong WSC obtains its water supply from the Trinity Aquifer at 6 acft/yr in 2030 and 41 acft/yr in 2080. They also have a contract for surface water from Central Texas WSC at 1,564 acft/yr. No shortages are projected and no change in water supply is recommended.

5.1.2.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended for Armstrong WSC. The entities' water usage utilized for demand projections is 159 gpcd. The RWPG recommends conservation to reduce usage to a goal of 140 gpcd.

1. Conservation:
   a. Cost Source: Volume II.
   b. Date to be Implemented: 2030.
   c. Project Cost: maximum of $49,932 in 2080
   d. Unit Cost: $684 /acft.

Table 5.1-3 Recommended Plan Costs by Decade for Armstrong WSC

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*1,063*	*990*	*937*	*900*	*859*	*813*
Conservation						
Supply From Plan Element (acft/yr)	52	57	62	65	69	73
Annual Cost ($/yr)	$35,568	$38,988	$ 42,408	$44,460	$47,196	$49,932
Projected Surplus/(Shortage) after Conservation (acft/yr)	*1,115*	*1,047*	*999*	*965*	*928*	*886*

5.1.3 Bell County WCID No. 2

5.1.3.1 Description of Supply

Bell County WCID No. 2 obtains its water supply from the Trinity Aquifer at 130 acft/yr. This entity also had a contract for treated surface water from the City of Temple at 323 acft/yr. No shortages are projected for Bell County WCID No. 2.

5.1.3.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended for Bell County WCID No. 2. The entities' water usage utilized for demand projections is 175 gpcd. The RWPG recommends conservation to reduce usage to a goal of 140 gpcd.

1. Conservation:
   a. Cost Source: Volume II.
   b. Date to be Implemented: 2030.
   c. Project Cost: maximum of $49,248 in 2080.
   d. Unit Cost: $684/acft.
2. Groundwater Development – Trinity Aquifer:
   a. Cost Source: Volume II.
   b. Date to be Implemented: before 2060.
   c. Project Cost: $979,000.
   d. Unit Cost: maximum of $1,460/acft.

Table 5.1-4 Recommended Plan Costs by Decade for Bell County WCID No. 2

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*110*	*91*	*75*	*67*	*57*	*46*
Conservation						
Supply From Plan Element (acft/yr)	25	64	67	68	70	72
Annual Cost ($/yr)	$17,100	$43,776	$45,828	$46,512	$47,880	$49,248
Projected Surplus/(Shortage) after Conservation (acft/yr)	*135*	*155*	*142*	*135*	*127*	*118*
Groundwater Development - Trinity Aquifer						
Supply From Plan Element (acft/yr)	0	0	0	57	57	57
Annual Cost ($/yr)	—	—	—	$138,000	$138,000	$31,000
Unit Cost ($/acft)	—	—	—	$2,421	$2,421	$544
Projected Surplus/(Shortage) after Recommended WMS (acft/yr)	*135*	*155*	*142*	*192*	*184*	*175*

5.1.4 Bell County WCID No. 3

5.1.4.1 Description of Supply

Bell County WCID No. 3 purchases its water supply from Bell County WCID No. 1 and intends to increase its contract with WCID No. 1 to meet demands, current contract is for 1,490 acft/yr, which supplies 1,285 acft/yr in 2030 and 1,244 acft/yr in 2080. Bell County WCID No. 3 has projected shortages throughout the planning period.

5.1.4.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended for Bell County WCID No. 3. The most recent water loss audit report shows a water loss of approximately 22% and recommends water loss mitigation. The entities' water usage utilized for demand projections is 161 gpcd. The RWPG recommends conservation to reduce usage to a goal of 140 gpcd.

1. Conservation:
    a. Cost Source: Volume II.
    b. Date to be Implemented: 2030.
    c. Annual Cost: maximum of $244,188 in 2080
    d. Unit Cost: $684 /acft.
2. Water Loss Mitigation:
    a. Cost Source: Volume II.
    b. Date to be Implemented: 2030.
    c. Annual Cost: maximum of $75,300 in 2080
    d. Unit Cost: $684 /acft.

Table 5.1-5. Recommended Plan Costs by Decade for Bell County WCID No. 3

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*(374)*	*(756)*	*(1,351)*	*(1,947)*	*(2,092)*	*(2,237)*
Conservation						
Supply From Plan Element (acft/yr)	122	208	268	328	342	357
Annual Cost ($/yr)	$83,448	$142,272	$183,312	$224,352	$233,928	$244,188
Water Loss Reduction						
Supply From Plan Element (acft/yr)	120	147	189	232	241	251
Annual Cost ($/yr)	$58,325	$66,425	$56,700	$69,600	$72,300	$75,300
Projected Surplus/(Shortage) after Conservation and Water Loss Reduction (acft/yr)	*(132)*	*(401)*	*(894)*	*(1,387)*	*(1,509)*	*(1,629)*
Projected Surplus/(Shortage) after Recommended WMS (acft/yr)	*(132)*	*(401)*	*(894)*	*(1,387)*	*(1,509)*	*(1,629)*

5.1.5 Bell-Milam-Falls WSC

5.1.5.1 Description of Supply

Bell-Milam Falls WSC is located in multiple counties (Bell, Falls, Milam and Williamson) and obtains its water supply from the Trinity Aquifer at 360 acft/yr. This entity also has a contract for surface water from Lake Stillhouse Hollow from Central Texas WSC at 2,327 acft/yr. Totals shown in Table 51.6 represent cumulative totals for Bell-Milam Falls WSC. No shortages are projected for Bell-Milam Falls WSC.

5.1.5.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended. The entities' water usage utilized for demand projections is 162 gpcd the RWPG recommends conservation to reduce usage to a goal of 140 gpcd. The most recent water loss audit report shows a water loss of approximately 31% and recommends water loss mitigation.

1. Conservation:
   a. Cost Source: Volume II.
   b. Date to be Implemented: 2030.
   c. Annual Cost: maximum of $73,872 in 2080
   d. Unit Cost: $684 /acft.
2. Water Loss Reduction:
   a. Cost Source: Volume II.
   b. Date to be Implemented: 2030.
   c. Annual Cost: maximum of $719,397 in 2040
   d. Unit Cost: $684 /acft.

Table 5.1-6. Recommended Plan Costs by Decade for Bell-Milam-Falls WSC

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*1,754*	*1,735*	*1,721*	*1,711*	*1,701*	*1,687*
Conservation						
Supply From Plan Element (acft/yr)	67	102	103	106	107	108
Annual Cost ($/yr)	$45,828	$69,768	$70,452	$72,504	$73,188	$73,872
Water Loss Reduction						
Supply From Plan Element (acft/yr)	152	155	158	158	160	163
Annual Cost ($/yr)	$718,198	$719,397	$63,170	$63,170	$63,969	$65,169
Projected Surplus/(Shortage) after Conservation and Water Loss Reduction (acft/yr)	*1,973*	*1,992*	*1,982*	*1,975*	*1,968*	*1,958*

5.1.6 City of Belton

5.1.6.1 Description of Supply

The City of Belton has a contract to purchase water from the Brazos River Authority from Lake Belton. City of Belton has contracted for 2,500 acft/yr of surface water supplies from the Brazos River Authority, which can supply 2,084 acft/yr in 2030 and 2,500 acft/yr in 2080, based on water availability analyses prescribed under water planning guidelines. Belton contracts with Bell County WCID No. 1 to divert, treat, and deliver water from Lake Belton to the City at 5,966 acft/yr, which supplies 5,144 acft/yr in 2030 and 5,966 acft/yr in 2080. The City also has a contract with Central Texas WSC for 125 acft/yr. A shortage is projected for the City of Belton in 2050.

5.1.6.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended for the City of Belton. The entities' water usage utilized for demand projections is 157 gpcd the RWPG recommends conservation to reduce usage to a goal of 140 gpcd. The remaining unmet needs resulting from contracts not being fully allocated is a result of the conservative methodology of determining source supply volumes. Contract supplies from the BRA are firm supplies.

1. Conservation:
   a. Cost Source: Volume II
   b. Date to be Implemented: 2030
   c. Annual Cost: maximum of $493,848 in 2080
   d. Unit Cost: $684 /acft.
2. Water Treatment Plant Expansion:
   a. Cost Source: Volume II.
   b. Date to be Implemented: before 2070.
   c. Project Cost: $11,925,000.
   d. Unit Cost: maximum of $1,361/acft.

3. Lake Granger Aquifer Storage and Recovery:
    a. Cost Source: Volume II.
    b. Date to be Implemented: before 2070.
    c. Project Cost: Costs borne by BRA.
    d. Unit Cost: Costs borne by BRA.
4. Water Treatment Plant Expansion:
    a. Cost Source: Volume II.
    b. Date to be Implemented: before 2060.
    c. Project Cost: $14,148,000.
    d. Unit Cost: maximum of $1,630/acft.
5. Alternative: Lake Granger Augmentation – Ph 2 (Groundwater):
    a. Cost Source: Volume II.
    b. Date to be Implemented: before 2070.
    c. Project Cost: $11,925,000.
    d. Unit Cost: maximum of $1,361/acft.

Table 5.1-7 Recommended Plan Costs by Decade for City of Belton

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*1,715*	*671*	*(379)*	*(1,341)*	*(2,141)*	*(2,706)*
Conservation						
Supply From Plan Element (acft/yr)	402	466	546	619	680	722
Annual Cost ($/yr)	$274,968	$318,744	$373,464	$423,396	$465,120	$493,848
Projected Surplus/(Shortage) after Conservation (acft/yr)	*2,117*	*1,137*	*167*	*(722)*	*(1,461)*	*(1,984)*
Lake Granger ASR						
Supply From Plan Element (acft/yr)	0	0	390	466	491	491
Annual Cost ($/yr)	—	—	—	—	—	—
Unit Cost ($/acft)	—	—	—	—	—	—
Water Treatment Plant Expansion						
Supply From Plan Element (acft/yr)	—	—	—	676	676	676
Annual Cost ($/yr)	—	—	—	$1,902,000	$1,902,000	$907,000
Unit Cost ($/acft)	—	—	—	$1,630	$1,630	$777
Projected Surplus/(Shortage) after Recommended WMS (acft/yr)	*2,117*	*1,137*	*557*	*431*	*(294)*	*(817)*

Notes:
(1) Quantity represents increase in treatment capacity required to develop existing supplies currently constrained by treatment capacity.

5.1.7 Dog Ridge WSC

5.1.7.1 Description of Supply

Dog Ridge WSC has a surface water contract with Central Texas WSC. Dog Ridge WSC has projected shortages in all planning decades. Dog Ridge WSC had a contract for 1,500 acft/yr of surface water supplies from the Brazos River Authority which has been transferred to Central Texas WSC. The contract with Central Texas WSC is for 840 acft/yr according to data found within the Central Texas WSC's master water plan.

5.1.7.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended for Dog Ridge WSC. The entities' water usage utilized for demand projections is 172 gpcd the RWPG recommends conservation to reduce usage to a goal of 140 gpcd. The most recent water loss audit report shows a water loss of approximately 35% and recommends water loss mitigation.

1. Conservation:
   a. Cost Source: Volume II.
   b. Date to be Implemented: before 2030.
   c. Annual Cost: maximum of $151,164 in 2080.
   d. Unit Cost: $684/acft.
2. Water Loss Reduction:
   a. Cost Source: Volume II.
   b. Date to be Implemented: before 2030.
   c. Annual Cost: maximum of $177,564 in 2040.
   d. Unit Cost: $872/acft.
3. Increase Contract with Central Texas WSC – Contingent on WWP WMSs:
   a. Cost Source: Volume II.
   b. Date to be Implemented: before 2080.
   c. Annual Cost: Cost of water purchase.
   d. Unit Cost: Contract Rate set by WWP.

Table 5.1-8 Recommended Plan Costs by Decade for Dog Ridge WSC

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*(102)*	*(217)*	*(307)*	*(369)*	*(439)*	*(516)*
Conservation						
Supply From Plan Element (acft/yr)	71	172	187	197	209	221
Annual Cost ($/yr)	$48,564	$117,648	$127,908	$134,748	$142,956	$151,164
Water Loss Reduction						
Supply From Plan Element (acft/yr)	192	216	234	247	261	276
Annual Cost ($/yr)	$167,501	$177,564	$98,120	$103,572	$109,442	$115,732
Unit Cost ($/acft)	$872	$822	$419	$419	$419	$419

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) after Conservation	*161*	*171*	*114*	*75*	*31*	*(19)*
Increase Contract with Central Texas WSC						
Supply From Plan Element (acft/yr)	—	—	—	—	—	20
Annual Cost ($/yr)	—	—	—	—	—	$20,000
Unit Cost ($/acft)	—	—	—	—	—	$1,000
Projected Surplus/(Shortage) after recommended WMS (acft/yr)	*161*	*171*	*114*	*75*	*31*	*1*

5.1.8 East Bell WSC

5.1.8.1 Description of Supply

East Bell WSC is split between Bell and Falls counties, yet the majority of demand lies within Bell County. The WSC obtains its water supply from the Trinity Aquifer at 383 acft/yr and treated surface water from Central Texas WSC at 847 acft/yr. Supplies are projected to be adequate to meet future demands across the entire service area.

5.1.8.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended for Wast Bell WSC. The entities' water usage utilized for demand projections is 155 gpcd the RWPG recommends conservation to reduce usage to a goal of 140 gpcd.

1. Conservation:
    a. Cost Source: Volume II.
    b. Date to be Implemented: before 2030.
    c. Annual Cost: maximum of $19,836 in 2030.
    d. Unit Cost: $684/acft.

Table 5.1-9 Recommended Plan Costs by Decade for East Bell WSC

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*819*	*845*	*864*	*883*	*903*	*925*
Conservation						
Supply From Plan Element (acft/yr)	29	25	23	22	21	21
Annual Cost ($/yr)	$19,836	$17,100	$15,732	$15,048	$14,364	$14,364
Projected Surplus/(Shortage) after Conservation	*848*	*870*	*887*	*905*	*924*	*946*

5.1.9 Elm Creek WSC

5.1.9.1 Description of Supply

Elm Creek WSC service area includes portions of Bell, Coryell, and McLennan counties, yet the majority of demand lies within Bell County. Elm Creek WSC has a contract to purchase water from Bluebonnet WSC from Lake Belton at 654 acft/yr, which supplies 633 acft/yr in 2030 and 612 acft/yr in 2080. The surpluses and shortages shown in Table 5.1-10 represent the cumulative totals for Elm Creek WSC across all counties it serves.

5.1.9.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended for Elm Creek WSC. Conservation is not recommended because the entity's usage is 143 gpcd, which is below the selected goal of 140 gpcd.The remaining unmet need resulting in 2070 from contracts not being fully allocated is a result of the conservative methodology of determining source supply volumes.

1. Bluebonnet WSC to Firm Up Contracted Supply:
    a. Bluebonnet WSC provides this supply under contract to entity. Bluebonnet WSC to develop any combinations of strategies as described in Section 5.38 to firm up this amount.
    b. Cost Source: Volume II.
    c. Date to be Implemented: before 2050.
    d. Project Cost: associated project costs to be borne by Bluebonnet WSC.
    e. Unit Cost: supply already under contract.
2. Reallocation of Supply from Moffat WSC:
    a. Cost Source: Volume II.
    b. Date to be Implemented: before 2050.
    c. Annual Cost: maximum of $150,612.
    d. Unit Cost: $978/acft (reimbursement of cost under Moffat’s take-or-pay contract with Bluebonnet WSC).

Table 5.1-10 Recommended Plan Costs by Decade for Elm Creek WSC

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*(64)*	*(104)*	*(146)*	*(189)*	*(232)*	*(271)*
Bluebonnet WSC to Firm Up Contracted Supply						
Supply From Plan Element (acft/yr)	—	—	33	37	42	42
Annual Cost ($/yr)	—	—	$2,550	$2,850	$3,240	$3,240
Unit Cost ($/acft)	—	—	$77	$77	$77	$77
Reallocation of Supply from Moffat WSC						
Supply From Plan Element (acft/yr)	—	—	14	84	154	154
Annual Cost ($/yr)	—	—	$13,692	$82,152	$150,612	$150,612
Unit Cost ($/acft)	—	—	$978	$978	$978	$978
Projected Surplus/(Shortage) after recommended WMS (acft/yr)	*(64)*	*(104)*	*(132)*	*(105)*	*(78)*	*(117)*

5.1.10 Fort Hood (Fort Cavazos)

5.1.10.1 Description of Supply

The U.S. Department of the Army (Fort Cavasos, formerly Fort Hood) has a water right to store and divert 12,000 acft/yr in Lake Belton within BRA. The Fort Cavasos service area includes portions of Bell and Coryell Counties. Bell County WCID No. 1 and City of Gatesville divert, treat and deliver its Lake Belton supply to the Army base. No shortages are projected for Fort Cavasos. The surplus shown in Table 5.1-10 represents the cumulative totals for Fort Cavasos in the counties it serves.

5.1.10.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended for Fort Cavasos. The entities' water usage utilized for demand projections is 215 gpcd the RWPG recommends conservation to reduce usage to a goal of 140 gpcd. Fort Cavazos also uses Aquifer Storage and Recovery (ASR) to ensure water during droughts or emergencies. Treated water from Lake Belton is stored in an existing aquifer via pipelines. During shortages, stored water is withdrawn, disinfected, and delivered back through the same infrastructure, providing a redundant, on-post drinking water source.

1. Conservation:
   a. Cost Source: Volume II.
   b. Date to be Implemented: 2030.
   c. Annual Cost: maximum of $2,316,024 in 2080.
   d. Unit Cost: $684/acft.
2. Aquifer Storage and Recovery:
   a. Cost Source: Volume II.
   b. Date to be Implemented: 2040.
   c. Project Cost: $36,674,000
   d. Unit Cost: $3,513/acft

Table 5.1-11 Recommended Plan Costs by Decade for Fort Hood

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*3,467*	*3,156*	*2,816*	*2,475*	*2,135*	*1,795*
Conservation						
Supply From Plan Element (acft/yr)	661	1,585	2,565	3,161	3,274	3,386
Annual Cost ($/yr)	$452,124	$1,084,140	$1,754,460	$2,162,124	$2,239,416	$2,316,024
Projected Surplus/(Shortage) after Conservation (acft/yr)	*4,128*	*4,741*	*5,381*	*5,636*	*5,409*	*5,181*
Additional Demands from Recommended Strategies from Others						
Provide raw supply to 439 WSC (acft/yr)	—	—	—	(32)	(324)	(626)
Provide raw supply to Harker Heights (acft/yr)	—	—	(500)	(500)	(500)	(500)
Provide raw supply to Copperas Cove (acft/yr)	—	—	—	—	(125)	(1,285)

Plan Element	2030	2040	2050	2060	2070	2080
Total Surplus/(Shortage) Including Recommended Strategies (acft/yr)	*4,128*	*4,741*	4,881	5,104	4,460	2,770
Aquifer Storage and Recovery						
Supply From Plan Element (acft/yr)	0	934	934	934	934	934
Annual Cost ($/yr)	-	$3,281,000	$3,281,000	$703,000	$703,000	$703,000
Unit Cost ($/yr)	-	$3,513	$3,513	$753	$753	$753
Total Surplus/(Shortage) Including Recommended Strategies (acft/yr)	*4,128*	*5,675*	*5,815*	*6,038*	*5,394*	*3,704*

5.1.11 City of Harker Heights

5.1.11.1 Description of Supply

The City of Harker Heights has a contract to purchase water from the Brazos River Authority Little River System from Lake Stillhouse Hollow and Lake Belton. City of Harker Heights has contracted for 3,535 acft/yr of surface water supplies from the Brazos River Authority, which can supply 2,946 acft/yr in 2030 and 2,853 acft/yr in 2080, based on water availability analyses prescribed under water planning guidelines. Harker Heights also contracts with Bell County WCID No. 1 at 3,535 acft/yr, which supplies 4,540 acft/yr in 2030 and 4,397 acft/yr in 2080 to divert, treat, and deliver water from Lake Belton to the City. This entity has projected shortages starting 2040. Water Supply Plan

5.1.11.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to meet water needs for the City of Harker Heights. Associated costs are included for each strategy. The entities' water usage utilized for demand projections is 178 gpcd the RWPG recommends conservation to reduce usage to a goal of 140 gpcd.

1. Conservation:
    a. Cost Source: Volume II.
    b. Date to be Implemented: before 2030.
    c. Annual Cost: maximum of $1,266,768 in 2060.
    d. Unit Cost: $684/acft.
2. Purchase Raw Water Supply from Fort Cavazos:
    a. Cost Source: Volume II.
    b. Date to be Implemented: before 2050.
    c. Annual Cost: maximum of $500,000.
    d. Unit Cost: $100/acft.
3. Purchase Additional Diversion, Treatment, and Delivery from Bell County WCID No. 1:
    a. Cost Source: Volume II.
    b. Date to be Implemented: before 2070.
    c. Annual Cost: $185,000.
    d. Unit Cost: $1,000/acft.

Table 5.1-12 Recommended Plan Costs by Decade for City of Harker Heights

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*313*	*(813)*	*(1,957)*	*(2,348)*	*(2,396)*	*(2,443)*
Conservation						
Supply From Plan Element (acft/yr)	563	1,577	1,786	1,852	1,852	1,852
Annual Cost ($/yr)	$385,092	$1,078,668	$1,221,624	$1,266,768	$1,266,768	$1,266,768
Projected Surplus/(Shortage) after Conservation	*876*	*764*	*(171)*	*(496)*	*(544)*	*(591)*
Purchase Raw Water Supply from Fort Cavazos						
Supply From Plan Element (acft/yr)	—	—	500	500	500	500
Annual Cost ($/yr)	—	—	$50,000	$50,000	$50,000	$50,000
Unit Cost ($/acft)	—	—	$100	$100	$100	$100
Purchase Additional Diversion, Treatment, and Delivery from Bell County WCID No. 1						
Supply From Plan Element (acft/yr)	—	—	—	185	185	185
Annual Cost ($/yr)	—	—	—	$185,000	$185,000	$185,000
Unit Cost ($/acft)	—	—	—	$1,000	$1,000	$1,000
Total Surplus/(Shortage) Including Recommended Strategies (acft/yr)	876	764	329	189	141	94

5.1.12 City of Holland

The City of Holland has a contract to purchase water from the Central Texas WSC from Lake Stillhouse Hollow for 331 acft/yr. No shortages are projected for the City of Holland and no changes in the water supply is recommended. Conservation is not recommended because the entity's usage is 105 gpcd, which is below the selected goal of 140 gpcd.

5.1.13 City of Killeen

5.1.13.1 Description of Supply

The City of Killeen has a contract to purchase water from Bell County WCID No. 1 to divert, treat, and deliver water from Lake Belton to the City. Killeen provides supply for Bell County manufacturing entities. City of Killeen has contract for 39,964 acft/yr of water supplies from the Bell County WCID No. 1, which can supply 32,525 acft/yr in 2030 and 31,501 acft/yr in 2080, based on water availability analyses prescribed under water planning guidelines.

5.1.13.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to meet water needs for the City of Kileen. Associated costs are included for each strategy. Conservation is not recommended because the entity's usage is 125 gpcd, which is below the selected goal of 140 gpcd. The remaining unmet need in 2070 and 2080 is resulting from contracts not being fully allocated and is a result of the conservative methodology of determining source supply volumes.

1. Bell County WCID No. 1 North Reuse:
    a. Cost Source: Volume II.
    b. Date to be Implemented: before 2030.
    c. Annual Cost: maximum of $1,018,640.
    d. Unit Cost: $1,590/acft.
2. Bell County WCID No. 1 South Reuse:
    a. Cost Source: Volume II.
    b. Date to be Implemented: before 2030.
    c. Annual Cost: maximum of $1,018,640.
    d. Unit Cost: $2,282/acft.

Table 5.1-13 Recommended Plan Costs by Decade for the City of Killeen

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*11,349*	*7,851*	*4,566*	*937*	*(2,638)*	*(6,217)*
Reuse from Bell County WCID No. 1 – North						
Supply From Plan Element (acft/yr)	1,773	1,773	1,773	1,773	1,773	1,773
Annual Cost ($/yr)	$2,819,000	$2,819,000	$665,000	$665,000	$665,000	$665,000
Unit Cost ($/acft)	$1,590	$1,590	$375	$375	$375	$375
Reuse from Bell County WCID No. 1 – South						
Supply From Plan Element (acft/yr)	716	563	563	563	543	543
Annual Cost ($/yr)	$1,633,900	$1,284,800	$215,100	$215,100	$207,400	$207,400
Unit Cost ($/acft)	$2,282	$2,282	$382	$382	$382	$382
Projected Surplus/(Shortage) after Reuse	*13,838*	*10,187*	*6,902*	*3,273*	*(322)*	*(3,901)*

5.1.14 Little Elm Valley WSC

5.1.14.1 Description of Supply

Little Elm Valley WSC relies on the Trinity Aquifer for a groundwater supply of 92 acft/yr and has a contractual agreement with Central Texas WSC for treated water supplies. Under this contract, Little Elm Valley WSC is allocated 547 acft/yr of water from Central Texas WSC. No shortages are projected for Little Elm Valley WSC.

5.1.14.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended for Little Elm Valley WSC. The entities' water usage utilized for demand projections is 171 gpcd. The RWPG recommends conservation to reduce usage to a goal of 140 gpcd. The most recent water loss audit report shows a water loss of approximately 26% and recommends water loss mitigation.

1. Conservation:
    a. Cost Source: Volume II.
    b. Date to be Implemented: before 2030.
    c. Annual Cost: maximum of $53,352 in 2080.
    d. Unit Cost: $684/acft.
2. Water Loss Reduction:
    a. Cost Source: Volume II.
    b. Date to be Implemented: before 2030.
    c. Annual Cost: maximum of $91,264 in 2040.
    d. Unit Cost: $2,246/acft.

Table 5.1-14 Recommended Plan Costs by Decade for Little Elm Valley WSC

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*289*	*251*	*220*	*198*	*173*	*145*
Conservation						
Supply From Plan Element (acft/yr)	27	62	66	70	75	78
Annual Cost ($/yr)	$18,468	$42,408	$45,144	$47,880	$51,300	$53,352
Water Loss Reduction						
Supply From Plan Element (acft/yr)	40	44	48	51	53	57
Annual Cost ($/yr)	$89,828	$91,264	$17,228	$18,305	$19,023	$20,459
Unit Cost ($/acft)	$2,246	$2,074	$359	$359	$359	$359
Projected Surplus/(Shortage) after Conservation	*356*	*357*	*334*	*379*	*301*	*280*

5.1.15 Moffat WSC

5.1.15.1 Description of Supply

Moffat WSC has a contract to purchase water from Bluebonnet WSC from Lake Belton, as well as supplemental wells in the Trinity Aquifer that supply 361 acft/yr. Moffat WSC has contracted for 869 acft/yr of surface water supplies from the Bluebonnet WSC, which can supply 841 acft/yr in 2030 and 814 acft/yr in 2080, based on water availability analyses prescribed under water planning guidelines. No shortages are projected for Moffat WSC and no changes in the water supply are recommended.

5.1.15.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended for Moffat WSC. The entities’ water usage utilized for demand projections is 167 gpcd. The RWPG recommends conservation to reduce usage to a goal of 140 gpcd. The most recent water loss audit report shows a water loss of approximately 28% and recommends water loss mitigation.

1. Conservation:
   a. Cost Source: Volume II.
   b. Date to be Implemented: before 2030.
   c. Annual Cost: maximum of $30,780 in 2040.
   d. Unit Cost: $684/acft.
2. Water Loss Reduction:
   a. Cost Source: Volume II.
   b. Date to be Implemented: before 2030.
   c. Annual Cost: maximum of $102,883 in 2030.
   d. Unit Cost: $2,187/acft.

Table 5.1-15 Recommended Plan Costs by Decade for Moffat WSC

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*722*	*760*	*793*	*821*	*846*	*871*
Conservation						
Supply From Plan Element (acft/yr)	29	45	40	36	31	29
Annual Cost ($/yr)	$19,836	$30,780	$27,360	$24,624	$21,204	$19,836
Water Loss Reduction						
Supply From Plan Element (acft/yr)	52	46	41	37	33	29
Annual Cost ($/yr)	$102,883	$100,589	$15,679	$14,149	$12,620	$11,090
Unit Cost ($/acft)	$1,976	$2,187	$382	$382	$382	$382
Projected Surplus/(Shortage) after Conservation (acft/yr)	*803*	*851*	*874*	*894*	*910*	*929*

5.1.16 Morgan’s Point Resort

Morgan’s Point Resort contracts with the City of Temple for all its water supply for 1,935 acft/yr. No shortages are projected for Morgan’s Point Resort and no changes in the water supply is recommended. Conservation is not recommended because the entity's usage is 135 gpcd, which is below the selected goal of 140 gpcd.

5.1.17 Pendleton WSC

5.1.17.1 Description of Supply

Pendleton WSC relies on the Trinity Aquifer for a groundwater supply of 146 acft/yr and a contract to purchase water from Bluebonnet WSC from Lake Belton. No shortages are projected for Pendleton WSC and no changes in the water supply is recommended. Pendleton WSC has contracted for 461 acft/yr of surface water supplies from the Bluebonnet WSC, which can supply 446 acft/yr in 2030 and 432 acft/yr in 2080, based on water availability analyses prescribed under water planning guidelines.

5.1.17.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended for Pendleton WSC. The entities’ water usage utilized for demand projections is 169 gpcd the RWPG recommends conservation to reduce usage to a goal of 140 gpcd.

1. Conservation:
    a. Cost Source: Volume II.
    b. Date to be Implemented: before 2030.
    c. Annual Cost: maximum of $51,984 in 2080.
2. Unit Cost: $684/acft.

Table 5.1-16 Recommended Plan Costs by Decade for Pendleton WSC

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*177*	*144*	*117*	*100*	*80*	*61*
Conservation						
Supply From Plan Element (acft/yr)	31	66	69	70	73	76
Annual Cost ($/yr)	$21,204	$45,144	$47,196	$47,880	$49,932	$51,984
Projected Surplus/(Shortage) after Conservation (acft/yr)	*208*	*210*	*186*	*170*	*153*	*137*

5.1.18 City of Rogers

5.1.18.1 Description of Supply

The City of Rogers purchases treated surface water from Central Texas WSC. Rogers has contracted for 486 acft/yr of surface water supplies from the Central Texas WSC. No shortages are projected for the City of Rogers and no changes in the water supply is recommended.

5.1.18.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended for Rogers. The entities' water usage utilized for demand projections is 164 gpcd the RWPG recommends conservation to reduce usage to a goal of 140 gpcd. The most recent water loss audit report shows a water loss of approximately 38% and recommends water loss mitigation.

1. Conservation:
    a. Cost Source: Volume II.
    b. Date to be Implemented: before 2030.
    c. Annual Cost: maximum of $12,312 in 2040 and 2050.
    d. Unit Cost: $684/acft.
2. Water Loss Reduction:
    a. Cost Source: Volume II.
    b. Date to be Implemented: before 2030.
    c. Annual Cost: maximum of $50,828 in 2030.
    d. Unit Cost: $1,362/acft.

Table 5.1-17 Recommended Plan Costs by Decade for City of Rogers

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*322*	*328*	*332*	*337*	*343*	*349*
Conservation						
Supply From Plan Element (acft/yr)	12	18	18	17	16	16
Annual Cost ($/yr)	$8,208	$12,312	$12,312	$11,628	$10,944	$10,944
Water Loss Reduction						
Supply From Plan Element (acft/yr)	38	37	36	35	34	32
Annual Cost ($/yr)	$50,828	$50,399	$15,456	$15,027	$14,598	$13,739
Unit Cost ($/acft)	$1,338	$1,362	$429	$429	$429	$429
Projected Surplus/(Shortage) after Conservation (acft/yr)	*372*	*383*	*386*	*389*	*393*	*397*

5.1.19 Salado WSC

5.1.19.1 Description of Supply

Salado WSC currently obtains water from the Edwards Aquifer at 2,108 acft/yr and through purchases of treated supply from Kempner WSC at 193 acft/yr. The entity also has a contract with the BRA. Salado WSC has contracted for 1,600 acft/yr of surface water supplies from the Brazos River Authority, which can supply 1,333 acft/yr in 2030 and 1, 292 acft/yr in 2080, based on water availability analyses prescribed under water planning guidelines. No shortage is projected for Salado WSC.

5.1.19.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended for Salado WSC. The entities' water usage utilized for demand projections is 296 gpcd. The RWPG recommends conservation to reduce usage to a goal of 140 gpcd.

1. Conservation:
    a. Cost Source: Volume II.
    b. Date to be Implemented: 2030.
    c. Annual Cost: maximum $1,543,788 in 2080.
    d. Unit Cost: $684/acft.

Table 5.1-18 Recommended Plan Costs by Decade for Salado WSC

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*(273)*	*(567)*	*(900)*	*(1,273)*	*(1,692)*	*(2,163)*
Conservation						
Supply From Plan Element (acft/yr)	216	512	892	1,344	1,906	2,257
Annual Cost ($/yr)	$147,744	$350,208	$610,128	$919,296	$1,303,704	$1,543,788
Projected Surplus/(Shortage) after Conservation	*(57)*	*(55)*	*(8)*	*71*	*214*	*94*

5.1.20 City of Temple

5.1.20.1 Description of Supply

The City of Temple obtains its water supply from surface water from Lake Belton through the BRA and run-of-the river water rights. City of Temple has contracted for 30,453 acft/yr of surface water supplies from the Brazos River Authority, which can supply 25,380 acft/yr in 2030 and 24,582 acft/yr in 2080, based on water availability analyses prescribed under water planning guidelines. The City supplies several neighboring communities with treated water. The City is projected to have no shortage of supplies through the planning period.

5.1.20.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended for the City of Temple. The entities' water usage utilized for demand projections is 227 gpcd. The RWPG recommends conservation to reduce usage to a goal of 140 gpcd.

1. Conservation:
   a. Cost Source: Volume II.
   b. Date to be Implemented: before 2030.
   c. Annual Cost: maximum $10,290,780 in 2080.
   d. Unit Cost: $684/acft.
2. Expand Water Treatment Plant Capacity. Strategy includes two identical expansions. First treatment plant expansion will increase available supply to cover shortage for 2030:
   a. Cost Source: Volume II.
   b. Date to be implemented: first expansion before 2030; second expansion before 2040.
   c. Project Cost: $42,162,000.
   d. Unit Cost: maximum of $2,283.

Table 5.1-19 Recommended Plan Costs by Decade for the City of Temple

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*6,576*	*2,142*	*(1,571)*	*(4,449)*	*(7,547)*	*(10,887)*
Conservation						
Supply From Plan Element (acft/yr)	2,375	5,762	9,836	13,473	14,215	15,045
Annual Cost ($/yr)	$1,624,500	$3,941,208	$6,727,824	$9,215,532	$9,723,060	$10,290,780
Projected Surplus/(Shortage) after Conservation	*8,951*	*7,904*	*8,265*	*9,024*	*6,668*	*4,158*
Water Treatment Plant Expansion (1)						
Supply From Plan Element (acft/yr)(2)	2,352	2,352	3,610	3,138	2,707	2,256
Annual Cost ($/yr)	$2,685,000	$5,370,000	$3,887,000	$2,404,000	$2,404,000	$2,404,000
Unit Cost ($/acft)	$1,142	$2,283	$826	$511	$511	$511
Projected Surplus/(Shortage) after recommended WMS (acft/yr)	*8,951*	*7,904*	*8,265*	*9,024*	*6,668*	*4,158*

Notes:
(1) Two separate expansions at 2.1 MGD each with the first completed by 2030 and the second completed before 2040.
(2) Quantity represents increase in treatment capacity required to develop additional supplies and does not include the supply itself.

5.1.21 The Grove WSC

5.1.21.1 Description of Supply

The Grove WSC services entities in Bell and Coryell counties, with the majority of demand lying within Bell County. The WSC purchases treated surface water from the City of Gatesville and raw surface water from the Brazos River authority Little River System. The Grove WSC has a contract for 400 acft/yr of surface water supplies from the Brazos River Authority, which can supply 333 acft/yr in 2030 and 323 acft/yr in 2080, based on water availability analyses prescribed under water planning guidelines.

5.1.21.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended for The Grove WSC. Conservation is not recommended because the entity's usage is 139 gpcd, which is below the selected goal of 140 gpcd. The City's contractual supply is sufficient to meet demands in all decades. The remaining unmet need reported, results from contracts not being fully allocated as a result of the conservative methodology of determining source supply volumes.

Table 5.1-20 Projected Surplus/Shortage by Decade for The Grove WSC

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*12*	*3*	*(5)*	*(13)*	*(18)*	*(56)*

5.1.22 City of Troy

The City of Troy obtains its water from a contract with the City of Temple for 968 acft/yr and wells located in the Trinity Aquifer which supply 82 acft/yr. No shortages are projected for the City of Troy and no changes in the water supply is recommended. Conservation is not recommended because the entity's usage is 119 gpcd, which is below the selected goal of 140 gpcd.

5.1.23 West Bell County WSC

5.1.23.1 Description of Supply

West Bell County WSC obtains its water through a contract with the Central Texas WSC. West Bell County WSC has contracted for 1,660 acft/yr of surface water supplies from the Central Texas WSC. No shortages are projected for West Bell County WSC.

5.1.23.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended for West Bell County WSC. The entities' water usage utilized for demand projections is 166 gpcd. The RWPG recommends conservation to reduce usage to a goal of 140 gpcd.

1. Conservation:
    a. Cost Source: Volume II.
    b. Date to be Implemented: 2030.
    c. Annual Cost: maximum $85,500 in 2080.
    d. Unit Cost: $684/acft.

Table 5.1-21 Recommended Plan Costs by Decade for West Bell County WSC

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*877*	*823*	*780*	*754*	*725*	*691*
Conservation						
Supply From Plan Element (acft/yr)	59	108	113	117	120	125
Annual Cost ($/yr)	$40,356	$73,872	$77,292	$80,028	$82,080	$85,500
Projected Surplus/(Shortage) after Conservation	*936*	*931*	*893*	*871*	*845*	*816*

5.1.24 Bell County-Other

5.1.24.1 Description of Supply

Bell County-Other entities obtain water supply from groundwater from the Trinity Aquifer and treated surface water from Bell County WCID No. 1, Central Texas WSC, and City of Temple. Shortages are projected for County Other by 2030.

5.1.24.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended for Bell County-Other. Conservation is recommended to reduce usage to a goal of 140 gpcd.

1. Conservation:
    a. Cost Source: Volume II.
    b. Date to be Implemented: 2030.
    c. Annual Cost: maximum $24,191 in 2070.
    d. Unit Cost: $560/acft.

Table 5.1-22 Recommended Plan Costs by Decade for Bell County - Other

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*(510)*	*(602)*	*(638)*	*(573)*	*(459)*	*(299)*
Conservation						
Supply From Plan Element (acft/yr)	37	38	40	37	32	24
Annual Cost ($/yr)	$25,308	$25,992	$27,360	$25,308	$21,888	$16,416
Projected Surplus/(Shortage) after Conservation	*(473)*	*(564)*	*(598)*	*(536)*	*(427)*	*(275)*

5.1.25 Manufacturing

5.1.25.1 Description of Supply

Water supply for manufacturing in Bell County is obtained by purchase from the cities of Killeen, Temple, and Troy, and from wells within the Trinity Aquifer. Bell County Manufacturing is projected to have shortages beginning in 2030.

5.1.25.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to meet water needs for Bell County Manufacturing. Conservation is recommended.

1. Conservation:
    a. Cost Source: Volume II.
    b. Date to be Implemented: before 2030.
    c. Annual Cost: Not determined.
2. Edwards Aquifer Development:
    a. Cost Source: Volume II.
    b. Date to be Implemented: before 2030.
    c. Project Cost:$769,000
    d. Unit Cost: $133
3. Reuse Supplies from Bell County WCID No. 1 (North):
    a. Cost Source: Volume II.
    b. Date to be Implemented: by 2030.
    c. Annual Cost: Costs to be borne by Bell County WCID No. 1.
    d. Unit Cost: $1,590/acft.

Table 5.1-23 Recommended Plan Costs by Decade for Bell County - Manufacturing

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*(467)*	*(503)*	*(540)*	*(579)*	*(619)*	*(661)*
Conservation						
Supply From Plan Element (acft/yr)	29	50	73	75	78	81
Annual Cost ($/yr)	ND	ND	ND	ND	ND	ND
Projected Surplus/(Shortage) after Conservation	*(438)*	*(453)*	*(467)*	*(441)*	*(541)*	*(580)*
Edwards Aquifer Development						
Supply From Plan Element (acft/yr)	*525*	*525*	*525*	*525*	*525*	*525*
Annual Cost ($/yr)	*$70,000*	*$70,000*	*$16,000*	*$16,000*	*$16,000*	*$16,000*
Unit Cost ($/acft)	*$133*	*$133*	*$30*	*$30*	*$30*	*$30*

Plan Element	2030	2040	2050	2060	2070	2080
Purchase Reuse Supplies from Bell County WCID No. 1 (North)						
Supply From Plan Element (acft/yr)	152	152	152	152	152	152
Annual Cost ($/yr)	$241,680	$241,680	$57,000	$57,000	$57,000	$57,000
Unit Cost ($/acft)	$1,590	$1,590	$375	$375	$375	$375
Projected Surplus/(Shortage) after recommended WMS (acft/yr)	*257*	*224*	*210*	*236*	*136*	*97*

Notes:
(1) ND – Not Determined. Costs to implement industrial conservation technologies will vary based on each location.

5.1.26 Steam-Electric

Steam-Electric operations in Bell County obtain reuse water supply from the City of Temple. Steam-Electric has a projected surplus throughout the planning period and no changes in water supply are recommended.

5.1.27 Mining

5.1.27.1 Description of Supply

Mining in Bell County obtains water supply from wells within the Trinity Aquifer and has a projected surplus throughout the planning period. No changes in water supply are recommended.

5.1.28 Irrigation

5.1.28.1 Description of Supply

Bell County Irrigation is supplied by groundwater from the Trinity and the Edwards (BFZ) Aquifers, and surface water from the Brazos River Authority Little River System. Bell County Irrigation has contracted for 308 acft/yr of surface water supplies from the Brazos River Authority, which can supply 257 acft/yr in 2030 and 249 acft/yr in 2080, based on water availability analyses prescribed under water planning guidelines. Irrigation is projected to have shortages beginning in 2030.

5.1.28.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to meet water needs for Bell County-Irrigation. Conservation is recommended.

1. Conservation:
   a. Cost Source: Volume II.
   b. Date to be Implemented: before 2030.
   c. Annual Cost: Not determined.
2. Groundwater Development – Edwards BFZ Aquifer:
   a. Cost Source: Volume II.
   b. Date to be Implemented: before 2030.
   c. Project Cost: $1,109,000.

d. Unit Cost: $125/acft.

Table 5.1-24 Recommended Plan Costs by Decade for Bell County - Irrigation

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*(934)*	*(940)*	*(947)*	*(952)*	*(959)*	*(964)*
Conservation						
Supply From Plan Element (acft/yr)	93	155	218	218	218	218
Annual Cost ($/yr)	ND	ND	ND	ND	ND	ND
Projected Surplus/(Shortage) after Conservation (acft/yr)	*(841)*	*(785)*	*(729)*	*(734)*	*(741)*	*(746)*
Groundwater Development – Edwards BFZ Aquifer						
Supply From Plan Element (acft/yr)	810	810	810	810	810	810
Annual Cost ($/yr)	$101,000	$101,000	$23,000	$23,000	$23,000	$23,000
Unit Cost ($/acft)	$125	$125	$28	$28	$28	$28
Projected Surplus/(Shortage) after recommended WMS (acft/yr)	*(31)*	*25*	*81*	*76*	*69*	*64*
ND – Not Determined. Costs to implement irrigation conservation technologies will vary based on each location.						

5.1.29 Livestock

Livestock water supply is projected to meet demands through 2080 and no changes in water supply are recommended.

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5.2 Bosque County Water Supply Plan

Table 5.2-1 lists each water user group in Bosque County and their corresponding surplus or shortage in years 2030 and 2080. A brief summary of the water user groups and the plan for the selected water user are presented in the following subsections.

Table 5.2-1 Bosque County Surplus/(Shortage)

Water User Group	Surplus/(Shortage) 2030 (acft/yr)	Surplus/(Shortage) 2080 (acft/yr)	Comment
Childress Creek WSC	174	213	Projected surplus
City of Clifton	96	(380)	Projected shortage - see plan below.
Cross Country WSC			See McLennan County
Highland Park WSC	(66)	(52)	Projected shortage - see plan below.
HILCO United Services			See Hill County
Hog Creek WSC			See McLennan County
City of Meridian	211	200	Projected surplus
Mustang Valley WSC	50	127	Projected surplus
Smith Bend WSC	197	200	Projected surplus
City of Valley Mills	81	62	Projected surplus
County-Other	5	601	Projected surplus
Manufacturing	241	241	Projected surplus
Steam-Electric	3,621	2,743	Projected surplus
Mining	282	195	Projected surplus
Irrigation	1,200	(627)	Projected shortage - see plan below.
Livestock	458	458	Projected surplus

5.2.1 Childress Creek WSC

5.2.1.1 Description of Supply

Childress Creek WSC obtains its water supply from groundwater from the Trinity Aquifer. No shortages are projected for the Childress Creek WSC.

5.2.1.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended to meet additional regional needs. Associated Childress Creek WSC costs are included for the Bosque County Regional Project. The most recent water loss audit report shows a water loss of approximately 42% and water loss mitigation is recommended. The entities' water usage utilized for demand projections is 230 gpcd. The RWPG recommends conservation to reduce usage to a goal of 140 gpcd.

1. Conservation:
    a. Cost Source: Volume II.
    b. Date to be Implemented: before 2030.
    c. Annual Cost: maximum of $81,396 in 2060
    d. Unit Cost: $684/acft.
2. Water Loss Reduction:
    a. Cost Source: Volume II.
    b. Date to be Implemented: before 2030.
    c. Annual Cost: maximum of $424,571 in 2030
3. Bosque County Regional Project:
    a. Cost Source: Volume II.
    b. Date to be Implemented: before 2040.
    c. Project Cost: $13,715,000 for Childress Creek WSC portion.
    d. Unit Cost: $5,571/acft.

Table 5.2-2 Recommended Plan Costs by Decade for Childress Creek WSC

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*174*	*180*	*189*	*196*	*205*	*213*
Conservation						
Supply From Plan Element (acft/yr)	28	60	92	119	115	113
Annual Cost ($/yr)	$19,152	$41,040	$62,928	$81,396	$78,660	$77,292
Water Loss Reduction						
Supply From Plan Element (acft/yr)	94	93	90	88	86	83
Annual Cost ($/yr)	$424,571	$424,132	$39,587	$38,707	$37,827	$36,508
Projected Surplus/(Shortage) after Conservation (acft/yr)	*296*	*333*	*371*	*403*	*406*	*409*
Bosque County Regional Project						
Supply From Plan Element (acft/yr)		203	203	203	203	203
Annual Cost ($/yr)		$1,130,900	$1,130,900	$238,900	$238,900	$238,900
Unit Cost ($/acft)		$5,571	$5,571	$1,177	$1,177	$1,177
Projected Surplus/(Shortage) after recommended WMS (acft/yr)	*296*	*536*	*574*	*606*	*609*	*612*

5.2.2 City of Clifton

5.2.2.1 Description of Supply

The City of Clifton obtains its water supply from groundwater from the Trinity Aquifer and from surface water from the North Bosque River. The City of Clifton owns water rights on the North Bosque River and diverts water into a 500 acft. off-channel reservoir. Based on the estimated availability of groundwater and surface water to the City, shortages are projected for the City beginning in 2040.

5.2.2.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to meet projected water supply shortages. Associated costs are included for each strategy. The entities' water usage utilized for demand projections is 201 gpcd. The RWPG recommends conservation to reduce usage to a goal of 140 gpcd.

1. Conservation:
   a. Cost Source: Volume II.
   b. Date to be Implemented: before 2030.
   c. Annual Cost: maximum of $215,460 in 2080.
   d. Unit cost of $684/acft.
2. Bosque County Regional Project – includes expansion of the Clifton OCR and WTP:
   a. Cost Source: Volume II.
   b. Date to be Implemented: 2040.
   c. Project Cost: $26,820,000 for the City's portion.
   d. Unit Cost: $5,572/acft.

Table 5.2-3 Recommended Plan Costs by Decade for City of Clifton

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*96*	*(2)*	*(98)*	*(197)*	*(302)*	*(380)*
Conservation						
Supply From Plan Element (acft/yr)	60	146	253	272	292	315
Annual Cost ($/yr)	$41,040	$99,864	$173,052	$186,048	$199,728	$215,460
Projected Surplus/(Shortage) after Conservation	*156*	*144*	*155*	*75*	*(10)*	*(65)*
Bosque County Regional Project						
Supply From Plan Element (acft/yr)		397	397	397	397	397
Annual Cost ($/yr)		$2,212,100	$2,212,100	$468,100	$468,100	$468,100
Unit Cost ($/acft)		$5,572	$5,572	$1,179	$1,179	$1,179
Projected Surplus/(Shortage) after recommended WMS (acft/yr)	*156*	*541*	*552*	*472*	*387*	*332*

5.2.3 Highland Park WSC

5.2.3.1 Description of Supply

Highland Park WSC obtains its water supply from groundwater from the Trinity Aquifer, and has a projected shortage from 2030 through 2080.

5.2.3.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to meet projected water supply shortages. Associated costs are included for each strategy. The entities' water usage utilized for demand projections is 264 gpcd. The RWPG recommends conservation to reduce usage to a goal of 140 gpcd.

1. Conservation:
   a. Cost Source: Volume II.
   b. Date to be Implemented: before 2030.
   c. Annual Cost: $43,092 in 2070; Unit Cost of $684/acft.
2. Groundwater Development – Trinity Aquifer:
   a. Cost Source: Volume II.
   b. Date to be Implemented: before 2030.
   c. Project Cost: $3,609,000.
   d. Unit Cost: $3,909/acft.

Table 5.2-4 Recommended Plan Costs by Decade for Highland Park WSC

Plan Element	2020	2030	2040	2050	2060	2070
Projected Surplus/(Shortage) (acft/yr)	*(66)*	*(64)*	*(62)*	*(58)*	*(55)*	*(52)*
Conservation						
Supply From Plan Element (acft/yr)	12	27	42	55	63	63
Annual Cost ($/yr)	$8,208	$18,468	$28,728	$37,620	$43,092	$43,092
Projected Surplus/(Shortage) after Conservation	*(54)*	*(37)*	*(20)*	*(3)*	*8*	*11*
Groundwater Development – Trinity Aquifer						
Supply From Plan Element (acft/yr)	77	77	77	77	77	77
Annual Cost ($/yr)	$301,000	$301,000	$47,000	$47,000	$47,000	$47,000
Unit Cost ($/acft)	$3,909	$3,909	$610	$610	$610	$610
Projected Surplus/(Shortage) after recommended WMS (acft/yr)	*23*	*40*	*57*	*74*	*85*	*88*

5.2.4 City of Meridian

5.2.4.1 Description of Supply

The City of Meridian obtains its water supply from groundwater from the Trinity Aquifer and has a contract to purchase treated water from the City of Clifton. No shortages are projected for the City of Meridian.

5.2.4.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to meet any unforeseen water needs that may arise. Associated costs are included for each strategy. Conservation was considered; however, the entity’s usage is below the selected goal of 140 gpcd.

1. Bosque County Regional Project – includes expansion of the Clifton OCR and WTP:
   a. Cost Source: Volume II.
   b. Date to be Implemented: before 2040.
   c. Project Cost: $15,133,000 for the City’s portion.
   d. Unit Cost: $5,576/acft.

Table 5.2-5 Recommended Plan Costs by Decade for City of Meridian

Plan Element	2020	2030	2040	2050	2060	2070
Projected Surplus/ (Shortage) (acft/yr)	*211*	*211*	*205*	*196*	*189*	*200*
Bosque County Regional Project						
Supply From Plan Element (acft/yr)	—	224	224	224	224	224
Annual Cost ($/yr)	—	$1,249,000	$1,249,000	$265,000	$265,000	$265,000
Unit Cost ($/acft)	—	$5,576	$5,576	$1,183	$1,183	$1,183
Projected Surplus/(Shortage) after recommended WMS (acft/yr)	*211*	*435*	*429*	*420*	*413*	*424*

5.2.5 Mustang Valley WSC

5.2.5.1 Description of Supply

The Mustang Valley WSC service area is primarily in Bosque County but also serves a small portion of Coryell County. The WSC obtains all of its water supply from Trinity Aquifer groundwater. No shortages are projected, the surpluses shown in Table 5.2-6 represent the cumulative totals for Mustang Valley WSC.

5.2.5.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, conservation is the recommended water management strategy to meet water needs for Mustang Valley WSC. Associated costs are included below. The entities' water usage utilized for demand projections is 215 gpcd. The RWPG recommends conservation to reduce usage to a goal of 140 gpcd.

1. Conservation:
   a. Cost Source: Volume II.
   b. Date to be Implemented: before 2030.
   c. Annual Cost: maximum of $90,972 in 2060.
   d. Unit Cost of $684/acft.

Table 5.2-6 Recommended Plan Costs by Decade for Mustang Valley WSC

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*50*	*62*	*77*	*92*	*108*	*127*
Conservation						
Supply From Plan Element (acft/yr)	34	77	116	133	127	121
Annual Cost ($/yr)	$23,256	$52,668	$79,344	$90,972	$86,868	$82,764
Projected Surplus/(Shortage) after Conservation (acft/yr)	*84*	*139*	*193*	*225*	*235*	*248*
Projected Surplus/(Shortage) after recommended WMS (acft/yr)	*84*	*139*	*193*	*225*	*235*	*248*

5.2.6 Smith Bend WSC

5.2.6.1 Description of Supply

Smith Bend WSC obtains all of its water supply from Trinity Aquifer groundwater. No shortages are projected for the WSC throughout the planning period and no changes in water supply are recommended. Conservation was considered; however, the entity's usage is below the selected goal of 140 gpcd.

5.2.7 City of Valley Mills

5.2.7.1 Description of Supply

The City of Valley Mills service area is primarily in Bosque County but also serves a small portion of McLennan County. The City obtains all of its water supply from groundwater from the Trinity Aquifer. No shortages are projected for the City of Valley Mills throughout the planning period. The surpluses shown in Table 5.2-7 represent the cumulative totals for the City of Valley Mills (including Bosque and McLennan Counties).

5.2.7.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to improve the City's water system reliability. Associated costs are included for each strategy. The entities' water usage utilized for demand projections is 179 gpcd. The RWPG recommends conservation to reduce usage to a goal of 140 gpcd.

1. Conservation:
   a. Cost Source: Volume II.
   b. Date to be Implemented: before 2030.
   c. Annual Cost: maximum of $35,568 in 2070.
   d. Unit Cost of $684/acft.
2. Bosque County Regional Project:
   a. Cost Source: Volume II.
   b. Date to be Implemented: before 2040.
   c. Project Cost: $12,294,000 for the City's portion.
   d. Unit Cost: $5,571/acft.

Table 5.2-7 Recommended Plan Costs by Decade for City of Valley Mills

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*81*	*78*	*74*	*70*	*65*	*62*
Conservation						
Supply From Plan Element (acft/yr)	18	48	49	50	52	51
Annual Cost ($/yr)	$12,312	$32,832	$33,516	$34,200	$35,568	$34,884
Projected Surplus/(Shortage) after Conservation (acft/yr)	*99*	*126*	*123*	*120*	*117*	*113*
Bosque County Regional Project						
Supply From Plan Element (acft/yr)	—	182	182	182	182	182

Plan Element	2030	2040	2050	2060	2070	2080
Annual Cost ($/yr)	—	$1,013,900	$1,013,900	$214,000	$214,000	$214,000
Unit Cost ($/acft)	—	$5,571	$5,571	$1,176	$1,176	$1,176
Projected Surplus/(Shortage) after recommended WMS (acft/yr)	*99*	*308*	*305*	*302*	*299*	*295*

5.2.8 County-Other

5.2.8.1 Description of Supply

Bosque County-Other entities obtain water supply from groundwater from the Trinity Aquifer. No shortages are projected for County-Other throughout the planning period.

5.2.8.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the Bosque County Regional Project is the recommended water management strategy to improve County-Other water system reliability. Associated costs are included below. Conservation was considered; however, the entity's 125 gpcd is below the selected goal of 140 gpcd.

1. Bosque County Regional Project:
   a. Cost Source: Volume II.
   b. Date to be Implemented: before 2040.
   c. Project Cost: $4,232,000 for the County-Other portion.
   d. Unit Cost: $5,563/acft.

Table 5.2-8 Recommended Plan Costs by Decade for County-Other

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*5*	*100*	*218*	*334*	*461*	*601*
Bosque County Regional Project						
Supply From Plan Element (acft/yr)	—	64	64	64	64	64
Annual Cost ($/yr)	—	$356,000	$356,000	$75,000	$75,000	$75,000
Unit Cost ($/acft)	—	$5,563	$5,563	$1,172	$1,172	$1,172
Projected Surplus/(Shortage) after recommended WMS (acft/yr)	*5*	*164*	*282*	*398*	*525*	*665*

5.2.9 Manufacturing

Water supply for manufacturing in Bosque County is obtained by purchase from a city or water supply corporation, from private Trinity aquifer wells operated by the manufacturing entity, or by limited surface water supplies. Childress Creek WSC, the City of Clifton, and the City of Hamilton sell groundwater to Bosque County manufacturing entities. No shortages are projected for manufacturing in Bosque County and no changes in water supply are recommended.

5.2.10 Steam-Electric

The water supply for Steam-Electric use in Bosque County consists of surface water contracts with the Brazos River Authority. No shortages are projected for Steam-Electric from the year 2030 through 2080 and no changes in water supply are recommended.

5.2.11 Mining

5.2.11.1 Description of Supply

Mining operations in Bosque County are supplied by Trinity Groundwater. No shortages are projected for Bosque County-Mining beginning in 2030 through 2080.

5.2.11.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, conservation is the only recommended water management strategy for Bosque County-Mining. Associated costs are included for each strategy.

1. Conservation:
   a. Cost Source: Volume II.
   b. Date to be Implemented: before 2030.
   c. Annual Cost: not determined.

Table 5.2-9 Recommended Plan Costs by Decade for Bosque County – Mining

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*282*	*245*	*222*	*207*	*198*	*195*
Conservation						
Supply From Plan Element (acft/yr)	59	104	132	131	128	127
Annual Cost ($/yr)	ND	ND	ND	ND	ND	ND
Projected Surplus/(Shortage) after Conservation (acft/yr)	*341*	*349*	*354*	*338*	*326*	*322*
Projected Surplus/(Shortage) after recommended WMS (acft/yr)	*341*	*349*	*354*	*338*	*326*	*322*
ND – Not determined. Costs to implement industrial conservation technologies will vary based on each location						

5.2.12 Irrigation

5.2.12.1 Description of Supply

Bosque County Irrigation is supplied by Trinity Groundwater and run of the river water rights. Irrigation is projected to have shortages beginning in 2070.

5.2.12.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to meet water needs for Bosque County-Irrigation. Associated costs are included for each strategy. The use of groundwater from the Trinity aquifer and conservation are recommended.

1. Conservation:
   a. Cost Source: Volume II.
   b. Date to be Implemented: before 2030.
   c. Annual Cost: maximum of $299,000.
   d. Unit Cost: $1,196/acft.
2. Groundwater Development – Trinity Aquifer:
   a. Cost Source: Volume II.
   b. Date to be Implemented: before 2030.
   c. Project Cost: $3,944,000.
   d. Unit Cost: $308.

Table 5.2-10 Recommended Plan Costs by Decade for Bosque County – Irrigation

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*1,200*	*835*	*469*	*104*	*(262)*	*(627)*
Conservation						
Supply From Plan Element (acft/yr)	107	179	250	250	250	250
Annual Cost ($/yr)	$128,000	$214,100	$299,000	$299,000	$299,000	$299,000
Projected Surplus/(Shortage) after Conservation (acft/yr)	*1,307*	*1,014*	*719*	*354*	*(12)*	*(377)*
Groundwater Development – Trinity Aquifer						
Supply From Plan Element (acft/yr)	1,175	1,175	1,175	1,175	1,175	1,175
Annual Cost ($/yr)	$362,000	$362,000	$83,000	$83,000	$83,000	$83,000
Unit Cost ($/acft)	$308	$308	$71	$71	$71	$71
Projected Surplus/(Shortage) after recommended WMS (acft/yr)	*2,482*	*2,189*	*1,894*	*1,529*	*1,163*	*798*

5.2.13 Livestock

Livestock demand is met by local water supply and Trinity Aquifer groundwater and is projected to meet needs through 2080. No changes in Bosque County Livestock water supply are recommended.

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5.3 Brazos County Water Supply Plan

Table 5.3-1 lists each water user group in Brazos County and their corresponding surplus or shortage in years 2030 and 2080. A brief summary of the water user groups and the plan for the selected water user are presented in the following subsections.

Table 5.3-1 Brazos County Surplus/(Shortage)

Water User Group	Surplus/(Shortage)		Comment
	2030 (acft/yr)	2080 (acft/yr)	
City of Bryan	(6,554)	(35,740)	Projected shortage - see plan below.
City of College Station	(7,548)	(17,056)	Projected shortage - see plan below.
Texas A&M University	(4,349)	(3,988)	Projected shortage - see plan below.
Wellborn SUD	226	(6,400)	Projected shortage - see plan below.
Wickson Creek SUD	583	(2,718)	Projected shortage – see plan below.
County-Other	(60)	(93)	Projected shortage – see plan below.
Manufacturing	486	289	Projected surplus
Steam-Electric	(285)	(269)	Projected shortage– see plan below.
Mining	(1,030)	(1,159)	Projected shortage – see plan below.
Irrigation	9,644	9,761	Projected surplus
Livestock	290	290	Projected surplus

5.3.1 City of Bryan

5.3.1.1 Description of Supply

The City of Bryan obtains its water supply from groundwater from the Carrizo-Wilcox and Sparta Aquifers. The City also provides water supply for Brazos County Manufacturing, Brazos County Steam-Electric, Wellborn SUD, and Wickson Creek SUD. Shortages are projected beginning in year 2030 for the City of Bryan.

5.3.1.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to meet the projected water shortage for the City of Bryan. Associated costs are included for each strategy. The entities' water usage utilized for demand projections is 169 gpcd. The RWPG recommends conservation to reduce usage to a goal of 140 gpcd.

1. Conservation:
    a. Cost Source: Volume II.
    b. Date to be Implemented: by 2030.
    c. Annual Cost: maximum of $4,954,212 in 2080.
    d. Unit Cost: $684/acft.

2. Wellfield Expansion in Brazos County – Carrizo-Wilcox Aquifer:
   a. Cost Source: Volume II.
   b. Date to be Implemented: by 2030.
   c. Project Cost: $40,369,000.
   d. Unit Cost: $550/acft.
3. Bryan ASR – Carrizo-Wilcox Aquifer:
   a. Cost Source: Volume II.
   b. Date to be Implemented: 2030.
   c. Project Cost: $110,082,000.
   d. Unit Cost: $699/acft.
4. Direct Non-Potable Reuse – Option 1:
   a. Cost Source: Volume II.
   b. Date to be Implemented: 2030.
   c. Project Cost: $21,892,000.
   d. Unit Cost: $4,060/acft.
5. Alternative: Indirect Potable Reuse – Option 2:
   a. Cost Source: Volume II.
   b. Date to be Implemented: 2030.
   c. Project Cost: $59,800,000.
   d. Unit Cost: $3,274/acft.
6. Wellfield Expansion in Robertson County – Carrizo-Wilcox Aquifer:
   a. Cost Source: Volume II.
   b. Date to be Implemented: by 2030.
   c. Project Cost: $297,302,000.
   d. Unit Cost: $2,697/acft.
7. Bryan ASR of Still Creek WWTP IPR:
   a. Cost Source: Volume II.
   b. Date to be Implemented: by 2040.
   c. Project Cost: $105,485,000.
   d. Unit Cost: $2,595/acft.

Table 5.3-2 Recommended Plan Costs by Decade for City of Bryan

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*(6,554)*	*(8,468)*	*(12,507)*	*(17,324)*	*(25,433)*	*(35,740)*
Conservation						
Supply From Plan Element (acft/yr)	1,410	3,253	3,853	4,568	5,753	7,243
Annual Cost ($/yr)	$964,440	$2,225,052	$2,635,452	$3,124,512	$3,935,052	$4,954,212
Projected Surplus/(Shortage) after Conservation (acft/yr)	*(5,144)*	*(5,215)*	*(8,654)*	*(12,756)*	*(19,680)*	*(28,497)*
Wellfield Expansion in Brazos County – Carrizo-Wilcox Aquifer						
Supply From Plan Element (acft/yr)	0	0	3,352	6,939	7,501	7,501
Annual Cost ($/yr)	$4,123,000	$4,123,000	$1,286,000	$1,286,000	$1,286,000	$1,286,000
Unit Cost ($/acft)[1]	$550	$550	$171	$171	$171	$171
Bryan ASR – Carrizo-Wilcox Aquifer						
Supply From Plan Element (acft/yr)	6,000	6,000	6,000	8,500	10,500	14,626
Annual Cost ($/yr)	$10,225,000	$10,225,000	$2,490,000	$2,490,000	$2,490,000	$2,490,000
Unit Cost ($/acft)	$699	$699	$170	$170	$170	$170
Wellfield Expansion in Robertson County – Carrizo-Wilcox Aquifer						
Supply From Plan Element (acft/yr)	1,557	2,943	4,329	5,715	7,102	7,102
Annual Cost ($/yr)	$26,894,000	$26,894,000	$6,029,000	$6,029,000	$6,029,000	$6,029,000
Unit Cost ($/acft)[2]	$2,697	$2,697	$605	$605	$605	$605
Bryan ASR of Still Creek WWTP IPR						
Supply From Plan Element (acft/yr)	–	5,377	5,377	5,377	5,377	5,377
Annual Cost ($/yr)	–	$13,952,000	$13,952,000	$6,541,000	$6,541,000	$6,541,000
Unit Cost ($/acft)	–	$2,519	$2,519	$1,216	$1,216	$1,216
Projected Surplus/(Shortage) after recommended WMS (acft/yr)	*2,413*	*9,105*	*10,404*	*13,775*	*10,800*	*6,109*

[1] Unit cost based on strategy yield of 7,501 ac-ft/yr, actual yield limited by MAG.
[2] Unit cost based on strategy yield of 9,973 ac-ft/yr, actual yield limited by MAG.

Table 5.3-3 Alternative Plan Costs by Decade for City of Bryan

Plan Element	2030	2040	2050	2060	2070	2080
Wellfield Expansion in Brazos County – Carrizo-Wilcox Aquifer						
Supply From Plan Element (acft/yr)	7,501	7,501	7,501	7,501	7,501	7,501
Annual Cost ($/yr)	$4,123,000	$4,123,000	$1,286,000	$1,286,000	$1,286,000	$1,286,000
Unit Cost ($/acft)	$550	$550	$171	$171	$171	$171
Wellfield Expansion in Robertson County – Carrizo-Wilcox Aquifer						
Supply From Plan Element (acft/yr)	9,973	9,973	9,973	9,973	9,973	9,973
Annual Cost ($/yr)	$26,894,000	$26,894,000	$6,029,000	$6,029,000	$6,029,000	$6,029,000
Unit Cost ($/acft)	$2,697	$2,697	$605	$605	$605	$605
Indirect Potable Reuse – Option 2						
Supply From Plan Element (acft/yr)	2,419	2,419	2,419	2,419	2,419	2,419
Annual Cost ($/yr)	$7,920,000	$7,920,000	$3,718,000	$3,718,000	$3,718,000	$3,718,000
Unit Cost ($/acft)	$3,274	$3,274	$1,537	$1,537	$1,537	$1,537

5.3.2 City of College Station

5.3.2.1 Description of Supply

The City of College Station obtains its water supply from groundwater from the Carrizo-Wilcox and Sparta Aquifers. The city provides water supply for Brazos County Manufacturing. Shortages are projected beginning by 2030 for the City of College Station.

5.3.2.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to meet the projected water shortage for the City of College Station. Associated costs are included for each strategy. The entities' water usage utilized for demand projections is 177 gpcd. The RWPG recommends conservation to reduce usage to a goal of 140 gpcd.

1. Conservation:
    a. Cost Source: Volume II.
    b. Date to be Implemented: by 2030.
    c. Annual Cost: maximum of $4,722,336 in 2060.
    d. Unit Cost: $684/acft.
2. College Station ASR of DPR:
    a. Cost Source: Volume II.
    b. Date to be Implemented: by 2030.
    c. Project Cost: $157,786,000.
    d. Unit Cost: $2,524/acft.

3. Groundwater Development in Brazos County – Carrizo-Wilcox Aquifer:
    a. Cost Source: Volume II.
    b. Date to be Implemented: by 2040.
    c. Project Cost: $16,700,000.
    d. Unit Cost: $303/acft.
4. Groundwater Development in Robertson County – Carrizo-Wilcox Aquifer:
    a. Cost Source: Volume II.
    b. Date to be Implemented: by 2040.
    c. Project Cost: $87,938,000.
    d. Unit Cost: $800/acft.
5. Direct Potable Reuse:
    a. Cost Source: Volume II.
    b. Date to be Implemented: by 2030.
    c. Project Cost: $127,755,000.
    d. Unit Cost: $2,022/acft.
6. Groundwater Desal – Carrizo-Wilcox Aquifer:
    a. Cost Source: Volume II.
    b. Date to be Implemented: by 2030.
    c. Project Cost: $110,083,000.
    d. Unit Cost: $2,703/acft.

Table 5.3-4 Recommended Plan Costs by Decade for City of College Station

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*(7,548)*	*(8,340)*	*(12,720)*	*(18,305)*	*(17,636)*	*(17,056)*
Conservation						
Supply From Plan Element (acft/yr)	1,837	4,993	5,873	6,904	6,781	6,673
Annual Cost ($/yr)	$1,256,508	$3,415,212	$4,017,132	$4,722,336	$4,638,204	$4,564,332
Projected Surplus/(Shortage) after Conservation (acft/yr)	*(5,711)*	*(3,347)*	*(6,847)*	*(11,401)*	*(10,855)*	*(10,383)*
College Station ASR of DPR						
Supply From Plan Element (acft/yr)	7,842	7,842	7,842	7,842	7,842	7,842
Annual Cost ($/yr)	$19,790,000	$19,790,000	$8,697,000	$8,697,000	$8,697,000	$8,697,000
Unit Cost ($/acft)	$2,524	$2,524	$1,109	$1,109	$1,109	$1,109
Groundwater Development in Brazos County: Carrizo-Wilcox						
Supply From Plan Element (acft/yr)	0	0	2,264	4,685	5,065	5,065
Annual Cost ($/yr)	$1,533,000	$1,533,000	$358,000	$358,000	$358,000	$358,000
Unit Cost ($/acft)	$303	$303	$71	$71	$71	$71
Groundwater Development in Robertson County: Carrizo-Wilcox						
Supply From Plan Element (acft/yr)	1,423	2,690	3,957	5,224	6,491	6,491
Annual Cost ($/yr)	$7,288,000	$7,288,000	$1,108,000	$1,108,000	$1,108,000	$1,108,000
Unit Cost ($/acft)	$800	$800	$122	$122	$122	$122
Groundwater Desal: Carrizo-Wilcox						
Supply From Plan Element (acft/yr)	6,720	6,720	6,720	6,720	6,720	6,720
Annual Cost ($/yr)	$18,166,000	$18,166,000	$10,420,000	$10,420,000	$10,420,000	$10,420,000
Unit Cost ($/acft)	$2,703	$2,703	$1,551	$1,551	$1,551	$1,551
Additional Demands from Strategies Recommended for Others						
Supply to Texas A&M University (acft/yr)	(3,400)	(3,400)	0	0	0	0
Projected Surplus/(Shortage) after recommended WMS (acft/yr)	*10,904*	*14,535*	*17,966*	*17,100*	*19,293*	*19,765*

Table 5.3-5 Alternative Plan Costs by Decade for City of College Station

Plan Element	2030	2040	2050	2060	2070	2080
Groundwater Development in Brazos County: Carrizo-Wilcox						
Supply From Plan Element (acft/yr)	5,065	5,065	5,065	5,065	5,065	5,065
Annual Cost ($/yr)	$1,533,000	$1,533,000	$358,000	$358,000	$358,000	$358,000
Unit Cost ($/acft)	$303	$303	$71	$71	$71	$71
Groundwater Development in Robertson County: Carrizo-Wilcox						
Supply From Plan Element (acft/yr)	9,115	9,115	9,115	9,115	9,115	9,115
Annual Cost ($/yr)	$7,288,000	$7,288,000	$1,108,000	$1,108,000	$1,108,000	$1,108,000
Unit Cost ($/acft)	$800	$800	$122	$122	$122	$122
Direct Potable Reuse						
Supply From Plan Element (acft/yr)	7,842	7,842	7,842	7,842	7,842	7,842
Annual Cost ($/yr)	$15,860,000	$15,860,000	$6,884,000	$6,884,000	$6,884,000	$6,884,000
Unit Cost ($/acft)	$2,022	$2,022	$878	$878	$878	$878

5.3.3 Texas A&M University

5.3.3.1 Description of Supply

Texas A&M University obtains utilizes groundwater from the Sparta and Carrizo-Wilcox Aquifers. They are projected to have an available supply from the Sparta Aquifer of 5,146 acft/yr in 2030 increasing to 5,397 acft/yr in 2080. The Universities available supply from the Carrizo-Wilcox Aquifer is 920 acft/yr in 2030 increasing to 1,015 acft/yr in 2080. A shortage is projected to begin in 2030 at 4,349 acft/yr, decreasing to 3,988 acft/yr by 2080.

5.3.3.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended for Texas A&M University. Associated costs are included. The entities' water usage utilized for demand projections is 477 gpcd. The RWPG recommends conservation to reduce usage to a goal of 140 gpcd.

1. Conservation:
   a. Cost Source: Volume II.
   b. Date to be Implemented: by 2030.
   c. Annual Cost: maximum of $4,233,276 in 2080.
   d. Unit Cost: $684/acft.
2. Groundwater Development - Sparta Aquifer:
   a. Cost Source: Volume II.
   b. Date to be Implemented: by 2030.
   c. Project Cost: $9,165,000.
   d. Unit Cost: $772/acft.

3. Purchase from College Station:
   a. Cost Source: Volume II.
   b. Date to be Implemented: by 2030.
   c. Project Cost: $0 existing emergency connection.
   d. Unit Cost: $684.

Table 5.3-6 Recommended Plan Costs by Decade for Texas A&M University

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*(4,349)*	*(3,988)*	*(3,988)*	*(3,988)*	*(3,988)*	*(3,988)*
Conservation						
Supply From Plan Element (acft/yr)	957	1,979	3,037	4,095	5,131	6,189
Annual Cost ($/yr)	$654,588	$1,353,636	$2,077,308	$2,800,980	$3,509,604	$4,233,276
Projected Surplus/(Shortage) after Conservation (acft/yr)	*(3,392)*	*(2,009)*	*(951)*	*107*	*1,143*	*2,201*
Groundwater Development – Sparta Aquifer						
Supply From Plan Element (acft/yr)	0	906	951	951	951	951
Annual Cost ($/yr)	$734,000	$734,000	$89,000	$89,000	$89,000	$89,000
Unit Cost ($/acft)	$772	$772	$94	$94	$94	$94
Purchase from College Station						
Supply From Plan Element (acft/yr)	3,400	3,400	0	0	0	0
Annual Cost ($/yr)	$2,325,600	$2,325,600	$0	$0	$0	$0
Unit Cost ($/acft)	$684	$684	$0	$0	$0	$0
Projected Surplus/(Shortage) after recommended WMS (acft/yr)	*8*	*2,297*	*0*	*1,058*	*2,094*	*3,152*

5.3.4 Wellborn SUD

5.3.4.1 Description of Supply

Wellborn SUD is located in Brazos and Robertson counties and currently obtains water from the Carrizo-Wilcox Aquifer (2,284 acft/yr) and through contracts with BRA (4,000 acft/yr) and the City of Bryan (2,240 acft/yr). Wellborn SUD has sufficient supplies but is constrained by its treatment plant capacity resulting in a shortage beginning in 2040.

5.3.4.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to meet the projected water shortage for Wellborn SUD. Associated costs are included. The entities' water usage utilized for demand projections is 188 gpcd. The RWPG recommends conservation to reduce usage to a goal of 140 gpcd.

1. Conservation:
    a. Cost Source: Volume II.
    b. Date to be Implemented: by 2030.
    c. Annual Cost: $2,119,032 in 2080.
    d. Unit Cost: $684/acft.
2. Surface Water Treatment Plant Expansion to 6 MGD:
    a. Cost Source: Volume II.
    b. Date to be Implemented: by 2030.
    c. Project Cost: $17,137,000.
    d. Unit Cost: $1,333/acft.
3. Surface Water Treatment Plant Expansion to 12 MGD:
    a. Cost Source: Volume II.
    b. Date to be Implemented: by 2040.
    c. Project Cost: $27,081,000.
    d. Unit Cost: $1,000/acft.
4. Groundwater Development in Brazos County – Yegua-Jackson Aquifer:
    a. Cost Source: Volume II.
    b. Date to be Implemented: by 2070.
    c. Project Cost: $26,367,000.
    d. Unit Cost: $912/acft.
5. Groundwater Development in Robertson County – Carrizo-Wilcox Aquifer:
    a. Cost Source: Volume II.
    b. Date to be Implemented: by 2030.
    c. Project Cost: $35,204,000.
    d. Unit Cost: $546/acft.

Table 5.3-7 Recommended Plan Costs by Decade for Wellborn SUD

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*239*	*(420)*	*(1,602)*	*(3,064)*	*(4,707)*	*(6,553)*
Conservation						
Supply From Plan Element (acft/yr)	504	1,264	1,919	2,268	2,659	3,098
Annual Cost ($/yr)	$344,736	$864,576	$1,312,596	$1,551,312	$1,818,756	$2,119,032
Projected Surplus/(Shortage) after Conservation (acft/yr)	*743*	*844*	*317*	*(796)*	*(2,048)*	*(3,455)*
Surface Water Treatment Plant Expansion to 6MGD						
Supply From Plan Element (acft/yr)	1,680	1,680	1,680	1,680	1,680	1,680
Annual Cost ($/yr)	$2,239,000	$2,239,000	$1,033,000	$1,033,000	$1,033,000	$1,033,000
Unit Cost ($/acft)	$1,333	$1,333	$615	$615	$615	$615
Surface Water Treatment Plant Expansion to 12MGD						
Supply From Plan Element (acft/yr)	—	1,164	1,027	898	776	660
Annual Cost ($/yr)	—	$3,360,000	$3,360,000	$1,455,000	$1,455,000	$1,455,000
Unit Cost ($/acft)[3]	—	$1,000	$1,000	$433	$433	$433
Groundwater Development in Brazos County – Yegua-Jackson Aquifer						
Supply From Plan Element (acft/yr)	—	—	—	—	1,000	2,036
Annual Cost ($/yr)	—	—	—	—	$2,129,000	$2,129,000
Unit Cost ($/acft)	—	—	—	—	$912	$912
Groundwater Development in Robertson County – Carrizo-Wilcox Aquifer						
Supply From Plan Element (acft/yr)	1,015	1,918	2,822	3,725	4,628	4,628
Annual Cost ($/yr)	$3,546,000	$3,546,000	$1,069,000	$1,069,000	$1,069,000	$1,069,000
Unit Cost ($/acft)	$3,494	$1,849	$379	$287	$231	$231
Projected Surplus/(Shortage) after recommended WMS (acft/yr)	*3,438*	*5,606*	*5,846*	*5,507*	*6,036*	*5,549*

Table 5.3-8 Alternative Plan Costs by Decade for Wellborn SUD

Plan Element	2030	2040	2050	2060	2070	2080
Groundwater Development in Brazos County – Yegua-Jackson Aquifer						
Supply From Plan Element (acft/yr)	—	—	—	—	2,335	2,335
Annual Cost ($/yr)	—	—	—	—	$2,129,000	$2,129,000
Unit Cost ($/acft)	—	—	—	—	$912	$912
Groundwater Development in Robertson County – Carrizo-Wilcox Aquifer						
Supply From Plan Element (acft/yr)	6,500	6,500	6,500	6,500	6,500	6,500
Annual Cost ($/yr)	$3,546,000	$3,546,000	$1,069,000	$3,546,000	$3,546,000	$1,069,000
Unit Cost ($/acft)	$546	$546	$164	$164	$164	$164

[3] Unit cost based on strategy yield of 3,360 ac-ft/yr, actual yield limited by surface water source supply.

5.3.5 Wickson Creek SUD

5.3.5.1 Description of Supply

Wickson Creek SUD is located in multiple counties (Grimes, Robertson, and Brazos). The balances shown in Table 5.3-1 represent the cumulative totals for Wickson Creek SUD. Supplies are obtained from the Sparta, Carrizo-Wilcox, and Yegua-Jackson Aquifers and purchases 1,500 ac-ft/yr from the City of Bryan. The entity also provides supply to Brazos and Grimes County Manufacturing. Wickson Creek SUD is projected to experience water supply shortages beginning in 2050 at 147 acft/yr, increasing to 2,876 acft/yr by 2080.

5.3.5.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended to meet the projected water shortage for Wickson Creek SUD. Associated costs are included. Conservation is not recommended because the entity's usage is 139 gpcd, which is below the selected goal of 140 gpcd.

1. Sparta Aquifer Development – Brazos County:
    a. Cost Source: Volume II.
    b. Date to be Implemented: by 2050.
    c. Project Cost: $16,135,000.
    d. Unit Cost: $482/acft.

Table 5.3-9 Recommended Plan Costs by Decade for Wellborn SUD

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*1,150*	*597*	*(147)*	*(1,006)*	*(1,934)*	*(2,876)*
Sparta Aquifer Development – Brazos County						
Supply From Plan Element (acft/yr)	—	—	250	1,250	2,000	2,900
Annual Cost ($/yr)	—	—	$1,398,000	$1,398,000	$263,000	$263,000
Unit Cost ($/acft)	—	—	$482	$482	$91	$91
Projected Surplus/(Shortage) after recommended WMS (acft/yr)	*1,150*	*597*	*103*	*244*	*66*	*24*

5.3.6 County-Other

5.3.6.1 Description of Supply

Brazos County-Other entities obtain water supply from groundwater from the Carrizo-Wilcox, Queen City and Yegua-Jackson Aquifers. Shortages are projected for County Other by 2030.

5.3.6.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended for Brazos County-Other. Conservation was considered; however, the entity’s usage is below the selected goal of 140 gpcd.

1. Yegua-Jackson Aquifer Development – Brazos County:
   a. Cost Source: Volume II.
   b. Date to be Implemented: by 2030.
   c. Project Cost: $1,351,000.
   d. Unit Cost: $848/acft.

Table 5.3-10 Recommended Plan Costs by Decade for Wellborn SUD

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*(60)*	*42*	*33*	*9*	*(34)*	*(93)*
Yegua-Jackson Aquifer Development – Brazos County						
Supply From Plan Element (acft/yr)	125	125	125	125	125	125
Annual Cost ($/yr)	$106,000	$106,000	$11,000	$11,000	$11,000	$11,000
Unit Cost ($/acft)	$848	$848	$88	$88	$88	$88
Projected Surplus/(Shortage) after recommended WMS (acft/yr)	*65*	*167*	*158*	*134*	*91*	*32*

5.3.7 Manufacturing

Water supply for manufacturing in Brazos County is obtained from nearby WUGs and wells within the Carrizo-Wilcox and Sparta Aquifers. Manufacturing is projected to have a surplus in water supply throughout the planning period.

5.3.8 Steam-Electric

5.3.8.1 Description of Supply

Supplies for Steam-Electric demand in Brazos County are obtained through groundwater from the Sparta and the Carrizo-Wilcox Aquifers and from Bryan Utilities Lake. Brazos County Steam-Electric is projected to have a shortage in year 2030.

5.3.8.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended to meet water needs for Brazos County Steam-Electric.

1. City of Bryan Direct Non-Potable Reuse – Option 1:
   a. Cost Source: Volume II.
   b. Date to be Implemented: by 2030.
   c. Project Cost: $21,892,000.
   d. Unit Cost: $4,060/acft.

Table 5.3-11 Recommended Plan Costs by Decade for Brazos County – Steam-Electric

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*(285)*	*(269)*	*(269)*	*(269)*	*(269)*	*(269)*
City of Bryan Direct Non-Potable Reuse – Option 1						
Supply From Plan Element (acft/yr)	605	605	605	605	605	605
Annual Cost ($/yr)	$2,456,000	$2,456,000	$916,000	$916,000	$916,000	$916,000
Unit Cost ($/acft)	$4,060	$4,060	$1,514	$1,514	$1,514	$1,514
Projected Surplus/(Shortage) after recommended WMS (acft/yr)	*320*	*336*	*336*	*336*	*336*	*336*

5.3.9 Mining

5.3.9.1 Description of Supply

Brazos County Mining operations obtain supply from the Yegua-Jackson Aquifer. Brazos County Mining is projected to have a shortage in year 2030.

5.3.9.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended to meet water needs for Brazos County Mining. Conservation is recommended to reduce usage.

1. Conservation:
    a. Cost Source: Volume II.
    b. Date to be Implemented: by 2030.
    c. Project Cost: Not determined.
2. Sparta Aquifer Development – Brazos County:
    a. Cost Source: Volume II.
    b. Date to be Implemented: by 2080.
    c. Project Cost: $1,448,000.
    d. Unit Cost: $373/acft.
3. Yegua-Jackson Aquifer Development – Brazos County:
    a. Cost Source: Volume II.
    b. Date to be Implemented: by 2030.
    c. Project Cost: $4,530,000.
    d. Unit Cost: $292/acft.

Table 5.3-12 Recommended Plan Costs by Decade for Wellborn SUD

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*(1,030)*	*(1,058)*	*(1,085)*	*(1,101)*	*(1,125)*	*(1,159)*
Conservation						
Supply From Plan Element (acft/yr)	80	135	191	192	194	196
Annual Cost ($/yr)[4]	ND	ND	ND	ND	ND	ND
Projected Surplus/(Shortage) after Conservation (acft/yr)	*(950)*	*(923)*	*(894)*	*(909)*	*(931)*	*(963)*
Sparta Aquifer Development – Brazos County						
Supply From Plan Element (acft/yr)	—	—	—	—	—	300
Annual Cost ($/yr)	—	—	—	—	—	$112,000
Unit Cost ($/acft)	—	—	—	—	—	$373
Yegua-Jackson Aquifer Development – Brazos County						
Supply From Plan Element (acft/yr)	1,200	1,200	1,200	1,200	1,200	1,200
Annual Cost ($/yr)	$350,000	$350,000	$31,000	$31,000	$31,000	$31,000
Unit Cost ($/acft)	$292	$292	$26	$26	$26	$26
Projected Surplus/(Shortage) after recommended WMS (acft/yr)	*250*	*277*	*306*	*291*	*269*	*537*

5.3.10 Irrigation

Brazos County Irrigation is supplied by Sparta, Carrizo-Wilcox, Yegua-Jackson, and Brazos River Alluvium groundwater and from run-of-river diversion rights from the Brazos River and contracts with BRA. Surpluses of 9,644 acft/yr are projected for irrigation beginning in year 2030 and increasing to 9,761 acft/yr by 2080. No changes in water supply are recommended.

5.3.11 Livestock

Livestock water supply is projected to meet demands through 2080 and no changes in water supply are recommended.

[4] ND – Not Determined. Costs to implement industrial conservation technologies will vary based on each location.

5.4 Burleson County Water Supply Plan

Table 5.4-1 lists each water user group in Burleson County and their corresponding surplus or shortage in years 2030 and 2080. A brief summary of the water user groups and the plan for the water users are presented in the following subsections.

Table 5.4-1 Burleson County Surplus/(Shortage)

Water User Group	Surplus/(Shortage)		Comment
	2030 (acft/yr)	2080 (acft/yr)	
Cade Lakes WSC	55	58	Projected surplus
City of Caldwell	1,329	1,373	Projected surplus
Deanville WSC	284	302	Projected surplus
Milano WSC			See Milam County
City of Snook	84	94	Projected surplus
City of Somerville	575	582	Projected surplus
Southwest Milam WSC			See Milam County
County-Other	659	720	Projected surplus
Manufacturing	(28)	(56)	Projected shortage - see plan below.
Steam-Electric	–	–	No projected demand
Mining	(3,551)	(3,551)	Projected shortage - see plan below.
Irrigation	4,335	4,339	Projected surplus
Livestock	670	670	Projected surplus

5.4.1 Cade Lakes WSC

5.4.1.1 Description of Supply

The Cade Lakes WSC obtains its water supply from groundwater from the Carrizo-Wilcox Aquifer. The supply is projected to be sufficient through the planning period.

5.4.1.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management plan is recommended for the Cade Lakes WSC. Associated costs are included. The most recent water loss audit report shows a water loss of approximately 61% and recommends water loss mitigation. The entities' water usage utilized for demand projections is 230 gpcd. The RWPG recommends conservation to reduce usage to a goal of 140 gpcd.

1. Conservation:
    a. Cost Source: Volume II.
    b. Date to be Implemented: by 2030.
    c. Annual Cost: maximum of $28,044 in 2060 and 2070.
    d. Unit Cost: $684/acft.
2. Water Loss Reduction:
    a. Cost Source: Volume II.
    b. Date to be Implemented: by 2030.
    c. Annual Cost: $91,339 in 2030.
    d. Unit Cost: $1,791/acft.

Table 5.4-2 Recommended Plan Costs by Decade for Cade Lakes WSC

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*55*	*54*	*55*	*56*	*57*	*58*
Conservation						
Supply From Plan Element (acft/yr)	9	21	31	41	41	40
Annual Cost ($/yr)	$6,156	$14,364	$21,204	$28,044	$28,044	$27,360
Water Loss Reduction						
Supply From Plan Element (acft/yr)	51	51	51	50	50	49
Annual Cost ($/yr)	$91,339	$91,339	$23,562	$23,100	$23,100	$22,638
Unit Cost ($/acft)	$1,791	$1,791	$462	$462	$462	$462
Projected Surplus/(Shortage) after Conservation and Water Loss Reduction (acft/yr)	*115*	*126*	*137*	*147*	*148*	*147*

5.4.2 City of Caldwell

5.4.2.1 Description of Supply

The City of Caldwell obtains its water supply from groundwater from the Carrizo-Wilcox Aquifer. The supply is projected to be 2,248 acft/yr in 2030 and 2,276 acft/yr in 2080 and is projected to be sufficient through the planning period.

5.4.2.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management plan is recommended for the City of Caldwell. Associated costs are included. The entities' water usage utilized for demand projections is 196 gpcd. The RWPG recommends conservation to reduce usage to a goal of 140 gpcd.

1. Conservation:
    a. Cost Source: Volume II.
    b. Date to be Implemented: by 2030.
    c. Annual Cost: maximum of $166,896 in 2050.
    d. Unit Cost: $684/acft.

Table 5.4-3 Recommended Plan Costs by Decade for City of Caldwell

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*1,329*	*1,353*	*1,356*	*1,361*	*1,367*	*1,373*
Conservation						
Supply From Plan Element (acft/yr)	73	162	244	243	241	239
Annual Cost ($/yr)	$49,932	$110,808	$166,896	$166,212	$164,844	$163,476
Projected Surplus/(Shortage) after Conservation (acft/yr)	*1,402*	*1,515*	*1,600*	*1,604*	*1,608*	*1,612*

5.4.3 Deanville WSC

5.4.3.1 Description of Supply

The Deanville WSC obtains its water supply from groundwater from the Carrizo-Wilcox Aquifer. The supply is projected to be 651 acft/yr in 2030 and 659 acft/yr in 2080. The water supply is projected to be sufficient through the planning period and no changes in water supply are recommended.

5.4.3.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management plan is recommended for Deanville WSC. Associated costs are included. The entities' water usage utilized for demand projections is 175 gpcd. The RWPG recommends conservation to reduce usage to a goal of 140 gpcd.

1. Conservation:
    a. Cost Source: Volume II.
    b. Date to be Implemented: by 2030.
    c. Annual Cost: maximum of $43,776 in 2040.
    d. Unit Cost: $684/acft.

Table 5.4-4 Recommended Plan Costs by Decade for Deanville WSC

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*284*	*291*	*293*	*296*	*299*	*302*
Conservation						
Supply From Plan Element (acft/yr)	26	64	64	63	62	62
Annual Cost ($/yr)	$17,784	$43,776	$43,776	$43,092	$42,408	$42,408
Projected Surplus/(Shortage) after Conservation (acft/yr)	*310*	*355*	*357*	*359*	*361*	*364*

5.4.4 City of Snook

5.4.4.1 Description of Supply

The City of Snook obtains its water supply from groundwater from the Sparta Aquifer. No shortages are projected through the planning period.

5.4.4.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management plan is recommended for the City of Snook. Associated costs are included. The entities' water usage utilized for demand projections is 318 gpcd. The RWPG recommends conservation to reduce usage to a goal of 140 gpcd.

1. Conservation:
    a. Cost Source: Volume II.
    b. Date to be Implemented: by 2030.
    c. Annual Cost: maximum of $151,164 in 2080.
    d. Unit Cost: $684/acft.

Table 5.4-5 Recommended Plan Costs by Decade for City of Snook

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*84*	*82*	*84*	*88*	*91*	*94*
Conservation						
Supply From Plan Element (acft/yr)	35	77	117	158	198	221
Annual Cost ($/yr)	$23,940	$52,668	$80,028	$108,072	$135,432	$151,164
Projected Surplus/(Shortage) after Conservation (acft/yr)	*119*	*159*	*201*	*246*	*289*	*315*

5.4.5 City of Somerville

5.4.5.1 Description of Supply

The City of Somerville obtains its water supply from groundwater from the Sparta Aquifer which is projected to provide an available groundwater supply of 843 acft/yr through the planning period. Water supply is projected to be sufficient through the planning period.

5.4.5.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management plan is recommended for the City of Somerville. Associated costs are included. The entities' water usage utilized for demand projections is 187 gpcd. The RWPG recommends conservation to reduce usage to a goal of 140 gpcd.

1. Conservation:
    a. Cost Source: Volume II.
    b. Date to be Implemented: by 2030.
    c. Annual Cost: $41,724 in 2060.
    d. Unit Cost: $684/acft.

Table 5.4-6 Recommended Plan Costs by Decade for City of Somerville

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*575*	*574*	*576*	*577*	*580*	*582*
Conservation						
Supply From Plan Element (acft/yr)	20	47	60	61	60	60
Annual Cost ($/yr)	$13,680	$32,148	$41,040	$41,724	$41,040	$41,040
Projected Surplus/(Shortage) after Conservation (acft/yr)	*595*	*621*	*636*	*638*	*640*	*642*

5.4.6 County-Other

Burleson County-Other entities obtain water supply from groundwater from the Queen City and Carrizo-Wilcox Aquifers. The supply is projected to be sufficient through the planning period and no change in water supply is recommended. Conservation was considered; however, the entity's usage is below the selected goal of 140 gpcd.

5.4.7 Manufacturing

5.4.7.1 Description of Supply

Water supply for manufacturing in Burleson County is obtained from Sparta wells operated by the various manufacturing entities. Manufacturing is projected to have a shortage of water beginning in the year 2030 and continuing through 2080.

5.4.7.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to meet the entity's water needs. Associated costs are included. Conservation is recommended.

1. Conservation:
    a. Cost Source: Volume II.
    b. Date to be Implemented: by 2030.
    c. Annual Cost: not determined.
2. Groundwater Development – Sparta Aquifer:
    a. Cost Source: Volume II.
    b. Date to be Implemented: by 2030.
    c. Project Cost: $359,000.
    d. Unit Cost: $1,120/acft.

3. Groundwater Development – Queen City Aquifer:
    a. Cost Source: Volume II.
    b. Date to be Implemented: by 2030.
    c. Project Cost: $870,000.
    d. Unit Cost: $1,400/acft.

Table 5.4-7 Recommended Plan Costs by Decade for Burleson County – Manufacturing

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*(28)*	*(33)*	*(38)*	*(44)*	*(50)*	*(56)*
Conservation						
Supply From Plan Element (acft/yr)	4	7	10	11	11	12
Annual Cost ($/yr)	ND	ND	ND	ND	ND	ND
Projected Surplus/(Shortage) after Conservation (acft/yr)	*(24)*	*(26)*	*(28)*	*(33)*	*(39)*	*(44)*
Groundwater Development – Sparta Aquifer						
Supply From Plan Element (acft/yr)	7	6	7	8	10	10
Annual Cost ($/yr)	$28,000	$28,000	$3,000	$3,000	$3,000	$3,000
Unit Cost ($/acft)(1)	$1,120	$1,120	$120	$120	$120	$120
Groundwater Development – Queen City Aquifer						
Supply From Plan Element (acft/yr)	50	50	50	50	50	50
Annual Cost ($/yr)	$70,000	$70,000	$9,000	$9,000	$9,000	$9,000
Unit Cost ($/acft)	$1,400	$1,400	$180	$180	$180	$180
Projected Surplus/(Shortage) after recommended WMS (acft/yr)	*33*	*30*	*29*	*25*	*21*	*16*
ND – Not determined. Costs to implement industrial conservation technologies will vary based on each location.						

Notes:
(1) Unit cost calculated for project yield of 25 acft/yr.

5.4.8 Steam-Electric

No Steam-Electric demand exists or is projected for the county.

5.4.9 Mining

5.4.9.1 Description of Supply

Burleson County Mining is supplied by Yegua-Jackson groundwater and has a projected water supply shortage beginning in 2030 of 3,551 acft/yr, which is constant throughout the planning period.

5.4.9.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended to meet water needs for Burleson County Mining. Conservation is recommended.

1. Conservation:
    a. Cost Source: Volume II.
    b. Date to be Implemented: before 2030.
    c. Annual Cost: Not determined.

Table 5.4-8 Recommended Plan Costs by Decade for Burleson County – Mining

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*(3,551)*	*(3,551)*	*(3,551)*	*(3,551)*	*(3,551)*	*(3,551)*
Conservation						
Supply From Plan Element (acft/yr)	167	278	390	390	390	390
Annual Cost ($/yr)	ND	ND	ND	ND	ND	ND
Projected Surplus/(Shortage) after Conservation (acft/yr)	*(3,384)*	*(3,273)*	*(3,161)*	*(3,161)*	*(3,161)*	*(3,161)*
ND – Not determined. Costs to implement industrial conservation technologies will vary based on each location.						

5.4.10 Irrigation

Water supply for irrigation in Burleson County is obtained from the Carrizo-Wilcox, Yegua-Jackson, and Brazos River Alluvium Aquifers. Irrigation has a projected surplus throughout the planning period and no changes in water supply are recommended.

5.4.11 Livestock

Livestock water supply is projected to meet demands through 2080 and no changes in water supply are recommended.

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5.5 Callahan County Water Supply Plan

Table 5.5-1 lists each water user group in Callahan County and their corresponding surplus or shortage in years 2030 and 2040. For each water user group with a projected shortage, a water supply plan has been developed and is presented in the following subsections.

Table 5.5-1 Callahan County Surplus/(Shortage)

Water User Group	Surplus/(Shortage)		Comment
	2030 (acft/yr)	2040 (acft/yr)	
City of Baird	(232)	(217)	Projected shortage - see plan below.
Callahan County WSC	0	0	No projected surplus or shortage
City of Clyde	(100)	993	Projected shortage - see plan below.
City of Cross Plains	99	110	Projected surplus
Eula WSC	(136)	(159)	Projected shortage - see plan below.
Hamby WSC			See Jones County
Potosi WSC			See Taylor County
Westbound WSC			See Eastland County
County-Other	108	217	Projected surplus
Steam-Electric	–	–	No demand projected
Manufacturing	–	–	No demand projected
Mining	78	78	Projected surplus
Irrigation	546	546	Projected surplus
Livestock	24	24	Projected surplus

5.5.1 City of Baird

5.5.1.1 Description of Supply

The City of Baird obtains its water supply from surface water supplied from Lake Baird and from the City of Abilene. The City's contractual purchase from the City of Abilene is 77 acft/yr, but the City's contract is not capped annually and has the ability to purchase additional supply from Abilene when needed. The total amount of surface water availability from Lake Baird is 20 acft/yr throughout the planning horizon.

5.5.1.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water supply plan is recommended for the City of Baird. Associated costs are included for each strategy. The entities' water usage utilized for demand projections is 196 gpcd. The RWPG recommends conservation to reduce usage to a goal of 140 gpcd.

1. Conservation:
   a. Cost Source: Volume II.
   b. Date to be Implemented: before 2030.
   c. Annual Cost: maximum of $58,824 in 2050.

   d. Unit Cost: $684/acft.

2. Purchase Additional Supply from Abilene:
   a. Cost Source: Abilene Water Rates.
   b. Date to be Implemented: 2030.
   c. Project Cost: $0 (Current infrastructure assumed to be adequate).
   d. Unit Cost: $2,314/acft ($7.10/1,000 gal).

Table 5.5-2 Recommended Plan Costs by Decade for the City of Baird

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*(232)*	*(231)*	*(228)*	*(225)*	*(221)*	*(217)*
Conservation						
Supply from Plan Element (acft/yr)	26	58	86	86	84	83
Annual Cost ($/yr)	$17,784	$39,672	$58,824	$58,824	$57,456	$56,772
Projected Surplus/(Shortage) after Conservation (acft/yr)	*(206)*	*(173)*	*(142)*	*(139)*	*(137)*	*(134)*
Purchase Additional Supply from Abilene						
Supply from Plan Element (acft/yr)	206	173	142	139	137	134
Annual Cost ($/yr)	$476,684	$400,322	$328,588	$321,646	$317,018	$310,076
Unit Cost ($/acft)	$2,314	$2,314	$2,314	$2,314	$2,314	$2,314
Projected Surplus/(Shortage) after recommended WMS (acft/yr)	*0*	*0*	*0*	*0*	*0*	*0*

5.5.2 Callahan County WSC

Callahan County WSC obtains its water supply from a contract with Clyde. Supplies are sufficient to meet demands through 2080. Conservation was also considered; however, the entity's current per capita use rate of 78 is below the selected target rate of 140 gpcd.

5.5.3 City of Clyde

The City of Clyde uses surface water from Clyde Lake, however the Brazos G WAM shows the yield of the lake to be zero throughout the planning horizon. Clyde has recently acquired a 1,750 acft/yr water right for supplies from Fort Phantom Hill Reservoir. The City is in the process of building infrastructure to access this supply. Clyde also has a contractual purchase of 307 acft/yr from the City of Abilene that can help in meeting the city's projected demands. No current or future shortages are projected. Clyde has contractual sales to Eula WSC of 221 acft/yr through 2080 and Callahan County WSC from 190 to 205 acft/yr from 2030 to 2080, respectively.

5.5.3.1 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water supply plan is recommended for the City of Clyde. Associated costs are included for each strategy. Conservation was also considered; however, the entity's usage of 78 gpcd is below the selected goal of 140 gpcd.

1. Purchase Additional Supply from Abilene:

a. Cost Source: Abilene Water Rates.
b. Date to be Implemented: 2030.
c. Project Cost: none.
d. Unit Cost: $2,314/acft ($7.10/1,000 gal).

Table 5.5-3 Recommended Plan Costs by Decade for the City of Clyde

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*(100)*	*1,401*	*1,241*	*1,012*	*1,002*	*993*
Purchase Additional Supply from Abilene						
Supply from Plan Element (acft/yr)	100	–	–	–	–	–
Annual Cost ($/yr)	$231,400	–	–	–	–	–
Unit Cost ($/acft)	$2,314					
Projected Surplus/(Shortage) after recommended WMS (acft/yr)	*0*	*1,401*	*1,241*	*1,012*	*1,002*	*993*

5.5.4 City of Cross Plains

5.5.4.1 Description of Supply

The City of Cross Plains uses locally available groundwater from the Trinity Aquifer at 310 acft/yr. The city is projected to have sufficient supplies through the planning period.

5.5.4.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water supply plan is recommended for the City of Cross Plains. Associated costs are included for each strategy. The entities' water usage utilized for demand projections is 210 gpcd. The RWPG recommends conservation to reduce usage to a goal of 140 gpcd.

1. Conservation:
   a. Cost Source: Volume II.
   b. Date to be Implemented: before 2030.
   c. Annual Cost: maximum of $44,460 in 2060.
   d. Unit Cost: $684/acft.

Table 5.5-4 Recommended Plan Costs by Decade for the City of Cross Plains

Plan Element	2020	2030	2040	2050	2060	2070
Projected Surplus/(Shortage) (acft/yr)	*99*	*99*	*102*	*103*	*107*	*110*
Conservation						
Supply from Plan Element (acft/yr)	16	37	58	65	64	63
Annual Cost ($/yr)	$10,944	$25,308	$39,672	$44,460	$43,776	$43,092
Projected Surplus/(Shortage) after Conservation (acft/yr)	*115*	*136*	*160*	*168*	*171*	*173*
Projected Surplus/(Shortage) after recommended WMS (acft/yr)	*115*	*136*	*160*	*168*	*171*	*173*

5.5.5 EULA WSC

5.5.5.1 Description of Supply

Eula WSC has a contract with Abilene for 61 acft/yr and Clyde for 221 acft/yr and a surplus is projected.

5.5.5.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water supply plan is recommended for Eula WSC. Associated costs are included for each strategy. The most recent water loss audit report shows a water loss of approximately 69% and water loss mitigation is recommended. Conservation was considered; however, the entity's current per capita use rate of 85 gpcd is below the selected target rate of 140 gpcd.

1. Water Loss Reduction:
   a. Cost Source: Volume II.
   b. Date to be Implemented: before 2030.
   c. Annual Cost: maximum of $448,345 in 2040.

Table 5.5-5 Recommended Plan Costs by Decade for Eula WSC

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*(136)*	*(140)*	*(144)*	*(149)*	*(153)*	*(159)*
Water Loss Reduction						
Supply from Plan Element (acft/yr)	136	140	144	149	153	159
Annual Cost ($/yr)	$446,477	$448,345	$67,263	$69,599	$71,467	$74,270
Projected Surplus/(Shortage) after Conservation (acft/yr)	*0*	*0*	*0*	*0*	*0*	*0*
Projected Surplus/(Shortage) after recommended WMS (acft/yr)	*0*	*0*	*0*	*0*	*0*	*0*

5.5.6 County-Other

The water supply entities comprising County-Other mostly rely on groundwater systems in the Trinity Aquifer and show a projected surplus throughout the planning period. No changes in water supply are recommended for Callahan County-Other. Conservation was considered; however, the entity's current per capita use rate of 72 gpcd is below the selected target rate of 140 gpcd.

5.5.7 Manufacturing

No Manufacturing demand exists or is projected for the county.

5.5.8 Steam-Electric

No Steam-Electric demand exists or is projected for the county.

5.5.9 Mining

Mining activities are projected to decrease to 2 acft/yr throughout the planning horizon. Available Trinity Aquifer supplies at 80 acft/yr in Callahan County will be used to meet the projected demands. No changes in water supply are recommended for Mining in Callahan County.

5.5.10 Irrigation

5.5.10.1 Description of Supply

Irrigation activities are expected to remain constant at 522 acft/yr and are fully supplied from local Trinity Aquifer groundwater. Conservation is not needed as there are projected surplus supplies to meet irrigation demands.

5.5.11 Livestock

Livestock demand is met by local water supply and is projected to meet needs through 2080. No changes in Callahan County Livestock water supply are recommended.

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5.6 Comanche County Water Supply Plan

Table 5.6-1 lists each water user group in Comanche County and their corresponding surplus or shortage in years 2030 and 2080. A brief summary of the water user groups and the plan for the selected water user are presented in the following subsections.

Table 5.6-1 Comanche County Surplus/(Shortage)

Water User Group	Surplus/(Shortage)		Comment
	2030 (acft/yr)	2080 (acft/yr)	
City of Comanche	164	189	Projected surplus
City of De Leon	72	42	Projected surplus
County-Other	(364)	(234)	Projected shortage - see plan below.
Manufacturing	4	0	Projected surplus
Steam-Electric	0	0	No demand projected
Mining	117	104	Projected surplus
Irrigation	(9,252)	(9,426)	Projected shortage - see plan below.
Livestock	(1)	(1)	Projected shortage – see plan below

5.6.1 City of Comanche

The City of Comanche obtains its water supply through purchases of treated surface water under contract from the Upper Leon River Municipal Water District. The water supplied by the Upper Leon River Municipal Water District is diverted from Lake Proctor under contracts with the Brazos River Authority. The City of Comanche is projected to obtain up to 706 acft/yr of treated surface water supply from the Upper Leon River Municipal Water District through the planning period. The City of Comanche is also contracted to sell 20 acft/yr of treated surface water to Manufacturing entities in Comanche County. No shortage is projected for the City of Comanche and no changes in water supply are recommended. The most recent water loss audit report shows a water loss of approximately 27% and water loss mitigation is recommended. Conservation was also considered; however, the entity's usage is 113 gpcd, which is below the selected goal of 140 gpcd.

1. Water Loss Reduction:
    a. Cost Source: Volume II.
    b. Date to be Implemented: before 2030.
2. Annual Cost: maximum of $44,878 in 2030.

Table 5.6-2 Recommended Plan Costs by Decade for the City of Comanche

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*164*	*172*	*181*	*184*	*187*	*189*
Water Loss Reduction						
Supply From Plan Element (acft/yr)	67	66	65	65	64	64
Annual Cost ($/yr)	$44,878	$44,503	$24,353	$24,353	$23,979	$23,979
Projected Surplus/(Shortage) after Conservation (acft/yr)	*231*	*238*	*246*	*249*	*251*	*253*
Projected Surplus/(Shortage) after recommended WMS (acft/yr)	*231*	*238*	*246*	*249*	*251*	*253*

5.6.2 City of De Leon

The City of De Leon obtains its water supply through purchases of treated surface water under contract from the Upper Leon River Municipal Water District. The water supplied by the Upper Leon River Municipal Water District is diverted from Lake Proctor under contracts with the Brazos River Authority. The City of De Leon is projected to obtain up to 307 acft/yr of treated surface water supply from the Upper Leon River Municipal Water District through the planning period. No supply shortage is projected for the City of De Leon and no change in water supply is recommended. Conservation was also considered; however, the entity's usage is 99 gpcd, which is below the selected goal of 140 gpcd.

5.6.3 County-Other

5.6.1.1 Description of Supply

Entities comprising the Comanche County-Other WUG obtain their water supply primarily through groundwater production from the Trinity Aquifer. Additionally, Comanche County WSC purchases treated surface water under contract from the Upper Leon Municipal Water District. Shortages are projected for each decade within the planning period.

5.6.1.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended for County-Other. Conservation was also considered; however, the entity's usage is 95 gpcd, which is below the selected goal of 140 gpcd. Associated costs are included for each strategy.

1. Trinity Aquifer Development, Erath County:
   a. Cost Source: Volume II.
   b. Date to be Implemented: before 2030.
   c. Project Cost: $8,981,000.
   d. Unit Cost: maximum of $1,877/acft.

Table 5.6-3 Recommended Plan Costs by Decade for Comanche County-Other

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*(364)*	*(333)*	*(292)*	*(276)*	*(256)*	*(234)*
Groundwater Development – Trinity Aquifer (Erath County)						
Supply From Plan Element (acft/yr)	376	394	408	389	398	398
Annual Cost ($/yr)	$706,000	$740,000	$134,000	$128,000	$131,000	$131,000
Unit Cost ($/acft)	$1,877	$1,877	$328	$328	$328	$328
Projected Surplus/(Shortage) after Recommended WMS (acft/yr)	*12*	*61*	*116*	*113*	*142*	*164*

5.6.4 Manufacturing

Comanche County Manufacturing entities obtain water supply through purchases of treated surface water from the City of Comanche, which is projected to provide up to 21 acft/yr of supply during the planning period. Additionally, local groundwater production from the Trinity Aquifer is also used by Manufacturing entities in the county. No shortages are projected and no change in water supply is recommended.

5.6.5 Steam-Electric

There is no projected demand for Comanche County Steam-Electric.

5.6.6 Mining

5.6.1.3 Description of Supply

Mining operations in Comanche County are supplied through groundwater production from the Trinity Aquifer. Supply projections show no water shortages.

5.6.1.4 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, conservation and development of Trinity aquifer groundwater to increase supply is recommended for Comanche County-Mining. Associated costs are included for each strategy.

1. Conservation:
   a. Cost Source: Volume II.
   b. Date to be Implemented: before 2030.
   c. Annual Cost: not determined.
2. Trinity Aquifer Development, Erath County:
   a. Cost Source: Volume II.
   b. Date to be Implemented: before 2030.
   c. Project Cost: $7,249,000.
   d. Unit Cost: maximum of $2,378 /acft.

Table 5.6-4 Recommended Plan Costs by Decade for Comanche County – Mining

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	117	116	112	110	107	104
Conservation						
Supply From Plan Element (acft/yr)	13	26	26	19	13	9
Annual Cost ($/yr)	ND	ND	ND	ND	ND	ND
Projected Surplus/(Shortage) after Conservation (acft/yr)	*130*	*142*	*138*	*129*	*120*	*113*
Groundwater Development – Trinity Aquifer						
Supply From Plan Element (acft/yr)	221	233	241	229	235	235
Annual Cost ($/yr)	$526,000	$554,000	$63,000	$60,000	$61,000	$61,000
Unit Cost ($/acft)	$2,378	$2,378	$261	$261	$261	$261
ND – Not determined. Costs to implement industrial conservation technologies will vary based on each location						

5.6.7 Irrigation

5.6.1.5 Description of Supply

Comanche County Irrigation is supplied through groundwater production from the Trinity Aquifer and through purchases of raw surface water from the Brazos River Authority. Irrigation is projected to have shortages throughout the planning period. Comanche Irrigation has contracted for 6,652 acft/yr of surface water supplies from the Brazos River Authority, which can supply 5,544 acft/yr in 2030 and 5,370 acft/yr in2080, based on water availability analyses prescribed under water planning guidelines.

5.6.1.6 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to meet water needs for Comanche County-Irrigation. Conservation is recommended. Associated costs are included for each strategy.

1. Conservation:
    a. Cost Source: Volume II.
    b. Date to be Implemented: before 2030.
    c. Annual Cost: maximum of $3,747,000.
    d. Unit Cost: $1,667 /acft.
2. Firm Up BRA Little River Supplies:
    a. Cost Source: Volume II.
    b. Date to be Implemented: before 2030.
    c. Annual Cost: Costs borne by BRA.
    d. Unit Cost: Costs borne by BRA.

3. Leave Needs Unmet:
    a. Cost Source: Cost of not meeting needs – see Appendix G.
    b. Date to be Implemented: before 2030.

Table 5.6-5 Recommended Plan Costs by Decade for Comanche County – Irrigation

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*(9,252)*	*(9,279)*	*(9,322)*	*(9,349)*	*(9,392)*	*(9,426)*
Conservation						
Supply From Plan Element (acft/yr)	964	1,606	2,248	2,248	2,248	2,248
Annual Cost ($/yr)	$1,607,000	$2,677,000	$3,747,000	$3,747,000	$3,747,000	$3,747,000
Unit Cost ($/acft)	$1,667	$1,667	$1,667	$1,667	$1,667	$1,667
Projected Surplus/(Shortage) after Conservation (acft/yr)	*(8,288)*	*(7,673)*	*(7,074)*	*(7,101)*	*(7,144)*	*(7,178)*
Firm Up BRA Little River Supplies						
Supply From Plan Element (acft/yr)	1,159	1,196	1,233	1,269	1,306	1,306
Annual Cost ($/yr)	—	—	—	—	—	—
Unit Cost ($/acft)	—	—	—	—	—	—
Leave Needs Unmet (acft/yr)	*(7,129)*	*(6,477)*	*(5,841)*	*(5,832)*	*(5,838)*	*(5,872)*

5.6.8 Livestock

Comanche County Livestock is obtained from local supplies and groundwater production from the Trinity aquifer. Irrigation is projected to have shortages throughout the planning period. A small amount of projected need remains unmet throughout the planning period.

Table 5.6-6 Recommended Plan Costs by Decade for Comanche County – Livestock

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*(1)*	*(1)*	*(1)*	*(1)*	*(1)*	*(1)*
Leave Needs Unmet (acft/yr)	(1)	(1)	(1)	(1)	(1)	(1)

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5.7 Coryell County Water Supply Plan

Table 5.7-1 lists each water user group in Coryell County and their corresponding surplus or shortage in years 2030 and 2080. A brief summary of the water user groups and the plan for the selected water user are presented in the following subsections.

Table 5.7-1. Coryell County Surplus/(Shortage)

Water User Group	Surplus/(Shortage)		Comment
	2030 (acft/yr)	2080 (acft/yr)	
Central Texas College District	(151)	(153)	Projected shortage - see plan below.
City of Copperas Cove	1,089	(3,297)	Projected shortage - see plan below.
Coryell City Water Supply District	256	700	Projected surplus
Elm Creek WSC			See Bell County
Flat WSC	(92)	(94)	Projected shortage - see plan below.
Fort Gates WSC	(192)	(203)	Projected shortage - see plan below.
Fort Hood			See Bell County
City of Gatesville	(1,066)	(2,025)	Projected shortage - see plan below.
Kempner WSC			See Lampasas County
Mountain WSC	93	90	Projected surplus
Multi-County WSC	(149)	(134)	Projected shortage - see plan below.
Mustang Valley WSC			See Bosque County
City of Oglesby	171	171	Projected surplus
The Grove WSC			See Bell County
County-Other	213	336	Projected surplus
Manufacturing	0	0	No projected surplus or shortage
Steam-Electric	—	—	No projected demand
Mining	192	190	Projected surplus
Irrigation	703	625	Projected surplus
Livestock	119	119	Projected surplus

5.7.1 Central Texas College District

5.7.1.1 Description of Supply

The service area for the Central Texas College District is within both Coryell and Bell Counties and their sole source of water is through the purchase of treated water from the City of Copperas Cove. The quantities shown in Table 5.7-1 represent the cumulative totals for the Central Texas College District as a whole. Shortages are projected from 2030 to 2080.

5.7.1.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended for the Central Texas College District. The entities' water usage utilized for demand projections is 283 gpcd. The RWPG recommends conservation to reduce usage to a goal of 140 gpcd. Needs remain unmet throughout the planning period. These needs will only occur during a drought equivalent or worse than the drought of record. While not a strategy recommended by the Brazos G RWPG, the impacts of the unmet needs may be mitigated through demand management in the event of a serious drought.

1. Conservation
   a. Cost Source: Volume II, Chapter 2
   b. Date to be Implemented: before 2030
   c. Annual Cost: maximum of $94,392 in 2070
   d. Unit Cost: $684/acft.

Table 5.7-2. Recommended Plan Costs by Decade for the Central Texas College District

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*(151)*	*(152)*	*(153)*	*(153)*	*(153)*	*(153)*
Conservation						
Supply From Plan Element (acft/yr)	25	52	80	109	138	138
Annual Cost ($/yr)	$17,100	$35,568	$54,720	$74,556	$94,392	$94,392
Projected Surplus/(Shortage) after Conservation (acft/yr)	*(126)*	*(100)*	*(73)*	*(44)*	*(15)*	*(15)*
Projected Surplus/(Shortage) after recommended WMS (acft/yr)	*(126)*	*(100)*	*(73)*	*(44)*	*(15)*	*(15)*

5.7.2 City of Copperas Cove

5.7.2.1 Description of Supply

The service area for the City of Copperas Cove is within both Coryell and Lampasas Counties. The quantity shown in Table 5.7-1 represents the cumulative totals for the City of Copperas Cove as a whole. The City obtains its water supply solely through purchases of treated surface water under contract from Bell County WCID No.1. Bell County WCID No. 1 is projected to provide up to the contracted 8,824 acft/yr of treated surface water sourced from Lake Belton to the City of Copperas Cove at the beginning of the planning period; however, this contracted supply is constrained based on water availability analyses developed under regional water planning assumptions, rules, and guidelines, and will only provide 7,608 acft/yr in 2030 to 7,369 acft/yr of supply by 2080. Shortages are projected to begin by 2040. Conservation was considered; however, the entity's usage of 119 gpcd is below the selected goal of 140 gpcd.

5.7.2.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended for the City of Copperas Cove. Needs remain unmet from 2040 to 2080. These needs will only occur during a drought equivalent or worse than the drought of record. While not a strategy recommended by the Brazos G RWPG, the impacts of the unmet needs may be mitigated through demand management in the event of a serious drought.

1. Purchase Raw Water Supply from Fort Hood.
    a. Cost Source: Volume II
    b. Date to be Implemented: before 2060
    c. Annual Cost: $156,000
    d. Unit Cost: $121/acft.

Table 5.7-3. Recommended Plan Costs by Decade for the City of Copperas Cove

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*1,089*	*(1,026)*	*(2,374)*	*(3,285)*	*(3,610)*	*(3,297)*
Purchase Raw Water Supply from Fort Hood						
Supply From Plan Element (acft/yr)	—	—	—	32	32	1,285
Annual Cost ($/yr)	—	—	—	$4,000	$4,000	$156,000
Unit Cost ($/acft)	—	—	—	$121	$121	$121
Projected Surplus/(Shortage) after recommended WMS (acft/yr)	*1,089*	*(1,026)*	*(2,374)*	*(3,253)*	*(3,578)*	*(2,012)*

5.7.3 Coryell City Water Supply District

5.7.3.1 Description of Supply

Coryell City Water Supply District obtains its water supply primarily though purchases of treated surface water under contract from the City of Gatesville; the supply available to the District under this contract is projected to range from 1,044 acft/yr to 1,542 acft/yr. The District also purchases raw surface water under contract from the Brazos River Authority in the amount of 300 actft/yr which is treated by the City of Gatesville. This BRA contract for 300 acft/yr of surface water supplies 250 acft/yr in 2030 and 242 acft/yr in 2080, based on water availability analyses developed under regional water planning assumptions, rules, and guidelines. The remainder of the Distict's water supply is obtained through groundwater production from the Trinity Aquifer which is projected to provide 83 acft/yr of supply through the planning period. No shortages are projected for Coryell City Water Supply District and no changes in water supply are recommended. This WUG is located in Coryell and McLennan Counties. The quantity shown in Table 5.7-4 represents the cumulative totals for Coryell City Water Supply District.

5.7.3.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended for the Coryell City Water Supply District. The entities' water usage utilized for demand projections is 163 gpcd. The RWPG recommends conservation to reduce usage to a goal of 140 gpcd.

1. Conservation
   a. Cost Source: Volume II, Chapter 2
   b. Date to be Implemented: before 2030
   c. Annual Cost: maximum of $93,708 in 2070
   d. Unit Cost: $684/acft.

Table 5.7-4. Recommended Plan Costs by Decade for Coryell City Water Supply District

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*256*	*355*	*451*	*576*	*703*	*700*
Conservation						
Supply From Plan Element (acft/yr)	85	135	136	135	137	135
Annual Cost ($/yr)	$58,140	$92,340	$93,024	$92,340	$93,708	$92,340
Projected Surplus/(Shortage) after Conservation (acft/yr)	*341*	*490*	*587*	*711*	*840*	*835*
Projected Surplus/(Shortage) after recommended WMS (acft/yr)	*341*	*490*	*587*	*711*	*840*	*835*

5.7.4 Flat WSC

5.7.4.1 Description of Supply

Flat Creek WSC obtains its water supply solely through purchases of treated surface water under contract with the City of Gatesville, which is projected to supply up to 102 acft/yr through the planning period. Shortages are projected for Flat Creek WSC beginning in 2030.

5.7.4.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended for Flat WSC. The entities' water usage utilized for demand projections is 258 gpcd. The RWPG recommends conservation to reduce usage to a goal of 140 gpcd.

1. Conservation
   a. Cost Source: Volume II
   b. Date to be Implemented: 2030
   c. Annual Cost: maximum of $60,192 in 2070
   d. Unit Cost: $684/acft

2. Purchase Additional Water from Gatesville
    a. Cost Source: Gatesville Water Rate
    b. Date to be Implemented: 2030
    c. Project Cost: N/A
    d. Unit Cost: $1,466/acft ($4.50/1000 gal)
3. Coryell County OCR (Purchase Raw Water Supply from Multi-County WSC; supply would be provided out of the Coryell County OCR)
    a. Cost Source: Volume II
    b. Date to be Implemented: 2050
    c. Annual Cost: maximum of $69,000
    d. Unit Cost: $3,135/acft.

Table 5.7-5. Recommended Plan Costs by Decade for Flat WSC

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*(92)*	*(96)*	*(99)*	*(97)*	*(95)*	*(94)*
Conservation						
Supply From Plan Element (acft/yr)	17	37	58	77	88	88
Annual Cost ($/yr)	$11,628	$25,308	$39,672	$52,668	$60,192	$60,192
Projected Surplus/(Shortage) after Conservation (acft/yr)	*(75)*	*(59)*	*(41)*	*(20)*	*(7)*	*(6)*
Purchase Additional Water from Gatesville						
Supply From Plan Element (acft/yr)	75	59	38	8	—	—
Annual Cost ($/yr)	$110,000	$86,000	$56,000	$12,000	—	—
Unit Cost ($/acft)	$1,466	$1,466	$1,466	$1,466	—	—
Coryell County OCR						
Supply From Plan Element (acft/yr)	—	—	3	12	22	22
Annual Cost ($/yr)	—	—	$9,000	$38,000	$69,000	$69,000
Unit Cost ($/acft)	—	—	$3,135	$3,135	$3,135	$3,135
Projected Surplus/(Shortage) after recommended WMS (acft/yr)	*0*	*0*	*0*	*0*	*15*	*16*

5.7.5 Fort Gates WSC

5.7.5.1 Description of Supply

Fort Gates WSC obtains its water supply through purchases of treated surface water from the City of Gatesville, which is projected to supply 120 acft/yr during the planning period. The entity also has a contract for purchasing raw surface water from the Brazos River Authority; however, Fort Gates WSC does not have facilities necessary to treat this water. Fort Gates WSC has contracted for 200 acft/yr of surface water supplies from the Brazos River Authority, which can supply 167 acft/yr in 2030 and 161 acft/yr in 2080, based on water availability analyses prescribed under water planning guidelines. Shortages are projected across the planning period for Fort Gates WSC.

5.7.5.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended for Flat WSC. The entities' water usage utilized for demand projections is 187 gpcd. The RWPG recommends conservation to reduce usage to a goal of 140 gpcd.

1. Conservation
    a. Cost Source: Volume II
    b. Date to be Implemented: before 2030
    c. Annual Cost: maximum of $77,976 in 2050
    d. Unit Cost: $684/acft
2. Firm Up BRA Little River Supplies
    a. Cost Source: Volume II
    b. Date to be Implemented: before 2030
    c. Annual Cost: Costs borne by BRA
    d. Unit Cost: Costs borne by BRA.

Table 5.7-6. Recommended Plan Costs by Decade for Fort Gates WSC

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*(192)*	*(203)*	*(210)*	*(207)*	*(206)*	*(203)*
Conservation						
Supply From Plan Element (acft/yr)	38	85	114	113	112	111
Annual Cost ($/yr)	$25,992	$58,140	$77,976	$77,292	$76,608	$75,924
Projected Surplus/(Shortage) after Conservation	*(154)*	*(118)*	*(96)*	*(94)*	*(94)*	*(92)*
Firm Up BRA Supplies						
Supply From Plan Element (acft/yr)	270	280	306	348	390	390
Annual Cost ($/yr)	—	—	—	—	—	—
Unit Cost ($/acft)	—	—	—	—	—	—
Projected Surplus/(Shortage) after recommended WMS (acft/yr)	*116*	*162*	*210*	*254*	*296*	*298*

5.7.6 City of Gatesville

5.7.6.1 Description of Supply

The City of Gatesville obtains its water supply through purchases of raw water under contract from the Brazos River Authority. The City of Gatesville has contracted for 5,898 acft/yr of surface water supplies from BRA, which can supply 4,915 acft/yr in 2030 and 4,761 acft/yr in 2080, based on water availability analyses developed under regional water planning assumptions, rules, and guidelines. The City of Gatesville also provides treated surface water to a number of nearby WUGs through wholesale supply contracts.

5.7.6.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to meet water needs for the City of Gatesville. The most recent water loss audit report shows a water loss of approximately 30% and water loss mitigation is recommended. The entities' water usage utilized for demand projections is 246 gpcd. The RWPG recommends conservation to reduce usage to a goal of 140 gpcd.

1. Conservation
   a. Cost Source: Volume II
   b. Date to be Implemented: before 2030
   c. Annual Cost: maximum of $1,261,296 by 2080
2. Water Loss Reduction
   a. Cost Source: Volume II
   b. Date to be Implemented: before 2030
   c. Annual Cost: maximum of $477,918 in 2040
3. Firm Up BRA Little River Supplies
   a. Cost Source: Volume II
   b. Date to be Implemented: before 2030
   c. Project Cost: Costs borne by BRA
   d. Unit Cost: Costs borne by BRA
4. Coryell County OCR (Purchase Raw Water Supply from Multi-County WSC; supply would be provided out of the Coryell County OCR)
   a. Cost Source: Volume II
   b. Date to be Implemented: before 2050
   c. Annual Cost: maximum of $4,790,000
   d. Unit Cost: $3,135/acft.

Table 5.7-7. Recommended Plan Costs by Decade for the City of Gatesville

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*(1,067)*	*(1,306)*	*(1,551)*	*(1,744)*	*(1,946)*	*(2,026)*
Conservation						
Supply From Plan Element (acft/yr)	354	780	1,247	1,686	1,836	1,844
Annual Cost ($/yr)	$242,136	$533,520	$852,948	$1,153,224	$1,255,824	$1,261,296
Water Loss Reduction						
Supply From Plan Element (acft/yr)	660	671	682	683	685	688
Annual Cost ($/yr)	$473,564	$477,918	$269,982	$270,378	$271,170	$272,357
Projected Surplus/(Shortage) after Conservation and Water Loss Reduction (acft/yr)	*(53)*	*145*	*378*	*625*	*575*	*506*

Plan Element	2030	2040	2050	2060	2070	2080
Additional Demands from Recommended Strategies from Others						
Increase Contract to Flat WSC (acft/yr)	(75)	(59)	(38)	(8)	—	—
Total Surplus/(Shortage) including Recommended Strategies	(128)	86	340	617	575	506
Firm Up BRA Little River Supplies						
Supply From Plan Element (acft/yr)	1,028	1,060	1,093	1,125	1,158	1,158
Annual Cost ($/yr)	—	—	—	—	—	—
Unit Cost ($/acft)	—	—	—	—	—	—
Coryell County OCR						
Supply From Plan Element (acft/yr)	—	—	981	1,152	1,528	1,528
Annual Cost ($/yr)	—	—	$3,075,000	$3,612,000	$4,790,000	$4,790,000
Unit Cost ($/acft)	—	—	$3,135	$3,135	$3,135	$3,135
Projected Surplus/(Shortage) after recommended WMS (acft/yr)	*900*	*1,146*	*2,414*	*2,894*	*3,261*	*3,192*

5.7.7 Mountain WSC

Mountain WSC obtains its water supply through groundwater production from the Trinity Aquifer and through purchases of treated surface water under contract from the City of Gatesville which is projected to provide up to 280 acft/yr of supply. Available supply from the Trinity Aquifer is projected at 147 acft/yr. No shortages are projected for Mountain WSC. The entities' water usage utilized for demand projections is 157 gpcd. The RWPG recommends conservation to reduce usage to a goal of 140 gpcd.

1. Conservation
    a. Cost Source: Volume II
    b. Date to be Implemented: before 2030
    c. Annual Cost: maximum of $19,152 in 2050; Unit cost of $684/acft.

Table 5.7-8. Recommended Plan Costs by Decade for Mountain WSC

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*93*	*86*	*82*	*84*	*87*	*90*
Conservation						
Supply From Plan Element (acft/yr)	27	27	28	28	27	27
Annual Cost ($/yr)	$18,468	$18,468	$19,152	$19,152	$18,468	$18,468
Projected Surplus/(Shortage) after Conservation (acft/yr)	*120*	*113*	*110*	*112*	*114*	*117*
Projected Surplus/(Shortage) after recommended WMS (acft/yr)	*120*	*113*	*110*	*112*	*114*	*117*

5.7.8 Multi-County WSC

5.7.8.1 Description of Supply

Multi-County WSC obtains its water supply through purchases of treated surface water under contract from the City of Hamilton, which is projected to provide 245 acft/yr of supply through the planning period. This WUG is located in Coryell and Hamilton Counties. The quantity shown in Table 5.7-9represents the cumulative totals for Multi-County WSC.

5.7.8.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to meet water needs for Multi-County WSC. Conservation was considered; however, the entity's usage of 93 gpcd is below the selected goal of 140 gpcd. The Coryell County Off-Channel Reservoir was evaluated and recommended as a water management strategy to meet future needs in Coryell County. The project would likely be developed in cooperation with the Brazos River Authority. The Multi-County WSC has been identified as the current project sponsor. It is also recommended that Multi-County WSC increase their contracted amount with the City of Hamilton to meet any additional shortages until the reservoir comes online.

1. Purchase additional water from City of Hamilton
    a. Cost Source: Hamilton Water Rate
    b. Date to be Implemented: before 2030
    c. Unit Cost: $2,037/acft ($6.25/1000 gal)
    d. Annual Cost: maximum of $354,000
2. Coryell County Off-Channel Reservoir
    a. Cost Source: Volume II
    b. Date to be Implemented: before 2050
    c. Project Cost: $129,699,000
    d. Unit Cost: maximum of $3,187/acft.

Table 5.7-9. Recommended Plan Costs by Decade for Multi-County WSC

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*(149)*	*(149)*	*(143)*	*(140)*	*(137)*	*(134)*
Purchase Additional Supply from the City of Hamilton						
Supply From Plan Element (acft/yr)	167	149	115	144	174	174
Annual Cost ($/yr)	$340,000	$304,000	$234,000	$293,000	$354,000	$354,000
Unit Cost ($/acft)	$2,037	$2,037	$2,037	$2,037	$2,037	$2,037
Coryell County Off-Channel Reservoir						
Supply From Plan Element (acft/yr)	—	—	843	663	277	277
Annual Cost ($/yr)	—	—	$2,687,000	$2,113,000	$883,000	$883,000
Unit Cost ($/acft)	—	—	$3,187	$3,187	$3,187	$3,187
Projected Surplus/(Shortage) after recommended WMS (acft/yr)	*18*	*0*	*815*	*667*	*314*	*317*

5.7.9 City of Oglesby

The City of Oglesby obtains its water supply solely through groundwater production from the Trinity Aquifer which is projected to provide 211 acft/yr of groundwater supply. No shortages are projected for the City during the planning period and no changes to water supply are recommended. Conservation was considered; however, the entity's usage of 74 gpcd is below the selected target rate of 140 gpcd.

5.7.10 County-Other

5.7.10.1 Description of Supply

Water supply for County-Other entities is obtained through groundwater production from the Trinity Aquifer, which is projected to provide 614 acft/yr of groundwater supply. Development of additional Trinity Aquifer groundwater is recommended as a water management strategy to supplement County-Other entity supply in Coryell County.

5.7.10.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to meet water needs for the entities in Coryell County-Other. Conservation was also considered; however, the entity's usage of 106 gpcd is below the selected goal of 140 gpcd.

1. Groundwater Development – Trinity Aquifer
    a. Cost Source: Volume II
    b. Date to be Implemented: before 2040
    c. Project Cost: $6,858,000
    d. Unit Cost: maximum of $540/acft.

Table 5.7-10. Recommended Plan Costs by Decade for Coryell County – Other

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*213*	*193*	*201*	*239*	*284*	*336*
Groundwater Development – Trinity Aquifer						
Supply From Plan Element (acft/yr)	—	259	525	815	1,107	1,107
Annual Cost ($/yr)	—	$140,000	$284,000	$85,000	$115,000	$115,000
Unit Cost ($/acft)	—	$540	$540	$104	$104	$104
Projected Surplus/(Shortage) after recommended WMS (acft/yr)	*213*	*452*	*726*	*1,054*	*1,391*	*1,443*

5.7.11 Manufacturing

Coryell County Manufacturing obtains water supply through purchases of treated surface water under contract from the City of Gatesville. No shortage is projected and no changes in water supply are recommended.

5.7.12 Steam-Electric

Coryell County has no current or projected future demand for Steam-Electric; therefore, no recommendations have been made.

5.7.13 Mining

5.7.13.1 Description of Supply

Mining demand in Coryell County is projected to slowly increase until 2080. Water supply to meet Mining demands is obtained solely through groundwater production from the Trinity Aquifer.

5.7.13.2 Recommended Strategy

Working within the planning criteria established by the Brazos G RWPG and TWDB, the development of Trinity Aquifer groundwater is recommended to supplement water supplies for Coryell County-Mining. Associated costs are included for each strategy.

1. Groundwater Development – Trinity Aquifer:
    a. Cost Source: Volume II.
    b. Date to be Implemented: before 2030.
    c. Project Cost: $5,534,000.
    d. Unit Cost: maximum of $370/acft.

Table 5.7-11. Recommended Plan Costs by Decade for Coryell County – Mining

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*192*	*191*	*191*	*191*	*190*	*190*
Groundwater Development - Trinity						
Supply From Plan Element (acft/yr)	1,270	1,270	1,270	1,270	1,270	1,270
Annual Cost ($/yr)	$470,000	$470,000	$81,000	$81,000	$81,000	$81,000
Unit Cost ($/acft)	$370	$370	$64	$64	$64	$64
Projected Surplus/(Shortage) after recommended WMS (acft/yr)	*1,462*	*1,461*	*1,461*	*1,461*	*1,460*	*1,460*

5.7.14 Irrigation

Coryell County Irrigation obtains water supply through Trinity Aquifer groundwater and Braozs river run-of-river water rights. No shortages are projected and no changes in water supply are recommended.

5.7.15 Livestock

Livestock water is obtained through local water supplies and through Trinity Aquifer groundwater. Livestock water supply is projected to meet demands through 2080 and no changes in water supply are recommended.

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5.8 Eastland County Water Supply Plan

Table 5.8-1 lists each water user group in Eastland County and their corresponding surplus or shortage in years 2030 and 2080. A brief summary of the water user groups and the plan for the selected water user are presented in the following subsection.

Table 5.8-1. Eastland County Surplus/(Shortage)

Water User Group	Surplus/(Shortage)		Comment
	2030 (acft/yr)	2080 (acft/yr)	
City of Cisco	120	(12)	Projected shortage - see plan below.
City of Eastland	1,455	1,488	Projected surplus
Fort Griffin SUD			See Stephens County
City of Gorman	58	97	Projected surplus
City of Ranger	1,383	1,458	Projected surplus
City of Rising Star	40	64	Projected surplus
Staff WSC	67	(26)	Projected shortage - see plan below.
Stephens Regional SUD			See Stephens County
Westbound WSC	0	0	No projected surplus or shortage
County-Other	214	330	Projected surplus
Manufacturing	826	(15)	Projected shortage - see plan below.
Steam-Electric	—	—	No projected demand
Mining	(313)	(314)	Projected shortage - see plan below.
Irrigation	621	621	Projected surplus
Livestock	628	628	Projected surplus

5.8.1 City of Cisco

The City of Cisco obtains its water supply through diversions from Lake Cisco under a water right held by the City, which is projected to provide the City with up to 977 acft/yr of water supply. The City also provides sales of treated surface water to Eastland County-Other users.

5.8.1.1 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended for the City of Cisco. The entities' water usage utilized for demand projections is 170 gpcd. The RWPG recommends conservation to reduce usage to a goal of 140 gpcd.

1. Conservation
    a. Cost Source: Volume II
    b. Date to be Implemented: before 2030
    c. Unit Cost: $684/acft
    d. Annual Cost: maximum of $80,028.

Table 5.8-2. Recommended Plan Costs by Decade for City of Cisco

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*120*	*94*	*60*	*38*	*15*	*(12)*
Conservation						
Supply From Plan Element (acft/yr)	54	110	114	115	115	117
Annual Cost ($/yr)	$36,936	$75,240	$77,976	$78,660	$78,660	$80,028
Projected Surplus/(Shortage) after Conservation	*174*	*204*	*174*	*153*	*130*	*105*
Projected Surplus/(Shortage) after recommended WMS (acft/yr)	*174*	*204*	*174*	*153*	*130*	*105*

5.8.2 City of Eastland

The City of Eastland obtains its water supply through purchases of treated surface water under contract for 3,314 acft/yr with the Eastland County Water Supply District. This contract is projected to provide an annual supply beginning at 2,302 acft/yr in 2030 and decreasing to 2,144 acft/yr by 20280 based on water availability analyses prescribed under water planning guidelines. The Eastland County Water Supply District sources raw surface water through diversions Lake Leon under a water right held by the water supply district. The City also provides sales of treated surface water under contract with Staff WSC, Westbound WSC, and entities in the County-Other WUG for Eastland County. No shortages are projected for the City of Eastland and no changes in water supply are recommended. The entities' water usage utilized for demand projections is 160 gpcd. The RWPG recommends conservation to reduce usage to a goal of 140 gpcd.

1. Conservation
   a. Cost Source: Volume II
   b. Date to be Implemented: before 2030
   c. Unit Cost: $684/acft
   d. Annual Cost: maximum of $40,356.

Table 5.8-3. Recommended Plan Costs by Decade for City of Eastland

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*1,455*	*1,474*	*1,488*	*1,496*	*1,495*	*1,488*
Conservation						
Supply From Plan Element (acft/yr)	59	50	46	42	40	37
Annual Cost ($/yr)	$40,356	$34,200	$31,464	$28,728	$27,360	$25,308
Projected Surplus/(Shortage) after Conservation	*1,514*	*1,524*	*1,534*	*1,538*	*1,535*	*1,525*
Projected Surplus/(Shortage) after recommended WMS (acft/yr)	*1,514*	*1,524*	*1,534*	*1,538*	*1,535*	*1,525*

5.8.3 City of Gorman

The City of Gorman obtains its water supply through purchases of treated surface water under contract from the Upper Leon River Municipal Water District, which is projected to provide up to 169 acft/yr of supply. The water supplied by the Upper Leon River Municipal Water District is diverted from Lake Proctor under contracts with the Brazos River Authority. No shortages are projected for the City of Gorman and no changes in water supply are recommended. Conservation was aslo considered; however, the entity's usage of 109 gpcd is below the selected goal of 140 gpcd.

5.8.4 City of Ranger

The City of Ranger obtains its water supply through purchases of treated surface water from the Eastland County Water Supply District, which is projected to provide up to 2,025 acft/yr across the planning period. The Eastland County Water Supply District sources raw surface water through diversions Lake Leon under a water right held by the water supply district. The City also provides sales of treated surface water and groundwater to Staff WSC. No shortages are projected for the City of Ranger and no changes in water supply are recommended.

5.8.4.1 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended for the City of Ranger. The entities' water usage utilized for demand projections is 166 gpcd. The RWPG recommends conservation to reduce usage to a goal of 140 gpcd.

1. Conservation
   a. Cost Source: Volume II
   b. Date to be Implemented: before 2030
   c. Unit Cost: $684/acft
   d. Annual Cost: maximum of $32,832.

Table 5.8-4. Recommended Plan Costs by Decade for City of Ranger

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*1,383*	*1,408*	*1,427*	*1,441*	*1,452*	*1,458*
Conservation						
Supply From Plan Element (acft/yr)	31	48	46	45	43	43
Annual Cost ($/yr)	$21,204	$32,832	$31,464	$30,780	$29,412	$29,412
Projected Surplus/(Shortage) after Conservation	*1,414*	*1,456*	*1,473*	*1,486*	*1,495*	*1,501*
Additional Demands from Recommended Strategies from Others						
Staff WSC – Purchase Additional Supply from Ranger	—	—	—	—	6	26
Total Surplus/(Shortage) including Recommended Strategies	1,414	1,456	1,473	1,486	1,489	1,475
Projected Surplus/(Shortage) after recommended WMS (acft/yr)	*1,414*	*1,456*	*1,473*	*1,486*	*1,489*	*1,475*

5.8.5 City of Rising Star

The City of Rising Star obtains its water supply solely through groundwater production from the Trinity Aquifer, which is projected to provide up to 170 acft/yr of supply. No shortages are projected for the City of Rising Star and no changes in water supply are recommended. The entities' water usage utilized for demand projections is 1 gpcd. The RWPG recommends conservation to reduce usage to a goal of 140 gpcd.

1. Conservation
    a. Cost Source: Volume II
    b. Date to be Implemented: before 2030
    c. Unit Cost: $684/acft
    d. Annual Cost: maximum of $12,996.

Table 5.8-5. Recommended Plan Costs by Decade for City of Rising Star

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*40*	*48*	*54*	*59*	*62*	*64*
Conservation						
Supply From Plan Element (acft/yr)	10	19	18	17	17	16
Annual Cost ($/yr)	$6,840	$12,996	$12,312	$11,628	$11,628	$10,944
Projected Surplus/(Shortage) after Conservation	*50*	*67*	*72*	*76*	*79*	*80*
Projected Surplus/(Shortage) after recommended WMS (acft/yr)	*50*	*67*	*72*	*76*	*79*	*80*

5.8.6 Staff WSC

Staff WSC obtains its water supply through purchases of treated surface water under contract with the City of Eastland, and purchases of treated surface and groundwater from the City of Ranger. Total supply purchases are projected to provide 262 acft/yr of supply to Staff WSC through the planning period.

5.8.6.1 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended for Staff WSC. Conservation was also considered; however, the entity's usage is below the selected goal of 140 gpcd.

2. Purchase Additional Supply from Ranger
    a. Cost Source: Ranger Water Rates
    b. Date to be Implemented: 2070
    c. Project Cost: none
    d. Unit Cost: $3,259/acft ($10/1,000 gal).

Table 5.8-6. Recommended Plan Costs by Decade for Staff WSC

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*67*	*50*	*25*	*11*	*(6)*	*(26)*
Purchase Additional Supply from Ranger						
Supply From Plan Element (acft/yr)	—	—	—	—	6	26
Annual Cost ($/yr)	—	—	—	—	$19,554	$84,734
Projected Surplus/(Shortage) after recommended WMS (acft/yr)	*67*	*50*	*25*	*11*	*0*	*0*

5.8.7 Westbound WSC

Westbound WSC obtains its water supply through purchases of treated surface water under contract for 280 acft/yr with the Eastland County Water Supply District. This contract is projected to provide an annual supply of 87 acft/yr in 2030 up to 99 acft/yr in 2080 based on water availability analyses prescribed under water planning guidelines. The Eastland County Water Supply District sources raw surface water through diversions Lake Leon under a water right held by the water supply district. The WSC is also supplied by Trinity Aquifer groundwater. Conservation was also considered; however, the entity’s usage of 73 gpcd is below the selected goal of 140 gpcd. No shortages are projected for Westbound WSC and no changes in water supply are recommended.

5.8.8 County-Other

The entities comprising Eastland County-Other obtain water supply from multiple sources in the County. The City of Eastland sells treated surface water under contract to the City of Carbon and Olden WSC. Entities comprising Eastland County-Other also rely on groundwater production from the Trinity Aquifer to meet demands. Water supply contracts are projected to provide users in Eastland County-Other with up to 267 acft/yr of treated surface water while available groundwater supplies are projected at 202 acft/yr. No shortages are projected through the planning period and no changes in water supply are recommended. The most recent water loss audit report shows a water loss of approximately 28% and water loss mitigation is recommended. Conservation was also considered; however, the entity’s usage of 82 gpcd is below the selected goal of 140 gpcd.

1. Water Loss Reduction
    a. Cost Source: Volume II
    b. Date to be Implemented: before 2030
    c. Annual Cost: maximum of $92,091 in 2030.

Table 5.8-7. Recommended Plan Costs by Decade for County-Other, Eastland

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*214*	*226*	*256*	*272*	*295*	*330*
Water Loss Reduction						
Supply From Plan Element (acft/yr)	33	31	28	26	22	18
Annual Cost ($/yr)	$92,091	$91,338	$10,535	$9,782	$8,277	$6,772
Projected Surplus/(Shortage) after Water Loss Reduction	*247*	*257*	*284*	*298*	*317*	*348*
Projected Surplus/(Shortage) after recommended WMS (acft/yr)	*247*	*257*	*284*	*298*	*317*	*348*

5.8.9 Manufacturing

Manufacturing in Eastland County is supplied with local water from Brazos run of the river water rights and treated surface water from the Eastland County Water Supply District. The Eastland County Water Supply District sources raw surface water through diversions Lake Leon under a water right held by the water supply district. There is a projected water supply shortage of 15 acft/yr in 2080.

5.8.9.1 Water Supply Plan

Leave needs unmet in the 2080 decade. These needs will only occur during a drought equivalent or worse than the drought of record. While not a strategy recommended by the Brazos G RWPG, the impacts of the unmet needs may be mitigated through demand management in the event of a serious drought.

5.8.10 Steam-Electric

No Steam-Electric demand exists or is projected for the county.

5.8.11 Mining

5.8.11.1 Description of Supply

Mining operations in Eastland County obtain water supply solely through groundwater production from the Trinity Aquifer. Current groundwater allocations in the county exceed the MAG supply and are not projected to be available for production in the future.

5.8.11.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to meet water needs for Eastland County-Mining. Conservation is recommended. These needs will only occur during a drought equivalent or worse than the drought of record. While not a strategy recommended by the Brazos G RWPG, the impacts of the unmet needs may be mitigated through demand management in the event of a serious drought.

1. Conservation
    a. Cost Source: Volume II
    b. Date to be Implemented: before 2030
    c. Annual Cost: not determined

2. Groundwater Development – Trinity Aquifer (Erath County)
    a. Cost Source: Volume II
    b. Date to be Implemented: before 2030
    c. Project Cost: $8,783,000
    d. Unit Cost: maximum of $7,424/acft.

Table 5.8-8. Recommended Plan Costs by Decade for Eastland County – Mining

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*(313)*	*(313)*	*(314)*	*(314)*	*(314)*	*(314)*
Conservation						
Supply From Plan Element (acft/yr)	1	2	2	2	1	1
Annual Cost ($/yr)	ND	ND	ND	ND	ND	ND
Projected Surplus/(Shortage) after Conservation (acft/yr)	*(312)*	*(311)*	*(312)*	*(312)*	*(313)*	*(313)*
Groundwater Development – Trinity Aquifer						
Supply From Plan Element (acft/yr)	90	76	92	77	91	91
Annual Cost ($/yr)	$668,000	$564,000	$65,000	$54,000	$64,000	$64,000
Unit Cost ($/acft)	$7,424	$7,424	$707	$707	$707	$707
Projected Surplus/(Shortage) after recommended WMS (acft/yr)	*(222)*	*(235)*	*(220)*	*(235)*	*(222)*	*(222)*
ND – Not determined. Costs to implement industrial conservation technologies will vary based on each location.						

5.8.12 Irrigation

Irrigation in Eastland County is supplied through groundwater production from the Trinity Aquifer and local water from Brazos run of the river water rights. No supply shortages are projected throughout the planning period and no change in water supply is recommended.

5.8.13 Livestock

The livestock demand for Eastland County is met with local surface water supplies and Trinity Aquifer groundwater. No supply shortages are projected throughout the planning period and no change in water supply is recommended.

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5.9 Erath County Water Supply Plan

Table 5.9-1 lists each water user group in Erath County and their corresponding surplus or shortage in years 2030 and 2080.

Table 5.9-1 Erath County Surplus/(Shortage)

Water User Group	Surplus/(Shortage)		Comment
	2030 (acft/yr)	2080 (acft/yr)	
City of Dublin	196	343	Projected surplus
City of Gordon			See Palo Pinto County
City of Stephenville	2,553	1,933	Projected surplus
County-Other	310	(347)	Projected shortage - see plan below
Manufacturing	(19)	6	Projected shortage – see plan below
Steam-Electric	—	—	No projected demand
Mining	992	987	Projected surplus
Irrigation	404	404	Projected surplus
Livestock	298	298	Projected surplus

5.9.1 City of Dublin

The City of Dublin obtains its water supply through purchases of treated surface water under contract from the Upper Leon River Municipal Water District. The water supplied by the Upper Leon River Municipal Water District is diverted from Lake Proctor under contracts with the Brazos River Authority. The City of Dublin is projected to obtain up to 598 acft/yr of treated surface water supply from the Upper Leon River Municipal Water District through the planning period. The City also provides sales of treated surface water to Manufacturing entities and entities comprising the County-Other WUG in Erath County. No shortages are projected for the City of Dublin and no change in water supply is recommended. Conservation was also considered; however, the City's usage of 105 gpcd is below the selected goal of 140 gpcd.

5.9.2 City of Stephenville

5.9.2.1 Description of Supply

The City of Stephenville obtains its water supply through groundwater production from the Trinity Aquifer and through purchases of treated surface water under contract with the Upper Leon River Municipal Water District. The Upper Leon River Municipal Water District has contracted with the Brazos River Authority for raw water supply from Lake Proctor. Treated water supply available under contract from the Upper Leon River Municipal Water District is projected at 1,862 acft/yr through the planning period while the groundwater supply available to the City is projected at 3,780 acft/yr. The City also provides sales of treated surface water to Manufacturing entities in Erath County. Supply shortages are projected for the City beginning in the 2070 decade.

5.9.2.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water supply plan is recommended for the City of Stephenville. Associated costs are included for each strategy. Conservation was also considered; however, the entity's usage of 136 gpcd is below the selected goal of 140 gpcd.

1. Trinity Aquifer Groundwater Development:
   a. Cost Source: Volume II.
   b. Date to be Implemented: before 2030.
   c. Project Cost: $7,501,000
   d. Unit Cost: maximum of $1,684 /acft.

Table 5.9-2 Recommended Plan Costs by Decade for City of Stephenville

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*1,671*	*,1,295*	*829*	*200*	*(497)*	*(1,260)*
Additional Demands from Recommended Strategies from Others						
Increase Supply to Erath County-Manufacturing (acft/yr)	(17)	(10)	(3)	—	—	—
Total Needs Including Recommended Strategies (acft/yr)	1,656	1,285	826	200	(497)	(1,260)
Groundwater Development – Trinity Aquifer						
Supply from Plan Element (acft/yr)	318	390	405	385	395	395
Annual Cost ($/yr)	$536,000	$657,000	$154,000	$146,000	$150,000	$150,000
Unit Cost ($/acft)	$1,684	$1,684	$380	$380	$380	$380
Projected Surplus/(Shortage) after Recommended WMS (acft/yr)	*1,972*	*1,675*	*1,231*	*585*	*(102)*	*(865)*

5.9.3 County-Other

5.9.3.1 Description of Supply

The water supply entities comprising County-Other rely primarily on groundwater production from the Trinity Aquifer for water supply. Some treated surface water supplies are provided through the City of Dublin and City of Gordon. Available Trinity Aquifer groundwater supplies are projected at 3,211 acft/yr, while treated surface water is projected to provide an additional 122 acft/yr of supply. Supply shortages are projected for the entity beginning by2070.

5.9.3.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water supply plan is recommended for the Erath County-Other. Associated costs are included for each strategy. The most recent water loss audit report shows a water loss of approximately 32% and water loss mitigation is recommended. Conservation was also considered; however, the entity's usage of 126 gpcd is below the selected goal of 140 gpcd.

1. Water Loss Reduction

   a. Cost Source: Volume II
   b. Date to be Implemented: before 2030
   c. Annual Cost: maximum of $281,402 in 2080

2. Trinity Aquifer Groundwater Development:

   a. Cost Source: Volume II.
   b. Date to be Implemented: before 2060.
   c. Project Cost: $2,475,000
   d. Unit Cost: maximum of $859 /acft.

Table 5.9-3 Recommended Plan Costs by Decade for Erath County – Other

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*727*	*499*	*310*	*63*	*(148)*	*(347)*
Water Loss Reduction						
Supply from Plan Element (acft/yr)	439	474	517	568	625	690
Annual Cost ($/yr)	$193,383	$207,657	$210,848	$231,647	$254,893	$281,402
Projected Surplus/(Shortage) after Conservation (acft/yr)	*1,296*	*1,135*	*934*	*696*	*430*	*131*
Groundwater Development – Trinity Aquifer						
Supply from Plan Element (acft/yr)	—	—	—	276	283	283
Annual Cost ($/yr)	—	—	—	$237,000	$243,000	$69,000
Unit Cost ($/acft)	—	—	—	$859	$859	$244
Projected Surplus/(Shortage) after Recommended WMS (acft/yr)	*1,296*	*1,135*	*934*	*972*	*713*	*414*

5.9.4 Manufacturing

5.9.4.1 Description of Supply

Manufacturing water supply in Erath County is obtained from multiple sources including through local groundwater production from the Trinity Aquifer, purchases of treated surface from the City of Dublin and County-Other entities, and groundwater purchases from the City of Stephenville. Manufacturing is projected to have a supply shortage until 2070.

5.9.4.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water supply plan is recommended for the Erath County-Other. Conservation is recommended. Associated costs are included for each strategy.

1. Conservation:

   a. Cost Source: Volume II.
   b. Date to be Implemented: before 2030.
   c. Annual Cost: not determined.

2. Purchase additional groundwater supply from the City of Stephenville:

a. Cost Source: Stephenville Water Rate.
b. Date to be Implemented: before 2030.
c. Annual Cost: maximum of $22,000.
d. Unit Cost: maximum of $1,271 /acft. ($3.90/1,000 gal).

Table 5.9-4 Recommended Plan Costs by Decade for Erath County – Manufacturing

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*(19)*	*(14)*	*(9)*	*(6)*	*(1)*	*6*
Conservation						
Supply from Plan Element (acft/yr)	2	4	6	6	6	6
Annual Cost ($/yr)	ND	ND	ND	ND	ND	ND
Projected Surplus/(Shortage) after Conservation (acft/yr)	(17)	(10)	(3)	0	5	12
Purchase additional supply from City of Stephenville						
Supply from Plan Element (acft/yr)	17	10	3	—	—	—
Annual Cost ($/yr)	$22,000	$13,000	$4,000	—	—	—
Unit Cost ($/acft)	$1,271	$1,271	$1,271	—	—	—
Projected Surplus/(Shortage) after Recommended WMS (acft/yr)	*0*	*0*	*0*	*0*	*5*	*12*
ND – Not determined. Costs to implement industrial conservation technologies will vary based on each location.						

5.9.5 Steam-Electric

No Steam-Electric demand exists or is projected for the county.

5.9.6 Mining

Water supply for Mining in Erath County is obtained through groundwater production from the Trinity Aquifer. No water supply shortages are projected for Mining entities in the County through the planning period.

5.9.7 Irrigation

Irrigation in Erath County obtains water solely through local groundwater production from the Trinity Aquifer and run-of-river rights in the Brazos River. Irrigation in the County is projected to have a surplus of available water through the planning period. No change in water supply is recommended.

5.9.8 Livestock

Water supply for Livestock is obtained through local stock surface water impoundments and Trinity Aquifer groundwater. No shortages are projected for Livestock use and no changes in water supply are recommended.

5.10 Falls County Water Supply Plan

Table 5.10-1 lists each water user group in Falls County and their corresponding surplus or shortage in years 2030 and 2080. For each water user group with a projected shortage, a water supply plan has been developed and is presented in the following subsections.

Table 5.10-1 Falls County Surplus/(Shortage)

Water User Group	Surplus/(Shortage)		Comment
	2030 (acft/yr)	2080 (acft/yr)	
Bell-Milam WSC			See Bell County
City of Bruceville-Eddy			See McLennan County
Cego-Durango WSC	2	(167)	Projected shortage - see plan below.
East Bell County WSC			See Bell County
Levi WSC			See McLennan County
Little Elm Valley WSC			See Bell County
City of Marlin	1,017	1,359	Projected surplus
North Milam WSC			See Milam County
City of Rosebud	479	507	Projected surplus
West Brazos WSC	278	250	Projected surplus
County-Other	(534)	26	Projected shortage - see plan below.
Manufacturing	—	—	No projected demand
Steam-Electric	—	—	No projected demand
Mining	68	68	Projected surplus
Irrigation	2,069	1,978	Projected surplus
Livestock	411	411	Projected surplus

5.10.1 Cego-Durango WSC

Cego-Durango WSC obtains its water supply solely through groundwater production from the Trinity Aquifer, which is projected to provide an available groundwater supply of 205 acft/yr through the planning period. Shortages are projected for Cego-Durango WSC by 2040.

5.10.1.1 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water supply plan is recommended for the Cego-Durango WSC. The entities' water usage utilized for demand projections is 159 gpcd. The RWPG recommends conservation to reduce usage to a goal of 140 gpcd.

1. Conservation:
    a. Cost Source: Volume II.
    b. Date to be Implemented: by 2030.
    c. Annual Cost: maximum of $23,256 in 2080.

   d. Unit Cost: $684/acft.

2. Contract with West Brazos WSC:
   a. Cost Source: Volume II.
   b. Date to be Implemented: by 2040.
   c. Annual Cost: $5,397,000.
   d. Unit Cost: $3,259/acft.

Table 5.10-2 Recommended Plan Costs by Decade for Cego-Durango WSC

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	2	(27)	(58)	(84)	(118)	(167)
Conservation						
Supply From Plan Element (acft/yr)	19	21	24	26	29	34
Annual Cost ($/yr)	$12,996	$14,364	$16,416	$17,784	$19,836	$23,256
Projected Surplus/(Shortage) after Conservation (acft/yr)	21	(6)	(34)	(58)	(89)	(133)
Contract with West Brazos WSC						
Supply From Plan Element (acft/yr)	—	135	135	135	135	135
Annual Cost ($/yr)	—	$440,000	$440,000	$60,000	$60,000	$60,000
Unit Cost ($/acft)	—	$3,259	$3,259	$444	$444	$444
Projected Surplus/(Shortage) after recommended WMS (acft/yr)	2	129	101	77	46	2

5.10.2 City of Marlin

5.10.2.1 Description of Supply

The City of Marlin obtains its water supply through raw water diversions from local reservoirs and the Brazos River under water rights held by the City. The City owns and operates two existing reservoirs – Marlin City Lake and New Marlin Reservoir – that impound runoff from Big Sandy Creek, The City also has contracted to purchase raw surface water from the Brazos River Authority. Surface water supplies available through diversions by the City are projected to provide up to 2,960 acft/yr of supply at the beginning of the planning period, then decreasing to 2,738 acft/yr at the end of the period. Purchases of raw surface water under contract with the Brazos River Authority are projected to provide a constant supply of 1,200 acft/yr through the planning period. No shortages are projected for the City of Marlin.

5.10.2.2 Water Supply Plan

The supplies projected are adequate to meet the City's water demand through 2080. Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water supply plan is recommended for the City of Marlin. The entities' water usage utilized for demand projections is 267 gpcd. The RWPG recommends conservation to reduce usage to a goal of 140 gpcd.

1. Conservation:
    a. Cost Source: Volume II.
    b. Date to be Implemented: before 2030.
    c. Annual Cost: maximum of $363,204 in 2080.
    d. Unit Cost: $684/acft.
2. Brushy Creek Reservoir:
    a. Cost Source: Volume II.
    b. Date to be Implemented: 2040.
    c. Total Project Cost: $54,402,000.
    d. Annual Cost: $4,164,000 (includes NRCS share of project).
    e. Unit Cost: $2,082/acft.

Table 5.10-3 Recommended Plan Costs by Decade for the City of Marlin

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	1,017	1,132	1,232	1,323	1,386	1,359
Conservation						
Supply From Plan Element (acft/yr)	114	231	344	448	524	531
Annual Cost ($/yr)	$77,976	$158,004	$235,296	$306,432	$358,416	$363,204
Projected Surplus/(Shortage) after Conservation (acft/yr)	1,131	1,363	1,576	1,771	1,910	1,890
Brushy Creek Reservoir						
Supply From Plan Element (acft/yr)	—	2,000	2,000	2,000	2,000	2,000
Annual Cost ($/yr)	—	$4,164,000	$4,164,000	$1,280,000	$1,280,000	$655,000
Unit Cost ($/acft)	—	$2,082	$2,082	$640	$640	$328
Projected Surplus/(Shortage) after recommended WMS (acft/yr)	1,131	3,363	3,576	3,771	3,910	3,890

5.10.3 City of Rosebud

5.10.3.1 Description of Supply

The City of Rosebud obtains its water supply primarily through purchases of treated surface water under contract from Central Texas WSC, which treats and delivers water from Stillhouse Hollow Lake through purchases under contract with the Brazos River Authority. This supply contract is projected to provide up to 525 acft/yr of supply to the City. Additionally, the City of Rosebud also contracts directly with the Brazos River Authority for purchases of raw surface water which is projected to provide 100 acft/yr of supply. No shortages are projected for the City of Rosebud. And no change in water supply is recommended.

5.10.3.2 Water Supply Plan

The supplies projected are adequate to meet the City's water demand through 2080. Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended for the City of Rosebud. The most recent water loss audit report shows a water loss of approximately 40% and recommends water loss mitigation. Conservation is not recommended because the entity's usage is 114 gpcd, which is below the selected goal of 140 gpcd.

1. Water Loss Reduction:
   a. Cost Source: Volume II.
   b. Date to be Implemented: by 2030.
   c. Annual Cost: maximum of $57,993.
   d. Unit Cost: $1,620/acft.

Table 5.10-4 Recommended Plan Costs by Decade for the City of Rosebud

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	479	489	495	501	505	507
Water Loss Reduction						
Supply From Plan Element (acft/yr)	38	35	33	30	28	27
Annual Cost ($/yr)	$57,993	$56,686	$14,376	$13,069	$12,198	$11,762
Unit Cost ($/acft)	$1,526	$1,620	$436	$436	$436	$436
Projected Surplus/(Shortage) after Water Loss Reduction (acft/yr)	517	524	528	531	533	534

5.10.4 West Brazos WSC

5.10.4.1 Description of Supply

The service area for West Brazos WSC is located in multiple counties (McLennan and Falls) and obtains its water supply solely through groundwater production from the Trinity Aquifer. The values presented in Table 5.10-1 for West Brazos WSC represents the cumulative supply surplus for the WUG. Trinity Aquifer groundwater supply available to West Brazos WSC is projected at 788 acft/yr during the planning period. No supply shortages are projected through the planning period for West Brazos WSC.

5.10.4.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water supply plan is recommended for the West Brazos WSC. The entities' water usage utilized for demand projections is 159 gpcd. The RWPG recommends conservation to reduce usage to a goal of 140 gpcd.

1. Conservation:
   a. Cost Source: Volume II.
   b. Date to be Implemented: before 2030.
   c. Annual Cost: maximum of $32,832 in 2080.

d. Unit Cost: $684/acft.

Table 5.10-5 Recommended Plan Costs by Decade for West Brazos WSC

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	382	360	343	319	290	255
Conservation						
Supply From Plan Element (acft/yr)	37	39	39	42	45	48
Annual Cost ($/yr)	$25,308	$26,676	$26,676	$28,728	$30,780	$32,832
Projected Surplus/(Shortage) after Conservation (acft/yr)	419	399	382	361	335	303
Additional Demands from Strategies Recommended for Others						
Supply to Cego-Durango WSC (acft/yr)	—	135	135	135	135	135
Projected Surplus/(Shortage) after recommended WMS (acft/yr)	419	264	247	226	200	168

5.10.5 County-Other

Entities comprising Falls County-Other obtain water supply through purchases of treated surface water from Central Texas WSC and through local groundwater production from the Brazos River Alluvium and Carrizo-Wilcox Aquifers. Supply purchases from Central Texas WSC are projected to provide a total of 326 acft/yr through the planning period; available groundwater supply from the Brazos River Alluvium Aquifer are projected at 170 acft/yr and available supply from the Carrizo-Wilcox Aquifer is projected to range between 46 and 69 acft/yr. Falls County-Other is projected to have water supply shortages beginning in 2030 at 300 acft/yr, decreasing to 21 acft/yr by 2060. In the decade of 2080, a water supply surplus of 260 acft/yr is projected.

5.10.5.1 Description of Supply

Various entities are dealing with elevated levels of arsenic in groundwater supplies and have been pursuing water management strategies through the FHLM WSC. Through a TWDB sponsored study coordinated by FHLM WSC, these entities have considered a regional brackish RO WTP in Limestone County, Carrizo-Wilcox Regional Groundwater in Limestone County, Tehuacana Reservoir, and supplies from City of Marlin (Brushy Creek Reservoir), and City of Waco. The recommended strategy is to provide for arsenic treatment for individual entities. This strategy does not provide new supply.

5.10.5.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended for Falls County-Other. The most recent water loss audit report shows a water loss of approximately 36% and recommends water loss mitigation. Conservation is not recommended because the entity's usage is 114 gpcd, which is below the selected goal of 140 gpcd.

1. Water Loss Reduction:
    a. Cost Source: Volume II.
    b. Date to be Implemented: by 2030.
    c. Annual Cost: maximum of $96,876.
    d. Unit Cost: $558/acft.
2. Groundwater Development – Brazos River Alluvium:
    a. Cost Source: Volume II.
    b. Date to be Implemented: by 2030.
    c. Project Cost: $323,000.
    d. Unit Cost: maximum of $89/acft.
3. Upgrade Treatment for Arsenic: Entities within County-Other for which Arsenic treatment is recommended include Moore WS.
    a. Cost Source: Volume II.
    b. Date to be Implemented: before 2030.
    c. Project Cost: $279,000.
    d. Unit Cost: maximum of $1,887/acft.

Table 5.10-6 Recommended Plan Costs by Decade for the Falls County – Other

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	(300)	(212)	(114)	(21)	103	260
Water Loss Reduction						
Supply From Plan Element (acft/yr)	178	160	141	122	98	64
Annual Cost ($/yr)	$96,876	$89,280	$59,502	$51,484	$41,356	$27,008
Unit Cost ($/acft)	$544	$558	$422	$422	$422	$422
Projected Surplus/(Shortage) after Conservation (acft/yr)	3	4	69	114	102	87
Groundwater Development – Brazos River Alluvium						
Supply From Plan Element (acft/yr)	325	325	325	325	325	325
Annual Cost ($/yr)	$29,000	$29,000	$6,000	$6,000	$6,000	$6,000
Unit Cost ($/acft)	$89	$89	$18	$18	$18	$18
Upgrade Treatment for Arsenic						
Supply From Plan Element (acft/yr)	46	50	53	53	53	53
Annual Cost ($/yr)	$100,000	$100,000	$80,000	$80,000	$80,000	$80,000
Unit Cost ($/acft)(1)	$1,887	$1,887	$1,509	$1,509	$1,509	$1,509
Projected Surplus/(Shortage) after recommended WMS (acft/yr)	249	323	405	479	579	702

Notes:
(1) Unit cost based on strategy yield of 53 ac-ft/yr, actual yield limited by source supply.

5.10.6 Manufacturing

No Manufacturing demand exists or is projected for the county.

5.10.7 Steam-Electric

No Steam-Electric demand exists or is projected for the county.

5.10.8 Mining

Mining operations in Falls County obtain water supply solely through groundwater production from the Brazos River Alluvium Aquifer. Mining has a projected surplus throughout the planning period and no changes in water supply are recommended.

5.10.9 Irrigation

Irrigation in Falls County obtains water supply through groundwater production from the Brazos River Alluvium. No supply shortages are projected for Irrigation through the planning period and no change in water supply is recommended.

5.10.10 Livestock

Livestock operations in Falls County obtain water supply through local stock surface water impoundments. No shortages are projected through the planning period and no change in water supply is recommended.

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5.11 Fisher County Water Supply Plan

Table 5.11-1 lists each water user group in Fisher County and their corresponding surplus or shortage in years 2030 and 2080. For each water user group with a projected shortage, a water supply plan has been developed and is presented in the following subsections.

Table 5.11-1 Fisher County Surplus/(Shortage)

Water User Group	Surplus/(Shortage)		Comment
	2030 (acft/yr)	2080 (acft/yr)	
City of Roby	34	44	Projected surplus
City of Rotan	(4)	(94)	Projected shortage - see plan below.
SUN WSC			See Taylor County
The Bitter Creek WSC			See Nolan County
County-Other	(24)	(13)	Projected shortage – see plan below.
Manufacturing	43	4	Projected surplus
Steam-Electric	–	–	No projected demand
Mining	110	110	Projected surplus
Irrigation	1,173	1,173	Projected surplus
Livestock	419	419	Projected surplus

5.11.1 City of Roby

5.11.1.1 Description of Supply

Water supplies are obtained from the Seymour Aquifer at 34 ac-fr/yr and the City of Sweetwater from 121 acft/yr to 117 acft/yr from 2030 to 2080, respectively. No shortage is projected for the City of Roby throughout the planning period.

5.11.1.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended for the City of Roby. The supplies projected are adequate to meet the City's water demand through 2080, although conservation is recommended to reduce usage to a goal of 140 gpcd.

a. Conservation:
   i. Cost Source: Volume II.
   ii. Date to be Implemented: 2030.
   iii. Annual Cost: maximum of $23,256 in 2080
   iv. Unit Cost: $684 /acft.

Table 5.11-2 Recommended Plan Costs by Decade for the City of Roby

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	34	37	39	40	42	44
Conservation						
Supply From Plan Element (acft/yr)	10	20	31	34	33	33
Annual Cost ($/yr)	$6,840	$13,680	$21,204	$23,256	$22,572	$22,572
Projected Surplus/(Shortage) after Conservation (acft/yr)	44	57	70	74	75	77

5.11.2 City of Rotan

5.11.2.1 Description of Supply

The City of Rotan currently purchases water under contract from the City of Snyder from 258 acft/yr to 140 acft/yr in 2030 to 2080, respectively. The City also provides supply for manufacturing demand in Fisher County at 4 acft/yr. Shortages are projected by 2030.

5.11.2.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB and in coordination with Region F, the following water management strategies are recommended to meet water needs for the City of Rotan. The entities' water usage utilized for demand projections is 165 gpcd. The RWPG recommends conservation to reduce usage to a goal of 140 gpcd.

a. Conservation:
   i. Cost Source: Volume II.
   ii. Date to be Implemented: 2030.
   iii. Annual Cost: maximum of $21,204 in 2080.
   iv. Unit Cost: $684/acft.
b. Subordination – CRMWD System (Water Supply from City of Snyder to meet Contract):
   i. Cost Source: Costs applied to CRMWD to meet contracts (2020 Region F Water Supply Plan).
   ii. Date to be Implemented: 2040.
   iii. Project Cost: none, existing infrastructure assumed sufficient.
   iv. Annual Cost: already contracted supplies.

Table 5.11-3 Recommended Plan Costs by Decade for City of Rotan

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	(4)	(23)	(50)	(69)	(83)	(94)
Conservation						
Supply from Plan Element (acft/yr)	18	31	30	30	29	28
Annual Cost ($/yr)	$12,312	$21,204	$20,520	$20,520	$19,836	$19,152
Projected Surplus/(Shortage) after Conservation (acft/yr)	14	8	(20)	(39)	(54)	(66)
Subordination – CRMWD System (Water Supply from City of Snyder)						
Supply from Plan Element (acft/yr)	-	19	46	65	79	88
Annual Cost ($/yr)	-	$0	$0	$0	$0	$0
Unit Cost ($/acft)	-	$0	$0	$0	$0	$0
Projected Surplus/(Shortage) after Recommended WMS (acft/yr)	14	27	26	26	25	22

5.11.3 County-Other

Entities in Fisher County-Other receive supplies from the Seymour Aquifer at 76 acft/yr and are projected to have a shortage of water beginning in2030.

5.11.3.1 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended. Conservation was also considered; however, the entity's current per capita use rate of 104 is below the selected target rate of 140 gpcd.

a. Groundwater Development – Seymour Aquifer:
   i. Cost Source: Volume II.
   ii. Date to be Implemented: before 2030.
   iii. Project Cost: $219,000.
   iv. Unit Cost: $640/acft.

Table 5.11-4 Recommended Plan Costs by Decade for County-Other Fisher

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	(24)	(20)	(18)	(16)	(15)	(13)
Seymour Aquifer Development						
Supply from Plan Element (acft/yr)	25	25	25	25	25	25
Annual Cost ($/yr)	$16,000	$16,000	$1,000	$1,000	$1,000	$1,000
Unit Cost ($/acft)	$640	$640	$40	$40	$40	$40
Projected Surplus/(Shortage) after recommended WMS (acft/yr)	1	5	7	9	10	12

5.11.4 Manufacturing

5.11.4.1 Description of Supply

Manufacturing obtains most of its supply from the Seymour Aquifer at 154 acft/yr in combination with 79 acft/yr from the Dockum Aquifer, minimal supplies from Hamlin at 2 acft/yr and Rotan at 4 acft/yr. Manufacturing is projected to have a surplus of water through the year 2080.

5.11.5 Steam-Electric

No Steam-Electric demand exists nor is projected for the county.

5.11.6 Mining

5.11.6.1 Description of Supply

Mining is projected to have a surplus of water through the year 2080. The main supply is from the Blaine Aquifer at 216 acft/yr.

5.11.6.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to supplement supply for Fisher County Mining. Conservation is recommended.

a. Conservation:
    i. Cost Source: Volume II.
    ii. Date to be Implemented: before 2030.
    iii. Annual Cost: Costs to implement industrial conservation technologies will vary based on each location and have not been determined.
b. Groundwater Development – Blaine Aquifer:
    i. Cost Source: Volume II.
    ii. Date to be Implemented: before 2030.
    iii. Project Cost: $2,272,000.
    iv. Unit Cost: $1,193/acft.

Table 5.11-5 Recommended Plan Costs by Decade for Fisher County – Mining

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	110	110	110	110	110	110
Conservation						
Supply from Plan Element (acft/yr)	12	20	25	22	19	17
Annual Cost ($/yr)	ND	ND	ND	ND	ND	ND
Projected Surplus/(Shortage) after Conservation (acft/yr)	122	130	135	132	129	127
Groundwater Development – Blaine Aquifer						
Supply from Plan Element (acft/yr)	166	118	75	38	5	5
Annual Cost ($/yr)	$198,000	$141,000	$17,000	$9,000	$1,000	$1,000
Unit Cost ($/acft)	$1,193	$1,193	$229	$229	$229	$229
Projected Surplus/(Shortage) after Recommended WMS (acft/yr)	288	248	210	170	134	132

Notes:
ND – Not Determined. Costs to implement industrial conservation technologies will vary based on each location.

5.11.7 Irrigation

Irrigation uses water supplies from the Blaine Aquifer at 3,642 acft/yr and Seymour Aquifers at 1,820 acft/yr. Irrigation in Fisher County is projected to have a surplus of water through the year 2080 and no change in water supply is recommended.

5.11.8 Livestock

Livestock water is obtained from local supplies and Seymour Aquifer groundwater and is projected to have a surplus of water through the year 2080; no changes in water supply are recommended.

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5.12 Grimes County Water Supply Plan

Table 5.12-1 lists each water user group in Grimes County and their corresponding surplus or shortage in years 2030 and 2080. A brief summary of the water user groups and the plan for the selected water user are presented in the following subsections.

Table 5.12-1. Grimes County Surplus/(Shortage)

Water User Group	Surplus/(Shortage)		Comment
	2030 (acft/yr)	2080 (acft/yr)	
Dobbin Plantersville WSC	(56)	(204)	Region H
G&W WSC	342	829	Projected surplus
City of Navasota	401	78	Projected surplus
TDCJ Luther Units	336	337	Projected surplus
TDCJ W. Pack Unit	180	182	Projected surplus
Wickson Creek SUD			See Brazos County
County-Other	(183)	(312)	Projected shortage - see plan below.
Manufacturing	71	62	Projected surplus
Steam-Electric	7,055	7,055	Projected surplus
Mining	(92)	(93)	Projected shortage - see plan below.
Irrigation	(190)	(190)	Projected shortage - see plan below.
Livestock	1,285	1,285	Projected surplus

5.12.1 Dobbin-Plantersville WSC

Dobbin Plantersville WSC serves customers in Grimes and Montgomery counties. The majority of the demand for the entity is in Montgomery County, which is part of Region H. Dobbin-Plantersville WSC obtains water supply through groundwater production from the Gulf Coast Aquifer. The WSC is projected to have a water supply shortage throughout the planning horizon. The Brazos G RWG supports the recommended WMSs for Dobbin-Plantersville WSC recommended by Region H for the purposes of the 2026 Regional Water Plan.

5.12.2 G&W WSC

G&W WSC serves customers in Grimes and Waller counties. The majority of the demand for the entity is in Waller County which is part of Region H. G & W WSC obtains water supply through groundwater production from the Gulf Coast Aquifer and through purchases of treated surface water from a supplier in in Region H. No shortages in supply are projected through the planning period. The Brazos G RWG supports the recommended WMSs for G&W WSC recommended by Region H for the purposes of the 2026 Regional Water Plan.

5.12.3 City of Navasota

5.12.3.1 Description of Supply

The City of Navasota obtains its water supply solely through groundwater production from the Gulf Coast Aquifer, which is projected to provide 2,096 acft/yr of supply. Additionally, the City provides a portion of supply under contract to Grimes County Manufacturing. No shortages are projected for the City through the planning period and no change to supply is recommended.

5.12.3.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended for City of Navasota. The most recent water loss audit report shows a water loss of approximately 18% and recommends water loss mitigation. The entities' water usage utilized for demand projections is 183 gpcd. The RWPG recommends conservation to reduce usage to a goal of 140 gpcd.

1. Conservation:
   a. Cost Source: Volume II.
   b. Date to be Implemented: by 2030.
   c. Annual Cost: maximum of $266,760 in 2080 .
   d. Unit Cost: $684/acft .
2. Water Loss Reduction:
   a. Cost Source: Volume II.
   b. Date to be Implemented: by 2030.
   c. Annual Cost: maximum of $45,196 in 2040 .
   d. Unit Cost: $726/acft .

Table 5.12-2. Recommended Plan Costs by Decade for City of Navasota

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*565*	*553*	*546*	*525*	*474*	*403*
Conservation						
Supply From Plan Element (acft/yr)	118	294	360	369	380	390
Annual Cost ($/yr)	$80,712	$201,096	$246,240	$252,396	$259,920	$266,760
Water Loss Reduction						
Supply From Plan Element (acft/yr)	61	64	66	67	69	71
Annual Cost ($/yr)	$44,296	$45,196	$19,800	$20,100	$20,700	$21,300
Unit Cost ($/acft)	$726	$706	$300	$300	$300	$300
Projected Surplus/(Shortage) after Conservation (acft/yr)	*580*	*699*	*713*	*657*	*578*	*539*

5.12.4 TDCJ - Luther Units

5.12.4.1 Description of Supply

The Texas Department of Criminal Justice – Luther Units obtains its water supply through groundwater production from the Gulf Coast Aquifer, which is projected to provide 825 acft/yr of water supply throughout the planning period. No shortages are projected for the WUG through the planning period.

5.12.4.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended for TDCJ – Luther Units. The entities' water usage utilized for demand projections is 247 gpcd. The RWPG recommends conservation to reduce usage to a goal of 140 gpcd.

1. Conservation:
   a. Cost Source: Volume II.
   b. Date to be Implemented: by 2030.
   c. Annual Cost: maximum $92,340 in 2070.
   d. Unit Cost: $684/acft.

Table 5.12-3. Recommended Plan Costs by Decade for TDCJ – Luther Units

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*336*	*337*	*337*	*337*	*337*	*337*
Conservation						
Supply From Plan Element (acft/yr)	28	59	91	124	135	135
Annual Cost ($/yr)	$19,152	$40,356	$62,244	$84,816	$92,340	$92,340
Projected Surplus/(Shortage) after Conservation (acft/yr)	*364*	*396*	*428*	*461*	*472*	*472*

5.12.5 TDCJ – W. Pack Unit

5.12.5.1 Description of Supply

The Texas Department of Criminal Justice – W. Pack Unit obtains its water supply through groundwater production from the Gulf Cost Aquifer, which is projected to provide 631 acft/yr of water supply throughout the planning period. No shortages are projected for the WUG through the planning period.

5.12.5.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended for TDCJ – W. Pack Unit. The entities' water usage utilized for demand projections is 245 gpcd. The RWPG recommends conservation to reduce usage to a goal of 140 gpcd.

1. Conservation:
    a. Cost Source: Volume II
    b. Date to be Implemented: by 2030
    c. Annual Cost: maximum of $127,224 in 2070
    d. Unit Cost: $684/acft.

Table 5.12-4. Recommended Plan Costs by Decade for TDCJ – W. Pack Unit

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*180*	*182*	*182*	*182*	*182*	*182*
Conservation						
Supply From Plan Element (acft/yr)	36	81	126	173	186	186
Annual Cost ($/yr)	$24,624	$55,404	$86,184	$118,332	$127,224	$127,224
Projected Surplus/(Shortage) after Conservation (acft/yr)	*216*	*263*	*308*	*355*	*368*	*368*

5.12.6 County-Other

5.12.6.1 Description of Supply

Entities comprising Grimes County-Other obtain water supply through groundwater production from the Gulf Coast and Carrizo-Wilcox Aquifers in the county, which when combined is projected to provide 1,251 acft/yr of available water supply throughout the planning period. County-Other entities are projected to have a supply shortage beginning in 2030 of 183 acft/yr; increasing to 312 acft/yr by 2080. The following water management strategies are recommended to meet the needs of Grimes County-Other. Conservation was also considered; however, the entity's usage is below the selected goal of 140 gpcd.

5.12.6.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to meet water needs for Grimes County-Other.

1. Gulf Coast Aquifer Development:
    a. Cost Source: Volume II.
    b. Date to be Implemented: by 2030.
    c. Project Cost: $3,541,000.
    d. Unit Cost: maximum of $809/acft.

Table 5.12-5. Recommended Plan Costs by Decade for Grimes County – Other

Plan Element	2020	2030	2040	2050	2060	2070
Projected Surplus/(Shortage) (acft/yr)	*(183)*	*(248)*	*(297)*	*(318)*	*(326)*	*(312)*
Groundwater Development – Gulf Coast Aquifer						
Supply From Plan Element (acft/yr)	350	350	350	350	350	350
Annual Cost ($/yr)	$283,000	$283,000	$34,000	$34,000	$34,000	$34,000
Unit Cost ($/acft)	$809	$809	$97	$97	$97	$97
Projected Surplus/(Shortage) after recommended WMS (acft/yr)	*167*	*102*	*53*	*32*	*24*	*38*

5.12.7 Manufacturing

Manufacturing operations in Grimes County obtain water supply through groundwater production from the Gulf Coast Aquifer and through purchases of groundwater from the City of Navasota and Wickson Creek SUD. No shortages are projected and no change in supply is recommended.

5.12.8 Steam-Electric

Grimes County Steam-Electric obtains water supply primarily through purchases of raw water under from the City of Huntsville and the Brazos River Authority. Groundwater production from the Gulf Coast Aquifer is also used, though the quantity is relatively small compared to the surface water supplies. No supply shortages are projected for Steam-Electric entities and no change in water supply is recommended.

5.12.9 Mining

5.12.9.1 Description of Supply

Mining operations in Grimes County are supplied by groundwater from the Gulf Coast Aquifer. Demands for Mining are projected to increase resulting in shortages beginning in 2030.

5.12.9.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to meet water needs for Grimes County-Mining. Conservation is recommended.

1. Conservation:
    a. Cost Source: Volume II.
    b. Date to be Implemented: by 2030.
    c. Annual Cost: not determined.
2. Gulf Coast Aquifer Groundwater Development:
    a. Cost Source: Volume II.
    b. Date to be Implemented: before 2030.
    c. Project Cost: $1,934,000.
    d. Unit Cost: maximum of $625/acft.

Table 5.12-6. Recommended Plan Costs by Decade for Grimes County – Mining

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*(92)*	*(92)*	*(92)*	*(92)*	*(93)*	*(93)*
Conservation						
Supply From Plan Element (acft/yr)	7	11	16	16	16	16
Annual Cost ($/yr)	ND	ND	ND	ND	ND	ND
Projected Surplus/(Shortage) after Conservation (acft/yr)	*(85)*	*(81)*	*(76)*	*(76)*	*(77)*	*(77)*
Groundwater Development – Gulf Coast Aquifer						
Supply From Plan Element (acft/yr)	248	248	248	248	248	248
Annual Cost ($/yr)	$155,000	$155,000	$19,000	$19,000	$19,000	$19,000
Unit Cost ($/acft)	$625	$625	$77	$77	$77	$77
ND – Not determined. Costs to implement industrial conservation technologies will vary based on each location						

5.12.10 Irrigation

5.12.10.1 Description of Supply

Irrigation in Grimes County is supplied through groundwater production from the Gulf Coast, Brazos River Alluvium, and Navasota River Alluvium Aquifers. Water supply shortages of 190 acft/yr are projected in each decade of the planning period for Irrigation.

5.12.10.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to meet water needs for Grimes County-Irrigation.

1. Conservation:
    a. Cost Source: Volume II.
    b. Date to be Implemented: by 2030.
    c. Annual Cost: Not determined.
2. Gulf Coast Aquifer Groundwater Development:
    a. Cost Source: Volume II
    b. Date to be Implemented: before 2030.
    c. Project Cost: $1,934,000.
    d. Unit Cost: maximum of $851/acft.

Table 5.12-7. Recommended Plan Costs by Decade for Grimes County – Irrigation

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*(190)*	*(190)*	*(190)*	*(190)*	*(190)*	*(190)*
Conservation						
Supply From Plan Element (acft/yr)	21	36	49	49	49	49
Annual Cost ($/yr)	ND	ND	ND	ND	ND	ND
Projected Surplus/(Shortage) after Conservation (acft/yr)	*(169)*	*(154)*	*(141)*	*(141)*	*(141)*	*(141)*
Groundwater Development – Gulf Coast Aquifer						
Supply From Plan Element (acft/yr)	181	181	181	181	181	181
Annual Cost ($/yr)	$154,000	$154,000	$18,000	$18,000	$18,000	$18,000
Unit Cost ($/acft)	$851	$851	$99	$99	$99	$99
ND – Not determined. Costs to implement irrigation conservation technologies will vary based on each location						

5.12.11 Livestock

Livestock in Grimes County is supplied through local stock surface water impoundments. No shortage is projected during the planning period and no change in water supply is recommended.

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5.13 Hamilton County Water Supply Plan

Table 5.13–1 lists each water user group in Hamilton County and their corresponding surplus or shortage in years 2030 and 2080. A brief summary of the water user groups and the plan for the selected water user are presented in the following subsections.

Table 5.13–1 Hamilton County Surplus/(Shortage)

Water User Group	Surplus/(Shortage) 2030 (acft/yr)	Surplus/(Shortage) 2080 (acft/yr)	Comment
City of Hamilton	143	172	Projected surplus
City of Hico	390	409	Projected surplus
Coryell City Water Supply District			See Coryell County
Multi-County WSC			See Coryell County
County-Other	35	64	Projected surplus
Manufacturing	(17)	(22)	Projected shortage - see plan below.
Steam-Electric	—	—	No projected demand
Mining	—	—	No projected demand
Irrigation	(276)	(286)	Projected surplus
Livestock	160	160	Projected surplus

5.13.1 City of Hamilton

5.13.1.1 Description of Supply

The City of Hamilton obtains its water supply through purchases of treated surface water under contract from the Upper Leon River Municipal Water District. The water supplied by the Upper Leon River Municipal Water District is diverted from Lake Proctor under contracts with the Brazos River Authority. The City of Hamilton is projected to obtain up to 921 acft/yr of treated surface water supply from the Upper Leon River Municipal Water District through the planning period. No shortages in water supply are projected for the City through the planning period and no change in supply is recommended.

5.13.1.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following plan is recommended for City of Hamilton. The most recent water loss audit report shows a water loss of approximately 39% and water loss mitigation is recommended. The entities' water usage utilized for demand projections is 179 gpcd. The RWPG recommends conservation to reduce usage to a goal of 140 gpcd.

1. Conservation:
   a. Cost Source: Volume II
   b. Date to be Implemented: before 2030
   c. Unit Cost: $684/acft

   d. Annual Cost: maximum of $69,084 in 2080

2. Water Loss Reduction:

   a. Cost Source: Volume II
   b. Date to be Implemented: before 2030
   c. Annual Cost: maximum of $147,007 in 2030.

Table 5.13–2 Recommended Plan Costs by Decade for City of Hamilton

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*143*	*147*	*147*	*154*	*163*	*172*
Conservation						
Supply From Plan Element (acft/yr)	40	101	101	100	98	96
Annual Cost ($/yr)	$27,360	$69,084	$69,084	$68,400	$67,032	$65,664
Water Loss Reduction						
Supply From Plan Element (acft/yr)	129	128	128	126	124	122
Annual Cost ($/yr)	$147,007	$146,575	$55,314	$54,450	$53,585	$52,721
Projected Surplus/(Shortage) after Conservation and Water Loss Reduction (acft/yr)	*312*	*376*	*376*	*380*	*385*	*390*
Additional Demands from Recommended Strategies from Others						
Multi-County WSC – Purchase Additional Supply from Hamilton (acft/yr)	(167)	(149)	(115)	(144)	(174)	(174)
Projected Surplus/(Shortage) after recommended WMS (acft/yr)	*145*	*227*	*261*	*236*	*211*	*216*

5.13.2 City of Hico

The City of Hico obtains its water supply through groundwater production from the Trinity Aquifer, which is projected to provide a constant 567 acft/yr of supply through the planning period. No shortages in supply are projected for the City during the planning period. Working within the planning criteria established by the Brazos G RWPG and TWDB, the following plan is recommended for City of Hamilton. The most recent water loss audit report shows a water loss of approximately 16% and water loss mitigation is recommended. Conservation was also considered; however, the entity's per capita usage of 134 is below the selected goal of 140 gpcd.

1. Water Loss Reduction

   a. Cost Source: Volume II
   b. Date to be Implemented: before 2030
   c. Annual Cost: maximum of $3,602 in 2030.

Table 5.13–3 Recommended Plan Costs by Decade for City of Hico

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*390*	*395*	*399*	*402*	*406*	*409*
Water Loss Reduction						
Supply From Plan Element (acft/yr)	2	2	2	2	2	2
Annual Cost ($/yr)	$3,602	$3,602	$600	$600	$600	$600
Projected Surplus/(Shortage) after Water Loss Reduction (acft/yr)	*392*	*397*	*401*	*404*	*408*	*411*
Projected Surplus/(Shortage) after recommended WMS (acft/yr)	*392*	*397*	*401*	*404*	*408*	*411*

5.13.3 County-Other

Entities in Hamilton County-Other obtain their water supply through groundwater production from the Trinity Aquifer, which is projected to provide a constant 450 acft/yr of supply. No shortages are projected throughout the planning period and no change in water supply is recommended. Conservation was also considered; however, the entity's per capita usage of 112 is below the selected goal of 140 gpcd.

5.13.4 Manufacturing

Manufacturing water supply in Hamilton County is obtained through groundwater production from the Trinity Aquifer. There is a projected throughout the planning period and the development of Trinity Aquifer groundwater is the recommended water management strategy to meet projected demand.

1. Groundwater Development – Trinity Aquifer:
   a. Cost Source: Volume II
   b. Date to be Implemented: before 2030
   c. Project Cost: $293,000
   d. Unit Cost: $1,182.

Table 5.13–4 Recommended Plan Costs by Decade for Hamilton County – Manufacturing

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*(17)*	*(18)*	*(19)*	*(20)*	*(21)*	*(22)*
Trinity Aquifer Development						
Supply From Plan Element (acft/yr)	17	18	19	20	21	21
Annual Cost ($/yr)	$20,000	$21,000	$4,000	$5,000	$5,000	$5,000
Unti Cost ($/acft)	$1,182	$1,182	$227	$227	$227	$227
Projected Surplus/(Shortage) after recommended WMS (acft/yr)	*0*	*0*	*0*	*0*	*0*	*0*

5.13.5 Steam-Electric

There is no projected water demand for Steam-Electric in Hamilton County.

5.13.6 Mining

There is no projected water demand for Mining in Hamilton County.

5.13.7 Irrigation

Irrigation water supply in Hamilton County is obtained through groundwater production from the Trinity Aquifer and local Brazos run of the river water rights. Supply shortages are projected for Irrigation throughout the planning period. The development of Trinity Aquifer groundwater is the recommended water management strategy to meet projected Irrigation demand. Hamilton County is MAG limited and demand is left unmet beginning in 2060.

1. Groundwater Development – Trinity Aquifer
    a. Cost Source: Volume II
    b. Date to be Implemented: before 2030
    c. Project Cost: $1,135,000
    d. Unit Cost: $444.

Table 5.13–5 Recommended Plan Costs by Decade for Hamilton County – Manufacturing

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*(276)*	*(278)*	*(281)*	*(284)*	*(286)*	*(286)*
Trinity Aquifer Development						
Supply From Plan Element (acft/yr)	284	283	282	281	280	279
Annual Cost ($/yr)	$126,000	$126,000	$46,000	$46,000	$45,000	$45,000
Unti Cost ($/acft)	$444	$444	$162	$162	$162	$162
Projected Surplus/(Shortage) after recommended WMS (acft/yr)	*8*	*5*	*1*	*(3)*	*(6)*	*(7)*

5.13.8 Livestock

Livestock water supply is obtained through local stock surface water impoundments and Trinity Aquifer groundwater, and is projected to meet demands through the planning period. No change in water supply is recommended.

5.14 Haskell County Water Supply Plan

Table 5.14-1 lists each water user group in Haskell County and their corresponding surplus or shortage in years 2030 and 2080. A brief summary of the water user groups and the plan for the selected water user are presented in the following subsections.

Table 5.14-1 Haskell County Surplus/(Shortage)

Water User Group	Surplus/(Shortage)		Comment
	2030 (acft/yr)	2080 (acft/yr)	
City of Haskell	(581)	(562)	Projected shortage - see plan below.
City of Stamford			See Jones County
County-Other	72	96	Projected surplus
Manufacturing	0	0	No projected surplus or shortage
Steam-Electric	—	—	No projected demand
Mining	(4)	(4)	Projected shortage - see plan below.
Irrigation	(8,309)	(8,309)	Projected shortage - see plan below.
Livestock	12	12	Projected surplus

5.14.1 City of Haskell

5.14.1.1 Description of Supply

Surface water supplies are obtained from a contract with North Central Texas Municipal Water Authority (NCTMWA). While the contract exceeds the City's projected demands, the current supplies from the NCTMWA are not sufficient to meet demands through 2080.

5.14.1.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended to meet the projected water shortage for the City of Haskell. The entities' water usage utilized for demand projections is 174 gpcd. The RWPG recommends conservation to reduce usage to a goal of 140 gpcd. Needs remain unmet in 2030 and 2040. These needs will only occur during a drought equivalent or worse than the drought of record. While not a strategy recommended by the Brazos G RWPG, the impacts of the unmet needs may be mitigated through demand management in the event of a serious drought prior to the recommended strategies coming online.

1. Conservation:
   a. Cost Source: Volume II
   b. Date to be Implemented: before 2030
   c. Annual Cost: maximum of $68,400 in 2080; Unit cost of $684/acft
2. Lake Creek Reservoir. This strategy would be developed by NCTMWA to augment existing supplies.
   a. Cost Source: Volume II
      i. Project requires an agreement with the BRA in order to develop sufficient supply

b. Date to be Implemented: before 2050
c. Project Cost: none (cost would be borne by NCTMWA)
d. Unit Cost: none (supply already purchased from NCTMWA).

Table 5.14-2 Recommended Plan Costs by Decade for City of Haskell

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*(581)*	*(573)*	*(564)*	*(566)*	*(566)*	*(562)*
Conservation						
Supply From Plan Element (acft/yr)	43	100	97	97	96	95
Annual Cost ($/yr)	$29,412	$68,400	$66,348	$66,348	$65,664	$64,980
Projected Surplus/(Shortage) after Conservation (acft/yr)	*(538)*	*(473)*	*(467)*	*(469)*	*(470)*	*(467)*
Lake Creek Reservoir						
Supply From Plan Element (acft/yr)	—	—	472	483	499	499
Annual Cost ($/yr)	—	—	—	—	—	—
Unit Cost ($/acft)	—	—	—	—	—	—
Projected Surplus/(Shortage) after recommended WMS (acft/yr	*(538)*	*(473)*	*5*	*14*	*29*	*32*

5.14.2 County-Other

Supplies for Haskell County other are obtained through groundwater production from the Seymour Aquifer and through contract supply purchases from the City of Stamford and NCTMWA. Although supplies from NCTMWA have been reduced due to projected availability of supplies, County-Other supplies are projected to be adequate to meet demands through 2080. No supply shortages are projected, however the most recent water loss audit report shows a water loss of approximately 53% and water loss mitigation is recommended. Conservation was also considered; however, the entity's per capita usage of 120 is below the selected goal of 140 gpcd.

1. Water Loss Reduction
   a. Cost Source: Volume II
   b. Date to be Implemented: before 2030
   c. Annual Cost: maximum of $57,983 in 2030

Table 5.14-3 Recommended Plan Costs by Decade for County-Other Haskell

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*72*	*76*	*87*	*89*	*91*	*96*
Water Loss Reduction						
Supply From Plan Element (acft/yr)	109	106	102	101	99	97
Annual Cost ($/yr)	$57,983	$56,619	$46,398	$45,943	$45,033	$44,124
Projected Surplus/(Shortage) after Water Loss Reduction (acft/yr)	*181*	*182*	*189*	*190*	*190*	*193*
Projected Surplus/(Shortage) after recommended WMS (acft/yr	*181*	*182*	*189*	*190*	*190*	*193*

5.14.3 Manufacturing

The water supply for Manufacturing use in Haskell County consists of groundwater from the Seymour Aquifer. No shortages are projected for manufacturing in Haskell County and no changes in water supply are recommended.

5.14.4 Steam-Electric

No Steam-Electric demand exists or is projected for the county.

5.14.5 Mining

5.14.5.1 Description of Supply

Mining operations in Haskell County are supplied solely though groundwater production from the Seymour Aquifer; however, this aquifer is projected to have zero supply availability through the planning period.

5.14.5.2 Recommended Strategy

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended for Haskell County-Mining. These needs will only occur during a drought equivalent or worse than the drought of record. While not a strategy recommended by the Brazos G RWPG, the impacts of the unmet needs may be mitigated through demand management in the event of a serious drought.

1. Leave Needs Unmet:
   a. Cost Source: Cost of not meeting needs – see appendix G
   b. Date to be Implemented: before 2030.

Table 5.14-4 Recommended Plan Costs by Decade for Haskell County – Mining

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*(4)*	*(4)*	*(4)*	*(4)*	*(4)*	*(4)*
Leave Needs Unmet (acft/yr)	(4)	(4)	(4)	(4)	(4)	(4)

5.14.6 Irrigation

5.14.6.1 Description of Supply

Haskell County Irrigation is supplied through groundwater production from the Seymour Aquifer; however, no available supply is projected for this aquifer through the planning period.

5.14.6.2 Recommended Strategy

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to meet water needs for Haskell County-Irrigation. Conservation is recommended.

1. Conservation:
    a. Cost Source: Volume II
    b. Date to be Implemented: before 2030
    c. Annual Cost: maximum of $7,875,640
    d. Unit Cost: $1,964/acft
2. Rolling Plains GCD Managed Aquifer Recharge:
    a. Cost Source: Volume II
    b. Date to be Implemented: before 2040
    c. Total Project Cost: $7.05 million
    d. Annual Cost: $513,000
    e. Unit Cost: $34/acft
3. Leave Needs Unmet:
    a. Cost Source: Cost of not meeting needs – see appendix G
    b. Date to be Implemented: before 2030.

Table 5.14-5 Recommended Plan Costs by Decade for Haskell County – Irrigation

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*(8,309)*	*(8,195)*	*(8,309)*	*(8,195)*	*(8,309)*	*(8,309)*
Conservation						
Supply From Plan Element (acft/yr)	1,747	2,912	3,922	3,933	4,010	4,010
Annual Cost ($/yr)	$3,431,108	$5,719,168	$7,702,808	$7,724,412	$7,875,640	$7,875,640
Projected Surplus/(Shortage) after Conservation (acft/yr)	*(6,562)*	*(5,283)*	*(4,387)*	*(4,262)*	*(4,299)*	*(4,299)*
Rolling Plains GCD Managed Aquifer Recharge						
Supply From Plan Element (acft/yr)	0	10,000	15,500	15,500	15,500	15,500
Annual Cost ($/yr)	0	$513,000	$513,000	$513,000	$513,000	$513,000
Leave Needs Unmet (acft/yr)	(6,562)	0	0	0	0	0

5.14.7 Livestock

Livestock demand is met by local water supply and is projected to meet demands through 2080 and no changes in water supply are recommended.

5.15 Hill County Water Supply Plan

Table 5.15-1 lists each water user group in Hill County and their corresponding surplus or shortage in years 2030 and 2080. For each water user group with a projected shortage, a water supply plan has been developed and is presented in the following subsections. Water supply plans are also presented for some entities that need pumping/conveyance facilities to utilize their existing water resources, or to become a regional provider.

Table 5.15-1 Hill County Surplus (Shortage)

Water User Group	Surplus/(Shortage)		Comment
	2030 (acft/yr)	2080 (acft/yr)	
Birome WSC	120	108	Projected surplus
Bold Springs WSC			See McLennan County
Brandon-Irene WSC	(85)	(192)	Projected shortage - see plan below.
Chatt WSC	(100)	(152)	Projected shortage - see plan below.
Double Diamond Utilities	(310)	(724)	Projected shortage - see plan below.
Files Valley WSC	338	(6)	Projected shortage - see plan below.
Gholson WSC			See McLennan County
HILCO United Services	(811)	(935)	Projected shortage - see plan below.
Hill County WSC	389	321	Projected surplus
City of Hillsboro	168	(550)	Projected shortage - see plan below.
City of Hubbard	195	143	Projected surplus
City of Itasca	(31)	(54)	Projected shortage - see plan below.
Johnson County SUD			See Johnson County
Parker WSC			See Johnson County
Post Oak SUD	(130)	(205)	Projected shortage - see plan below.
City of Whitney	0	(35)	Projected shortage - see plan below.
Woodrow-Osceola WSC	(444)	(506)	Projected shortage - see plan below.
County-Other	(296)	(390)	Projected shortage - see plan below.
Manufacturing	43	63	Projected surplus
Mining	220	205	Projected surplus
Irrigation	164	29	Projected surplus
Livestock	474	474	Projected surplus

5.15.1 Birome WSC

Birome WSC is located in Hill, Limestone, and McLennan Counties, however most of its demand is within Hill County. Birome WSC obtains its water from the Trinity Aquifer and purchases water from Post Oak SUD. Surpluses are projected through 2080 for Birome WSC, and no changes in water supply are recommended. Conservation is not recommended because the entity's usage is 137 gpcd, which is below the selected goal of 140 gpcd.

Table 5.15-2 Recommended Plan Costs by Decade for Brandon-Irene WSC

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	195	186	174	165	151	138
Additional Demands from Strategies Recommended for Others						
Supply to Post Oak SUD (acft/yr)	125	125	125	125	125	125
Projected Surplus/(Shortage) Including Recommended Strategies (acft/yr)	70	61	49	40	26	13

5.15.2 Brandon-Irene WSC

5.15.2.1 Description of Supply

Brandon-Irene WSC is located in Hill and Navarro Counties, however most of its demand is located in Hill County. Brandon-Irene WSC obtains its water from the Trinity Aquifer and surface water through a contract with Aquilla WSD which provides 287 acft/yr. The WSC also provides supply to the City of Bynum in Hill County (County-Other). Shortages are projected throughout the planning horizon for Brandon Irene WSC.

5.15.2.1 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following plan is recommended for Brandon-Irene WSC. Associated costs are included for each strategy. The entities' water usage utilized for demand projections is 249 gpcd. The RWPG recommends conservation to reduce usage to a goal of 140 gpcd.

a. Conservation:
    i. Cost Source: Volume II.
    ii. Date to be Implemented: by 2030.
    iii. Project Cost: maximum of $183,312 in 2080.
    iv. Unit Cost: $684/acft.
b. Trinity Aquifer Development:
    i. Cost Source: Volume II.
    ii. Date to be Implemented: by 2030.
    iii. Project Cost: maximum of $183,312 in 2080.
    iv. Unit Cost: $684/acft.

Table 5.15-3 Recommended Plan Costs by Decade for Brandon-Irene WSC

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	(62)	(81)	(95)	(111)	(139)	(170)
Conservation						
Supply From Plan Element (acft/yr)	45	104	167	231	260	268
Annual Cost ($/yr)	$30,780	$71,136	$114,228	$158,004	$177,840	$183,312
Projected Surplus/(Shortage) after Conservation (acft/yr)	(17)	23	72	120	121	98
Trinity Aquifer Development						
Supply From Plan Element (acft/yr)	30	30	30	30	30	30
Annual Cost ($/yr)	$155,000	$155,000	$18,000	$18,000	$18,000	$18,000
Unit Cost ($/acft)	$5,167	$5,167	$600	$600	$600	$600
Additional Demands from Strategies Recommended for Others						
Supply to Hill County-Other (acft/yr)	57	63	59	66	63	70
Projected Surplus/(Shortage) after recommended WMS (acft/yr)	13	53	102	150	151	128

5.15.3 Chatt WSC

5.15.3.1 Description of Supply

Chatt WSC obtains water supply from the Trinity Aquifer which is projected to provide an available groundwater supply of 84 acft/yr through the planning period. Chatt WSC also purchases 86 acft/yr of treated surface water from Aquilla WSD. The WSC provides water to Hill County Manufacturing. A shortage is projected for Chatt WSC throughout the planning horizon.

5.15.3.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following plan is recommended to meet projected needs. Associated costs are included for each strategy. The most recent water loss audit report shows a water loss of approximately 27% and recommends water loss mitigation. The entities' water usage utilized for demand projections is 162 gpcd. The RWPG recommends conservation to reduce usage to a goal of 140 gpcd.

a. Conservation:
   i. Cost Source: Volume II.
   ii. Date to be Implemented: 2030.
   iii. Project Cost: maximum of $17,100 in 2080.
   iv. Unit Cost: $684/acft.
b. Water Loss Reduction:
   i. Cost Source: Volume II.
   ii. Date to be Implemented: 2030.

iii. Project Cost: maximum of $84,125 in 2030.
iv. Unit Cost: $3,116/acft.

c. Groundwater Development – Woodbine Aquifer:

i. Cost Source: Volume II.
ii. Date to be Implemented: 2030.
iii. Project Cost: $2,140,000.
iv. Unit Cost: $1,690/acft.

d. Purchase Water from Files Valley WSC:

i. Cost Source: Volume II.
ii. Date to be Implemented: 2060.
iii. Project Cost: Cost of purchase only.
iv. Unit Cost: $652/acft.

Table 5.15-4 Recommended Plan Costs by Decade for Chatt WSC

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	(100)	(110)	(119)	(128)	(142)	(152)
Conservation						
Supply From Plan Element (acft/yr)	15	23	23	24	24	25
Annual Cost ($/yr)	$10,260	$15,732	$15,732	$16,416	$16,416	$17,100
Water Loss Reduction						
Supply From Plan Element (acft/yr)	27	27	28	28	28	30
Annual Cost ($/yr)	$84,125	$84,125	$10,284	$10,284	$10,284	$11,018
Projected Surplus/(Shortage) after Conservation and Water Loss Reduction (acft/yr)	(58)	(60)	(68)	(76)	(90)	(97)
Groundwater Development – Woodbine Aquifer						
Supply From Plan Element (acft/yr)	100	100	100	100	100	100
Annual Cost:	$169,000	$169,000	$18,000	$18,000	$18,000	$18,000
Unit Cost:	$1,690	$1,690	$180	$180	$180	$180
Purchase Water from Files Valley WSC						
Supply From Plan Element (acft/yr)	—	—	—	1	12	12
Annual Cost ($/yr)	—	—	—	$652	$7,820	$7,820
Unit Cost ($/acft)	—	—	—	$652	$652	$652
Projected Surplus/(Shortage) after recommended WMS (acft/yr)	42	40	32	25	22	15

5.15.4 Double Diamond Utilities

5.15.4.1 Description of Supply

Double Diamond Utilities is located in Hill and Johnson Counties, however most of its demand is located in Hill County. The Utility obtains water supply from the Trinity Aquifer and has a contract to purchase surface water from the Brazos River Authority (BRA) for 1,619 acft/yr, of that contracted supply 1,000 ac-ft is diverted from Possum Kingdom Lake and the remaining 619 ac-ft is diverted upstream of Lake Whitney. Double Diamond Utilities' water supply is projected to have water supply shortages beginning in 2030. Balances represented in Table 5.15 4 are for the entire Utility.

5.15.4.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following plan is recommended to meet projected needs. The entities' water usage utilized for demand projections is 1023 gpcd. The RWPG recommends conservation to reduce usage to a goal of 140 gpcd. In 2050, the remaining unmet need results from contracts not being fully allocated and is a consequence of the conservative methodology used to determine source supply volumes. Contract supplies from the BRA are firm supplies.

a. Conservation:
   i. Cost Source: Volume II.
   ii. Date to be Implemented: by 2030.
   iii. Project Cost: maximum of $1,842,012 in 2080.
   iv. Unit Cost: $684/acft.
b. Groundwater Development – Trinity Aquifer:
   i. Cost Source: Volume II.
   ii. Date to be Implemented: by 2030.
   iii. Project Cost: $8,225,000.
   iv. Unit Cost: $1,138/acft.
c. Need left unmet:
   i. 130 ac-ft of need left unmet in 2030.

Table 5.15-5 Recommended Plan Costs by Decade for Double Diamond Utilities

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	(712)	(989)	(1,276)	(1,558)	(1,858)	(2,194)
Conservation						
Supply From Plan Element (acft/yr)	314	690	1,110	1,574	2,096	2,693
Annual Cost ($/yr)	$214,776	$471,960	$759,240	$1,076,616	$1,433,664	$1,842,012
Projected Surplus/(Shortage) after Conservation (acft/yr)	(398)	(299)	(166)	16	238	499
Groundwater Development – Trinity Aquifer						
Supply From Plan Element (acft/yr)	268	201	118	26	0	0

Annual Cost ($/yr)	$728,000	$728,000	$149,000	$149,000	—	—
Unit Cost ($/acft)	$2,716	$3,622	$1,263	$5,731	—	—
Projected Surplus/(Shortage) after recommended WMS (acft/yr)	(130)	1,506	1,501	1,539	1,685	1,899

Table 5.15-6 Alternative Plan Costs by Decade for Double Diamond Utilities

Plan Element	2030	2040	2050	2060	2070	2080
Groundwater Development – Trinity Aquifer						
Supply From Plan Element (acft/yr)	640	640	640	640	640	640
Annual Cost ($/yr)	$728,000	$728,000	$149,000	$149,000	$149,000	$149,000
Unit Cost ($/acft)	$1,138	$1,138	$233	$233	$233	$233
Intake and WTP – Utilize BRA Contract						
Supply From Plan Element (acft/yr)	—	1,619	1,619	1,619	1,619	1,619
Annual Cost ($/yr)	—	$7,589,000	$7,589,000	$3,228,000	$3,228,000	$3,228,000
Unit Cost ($/acft)	—	$4,687	$4,687	$1,994	$1,994	$1,994

After recommended strategies 130 acft/yr of supply shortage remains for the 2030 planning decade. This shortage would occur during drought conditions. The shortage could be mitigated by water use restrictions during drought conditions. Contract supplies from the BRA are firm supplies, reduction in supply from BRA is a consequence of the conservative methodology used to determine source supply volumes.

5.15.5 Files Valley WSC

5.15.5.1 Description of Supply

Files Valley WSC is located in Hill and Ellis (Region C) counties, however most of its demand is located in Hill County. The WSC has a contract for 1,149 acft/yr of treated surface water from Lake Aquilla through Aquilla Water Supply District. Files Valley WSC also provides water to Parker WSC and and Ellis County-Other entities. The WSC has a projected shortage throughout the planning period.

5.15.5.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following plan is recommended for Files Valley WSC. The entities' water usage utilized for demand projections is 179 gpcd. The RWPG recommends conservation to reduce usage to a goal of 140 gpcd.

a. Conservation:
    i. Cost Source: Volume II.
    ii. Date to be Implemented: by 2030.
    iii. Project Cost: maximum of $155,268 in 2080.
    iv. Unit Cost: $684/acft.
b. Groundwater Development – Trinity Aquifer:
    i. Cost Source: Volume II.
    ii. Date to be Implemented: by 2030.

iii. Project Cost: $12,712,000.
iv. Unit Cost: $1,461/acft.

c. Purchases from Tarrant Regional WD:

i. Cost Source: Region C.
ii. Date to be Implemented: by 2030.
iii. Project Cost: Region C.
iv. Unit Cost: Region C.

d. Purchases from Waxahachie:

i. Cost Source: Region C.
ii. Date to be Implemented: by 2030.
iii. Project Cost: Region C.
iv. Unit Cost: Region C.

Table 5.15-7 Recommended Plan Costs by Decade for Files Valley WSC

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	(143)	(196)	(246)	(298)	(355)	(418)
Conservation						
Supply From Plan Element (acft/yr)	69	183	193	203	214	227
Annual Cost ($/yr)	$47,196	$125,172	$132,012	$138,852	$146,376	$155,268
Projected Surplus/(Shortage) after Conservation (acft/yr)	(74)	(13)	(53)	(95)	(141)	(191)
Groundwater Development – Trinity Aquifer						
Supply From Plan Element (acft/yr)	289	267	248	197	206	212
Annual Cost ($/yr)	$999,000	$999,000	$104,000	$104,000	$104,000	$104,000
Unit Cost ($/acft)	$3,457	$3742	$419	$528	$505	$491
Supply from Region C Strategies						
Purchases from Tarrant Regional WD	0	0	12	41	59	59
Purchases from Waxahachie	53	57	50	23	9	9
Projected Surplus/(Shortage) after recommended WMS (acft/yr)	268	311	257	166	133	89

Table 5.15-8 Alternative Plan Costs by Decade for Files Valley WSC

Plan Element	2030	2040	2050	2060	2070	2080
Groundwater Development – Trinity Aquifer						
Supply From Plan Element (acft/yr)	684	684	684	684	684	684
Annual Cost ($/yr)	$999,000	$999,000	$104,000	$104,000	$104,000	$104,000
Unit Cost ($/acft)	$2,716	$2,716	$152	$152	$152	$152
Intake and WTP – Utilize BRA Contract						
Supply From Plan Element (acft/yr)	—	1,619	1,619	1,619	1,619	1,619
Annual Cost ($/yr)	—	$7,589,000	$7,589,000	$3,228,000	$3,228,000	$3,228,000
Unit Cost ($/acft)	—	$4,687	$4,687	$1,994	$1,994	$1,994

5.15.6 HILCO United Services

5.15.6.1 Description of Supply

HILCO United Services is located in Hill, Ellis, and Bosque counties, however most of its demand is located in Hill County. HILCO United Services obtains its water supply from the Trinity Aquifer. HILCO United Services has contracted for 150 acft/yr of surface water supplies from the Brazos River Authority, which can supply 150 acft/yr in 2030 decreasing to 137 acft/yr in 2080, based on water availability analyses proscribed under water planning guidelines. HILCO United Services is projected to have shortages during the entire planning period.

5.15.6.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB. The entities' water usage utilized for demand projections is 187 gpcd. The RWPG recommends conservation to reduce usage to a goal of 140 gpcd.

a. Conservation:
   i. Cost Source: Volume II.
   ii. Date to be Implemented: by 2030.
   iii. Project Cost: maximum of $254,448 in 2080.
   iv. Unit Cost: $684/acft.

Table 5.15-9 Recommended Plan Costs by Decade for HILCO United Services

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	(1,119)	(1,169)	(1,222)	(1,269)	(1,336)	(1,404)
Conservation						
Supply From Plan Element (acft/yr)	106	245	333	344	357	372
Annual Cost ($/yr)	$72,504	$167,580	$227,772	$235,296	$244,188	$254,448
Projected Surplus/(Shortage) after Conservation (acft/yr)	(1,013)	(924)	(889)	(925)	(979)	(1,032)

5.15.7 Hill County WSC

Hill County WSC obtains its water supply from the Trinity Aquifer and a treated surface water contract with Aquilla Water Supply District which supplies 230 acft/yr. The existing contract and production capacity of the wells and groundwater availability are adequate to supply the needs of the WSC through the year 2080. No change in water supply is recommended. Conservation was considered; however, the entity's usage is below the selected goal of 140 gpcd.

5.15.8 City of Hillsboro

5.15.8.1 Description of Supply

The City of Hillsboro purchases its water supply from the Aquilla WSD, amounting to 3,640 acft/yr. Based on water availability analyses conducted under water planning guidelines, this supply is expected to meet the city's needs through 2030, with 3,640 acft/yr available, decreasing to 3,320 acft/yr by 2080. However, a water supply shortage is projected to begin in 2060 at 71 acft/yr, increasing to 550 acft/yr by 2080.

5.15.8.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB. Conservation is recommended to reduce usage to a goal of 140 gpcd.

a. Conservation:
   i. Cost Source: Volume II.
   ii. Date to be Implemented: by 2030.
   iii. Annual Cost: maximum of $843,372 in 2080.
   iv. Unit Cost: $684/acft.
b. Increase contract with Aquilla WSD – Contingent upon Lake Aquilla Pool Reallocation:
   i. Cost Source: Volume II.
   ii. Date to be Implemented: before 2060.
   iii. Project Cost: Borne by Aquilla WSD.
   iv. Unit Cost: $774/acft.

Table 5.15-10 Recommended Plan Costs by Decade for the City of Hillsboro

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	168	73	7	(71)	(306)	(550)
Conservation						
Supply From Plan Element (acft/yr)	273	635	1,016	1,180	1,204	1,233
Annual Cost ($/yr)	$186,732	$434,340	$694,944	$807,120	$823,536	$843,372
Projected Surplus/(Shortage) after Conservation (acft/yr)	441	708	1,023	1,109	898	683
Increase contract with Aquilla WSD						
Supply From Plan Element (acft/yr)	—	—	—			

Plan Element	2030	2040	2050	2060	2070	2080
Annual Cost ($/yr)	—	—	—			
Unit Cost ($/acft)	—	—	—			
Projected Surplus/(Shortage) after Conservation (acft/yr)	1,846	1,721	1,830	1,935	1,894	1,708

5.15.9 City of Hubbard

5.15.9.1 Description of Supply

The City of Hubbard obtains its water supply from the Trinity Aquifer and from Lake Navarro Mills through the Post Oak Special Utility District (SUD). The City of Hubbard has a projected surplus throughout the planning period. No change in water supply is recommended. Conservation is not recommended because the entity's usage is 132 gpcd, which is below the selected goal of 140 gpcd.

5.15.10 City of Itasca

5.15.10.1 Description of Supply

The City of Itasca obtains its water supply from the Trinity Aquifer which is projected to provide an available groundwater supply of 217 acft/yr through the planning period. The production capacity of the wells and groundwater availability are not adequate to supply the demands of the City of Itasca through the year 2080.

5.15.10.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following plan is recommended to meet projected needs. Conservation is not recommended because the entity's usage is 110 gpcd, which is below the selected goal of 140 gpcd.

a. Groundwater Development – Trinity Aquifer:
    i. Cost Source: Volume II.
    ii. Date to be Implemented: by 2030.
    iii. Project Cost: $2,366,000.
    iv. Unit Cost: $3,473/acft.

Table 5.15-11 Recommended Plan Costs by Decade for City of Itasca

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	(31)	(36)	(40)	(44)	(49)	(54)
Groundwater Development – Trinity Aquifer						
Supply From Plan Element (acft/yr)	40	40	40	45	50	55
Annual Cost ($/yr)	$191,000	$191,000	$24,000	$24,000	$24,000	$24,000
Unit Cost ($/acft)	$4,775	$4,775	$600	$533	$480	$436
Projected Surplus/(Shortage) after recommended WMS (acft/yr)	9	4	0	1	1	1

5.15.11 Post Oak SUD

5.15.11.1 Description of Supply

Post Oak SUD services Hill, Navarro, and Limestone counties, however the majority of demand is in Hill County. Post Oak SUD purchases raw and treated surface water supply from Corsicana which can supply 870 acft/yr in 2030 and 718 acft/yr in 2080, based on water availability analyses prescribed under water planning guidelines. The SUD has a projected water supply shortage beginning in 2030 and continuing throughout the planning period. Balance and strategies represented in Table 5.15 6 are for the entire SUD across all counties and planning areas.

5.15.11.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following plan is recommended to meet projected needs. Associated costs are included for each strategy. The entities' water usage utilized for demand projections is 205 gpcd. The RWPG recommends conservation to reduce usage to a goal of 140 gpcd.

a. Conservation:
   i. Cost Source: Volume II.
   ii. Date to be Implemented: by 2030.
   iii. Annual Cost: maximum of $66,348 in 2060.
   iv. Unit Cost: $684/acft.
b. Buyback contracted supply from Birome WSC:
   i. Cost Source: Volume II.
   ii. Date to be Implemented: 2030.
   iii. Annual Cost: Cost of existing contract.
   iv. Unit Cost: Cost of purchased water.
c. Buyback contracted supply from Coolidge:
   i. Cost Source: Volume II.
   ii. Date to be Implemented: 2030.
   iii. Annual Cost: Cost of existing contract.
   iv. Unit Cost: Cost of purchased water.
d. Alternative: Purchase Additional Supply from Corsicana:
   i. Cost Source: Volume II.
   ii. Date to be Implemented: 2030.
   iii. Annual Cost: maximum of $281,274 in 2070.
   iv. Unit Cost: $2,591/acft.

Table 5.15-12 Recommended Plan Costs by Decade for Post Oak SUD

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	(208)	(185)	(227)	(261)	(296)	(292)
Conservation						
Supply From Plan Element (acft/yr)	25	60	93	97	94	96
Annual Cost ($/yr)	$17,100	$41,040	$63,612	$66,348	$64,296	$65,664
Projected Surplus/(Shortage) after Conservation (acft/yr)	(183)	(125)	(134)	(164)	(202)	(196)
Buyback contracted supply from Birome WSC						
Supply From Plan Element (acft/yr)	125	125	125	125	125	125
Annual Cost ($/yr)	—	—	—	—	—	—
Unit Cost ($/acft)	—	—	—	—	—	—
Buyback contracted supply from Coolidge						
Supply From Plan Element (acft/yr)	58	0	9	39	77	71
Annual Cost ($/yr)	—	—	—	—	—	—
Unit Cost ($/acft)	—	—	—	—	—	—
Projected Surplus/(Shortage) after recommended WMS (acft/yr)	0	0	0	0	0	0

5.15.12 City of Whitney

5.15.12.1 Description of Supply

The City of Whitney obtains its water supply from the Trinity Aquifer. The City of Whitney has contract for 750 acft/yr of water supplies from the Brazos River Authority, which can supply 750 acft/yr in 2030 and 649 acft/yr in 2080, based on water availability analyses prescribed under water planning guideline; however, the City has not constructed the required infrastructure to utilize this supply.

5.15.12.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following plan is recommended to meet projected needs. Associated costs are included. The entities' water usage utilized for demand projections is 172 gpcd. The RWPG recommends conservation to reduce usage to a goal of 140 gpcd.

a. Conservation:
    i. Cost Source: Volume II.
    ii. Date to be Implemented: by 2030.
    iii. Annual Cost: maximum of $54,720 in 2080.
    iv. Unit Cost: $684/acft.

b. Intake and WTP – Utilize BRA Contract:
   i. Cost Source: Volume II.
   ii. Date to be Implemented: by 2040.
   iii. Project Cost: $47,722,000.
   iv. Unit Cost: $7,967/acft.

Table 5.15-13 Recommended Plan Costs by Decade for City of Whitney

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	(454)	(466)	(474)	(483)	(494)	(505)
Conservation						
Supply From Plan Element (acft/yr)	33	75	76	77	79	80
Annual Cost ($/yr)	$22,572	$51,300	$51,984	$52,668	$54,036	$54,720
Projected Surplus/(Shortage) after Conservation (acft/yr)	(421)	(391)	(398)	(406)	(415)	(425)
Intake and WTP – Utilize BRA Contract						
Supply From Plan Element (acft/yr)	750	750	750	750	750	750
Annual Cost ($/yr)	$5,975,000	$5,975,000	$2,619,000	$2,619,000	$2,619,000	$2,619,000
Unit Cost ($/acft)	$7,967	$7,967	$3,492	$3,492	$3,492	$3,492
Projected Surplus/(Shortage) after recommended WMS (acft/yr)	329	359	352	344	335	325

5.15.13 Woodrow-Osceola WSC

5.15.13.1 Description of Supply

Woodrow-Osceola WSC obtains its water supply from the Trinity Aquifer. The existing production capacity of the wells and groundwater availability are not adequate to supply the demands of the WSC through the year 2080.

5.15.13.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following plan is recommended for Woodrow-Osceola WSC. The entities' water usage utilized for demand projections is 176 gpcd. The RWPG recommends conservation to reduce usage to a goal of 140 gpcd.

a. Conservation:
   i. Cost Source: Volume II.
   ii. Date to be Implemented: by 2030.
   iii. Annual Cost: maximum of $75,924 in 2080.
   iv. Unit Cost: $684/acft.

b. Trinity Aquifer Development:
   i. Cost Source: Volume II.

   ii. Date to be Implemented: by 2030.
   iii. Project Cost: $5,081,000.
   iv. Unit Cost: $1,066/acft.

c. Needs left unmet.

Table 5.15-14 Recommended Plan Costs by Decade for Woodrow-Osceola WSC

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	(546)	(561)	(571)	(582)	(594)	(608)
Conservation						
Supply From Plan Element (acft/yr)	43	102	104	106	108	111
Annual Cost ($/yr)	$29,412	$69,768	$71,136	$72,504	$73,872	$75,924
Projected Surplus/(Shortage) after Conservation (acft/yr)	(503)	(459)	(467)	(476)	(486)	(497)
Trinity Aquifer Development						
Supply From Plan Element (acft/yr)	425	425	425	425	425	425
Annual Cost ($/yr)	$453,000	$453,000	$96,000	$96,000	$96,000	$96,000
Unit Cost ($/acft)	$1,066	$1,066	$226	$226	$226	$226
Projected Surplus/(Shortage) after recommended WMS (acft/yr)	(78)	(34)	(42)	(51)	(61)	(72)
Unmet Need	(78)	(34)	(42)	(51)	(61)	(72)

After recommended strategies a maximum of 78 acft/yr of supply shortage remains for the 2030 planning decade and planning period. This shortage would occur during drought conditions. The shortage could be mitigated by water use restrictions during drought conditions.

5.15.14 County-Other

5.15.14.1 Description of Supply

Entities in Hill County-Other use Trinity and Woodbine Aquifer groundwater and surface water from Brandon-Irene WSC, Corsicana, and the Trinity River Authority. County-Other entities are projected to have a shortage in water supply from 2030 through 2080.

5.15.14.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following plan is recommended to meet projected needs. Associated costs are included for each strategy. Conservation was also considered; however, the entity's usage is below the selected goal of 140 gpcd.

a. Purchase Additional Supply from Brandon-Irene WSC:
   i. Cost Source: Volume II.
   ii. Date to be Implemented: 2030.
   iii. Project Cost: Cost of purchase only.

    iv. Unit Cost: $1,629/acft.

b. Trinity Aquifer Development:
    i. Cost Source: Volume II.
    ii. Date to be Implemented: by 2030.
    iii. Project Cost: $2,635,000.
    iv. Unit Cost: $1,168/acft.

c. Woodbine Aquifer Development:
    i. Cost Source: Volume II.
    ii. Date to be Implemented: by 2030.
    iii. Project Cost: $877,000.
    iv. Unit Cost: $2,760/acft.

Table 5.15-15 Recommended Plan Costs by Decade for Hill County - Other

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	(296)	(309)	(331)	(356)	(379)	(390)
Purchase Additional Supply from Brandon-Irene WSC						
Supply From Plan Element (acft/yr)	57	63	59	66	63	70
Annual Cost ($/yr)	$92,868	$102,643	$96,126	$107,531	$102,643	$114,048
Unit Cost ($/acft)	$1,629	$1,629	$1,629	$1,629	$1,629	$1,629
Trinity Aquifer Development						
Supply From Plan Element (acft/yr)	87	88	83	72	77	83
Annual Cost ($/yr)	$229,000	$229,000	$44,000	$44,000	$44,000	$44,000
Unit Cost ($/acft)	$1,168	$1,168	$224	$224	$224	$224
Woodbine Aquifer Development						
Supply From Plan Element (acft/yr)	25	24	25	24	25	25
Annual Cost ($/yr)	$69,000	$69,000	$7,000	$7,000	$7,000	$7,000
Unit Cost ($/acft)	$2,760	$2,760	$280	$280	$280	$280
Projected Surplus/(Shortage) after recommended WMS (acft/yr)	(127)	(134)	(164)	(194)	(214)	(212)

5.15.15 Manufacturing

Hill County Manufacturing purchases its water supply from Chatt WSC and is projected to have sufficient water supplies through the year 2080. No changes in water supply are recommended. Conservation was considered; however, the entity’s usage is below the selected goal of 140 gpcd.

5.15.16 Steam-Electric

No Steam-Electric demand exists or is projected for the county.

5.15.17 Mining

Supplies for Mining in Hill County include groundwater from the Trinity, Woodbine, and Brazos River Alluvium Aquifers and from a BRA contract for 1,000 acft/yr. Mining has a projected surplus throughout the planning period.

5.15.18 Irrigation

Supplies for Irrigation in Hill County include groundwater from the Woodbine and Brazos River Alluvium Aquifers, and from a BRA contract for 1,000 acft/yr. There are no projected shortages identified within the planning horizon.

5.15.19 Livestock

Livestock water supply is projected to meet demands through the year 2080 and no changes in water supply are recommended.

5.16 Hood County Water Supply Plan

Table 5.16-1 lists each water user group in Hood County and their corresponding surplus or shortage in years 2030 and 2080. A brief summary of the water user groups and the plan for the selected water user are presented in the following subsections.

Table 5.16-1 Hood County Surplus/(Shortage)

Water User Group	Surplus/(Shortage)		Comment
	2030 (acft/yr)	2080 (acft/yr)	
Acton MUD	2,038	,(407)	Projected shortage - see plan below
City of Granbury	(767)	(3,259)	Projected shortage - see plan below
City of Lipan	27	(43)	Projected shortage – see plan below
Santo SUD			See Palo Pinto County
City of Tolar	41	4	Projected surplus
County-Other	(2,489)	(4,211)	Projected shortage – see plan below
Manufacturing	6	1	Projected surplus
Steam-Electric	6,999	5,648	Projected surplus
Mining	(2,955)	(4,293)	Projected shortage - see plan below
Irrigation	2,200	1,515	Projected surplus
Livestock	98	98	Projected surplus

5.16.1 Acton MUD

5.16.1.1 Description of Supply

The Acton MUD service area includes portions of Hood and Johnson Counties. Acton MUD obtains its water supply from groundwater from the Trinity Aquifer and a contract with the Brazos River Authority for water from Lake Granbury. Treated surface water is constrained by the SWATS plant capacity, co-owned with Johnson County SUD through the Brazos Regional Public Utility Agency. The surpluses and shortages shown in Table 5.16-2 represent the cumulative totals for Acton MUD in Hood and Johnson Counties.

5.16.1.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to meet the projected water shortage for Acton MUD. The entities' water usage utilized for demand projections is 185 gpcd. The RWPG recommends conservation to reduce usage to a goal of 140 gpcd.

1. Conservation
    a. Cost Source: Volume II
    b. Date to be Implemented: before 2030
    c. Annual Cost: maximum of $527,364 in 2080; Unit cost of $684/acft

2. Groundwater Development – Trinity Aquifer:
   a. Cost Source: Volume II.
   b. Date to be implemented: by 2030.
   c. Project Cost: $3,385,000
   d. Unit Cost: $727/acft
3. Increase WTP Capacity (SWATS):
   a. Cost Source: Volume II.
   b. Date to be Implemented: by 2040.
   c. Project Cost: $29,181,000 (Acton MUD portion).
   d. Annual Cost: $3,469,000

Table 5.16-2 Recommended Plan Costs by Decade for Acton MUD

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*2,038*	*1,805*	*1,546*	*704*	*(131)*	*(407)*
Conservation						
Supply From Plan Element (acft/yr)	170	443	603	655	711	771
Annual Cost ($/yr)	$116,280	$303,012	$412,452	$448,020	$486,324	$527,364
Projected Surplus/(Shortage) after Conservation (acft/yr)	*2,208*	*2,248*	*2,149*	*1,359*	*580*	*364*
Groundwater Development – Trinity Aquifer (Hood and Johnson Counties)						
Supply From Plan Element (acft/yr)	51	51	51	51	418	418
Annual Cost ($/yr)	$37,000	$37,000	$8,000	$8,000	$66,000	$66,000
Unit Cost ($/acft)	$727	$727	$158	$158	$158	$158
Increase WTP Capacity (SWATS)						
Supply From Plan Element (acft/yr)	—	3,728	3,476	3,752	3,548	2,753
Annual Cost ($/yr)	—	$3,469,000	$3,469,000	$1,415,000	$1,415,000	$1,415,000
Unit Cost ($/acft)	—	$924	$924	$377	$377	$377
Projected Surplus/(Shortage) after Recommended WMS (acft/yr)	*2,259*	*6,027*	*5,676*	*5,162*	*4,546*	*3,535*

5.16.2 City of Granbury

5.16.2.1 Description of Supply

The City of Granbury obtains its water supply from groundwater from the Trinity Aquifer and a contract with the Brazos River Authority for water from Lake Granbury. There is a water treatment plant constraint on the surface water from Lake Granbury, and a water supply shortage is projected beginning in 2030.

5.16.2.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to meet the projected water shortage for Granbury. The entities' water usage utilized for demand projections is 175 gpcd. The RWPG recommends conservation to reduce usage to a goal of 140 gpcd.

1. Conservation
    a. Cost Source: Volume II
    b. Date to be Implemented: before 2030
    c. Annual Cost: maximum of $674,424 in 2080; Unit cost of $684/acft
2. Granbury North Water Treatment Plant:
    a. Cost Source: Volume II.
    b. Date to be Implemented: by 2030.
    c. Project Cost: $45,500,000.
    d. Annual Cost: $7,155,000 (maximum of phased costs).

Table 5.16-3 Recommended Plan Costs by Decade for the City of Granbury

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*(767)*	*(1,190)*	*(1,630)*	*(2,111)*	*(2,651)*	*(3,259)*
Conservation						
Supply From Plan Element (acft/yr)	225	626	703	787	880	986
Annual Cost ($/yr)	$153,900	$428,184	$480,852	$538,308	$601,920	$674,424
Projected Surplus/(Shortage) after Conservation (acft/yr)	*(542)*	*(564)*	*(927)*	*(1,324)*	*(1,771)*	*(2,273)*
Granbury North Water Treatment Plant						
Supply From Plan Element (acft/yr)	2,800	2,800	2,800	2,800	2,800	2,800
Annual Cost ($/yr)	$8,994,000	$8,994,000	$4,811,000	$4,811,000	$4,811,000	$4,811,000
Unit Cost ($/acft)	$3,212	$3,212	$1,718	$1,718	$1,718	$1,718
Projected Surplus/(Shortage) after Recommended WMS (acft/yr)	2,258	2,236	1,873	1,476	1,029	527

5.16.3 City of Lipan

The City of Lipan receives 173 acft/yr of supply from the Trinity Aquifer. There is a projected shortage for the City beginning in 2060.

5.16.3.1 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to meet the projected water shortage for Lipan. Conservation was considered; however, the entity's per capita usage is below the selected goal of 140 gpcd.

1. Groundwater Development – Trinity Aquifer:
   a. Cost Source: Volume II.
   b. Date to be implemented: by 2060.
   c. Project Cost: $507,000.
   d. Unit Cost: $800.

Table 5.16-4. Recommended Plan Costs by Decade for the City of Lipan

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*27*	*15*	*2*	*(11)*	*(26)*	*(43)*
Trinity Aquifer Groundwater						
Supply From Plan Element (acft/yr)	—	—	—	50	50	50
Annual Cost ($/yr)	—	—	—	$40,000	$40,000	$4,000
Unit Cost ($/acft)	—	—	—	$800	$800	$80
Projected Surplus/(Shortage) after recommended WMS (acft/yr)	*27*	*15*	*2*	*39*	*24*	*7*

5.16.4 City of Tolar

The City of Tolar receives 224 acft/yr of supply from the Trinity Aquifer. There is a projected shortage for the City beginning in 2050.

5.16.4.1 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to meet the projected water shortage for Tolar. The entities' water usage utilized for demand projections is 148 gpcd. The RWPG recommends conservation to reduce usage to a goal of 140 gpcd.

1. Conservation:
   a. Cost Source: Volume II.
   b. Date to be Implemented: before 2030.
   c. Annual Cost: maximum of $674,424 in 2080; Unit cost of $684/acft.
2. Groundwater Development – Trinity Aquifer:
   a. Cost Source: Volume II.
   b. Date to be Implemented: by 2050.
   c. Project Cost: $1,580,000.
   d. Unit Cost: $1,008.

Table 5.16-5. Recommended Plan Costs by Decade for the City of Tolar

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*38*	*10*	*(20)*	*(52)*	*(89)*	*(130)*
Conservation						
Supply From Plan Element (acft/yr)	5	5	6	6	8	8
Annual Cost ($/yr)	$3,420	$3,420	$4,104	$4,104	$5,472	$5,472
Projected Surplus/(Shortage) after Conservation (acft/yr)	*43*	*15*	*(14)*	*(46)*	*(81)*	*(122)*
Trinity Aquifer Groundwater						
Supply From Plan Element (acft/yr)	—	—	125	125	125	125
Annual Cost ($/yr)	—	—	$126,000	$126,000	$15,000	$15,000
Unit Cost ($/acft)	—	—	$1,008	$1,008	$120	$120
Projected Surplus/(Shortage) after recommended WMS (acft/yr)	*43*	*15*	*111*	*79*	*44*	*3*

5.16.5 County-Other

5.16.5.1 Description of Supply

Entities in Hood County-Other receive groundwater from the Trinity Aquifer and surface water supplies through contracts with Acton MUD and the Brazos River Authority. Shortages are projected throughout the planning period. Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the development of Trinity Aquifer groundwater is recommended for County-Other entities. The Trinity Aquifer MAG limit is at capacity especially in later decades, and County-Other needs are left unmet. Conservation was considered; however, the entity's per capita usage of 94 is below the selected goal of 140 gpcd. These needs will only occur during a drought equivalent or worse than the drought of record. While not a strategy recommended by the Brazos G RWPG, the impacts of the unmet needs may be mitigated through demand management in the event of a serious drought prior to the recommended strategies coming online.

1. Trinity Aquifer Development:
    a. Cost Source: Volume II.
    b. Date to be Implemented: before 2030.
    c. Project Cost: $9,303,000.
    d. Unit Cost: $487 /acft.

Table 5.16-6. Plan Costs by Decade for Hood County – Other

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*(2,489)*	*(2,974)*	*(3,474)*	*(4,011)*	*(4,057)*	*(4,211)*
Trinity Aquifer Development						
Supply From Plan Element (acft/yr)	1,950	1,950	1,574	1,252	876	740
Annual Cost ($/yr)	$950,000	$950,000	$238,000	$189,000	$132,000	$112,000
Unit Cost ($/acft)	$487	$487	$151	$151	$151	$151
Leave Needs Unmet (acft/yr)	(539)	(1,024)	(1,900)	(2,759)	(3,181)	(3,471)

5.16.6 Manufacturing

Hood County Manufacturing obtains treated water from the Trinity Aquifer. Hood County Manufacturing is projected to have a surplus of water through the year 2080 and no changes in water supply are recommended.

5.16.7 Steam-Electric

Steam-Electric operations in Hood County are supplied by Trinity Aquifer groundwater and water from Lake Granbury. No shortages are projected and no change in water supply is recommended.

5.16.8 Mining

5.16.8.1 Description of Supply

Mining operations in Hood County are supplied by Trinity Groundwater. Demands for Mining are projected to increase significantly, resulting in shortages beginning in 2030.

5.16.8.2 Recommended Strategy

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to meet water needs for Hood County-Mining. Conservation is recommended.

1. Conservation:
    a. Cost Source: Volume II.
    b. Date to be Implemented: before 2030.
    c. Annual Cost: not determined.
    d. Groundwater Development – Trinity Aquifer.
2. Cost Source: Volume II:
    a. Date to be Implemented: before 2030.
    b. Project Cost: $6,465,000
    c. Unit Cost: Max of $138 /acft.

Table 5.16-7. Recommended Plan Costs by Decade for Hood County – Mining

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*(2,955)*	*(3,345)*	*(3,685)*	*(3,950)*	*(4,156)*	*(4,293)*
Conservation						
Supply From Plan Element (acft/yr)	61	121	155	148	142	143
Annual Cost ($/yr)	ND	ND	ND	ND	ND	ND
Projected Surplus/(Shortage) after Conservation (acft/yr)	*(2,894)*	*(3,224)*	*(3,530)*	*(3,802)*	*(4,014)*	*(4,150)*
Groundwater Well Development – Trinity Aquifer						
Supply From Plan Element (acft/yr)	2,894	3,246	3,530	3,802	4,014	4,150
Annual Cost ($/yr)	$399,000	$448,000	$99,000	$106,000	$112,000	$116,000
Unit Cost ($/acft)	$138	$138	$28	$28	$28	$28
Projected Surplus/(Shortage) after Recommended WMS (acft/yr)	*0*	*22*	*0*	*0*	*0*	*0*
ND – Not determined. Costs to implement industrial conservation technologies will vary based on each location						

5.16.9 Irrigation

Hood County Irrigation demand is met by Trinity Aquifer groundwater and the purchase of water from the Brazos River Authority and is projected to meet demands through 2080. No changes in water supply are recommended.

5.16.10 Livestock

Livestock demand is met by local water supply and Trinity Aquifer groundwater and is projected to meet demands through 2080. No changes in water supply are recommended.

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5.17 Johnson County Water Supply Plan

Table 5.17-1 lists each water user group in Johnson County and their corresponding surplus or shortage in years 2030 and 2080. A brief summary of the water user groups and the plan for the selected water user are presented in the following subsections.

Table 5.17-1 Johnson County Surplus/(Shortage)

Water User Group	Surplus/(Shortage)		Comment
	2030 (acft/yr)	2080 (acft/yr)	
Acton MUD			See Hood County
City of Alvarado	1,568	1,064	Projected surplus
Bethany WSC	938	694	Projected surplus
Bethesda WSC	(2,377)	(6,353)	Projected shortage - see plan below.
City of Burleson	(887)	(5,326)	Projected shortage - see plan below.
City of Cleburne	674	(6,060)	Projected shortage - see plan below.
City of Crowley	(4)	(39)	Region C
Double Diamond Utilities			See Hill County
City of Forth Worth	0	(853)	Region C
City of Godley	12	(112)	Projected shortage - see plan below.
City of Grandview	73	(128)	Projected shortage – see plan below.
Johnson County SUD	(2,122)	(10,456)	Projected shortage - see plan below.
City of Keene	689	495	Projected surplus
City of Mansfield	(241)	(2,467)	Region C
Mountain Peak SUD	(370)	(3,229)	Region C
Parker WSC	296	323	Project surplus
City of Rio Vista	91	(77)	Projected shortage – see plan below.
City of Venus	(31)	210	Projected shortage - see plan below.
County-Other	1,615	2,036	Projected surplus
Manufacturing	477	1,461	Projected surplus
Steam-Electric	(571)	(571)	Projected shortage - see plan below.
Mining	1,250	1,164	Projected surplus
Irrigation	(245)	(245)	Projected shortage - see plan below.
Livestock	159	159	Projected surplus

5.17.1 City of Alvarado

The City of Alvarado obtains its water supply from treated surface water from Johnson County SUD at 2,241 acft/yr. No shortages are projected for the City of Alvarado and no change in water supply is recommended. Conservation is not recommended because the entity's usage is 125 gpcd, which is below the selected goal of 140 gpcd.

5.17.2 Bethany SUD

Bethany SUD obtains its water supply from the Trinity Aquifer at 296 acft/yr throughout the planning period and treated surface water from Johnson County SUD at 1,120 acft/yr. No shortages are projected for Bethany WSC and no change in water supply is recommended. Conservation is not recommended because the entity's usage is 127 gpcd, which is below the selected goal of 140 gpcd.

5.17.3 Bethesda WSC

5.17.3.1 Description of Supply

Bethesda WSC is located in Johnson and Tarrant (Region C) counties and obtains its water supply from the Trinity Aquifer at 2,184 to 2,183 acft/yr and surface water contracts from Tarrant Regional Water District (TRWD) through the Fort Worth System at 3,341 to 7,191 acft/yr and Arlington System at 1,670 to 3,595 acft/yr. Bethesda WSC is projected to have a shortage from 2030 to 2080.

5.17.3.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, and in coordination with Region C, the following water management strategies are recommended to meet the projected water shortage for Bethesda WSC. The entities' water usage utilized for demand projections is 188 gpcd. The RWPG recommends conservation to reduce usage to a goal of 140 gpcd. The projected municipal unmet needs in 2030, 2050, and 2080 result from contracts not being fully allocated due to limited source availability as determined by using the Brazos G RWPG's adopted methodology for the purposes of the 2026 Brazos G RWP, which is consistent with the specific assumptions and methods required for regional water planning. These needs will only occur during a drought equivalent to or worse than the drought of record, with the full implementation of all existing water rights in the basin. While not a strategy recommended by the Brazos G RWPG, the impacts of the unmet needs can be mitigated through demand management in the event of a serious drought prior to the recommended strategies coming online.

1. Conservation:
   a. Cost Source: Volume II.
   b. Date to be Implemented: before 2030.
   c. Annual Cost: maximum of $2,114,928 in 2080.
   d. Unit Cost: $684/acft.
2. Purchase Additional Supplies from TRWD via Fort Worth:
   a. Cost Source: Region C Water Plan.
   b. Date to be Implemented: 2030.
   c. Project Cost: none.
   d. Unit Cost: $531/acft ($1.63/1,000 gal).
3. Trinity Aquifer Development:
   a. Cost Source: Volume II.
   b. Date to be Implemented: 2030.
   c. Project Cost: 1,045,000.
   d. Unit Cost: $661/acft.

4. Woodbine Aquifer Development:
   a. Cost Source: Volume II.
   b. Date to be Implemented: 2030.
   c. Project Cost: 1,045,000.
   d. Unit Cost: $661/acft.

Table 5.17-2 Recommended Plan Costs by Decade for Bethesda WSC

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*(2,401)*	*(2,276)*	*(3,242)*	*(4,025)*	*(5,095)*	*(6,403)*
Conservation						
Supply From Plan Element (acft/yr)	592	1,533	2,265	2,510	2,784	3,092
Annual Cost ($/yr)	$404,928	$1,048,572	$1,549,260	$1,716,840	$1,904,256	$2,114,928
Projected Surplus/(Shortage) after Conservation (acft/yr)	(1,809)	(743)	(977)	(1,515)	(2,311)	(3,311)
Purchase additional supplies from Fort Worth						
Supply From Plan Element (acft/yr)	378	937	881	1,522	2,894	2,886
Annual Cost ($/yr)						
Unit Cost ($/acft)	$531	$531	$531	$531	$531	$531
Trinity Aquifer Development						
Supply From Plan Element (acft/yr)	1,412	0	0	0	0	0
Annual Cost ($/yr)						
Unit Cost ($/acft)						
Woodbine Aquifer Development						
Supply From Plan Element (acft/yr)	0	0	0	0	0	369
Annual Cost ($/yr)						
Unit Cost ($/acft)						
Projected Surplus/(Shortage) after recommended WMS (acft/yr)	*(19)*	*194*	*(96)*	*7*	*583*	*(56)*

5.17.4 City of Burleson

5.17.4.1 Description of Supply

The City of Burleson obtains its water supply from Tarrant Regional Water District (TRWD) through the Fort Worth System, which ranges from 7,042 to 8,269 acft/yr. Burleson is projected to have a shortage from 2030 to 2080. Balance and strategies represented in the table below are for the entire city in both counties and regions.

5.17.4.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to meet the projected water shortage for the City of Burleson. Conservation is not recommended because the entity's usage is approximately equal to the selected goal of 140 gpcd. The projected municipal unmet needs result from contracts not being fully allocated due to limited source availability as determined by using the Brazos G RWPG's adopted methodology for the purposes of the 2026 Brazos G RWP, which is consistent with the specific assumptions and methods required for regional water planning. These needs will only occur during a drought equivalent to or worse than the drought of record, with the full implementation of all existing water rights in the basin. While not a strategy recommended by the Brazos G RWPG, the impacts of the unmet needs can be mitigated through demand management in the event of a serious drought prior to the recommended strategies coming online. The City may have the capability to secure additional firm supply from the Tarrant Regional Water District (TRWD) that would address this unmet need.

1. Purchase from TRWD via from Fort Worth
   a. Cost Source: Region C Water Plan:
   b. Date to be Implemented: 2030.
   c. Project Cost: Region C Water Plan .
   d. Unit Cost: Region C Water Plan .
2. Need left unmet.

Table 5.17-3 Recommended Plan Costs by Decade for the City of Burleson

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	(1,123)	(2,279)	(3,178)	(4,274)	(5,374)	(6,514)
Purchase from TRWD via Fort Worth						
Supply From Plan Element (acft/yr)	991	1,980	2,972	3,908	5,004	4,990
Annual Cost ($/yr)	–	–	–	–	–	–
Unit Cost ($/acft)	–	–	–	–	–	–
Projected Surplus/(Shortage) after recommended WMS (acft/yr)	*(132)*	*(299)*	*(206)*	*(366)*	*(370)*	*(1,524)*

5.17.5 City of Cleburne

The City of Cleburne is projected to have a shortage beginning in 2040. The City of Cleburne obtains its water supply from direct reuse at 1,344 acft/yr, 5,590 acft/yr from Pat Cleburne Reservoir, 55 acft/yr from Trinity Aquifer. The City of Cleburne has contracted for 15,000 acft/yr of surface water supplies from the Brazos River Authority, which can supply 15,000 acft/yr in 2030 and 13,222 acft/yr in 2080, based on water availability analyses prescribed under water planning guidelines. Currently, the City does not have the infrastructure to utilize 9,700 acft/yr from Lake Whitney.

5.17.5.1 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to meet the projected water shortage for the City of Cleburne. The entities' water usage utilized for demand projections is 192 gpcd. The RWPG recommends conservation to reduce usage to a goal of 140 gpcd.

1. Conservation:
   a. Cost Source: Volume II.
   b. Date to be Implemented: before 2030.
   c. Annual Cost: Maximum of $2,109,456 in 2080.
   d. Unit Cost: $684/acft.
2. City of Cleburne West Loop Reuse Phase 2:
   a. Cost Source: Volume II and City of Cleburne Water Supply and Reuse Integration Plan.
   b. Date to be Implemented: 2030.
   c. Project Cost: $25,807,000.
   d. Unit Cost: $693/acft.
3. Lake Whitney Desalination Phase 1:
   a. Cost Source: Volume II and City of Cleburne Water Supply and Reuse Integration Plan.
   b. Date to be Implemented: 2060.
   c. Project Cost: $107,899,000.
   d. Unit Cost: $3,018/acft.
4. Lake Whitney Desalination Phase 2:
   a. Cost Source: Volume II and City of Cleburne Water Supply and Reuse Integration Plan.
   b. Date to be Implemented: 2070.
   c. Project Cost: $39,719,000.
   d. Unit Cost: $2,495/acft.
5. Alternative Johnson County SUD Connection:
   a. Cost Source: City of Cleburne Water Supply and Reuse Integration Plan.
   b. Date to be Implemented: 2060.
   c. Project Cost: $6,902,000.
   d. Unit Cost: $1,597/acft.

Table 5.17-4 Recommended Plan Costs by Decade for the City of Cleburne

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	674	(653)	(1,963)	(3,177)	(4,749)	(6,060)
Conservation						
Supply From Plan Element (acft/yr)	572	1,483	2,360	2,574	2,815	3,084
Annual Cost ($/yr)	$391,248	$1,014,372	$1,614,240	$1,760,616	$1,925,460	$2,109,456
Projected Surplus/(Shortage) after Conservation (acft/yr)	1,246	830	397	(603)	(1,934)	(2,976)
Additional Demands from Recommended Strategies from Others						

Plan Element	2030	2040	2050	2060	2070	2080
Increase Reuse Amount to Johnson County Steam Electric (acft/yr)	571	571	571	571	571	571
Total Surplus/(Shortage) Including Recommended Strategies	*675*	*(259)*	*(174)*	*(1,174)*	*(2,505)*	*(3,547)*
City of Cleburne West Loop Reuse: Phase 2						
Supply From Plan Element (acft/yr)	5,377	5,377	5,377	5,377	5,377	5,377
Annual Cost ($/yr)	$3,724,000	$3,724,000	$1,914,000	$1,914,000	$1,914,000	$1,914,000
Unit Cost ($/acft)	$693	$693	$356	$356	$356	$356
Lake Whitney Desalination Phase 1						
Supply From Plan Element (acft/yr)	–	–	–	4,300	4,300	4,300
Annual Cost ($/yr)	–	–	–	$12,978,900	$12,978,900	$5,387,000
Unit Cost ($/acft)	–	–	–	$3,018	$3,018	$1,253
Lake Whitney Desalination Phase 2						
Supply From Plan Element (acft/yr)	–	–	–	–	3,100	3,100
Annual Cost ($/yr)	–	–	–	–	$7,734,200	$7,734,200
Unit Cost ($/acft)	–	–	–	–	$2,495	$2,495
Alternative: Johnson County SUD Connection						
Supply From Plan Element (acft/yr)	–	–	–	–	3,360	3,360
Annual Cost ($/yr)	–	–	–	–	$5,365,920	$5,365,920
Unit Cost ($/acft)	–	–	–	–	$1,597	$1,597
Projected Surplus/(Shortage) after recommended WMS (acft/yr)	6,052	5,118	5,203	8,503	10,272	9,230

5.17.6 City of Crowley

5.17.6.1 Description of Supply

The City of Crowley is mostly located in Tarrant County; however, a portion of the city limits is within Johnson County. The City obtains its water from the City of Fort Worth.

5.17.6.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, and through coordination with Region C. The full water plan for City of Crowley is discussed in the 2021 Region C Water Plan.

5.17.7 City of Fort Worth

The City of Fort Worth is a wholesale water provider in Region C in Tarrant County; however, a portion of the city limits is within Johnson County in Brazos G. The City obtains its water supply from surface water supplies located in Region C.

5.17.8 City of Godley

5.17.8.1 Description of Supply

The City of Godley obtains its water supply from groundwater from the Trinity Aquifer at 182 acft/yr. Based on the available groundwater supply, the City of Godley is projected to have shortages starting in 2040.

5.17.8.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended to meet water needs for the City of Godley. Conservation is not recommended because the entity's usage is 116 gpcd, which is below the selected goal of 140 gpcd.

1. Groundwater Development – Trinity Aquifer:
    a. Cost Source: Volume II.
    b. Date to be Implemented: before 2030.
    c. Project Cost: $1,231,000.
    d. Unit Cost[1]: $633/acft.

Table 5.17-5 Recommended Plan Costs by Decade for the City of Godley

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	12	(12)	(37)	(59)	(84)	(112)
Groundwater Development – Trinity Aquifer						
Supply From Plan Element (acft/yr)	87	97	110	124	57	57
Annual Cost ($/yr)	$95,000	$95,000	$8,000	$8,000	$8,000	$8,000
Unit Cost ($/acft)	$1,029	$979	$73	$65	$140	$140
Projected Surplus/(Shortage) after recommended WMS (acft/yr)	99	85	73	65	(27)	(55)

Remaining unmet needs are a result of the MAG limitation on groundwater. Such shortage would only occur during drought of record conditions. Drought restrictions can help to reduce demand to minimize the unmet need.

5.17.9 City of Grandview

5.17.9.1 Description of Supply

The City of Grandview obtains its water supply from groundwater from the Woodbine Aquifer at 364 acft/yr and is projected to have needs from 2050 through the year 2080. Balance and strategies represented in the table below are for the entire city in both counties and regions.

[1] Unit cost for strategy yield of 150 ac-ft/yr. Supply MAG limited.

5.17.9.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to meet the projected water shortage for the City of Grandview. The entities' water usage utilized for demand projections is 153 gpcd. The RWPG recommends conservation to reduce usage to a goal of 140 gpcd.

1. Conservation:
   a. Cost Source: Volume II.
   b. Date to be Implemented: by 2030.
   c. Annual Cost: maximum of $17,100 in 2080.
   d. Unit Cost: $684/acft.
2. Groundwater Development – Woodbine Aquifer:
   a. Cost Source: Volume II.
   b. Date to be Implemented: before 2060.
   c. Project Cost: $1,834,000.
   d. Unit Cost: $1,304/acft.

Table 5.17-6 Recommended Plan Costs by Decade for the City of Grandview

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	73	34	(6)	(42)	(83)	(128)
Conservation						
Supply From Plan Element (acft/yr)	16	17	19	21	24	25
Annual Cost ($/yr)	$10,944	$11,628	$12,996	$14,364	$16,416	$17,100
Projected Surplus/(Shortage) after Conservation (acft/yr)	89	51	13	(21)	(59)	(103)
Groundwater Development – Woodbine Aquifer						
Supply From Plan Element (acft/yr)	–	–	–	125	125	125
Annual Cost ($/yr)	–	–	–	$163,000	$163,000	$34,000
Unit Cost ($/acft)	–	–	–	$1,304	$1,304	$272
Projected Surplus/(Shortage) after recommended WMS (acft/yr)	89	51	13	104	66	22

5.17.10 Johnson County SUD

5.17.10.1 Description of Supply

Johnson County SUD obtains its water supply from the Trinity Aquifer, which is projected to provide an available groundwater supply of 1,537 acft/yr through the planning period. They also have contracts with Brazos River Authority, which supplies 9,528 acft/yr, and Mansfield, which supplies 7,215 acft/yr in 2030 and 8,845 acft/yr in 2080. Johnson County SUD is projected to have a shortages from 2040 to 2080. This WUG is located in multiple counties (Johnson, Tarrant (Region C), Ellis (Region C), and Hill). The balance shown in the table below represents the cumulative totals for all of Johnson County SUD.

5.17.10.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended to meet water needs for Johnson County SUD. Conservation is not recommended because the entity's usage is 123 gpcd, which is below the selected goal of 140 gpcd. The projected municipal unmet needs from 2060 to 2080 result from contracts not being fully allocated due to limited source availability as determined by using the Brazos G RWPG's adopted methodology for the purposes of the 2026 Brazos G RWP, which is consistent with the specific assumptions and methods required for regional water planning. These needs will only occur during a drought equivalent to or worse than the drought of record, with the full implementation of all existing water rights in the basin. While not a strategy recommended by the Brazos G RWPG, the impacts of the unmet needs can be mitigated through demand management in the event of a serious drought prior to the recommended strategies coming online. Notably, BRA contract supplies are reported by BRA as firm supplies.

1. Groundwater Development – Trinity Aquifer:
   a. Cost Source: Volume II.
   b. Date to be Implemented: before 2030.
   c. Project Cost: $17,220,000.
   d. Unit Cost: $1,175/acft.
2. Groundwater Development – Woodbine Aquifer:
   a. Cost Source: Volume II.
   b. Date to be Implemented: before 2030.
   c. Project Cost: $8,391,000.
   d. Unit Cost: $649/acft.
3. Increase WTP Capacity (SWATS):
   a. Cost Source: Volume II.
   b. Date to be Implemented: by 2040.
   c. Project Cost: $8,814,000 (Johnson County SUD portion).
   d. Unit Cost: $696/acft.
4. Purchase from Tarrant Regional WD:
   a. Cost Source: Volume II.
   b. Date to be Implemented: by 2030.
   c. Project Cost: Cost of water purchase.
   d. Unit Cost: $500/acft.

Table 5.17-7 Recommended Plan Costs by Decade for Johnson County SUD

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	(2,125)	(3,969)	(6,082)	(7,600)	(9,084)	(10,616)
Groundwater Development – Trinity Aquifer						
Supply From Plan Element (acft/yr)	60	60	400	750	1,274	1,274
Annual Cost ($/yr)	$1,497,000	$1,497,000	$285,000	$285,000	$285,000	$285,000
Unit Cost ($/acft)	$24,950	$24,950	$713	$380	$224	$224

Plan Element	2030	2040	2050	2060	2070	2080
Groundwater Development – Woodbine Aquifer						
Supply From Plan Element (acft/yr)	100	100	100	200	1,037	668
Annual Cost ($/yr)	$673,000	$673,000	$83,000	$83,000	$83,000	$83,000
Unit Cost ($/acft)	$6,730	$6,730	$830	$415	$80	$124
WTP Expansion (SWATS)						
Supply From Plan Element (acft/yr)	–	1,524	1,524	1,524	1,524	1,524
Annual Cost ($/yr)	–	–	$1,065,000	$1,065,000	$445,000	$445,000
Unit Cost ($/acft)	–	–	$696	$696	$291	$291
Purchase from Tarrant Regional WD						
Supply From Plan Element (acft/yr)	2,070	3,410	4,171	4,452	4,848	4,834
Annual Cost ($/yr)	$1,035,000	$1,705,000	$2,086,000	$2,226,000	$2,424,000	$2,417,000
Unit Cost ($/acft)	$500	$500	$500	$500	$500	$500

5.17.11 City of Keene

The City of Keene obtains its water supply from groundwater from the Trinity Aquifer at 439 acft/yr and a contract with Johnson County SUD at 1,120 acft/yr. The City of Keene is expected to have a surplus and no changes in water supply are recommended. Conservation is not recommended because the entity's usage is 130 gpcd, which is below the selected goal of 140 gpcd.

5.17.12 City of Mansfield

The City of Mansfield is located in Tarrant, Ellis and Johnson counties with a majority of its population and demand in Tarrant County. The City obtains its water supply from surface water from the Tarrant Regional Water District (TRWD), principally located in Region C. More information on City of Mansfield is discussed in the 2026 Region C Water Plan.

5.17.13 Mountain Peak SUD

Mountain Peak SUD is located in Johnson and Ellis counties, with a majority of its population and demand in Ellis County (Region C). The WUG obtains its water supply from the City of Midlothian. More information on Mountain Peak SUD is discussed in the 2026 Region C Water Plan.

5.17.14 Parker WSC

5.17.14.1 Description of Supply

Parker WSC is located in Hill and Johnson counties and obtains its water supply from the Trinity Aquifer at 274 acft/yr and surface water supplies from Files Valley WSC at 336 acft/yr. The Parker WSC is expected to have a surplus and no changes in water supply are recommended. The surplus/shortages shown in the table below represent the cumulative totals for Parker WSC.

5.17.14.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended for Parker WSC. The entities' water usage utilized for demand projections is 147 gpcd. The RWPG recommends conservation to reduce usage to a goal of 140 gpcd.

1. Conservation:
    a. Cost Source: Volume II.
    b. Date to be Implemented: 2030.
    c. Annual Cost: Maximum of $2,736 in 2070 and 2080.
    d. Unit Cost: $684/acft.
2. Trinity Aquifer Development:
    a. Cost Source: Volume II.
    b. Date to be Implemented: before 2060.
    c. Project Cost: $2,249,000.
    d. Unit Cost: $1,395/acft.

Table 5.17-8 Recommended Plan Costs by Decade for Parker WSC

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	302	305	308	312	317	323
Conservation						
Supply From Plan Element (acft/yr)	4	3	4	4	4	4
Annual Cost ($/yr)	$2,736	$2,052	$2,736	$2,736	$2,736	$2,736
Projected Surplus/(Shortage) after Conservation	306	308	312	316	321	327
Groundwater Development – Trinity Aquifer						
Supply From Plan Element (acft/yr)	0	0	0	48	124	124
Annual Cost ($/yr)	–	–	–	$173,000	$173,000	$15,000
Unit Cost ($/acft)	–	–	–	$3,604	$1,395	$121
Projected Surplus/(Shortage) after recommended WMS (acft/yr)	306	308	312	364	445	451

5.17.15 City of Rio Vista

5.17.15.1 Description of Supply

The City of Rio Vista obtains its water supply from groundwater from the Trinity Aquifer at 275 acft/yr. Shortages are projected for the City of Rio Vista.

5.17.15.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to meet water needs for the City of Rio Vista. The entities' water usage utilized for demand projections is 159 gpcd. The RWPG recommends conservation to reduce usage to a goal of 140 gpcd.

1. Conservation:
   a. Cost Source: Volume II.
   b. Date to be Implemented: 2030.
   c. Annual Cost: maximum of $25,308 in 2040.
   d. Unit Cost: $684/acft
2. Need left unmet.

Table 5.17-9 Recommended Plan Costs by Decade for the City of Rio Vista

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	90	65	36	3	(35)	(78)
Conservation						
Supply From Plan Element (acft/yr)	14	37	21	24	28	31
Annual Cost ($/yr)	$9,576	$25,308	$14,364	$16,416	$19,152	$21,204
Projected Surplus/(Shortage) after Conservation	104	102	57	27	(7)	(47)

The City of Rio Vista is projected to have unmet needs in 2070 and 2080. The nearest WUG is Johnson County SUD who also has projected need but may have sufficient supply available in the future with implementation of their WMSs. Impacts of unmet needs in a drought of record can be mitigated by the implementation of drought restrictions. The City may have the capability to secure permitted groundwater in amounts exceeding the MAG amounts identified as the maximum for regional water planning, which would address this unmet need.

5.17.16 City of Venus

5.17.16.1 Description of Supply

The City of Venus obtains its water supply from the Woodbine Aquifer at 103 acft/yr and surface water contract from the City of Midlothian in Region C for 442 acft/yr in 2030 and 308 in 2080, which 381 acft/yr in 2030 and 172 acft/yr in 2080. The city has no projected shortage.

5.17.16.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB and in coordination with Region C, the following water management strategies are recommended to meet water needs for the City of Venus. The entities' water usage utilized for demand projections is 168 gpcd. The RWPG recommends conservation to reduce usage to a goal of 140 gpcd. Note all shortages and supplies from strategies are totals for Region C and Brazos G.

1. Conservation:
   a. Cost Source: Volume II.
   b. Date to be Implemented: 2030.
   c. Annual Cost: maximum of $38,988 in 2080.
   d. Unit Cost: $684/acft.

2. Purchase Water from Midlothian (various Region C strategies):
   a. Cost Source: Region C Water Plan.
   b. Date to be Implemented: 2020.
   c. Project Cost: N/A.
   d. Unit Cost: $534/acft (maximum of weighted average of Region C strategies).

Table 5.17-10 Recommended Plan Costs by Decade for the City of Venus

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	42	4	(11)	(25)	(31)	(33)
Conservation						
Supply From Plan Element (acft/yr)	33	57	53	50	46	43
Annual Cost ($/yr)	$22,572	$38,988	$36,252	$34,200	$31,464	$29,412
Projected Surplus/(Shortage) after Conservation (acft/yr)	75	61	42	25	15	10
Purchase Water from Midlothian (various Region C strategies)						
Supply From Plan Element (acft/yr)	239	281	314	369	448	447
Annual Cost ($/yr)	$127,626	$150,054	$167,676	$197,046	$239,232	$238,698
Unit Cost ($/acft)	$534	$534	$534	$534	$534	$534
Projected Surplus/(Shortage) after recommended WMS (acft/yr)	314	342	356	394	463	457

5.17.17 County-Other

Entities in Johnson County-Other obtain water supply from the Trinity Aquifer at 7 acft/yr and as well as treated surface water from Johnson County SUD at 2,290 to 1,507 acft/yr and Grand Prairie at 628 to 866 acft/yr. A surplus of supply is projected for Johnson County-Other through 2080. No changes in water supply are recommended. Conservation was also considered; however, the entity’s usage is below the selected goal of 140 gpcd

5.17.18 Manufacturing

Johnson County Manufacturing is supplied by the Trinity Aquifer at 194 acft/yr, and the cities of Burleson at 2 acft/yr, Cleburne at 2,705 to 4,169 acft/yr and Hillsboro at 7 to 12 acft/yr. No shortage is projected for Johnson County Manufacturing and no changes in water supply are recommended.

5.17.19 Steam-Electric

5.17.19.1 Description of Supply

Johnson County Steam-Electric currently receives 1,344 acft/yr of reuse and potable water supplies from the City of Cleburne. Johnson County Steam-Electric is projected to have shortages through year 2080. Conservation for Steam-Electric use is not recommended by the Brazos G RWPG.

5.17.19.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to meet water needs for Johnson County Steam-Electric.

1. Purchase reuse water from the City of Cleburne:
   a. Cost Source: Volume II.
   b. Date to be Implemented: before 2030.
   c. Project Cost: $30,238,000.
   d. Unit Cost: $427/acft.

Table 5.17-11 Recommended Plan Costs by Decade for Johnson County – Steam-Electric

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*(571)*	*(571)*	*(571)*	*(571)*	*(571)*	*(571)*
Conservation						
Supply From Plan Element (acft/yr)	–	–	–	–	–	–
Annual Cost ($/yr)	–	–	–	–	–	–
Projected Surplus/(Shortage) after Conservation	*(571)*	*(571)*	*(571)*	*(571)*	*(571)*	*(571)*
Purchase reuse water from the City of Cleburne						
Supply From Plan Element (acft/yr)	571	571	571	571	571	571
Annual Cost ($/yr)	$243,817	$243,817	$84,508	$84,508	$84,508	$84,508
Unit Cost ($/acft)	$427	$427	$148	$148	$148	$148
Projected Surplus/(Shortage) after Reuse (acft/yr)	*0*	*0*	*0*	*0*	*0*	*0*

5.17.20 Mining

Johnson County Mining obtains its water supply from Cleburne at 1,443 acft/yr. Johnson County Mining is projected to have a surplus throughout the planning period. No changes in water supply are recommended.

5.17.21 Irrigation

Johnson County Irrigation obtains its water supply from the Trinity Aquifer at 167 acft/yr and the Woodbine Aquifer at 130 acft/yr. Shortages are projected for Johnson County Irrigation.

5.17.21.1 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to meet water needs for Johnson County Irrigation. Conservation is recommended.

1. Conservation:
   a. Cost Source: Volume II.
   b. Date to be Implemented: before 2030.
   c. Annual Cost: not determined.
2. Leave Need Unmet

Table 5.17-12 Recommended Plan Costs by Decade for Johnson County – Irrigation

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	(245)	(245	(245	(245	(245	(245)
Conservation						
Supply From Plan Element (acft/yr)	16	28	38	38	38	38
Annual Cost ($/yr)	ND	ND	ND	ND	ND	ND
Projected Surplus/(Shortage) after Conservation	*(252)*	*(241)*	*(229)*	*(229)*	*(229)*	*(229)*
Unmet Need	252	241	229	229	229	229
ND – Not Determined. Costs to implement irrigation conservation technologies will vary based on location.						

5.17.22 Livestock

Livestock water supply is projected to meet demands through 2080 and no changes in water supply are recommended.

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5.18 Jones County Water Supply Plan

Table 5.18-1 lists each water user group in Jones County and their corresponding surplus or shortage in years 2030 and 2080. For each water user group with a projected shortage, a water supply plan has been developed and is presented in the following subsections.

Table 5.18-1 Johnson County Surplus/(Shortage)

Water User Group	Surplus/(Shortage)		Comment
	2030 (acft/yr)	2080 (acft/yr)	
City of Abilene			See Taylor County
City of Anson	28	143	Projected surplus
Hamby WSC	0	0	No projected surplus or shortage
City of Hamlin	209	325	Projected surplus
Hawley WSC	0	0	No projected surplus or shortage
City of Stamford	470	818	Projected surplus
County-Other	(567)	(289)	Projected shortage - see plan below.
Manufacturing	-	-	No projected demand
Steam-Electric	-	-	No projected demand
Mining	70	70	Projected surplus
Irrigation	(164)	(164)	Projected shortage - see plan below.
Livestock	155	155	Projected surplus

5.18.1 City of Anson

5.18.1.1 Description of Supply

The City of Anson receives surface water supplies the West Central Texas MWD at 1,523 to 1,600 acft/yr. The City sells water both to the City of Hamlin and Hawley WSC. No shortages are projected for the City of Anson. Conservation was considered; however, the entity’s per capita usage of 139 is below the selected goal of 140 gpcd. No changes to Anson’s water supplies are recommended.

5.18.2 Hamby WSC

5.18.2.1 Description of Supply

Hamby WSC has a contract with the City of Abilene for up to 308 acft/yr. Under this contract with Abilene, Hamby WSC has enough supply to meet their projected demands throughout the planning horizon. Conservation was considered; however, the entity’s per capita usage of 116 is below the selected goal of 140 gpcd. No changes in the water supply plan are recommended.

5.18.3 City of Hamlin

5.18.3.1 Description of Supply

The City of Hamlin receives surface water supplies from the City of Anson, which ranges from 495 to 524 acft/yr. The City also provides 2 acft/yr to Manufacturing entities in Fisher County. A surplus is projected for the City of Hamlin.

5.18.3.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended for the City of Hamlin. The entities' water usage utilized for demand projections is 187 gpcd. The RWPG recommends conservation to reduce usage to a goal of 140 gpcd.

a. Conservation:
    i. Cost Source: Volume II.
    ii. Date to be Implemented: 2030.
    iii. Unit Cost: $684 /acft.
    iv. Annual Cost: maximum of $38,304 in 2050.

Table 5.18-2 Recommended Plan Costs by Decade for City of Hamlin

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*209*	*246*	*270*	*292*	*307*	*325*
Conservation						
Supply From Plan Element (acft/yr)	24	48	56	48	43	39
Annual Cost ($/yr)	$16,416	$32,832	$38,304	$32,832	$29,412	$26,676
Projected Surplus/(Shortage) after Conservation	*233*	*294*	*326*	*340*	*350*	*364*

5.18.4 Hawley WSC

Hawley WSC is located in multiple counties (Taylor, and Jones). This description represents the cumulative totals for Hawley WSC. Hawley WSC has water supply contracts with the City of Abilene for 383 acft/yr and the City of Anson for 221 acft/yr. Under these two water supply contracts, Hawley WSC has no shortages throughout the planning period. Conservation was considered; however, the entity's per capita usage of 109 is below the selected goal of 140 gpcd. No changes in the water supply plan are recommended.

5.18.5 City of Stamford

The City of Stamford is located in Jones and Haskell Counties. The balance shown below represents the cumulative totals for the City of Stamford. The City has a contract with BRA to compensate BRA for the reduction in yield of its system as the result of the City's upstream diversion. The City also provides water for local entities included in Haskell and Jones County-Others. The City's supply is sufficient to meet current and projected demands, with no shortages projected through 2080.

5.18.5.1 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended for the City of Stamford. The most recent water loss audit report shows a water loss of approximately 48% and water loss mitigation is recommended. The entities' water usage utilized for demand projections is 233 gpcd. The RWPG recommends conservation to reduce usage to a goal of 140 gpcd.

a. Conservation:
   i. Cost Source: Volume II.
   ii. Date to be Implemented: 2030.
   iii. Unit Cost: $684 /acft.
   iv. Annual Cost: maximum of $143,640 in 2060.
b. Water Loss Reduction:
   i. Cost Source: Volume II.
   ii. Date to be Implemented: 2030.
   iii. Annual Cost: maximum of $199,943 in 2030.

Table 5.18-3 Recommended Plan Costs by Decade for City of Stamford

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*470*	*527*	*589*	*652*	*728*	*818*
Conservation						
Supply From Plan Element (acft/yr)	*59*	*123*	*173*	*210*	*181*	*146*
Annual Cost ($/yr)	$40,356	$84,132	$118,332	$143,640	$123,804	$99,864
Supply From Plan Element (acft/yr)	245	226	206	184	158	128
Annual Cost ($/yr)	$199,943	$191,401	$92,607	$82,717	$71,029	$57,543
Projected Surplus/(Shortage) after Conservation and Water Loss Reduction (acft/yr)	*774*	*876*	*968*	*1,046*	*1,067*	*1,092*

5.18.6 County-Other

Entities in County-Other receive supplies through the City of Stamford at 89 acft/yr and the Seymour Aquifer at 201 acft/yr. County-Other entities are projected to have a shortage of water throughout the planning period.

5.18.6.1 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended for Jones County-Other. Conservation was considered; however, the entity's per capita usage of 113 is below the selected goal of 140 gpcd.

a. Groundwater Development – Seymour Aquifer:
   i. Cost Source: Volume II.
   ii. Date to be Implemented: before 2030.
   iii. Project Cost: $570,000.

iv. Unit Cost: $119/acft.

b. Purchase Additional Supplies from City of Abilene:

i. Cost Source: Abilene Water Rates.
ii. Date to be Implemented: before 2030.
iii. Project Cost: $570,000.
iv. Unit Cost: $119/acft.

Table 5.18-4 Recommended Plan Costs by Decade for Jones County-Other

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*(567)*	*(524)*	*(477)*	*(423)*	*(361)*	*(289)*
Seymour Aquifer Groundwater						
Supply From Plan Element (acft/yr)	400	402	402	405	408	411
Annual Cost ($/yr)	$48,000	$48,000	$9,000	$9,000	$9,000	$9,000
Unit Cost ($/acft)	$119	$119	$22	$22	$22	$22
Purchase Additional Supply from Abilene						
Supply From Plan Element (acft/yr)	167	122	102	112	121	121
Annual Cost ($/yr)	$386,400	$282,300	$236,000	$259,200	$280,000	$280,000
Unit Cost ($/acft)	$2,314	$2,314	$2,314	$2,314	$2,314	$2,314
Projected Surplus/(Shortage) after Recommended WMS (acft/yr)	0	0	27	94	168	243

5.18.7 Manufacturing

There is no projected demand for Manufacturing in Jones County.

5.18.8 Steam-Electric

There is no projected demand for Steam-Electric in Jones County.

5.18.9 Mining

Jones County Mining obtains its water supply from run-of-the river water rights which are not reliable in the drought of record and 79 acft/yr from the Seymour Aquifer. No shortages are projected for Mining in Jones County throughout the planning period and no changes in water supply are recommended.

5.18.10 Irrigation

5.18.10.1 Description of Supply

Jones County Irrigation is supplied by the Seymour Aquifer at 2,638 acft/yr. Irrigation is projected to have a shortage of water beginning in 2030 through 2080, but conservation efforts can cover the shortages across all decades of the planning period.

5.18.10.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to meet water needs for Jones County-Irrigation. Conservation is recommended.

a. Conservation:
   i. Cost Source: Volume II.
   ii. Date to be Implemented: 2030.
   iii. Annual Cost: $340,400 maximum in2050.
   iv. Unit Cost: $1,719 /acft.

Table 5.18-5 Recommended Plan Costs by Decade for Jones County – Irrigation

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*(64)*	*(64)*	*(64)*	*(64)*	*(64)*	*(64)*
Conservation						
Supply From Plan Element (acft/yr)	85	141	198	198	198	198
Annual Cost ($/yr)	$146,100	$242,400	$340,400	$340,400	$340,400	$340,400
Unit Cost ($/acft)	$1,719	$1,719	$1,719	$1,719	$1,719	$1,719
Projected Surplus/(Shortage) after Conservation (acft/yr)	*21*	*77*	*134*	*134*	*134*	*134*
Projected Surplus/(Shortage) after Recommended WMS (acft/yr)	*21*	*77*	*134*	*134*	*134*	*134*

5.18.11 Livestock

Livestock demand is met by local water supply and Seymour aquifer groundwater and is projected to meet demands through 2080 and no changes in water supply are recommended.

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5.19 Kent County Water Supply Plan

Table 5.19-1 lists each water user group in Kent County and their corresponding surplus or shortage in years 2040 and 2070. A brief summary of each water user group supply is presented in the following subsections.

Table 5.19-1 Kent County Surplus/(Shortage)

Water User Group	Surplus/(Shortage)		Comment
	2030 (acft/yr)	2080 (acft/yr)	
City of Jayton	152	140	Projected surplus
County-Other	(14)	(17)	Projected shortage – see plan below.
Manufacturing	-	-	No projected demand
Steam-Electric	-	-	No projected demand
Mining	706	706	Projected surplus
Irrigation	788	788	Projected surplus
Livestock	32	32	Projected surplus

5.19.1 City of Jayton

5.19.1.1 Description of Supply

Water supply for the City of Jayton is 249 acft/yr from the Seymour Aquifer. Jayton has sufficient supplies through 2080.

5.19.1.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water supply plan is recommended to supplement supply for the City of Jayton. Associated costs are included for each strategy. The entities' water usage utilized for demand projections is 180 gpcd. The RWPG recommends conservation to reduce usage to a goal of 140 gpcd.

a. Conservation:
    i. Cost Source: Volume II.
    ii. Date to be Implemented: before 2030.
    iii. Annual Cost: maximum of $14,364 in 2060.
    iv. Unit Cost: $684 /acft.

Table 5.19-2 Recommended Plan Costs by Decade for City of Jayton

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	152	153	149	146	143	140
Conservation						
Supply From Plan Element (acft/yr)	8	19	20	21	21	21
Annual Cost ($/yr)	$5,472	$12,996	$13,680	$14,364	$14,364	$14,364
Projected Surplus/(Shortage) after Conservation (acft/yr)	160	172	169	167	164	161
Projected Surplus/(Shortage) after Recommended WMS (acft/yr)	160	172	169	167	164	161

5.19.2 County-Other

Water supply for County-Other is from local groundwater and the Seymour Aquifer. Shortages are projected throughout the planning period.

5.19.2.1 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water supply plan is recommended to meet for entities in Kent County-Other. Associated costs are included for each strategy. Conservation was considered; however, the entity's per capita usage of 109 is below the selected goal of 140 gpcd.

a. Groundwater Development – Seymour Aquifer:
   i. Cost Source: Volume II.
   ii. Date to be Implemented: before 2030.
   iii. Project Cost: $243,000.
   iv. Unit Cost: $950/acft.

Table 5.19-3 Recommended Plan Costs by Decade for Kent County-Other

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	(14)	(14)	(13)	(14)	(16)	(17)
Seymour Aquifer Development						
Supply From Plan Element (acft/yr)	20	20	20	20	20	20
Annual Cost ($/yr)	$19,000	$19,000	$2,000	$2,000	$2,000	$2,000
Unit Cost ($/acft)	$950	$950	$100	$100	$100	$100
Projected Surplus/(Shortage) after recommended WMS (acft/yr)	6	6	7	6	4	3

5.19.3 Manufacturing

No Manufacturing demand exists or is projected for the county.

5.19.4 Steam-Electric

No Steam-Electric demand exists or is project for the county.

5.19.5 Mining

Mining operations are supplied with water from the Seymour Aquifer. No shortages are projected for Mining, surpluses are projected through 2080, and no change in water supply are recommended.

5.19.6 Irrigation

Irrigation in Kent county is supplied by the Dockum and Seymour Aquifers. No shortages are projected for Irrigation, a surplus of 788 acft/yr is projected through 2080. No changes in water supply are recommended.

5.19.7 Livestock

Livestock demand is met by local water supply and Dockum Aquifer groundwater and is projected to meet needs through 2080. No changes in Kent County Livestock water supply are recommended.

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5.20 Knox County Water Supply Plan

Table 5.20–1 lists each water user group in Knox County and their corresponding surplus or shortage in years 2030 and 2080. A brief summary of each water user group supply is presented in the following subsections.

Table 5.20-1 Knox County Surplus/(Shortage)

Water User Group	Surplus/(Shortage)		Comment
	2030 (acft/yr)	2080(acft/yr)	
City of Benjamin	(26)	(35)	Projected shortage – see plan below.
Knox City	(237)	(241)	Projected shortage - see plan below.
City of Munday	(219)	(253)	Projected shortage - see plan below.
County-Other	45	75	Projected surplus
Manufacturing	-	-	No projected demand
Steam-Electric	–	–	No projected demand
Mining	-	-	No projected demand
Irrigation	(10,331)	(10,212)	Projected shortage - see plan below
Livestock	102	102	Projected surplus

5.20.1 City of Benjamin

5.20.1.1 Description of Supply

The City of Benjamin obtains water through the purchase of treated surface water under contract from the North Central Texas Municipal Water Authority (NCTMWA) and through local groundwater production from the Seymour Aquifer. The City is contracted to purchase up to 64 acft/yr from the NCTMWA; however, due to availability of supplies, this contract is prorated to provide a maximum of only 14 acft/yr during the planning period. Additionally, no local groundwater supply from the Seymour Aquifer is projected to be available to the City. Needs remain unmet in the 2030 and 2040 decades. These needs will only occur during a drought equivalent or worse than the drought of record. While not a strategy recommended by the Brazos G RWPG, the impacts of the unmet needs may be mitigated through demand management in the event of a serious drought prior to the recommended strategies coming online.

5.20.1.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended for the City of Benjamin. The entities’ water usage utilized for demand projections is 277 gpcd. The RWPG recommends conservation to reduce usage to a goal of 140 gpcd.

1. Conservation:
   - Cost Source: Volume II.
   - Date to be Implemented: before 2030.
   - Annual Cost: maximum of $14,364 in 2070.
   - Unit Cost: $684/acft.
2. Lake Creek Reservoir. This strategy would be developed by NCTMWA to augment existing supplies.
   - Cost Source: Volume II:
     - Project requires an agreement with the BRA.
   - Date to be Implemented: before 2050.
   - Project Cost: none (cost would be borne by NCTMWA).
   - Unit Cost: none (supply already purchased from NCTMWA).

Table 5.20–2 Recommended Plan Costs by Decade for the City of Benjamin

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	(26)	(29)	(23)	(30)	(17)	(35)
Conservation						
Supply From Plan Element (acft/yr)	5	10	14	19	21	18
Annual Cost ($/yr)	$3,420	$6,840	$9,576	$12,996	$14,364	$12,312
Projected Surplus/(Shortage) after Conservation (acft/yr)	(21)	(19)	(9)	(11)	4	(17)
Lake Creek Reservoir						
Supply From Plan Element (acft/yr)	—	—	23	30	17	35
Annual Cost ($/yr)	—	—	—	—	—	—
Unit Cost ($/acft)	—	—	—	—	—	—
Projected Surplus/(Shortage) after recommended WMS (acft/yr)	(21)	(19)	14	19	21	18

5.20.2 Knox City

5.20.2.1 Description of Supply

Knox City obtains its water supply through purchases of treated surface water under contract from the NCTMWA. The City is contracted to purchase up to 187 acft/yr from the NCTMWA; however, due to availability of supplies, this contract is prorated to provide a maximum of only 24 acft/yr during the planning period. Additionally, no local groundwater supply is projected to be available. Needs remain unmet in 2030 and 2040.

These needs will only occur during a drought equivalent or worse than the drought of record. While not a strategy recommended by the Brazos G RWPG, the impacts of the unmet needs can be mitigated through demand management in the event of a serious drought prior to the recommended strategies coming online.

5.20.2.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended for Knox City. The most recent water loss audit report shows a water loss of approximately 37% and water loss mitigation is recommended. The entities' water usage utilized for demand projections is 224 gpcd. The RWPG recommends conservation to reduce usage to a goal of 140 gpcd.

a. Conservation:
    i. Cost Source: Volume II.
    ii. Date to be Implemented: before 2030.
    iii. Annual Cost: maximum of $60,192 in 2060.
    iv. Unit Cost: $684 /acft.

b. Water Loss Reduction:
    i. Cost Source: Volume II.
    ii. Date to be Implemented: before 2030.
    iii. Annual Cost: maximum of $52,078 in 2030.

b. Lake Creek Reservoir. This strategy would be developed by NCTMWA to augment existing supplies.
    i. Cost Source: Volume II:
        (1) Project requires a subordination agreement with the BRA.
    ii. Date to be Implemented: before 2030.
    iii. Project Cost: none (cost would be borne by NCTMWA).
    iv. Unit Cost: none (supply already purchased from NCTMWA).

Table 5.20-3 Recommended Plan Costs by Decade for Knox City

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*(237)*	*(238)*	*(240)*	*(241)*	*(241)*	*(241)*
Conservation						
Supply From Plan Element (acft/yr)	19	45	69	88	86	87
Annual Cost ($/yr)	$12,996	$30,780	$47,196	$60,192	$58,824	$59,508
Water Loss Reduction						
Supply From Plan Element (acft/yr)	55	55	55	55	54	54
Annual Cost ($/yr)	$52,078	$52,078	$23,458	$23,458	$23,031	$23,031
Projected Surplus/(Shortage) after Conservation and Water Loss Reduction (acft/yr)	*(163)*	*(138)*	*(116)*	*(98)*	*(101)*	*(100)*
Lake Creek Reservoir						
Supply From Plan Element (acft/yr)	—	-	192	197	202	202

Plan Element	2030	2040	2050	2060	2070	2080
Annual Cost ($/yr)	—	—	—	—	—	—
Unit Cost ($/acft)	—	—	—	—	—	—
Projected Surplus/(Shortage) after Recommended WMS (acft/yr)	(163)	(138)	76	99	101	102

5.20.3 City of Munday

5.20.3.1 Description of Supply

The City of Munday obtains surface water via a contract with NCTMWA. The City is contracted to purchase up to 291 acft/yr from the NCTMWA; however, due to availability of supplies, this contract is prorated to provide a maximum of only 22 acft/yr during the planning period. Additionally, no local groundwater supply is projected to be available to the City.

5.20.3.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended for the City of Munday. The entities' water usage utilized for demand projections is 180 gpcd. The RWPG recommends conservation to reduce usage to a goal of 140 gpcd.Needs remain unmet in 2030 and 2040. These needs will only occur during a drought equivalent or worse than the drought of record. While not a strategy recommended by the Brazos G RWPG, the impacts of the unmet needs can be mitigated through demand management in the event of a serious drought prior to the recommended strategies coming online.

a. Conservation:
   i. Cost Source: Volume II.
   ii. Date to be Implemented: before 2030.
   iii. Annual Cost: maximum of $34,200 in 2080
   iv. Unit Cost: $684 /acft.
b. Lake Creek Reservoir. This strategy would be developed by NCTMWA to augment existing supplies.
   i. Cost Source: Volume II:
      (1) Project requires a subordination agreement with the BRA.
   ii. Date to be Implemented: before 2030.
   iii. Project Cost: none (cost would be borne by NCTMWA).
   iv. Unit Cost: none (supply already purchased from NCTMWA).

Table 5.20-4 Recommended Plan Costs by Decade for the City of Munday

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*(219)*	*(224)*	*(231)*	*(235)*	*(242)*	*(253)*
Conservation						
Supply From Plan Element (acft/yr)	17	41	47	47	48	50
Annual Cost ($/yr)	$11,628	$28,044	$32,148	$32,148	$32,832	$34,200
Projected Surplus/(Shortage) after Conservation (acft/yr)	*(202)*	*(183)*	*(184)*	*(188)*	*(194)*	*(203)*
Lake Creek Reservoir						
Supply From Plan Element (acft/yr)	—	-	222	229	234	234
Annual Cost ($/yr)	—	—	—	—	—	—
Unit Cost ($/acft)	—	—	—	—	—	—
Projected Surplus/(Shortage) after Recommended WMS (acft/yr)	(202)	(183)	38	41	40	31

5.20.4 County-Other

Entities in Knox County-Other obtain water supply through groundwater production from the Seymour and Blaine Aquifers and through purchases of surface water under contracts with the BRA. No future local groundwater supply is projected to be available from the Seymour Aquifer; local available supply to Knox County-Other users from the Blaine Aquifer is projected at 100 acft/yr throughout the planning period. No water supply shortages are projected and no change in water supply is recommended. Conservation was also considered; however, the current per capita usage of 93 is below the selected goal of 140 gpcd.

5.20.5 Manufacturing

No Manufacturing demand exists or is projected for the county.

5.20.6 Steam-Electric

No Steam-Electric demand exists or is projected for the county.

5.20.7 Mining

No Mining demand exists or is projected for the county.

5.20.8 Irrigation

5.20.8.1 Description of Supply

Knox County Irrigation obtains water supplies from the Seymour and Blaine Aquifers. Irrigation shortages are projected throughout the planning horizon.

5.20.8.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended for Irrigation. Conservation is recommended.

a. Conservation:
   i. Cost Source: Volume II.
   ii. Date to be Implemented: before 2030.
   iii. Annual Cost: maximum of $5,762,700.
   iv. Unit Cost: $2,037 /acft.

b. Groundwater Development – Blaine Aquifer:
   i. Cost Source: Volume II.
   ii. Date to be Implemented: before 2030.
   iii. Project Cost: $956,000.
   iv. Unit Cost: maximum of $211 /acft.

c. Rolling Plains GCD Managed Aquifer Recharge:
   i. Cost Source: Volume II.
   ii. Date to be Implemented: before 2040.
   iii. Total Project Cost: $7.05 million.
   iv. Annual Cost: $513,000.
   v. Unit Cost: $34/acft.

c. Leave Needs Unmet:
   i. Cost Source: Cost of not meeting needs – see Appendix G.
   ii. Date to be Implemented: before 2030.

Table 5.20-5 Recommended Plan Costs by Decade for Knox County – Irrigation

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*(10,331)*	*(10,747)*	*(10,441)*	*(7,806)*	*(9,999)*	*(10,212)*
Conservation						
Supply From Plan Element (acft/yr)	1,319	2,199	2,791	2,665	2,829	2,829
Annual Cost ($/yr)	$2,686,800	$4,479,400	$5,685,300	$5,428,600	$5,762,700	$5,762,700
Projected Surplus/(Shortage) after Conservation (acft/yr)	*(9,012)*	*(8,548)*	*(7,650)*	*(5,141)*	*(7,170)*	*(7,383)*
Groundwater Development – Blaine Aquifer						
Supply From Plan Element (acft/yr)	383	383	383	383	383	383
Annual Cost ($/yr)	$81,000	$81,000	$14,000	$14,000	$14,000	$14,000
Unit Cost ($/acft)	$211	$211	$37	$37	$37	$37
Rolling Plains GCD - Managed Aquifer Recharge						
Supply From Plan Element (acft/yr)	-	-	1,000	1,000	1,000	1,000
Annual Cost ($/yr)	-	-	$513,000	$513,000	$513,000	$513,000
Unit Cost ($acft)	-	-	$34	$34	$34	$34
Leave Needs Unmet (acft/yr)	(8,629)	(8,165)	(6,267)	(3,758)	(5,787)	(6,000)

5.20.9 Livestock

Livestock demand is met by local water supply and Blaine Aquifer groundwater and is projected to meet needs through 2080. No changes in Knox County Livestock water supply are recommended.

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5.21 Lampasas County Water Supply Plan

Table 5.21-1 lists each water user group in Lampasas County and their corresponding surplus or shortage in years 2030 and 2080. A brief summary of the water user groups and the plan for the selected water user are presented in the following subsections.

Table 5.21-1 Lampasas County Surplus (Shortage)

Water User Group	Surplus/(Shortage)		Comment
	2030 (acft/yr)	2080 (acft/yr)	
City of Copperas Cove			See Coryell County
Corix Utilities Texas, Inc			See Washington county
Kempner WSC	(971)	(961)	Projected shortage - see plan below.
City of Lampasas	(432)	(977)	Projected shortage - see plan below.
Multi-County WSC			See Coryell County
County-Other	125	183	Projected surplus
Manufacturing	(59)	(68)	Projected shortage - see plan below.
Steam-Electric	-	-	No projected demand
Mining	81	81	Projected surplus
Irrigation	(144)	(167)	Projected shortage - see plan below.
Livestock	288	288	Projected surplus

5.21.1 Kempner WSC

Kempner WSC has service area in portions of Coryell, Bell, Lampasas, and Burnet (Region K) Counties. Kempner WSC has contracted for 8,900 acft/yr of surface water supplies from the Brazos River Authority, which can supply 7,417 acft/yr in 2030 and 7,184 acft/yr in 2080, based on water availability analyses prescribed under water planning guidelines. The WSC also has a contract with the Central Texas WSC. Kempner's supplies are constrained by water treatment capacity of 3,965 acft/yr. Kempner WSC sells supplies to the Lampasas County-Other, Lampasas County Mining, Salado WSC, and provides the conveyance of treated water from Central Texas WSC to the City of Lampasas. Shortages are projected for Kempner WSC in 2030 through 2080.

5.21.1.1 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to meet water needs for Kempner WSC. The most recent water loss audit report shows a water loss of approximately 31% and water loss mitigation is recommended. The entities' water usage utilized for demand projections is 176 gpcd. The RWPG recommends conservation to reduce usage to a goal of 140 gpcd. Kempner WSC has no shortages in the Region K portion; however, the Region K RWPG has recommended conservation and drought management strategies.

1. Conservation:
   a. Cost Source: Volume II.
   b. Date to be Implemented: before 2030.
   c. Unit Cost: $684 /acft.
   d. Annual Cost: maximum of $436,392 in 2050
2. Water Loss Reduction:
   a. Cost Source: Volume II.
   b. Date to be Implemented: before 2030.
   c. Annual Cost: maximum of $664,697 in 2040
3. Increase Water Treatment Plant Capacity:
   a. Cost Source: Volume II.
   b. Date to be Implemented: before 2030.
   c. Project Cost: $13,550,000
   d. Unit Cost: $835 /acft.

Table 5.21-2 Recommended Plan Costs by Decade for Kempner WSC

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*(971)*	*(881)*	*(855)*	*(897)*	*(936)*	*(961)*
Conservation						
Supply From Plan Element (acft/yr)	268	634	638	632	628	621
Annual Cost ($/yr)	$183,312	$433,656	$436,392	$432,288	$429,552	$424,764
Water Loss Reduction						
Supply From Plan Element (acft/yr)	553	569	575	571	566	560
Annual Cost ($/yr)	$658,290	$664,697	$230,261	$228,659	$226,657	$224,254
Drought Management & Conservation (Region K Portion)						
Supply From Plan Element (acft/yr)	44	47	50	53	57	61
Projected Surplus/(Shortage) after Conservation and Drought Management (acft/yr)	*(126)*	*369*	*408*	*359*	*315*	*281*
Increase WTP Capacity						
Supply From Plan Element (acft/yr)(1)	1,120	1,120	2,015	2,015	2,015	2,015
Annual Cost ($/yr)	$935,000	$935,000	$404,000	$727,000	$727,000	$727,000
Unit Cost ($/acft)	$835	$835	$361	$361	$361	$361
Projected Surplus/(Shortage) after Recommended WMS (acft/yr)	*1,104*	*1,489*	*2,423*	*2,374*	*2,330*	*2,296*

Notes:
(1) Quantity represents increase in treatment capacity required to develop existing supplies currently constrained by treatment capacity. Existing contracted supplies are sufficient to meet shortage if treatment capacity is expanded.

5.21.2 City of Lampasas

5.21.2.1 Description of Supply

The City of Lampasas has contracted for water supply from Kempner WSC at 1,281 acft/yr. The City of Lampasas has also contracted for 3,500 acft/yr of surface water supplies from the Brazos River Authority, which can supply 2,917 acft/yr in 2030 and 2,825 acft/yr in 2080, based on water availability analyses developed for the purposes of regional water planning under water planning guidelines and assumptions. The City's supplies are constrained by water treatment capacity. The City provides supply for Lampasas County-Manufacturing demands. Shortages are projected beginning in 2030 through 2080.

5.21.2.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to meet water needs for the City of Lampasas. The City also is considering an expansion to their conveyance system to access more of the contracted water through BRA. This WMS is included in Volume II but is not shown below because it would not increase the City's existing supply but allow them to access more of their existing contractual supply. The most recent water loss audit report shows a water loss of approximately 17% and water loss mitigation is recommended. The entities' water usage utilized for demand projections is 167 gpcd. The RWPG recommends conservation to reduce usage to a goal of 140 gpcd.

1. Conservation:
    a. Cost Source: Volume II.
    b. Date to be Implemented: before 2030.
    c. Annual Cost: maximum of $190,152 in 2070.
    d. Unit cost of $684/acft.
2. Water Loss Reduction:
    a. Cost Source: Volume II.
    b. Date to be Implemented: before 2030.
    c. Annual Cost: maximum of $35,678 in 2040.
3. New Water Treatment Plant
    a. Cost Source: Volume II.
    b. Date to be Implemented: before 2023.
    c. Project Cost: $53,624,000.
    d. Unti Cost: $1,912.

Table 5.21-3 Recommended Plan Costs by Decade for City of Lampasas

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*(432)*	*(604)*	*(778)*	*(933)*	*(1,008)*	*(977)*
Conservation						
Supply From Plan Element (acft/yr)	117	230	252	270	278	273
Annual Cost ($/yr)	$80,028	$157,320	$172,368	$184,680	$190,152	$186,732
Water Loss Reduction						
Supply From Plan Element (acft/yr)	40	44	48	51	53	52
Annual Cost ($/yr)	$34,478	$35,678	$14,400	$15,300	$15,900	$15,600
Projected Surplus/(Shortage) after Conservation and Water Loss Reduction (acft/yr)	*(275)*	*(330)*	*(478)*	*(612)*	*(677)*	*(652)*
Additional Demands from Recommended Strategies from Others						
Lampasas Manufacturing – Purchase Treated Water from Lampasas	(16)	(7)	(4)	-	-	-
New Water Treatment Plant						
Supply From Plan Element (acft/yr)	1,120	1,120	1,120	1,120	1,120	1,120
Annual Cost ($/yr)	$2,141,000	$2,141,000	$884,000	$884,000	$884,000	$884,000
Unit Cost ($/acft)	$1,912	$1,912	$789	$789	$789	$789
Projected Surplus/(Shortage) after Recommended WMS (acft/yr)	*829*	*783*	*638*	*508*	*443*	*468*

5.21.3 County-Other

Entities included in Lampasas County-Other obtain 5 acft/yr of water supply from the Trinity Aquifer and 6 acft/yr from the Marble Falls Aquifer. Surpluses are projected through 2080 and no changes in water supply are recommended. Conservation was considered; however, the entity's current per capita use rate of 121 is below the selected target rate of 140 gpcd.

5.21.4 Manufacturing

Lampasas County Manufacturing obtains its water supply the City of Lampasas at 137 to 213 acft/yr and run-of-river rights at 48 to 0 acft/yr from 2020 to 2070. Based on the available surface water supply, Lampasas County Manufacturing is projected to have a shortage throughout the planning period after conservation.

5.21.4.1 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to meet water needs for the Lampasas County Manufacturing. Conservation is recommended.

1. Conservation:
    a. Cost Source: Volume II.
    b. Date to be Implemented: by 2030.
    c. Annual Cost: not determined.
2. Increase treatment contract with City of Lampasas:
    a. Cost Source: Lampasas Water Rate.
    b. Date to be Implemented: 2030.
    c. Project Cost: Existing infrastructure assumed sufficient.
    d. Unit Cost: $1,499 /acft. ($4.60/1,000 gal).

Table 5.21-4 Recommended Plan Costs by Decade for Lampasas County-Manufacturing

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*(59)*	*(63)*	*(68)*	*(73)*	*(76)*	*(68)*
Conservation						
Supply From Plan Element (acft/yr)	6	11	15	15	15	15
Annual Cost ($/yr)	ND	ND	ND	ND	ND	ND
Projected Surplus/(Shortage) after Conservation	*(53)*	*(52)*	*(53)*	*(28)*	*(61)*	*(53)*
Increase treated water contract from City of Lampasas						
Supply From Plan Element (acft/yr)	16	7	4	-	–	–
Annual Cost ($/yr)	$24,000	$10,000	$6,000	-	–	–
Unit Cost ($/acft)	$1,499	$1,499	$1,499	-	-	-
Projected Surplus/(Shortage) after Recommended WMS (acft/yr)	*(37)*	*(45)*	*(49)*	*(58)*	*(61)*	*(53)*

Notes:
ND = Not determined. Costs to implement industrial conservation technologies will vary based on each location.

5.21.5 Steam-Electric

No Steam-Electric demand is projected for Lampasas County.

5.21.6 Mining

5.21.6.1 Description of Supply

Lampasas County Mining currently obtains its water supply from Kempner WSC at 25 acft/yr and the Ellenburger-San Saba Aquifer at 79 acft/yr. Mining is projected to have a surplus throughout the planning period.

5.21.6.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended for Lampasas County-Mining. Conservation is recommended.

1. Groundwater Development – Ellenburger-San Saba Aquifer:

a. Cost Source: Volume II.
b. Date to be Implemented: by 2030.
c. Project Cost: $3,769,000.
d. Unit Cost: $2,489/acft.

Table 5.21-5 Recommended Plan Costs by Decade for Lampasas County - Minning

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*81*	*81*	*81*	*81*	*81*	*81*
Groundwater Development – Ellenburger – San Saba Aquifer						
Supply From Plan Element (acft/yr)	73	83	97	115	133	133
Annual Cost ($/yr)	$182,000	$207,000	$48,000	$57,000	$66,000	$66,000
Unit Cost ($/acft)	$2,489	$2,489	$496	$496	$496	$496
Projected Surplus/(Shortage) after Recommended WMS (acft/yr)	*154*	*164*	*178*	*196*	*214*	*214*

5.21.7 Irrigation

5.21.7.1 Description of Supply

Lampasas County Irrigation is supplied by the Trinity, Marble Falls, and Ellenburger-San Saba Aquifers at 208 acft/yr and run of the river water rights at 169 to 14688 acft/yr. Irrigation is projected to have shortages throughout the planning period.

5.21.7.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to meet water needs for Lampasas County-Irrigation. Conservation is recommended.

1. Conservation:
    a. Cost Source: Volume II.
    b. Date to be Implemented: by 2030.
    c. Annual Cost: maximum of $65,300 in 2040.
    d. Unit Cost: $1,719 /acft.
2. Groundwater Development – Marble Falls Aquifer:
    a. Cost Source: Volume II.
    b. Date to be Implemented: by 2030.
    c. Project Cost: $3,772,000.
    d. Unit Cost: Max of $1,534 / acft.

Table 5.21-6 Recommended Plan Costs by Decade for Lampasas County - Irrigation

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*(144)*	*(149)*	*(153)*	*(158)*	*(162)*	*(167)*
Conservation						
Supply From Plan Element (acft/yr)	16	27	38	38	38	38
Annual Cost ($/yr)	$27,500	$46,400	$65,300	$65,300	$65,300	$65,300
Unit Cost ($/acft)	$1,719	$1,719	$1,719	$1,719	$1,719	$1,719
Projected Surplus/(Shortage) after Conservation (acft/yr)	(128)	(122)	(115)	(120)	(124)	(129)
Groundwater Development – Marble Falls Aquifer						
Supply From Plan Element (acft/yr)	203	195	198	201	204	204
Annual Cost ($/yr)	$311,000	$299,000	$47,000	$47,000	$48,000	$48,000
Unit Cost ($/acft)	$1,534	$1,534	$235	$235	$235	$235
Projected Surplus/(Shortage) after Recommended WMS (acft/yr)	*75*	*73*	*83*	*81*	*80*	*75*

5.21.8 Livestock

Livestock demand is met by local water supply and Ellenburger-San Saba Aquifer groundwater and is projected to meet needs through 2080. No changes in Lampasas County Livestock water supply are recommended.

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5.22 Lee County Water Supply Plan

Table 5.22-1 lists each water user group in Lee County and their corresponding surplus or shortage in years 2030 and 2080. A brief summary of the water user groups and the plan for the selected water user are presented in the following subsections.

Table 5.22-1 Lee County Surplus (Shortage)

Water User Group	Surplus/(Shortage)		Comment
	2040 (acft/yr)	2070 (acft/yr)	
Aqua WSC	6	(48)	Region K
City of Giddings	562	634	Projected surplus
Lee County WSC	1,176	620	Projected surplus
City of Lexington	291	316	Projected surplus
Southwest Milam WSC			See Milam County
County-Other	(115)	(33)	Projected shortage – see plan below.
Manufacturing	3	7	Projected surplus
Steam-Electric	0	0	No projected demand
Mining	1,775	2,088	Projected surplus
Irrigation	359	435	Projected surplus
Livestock	163	163	Projected surplus

5.22.1 Aqua WSC

Aqua WSC is located in Lee (Brazos G) and Bastrop (Region K), Fayette (Region K), Travis (Region K), and Caldwell (Region L) Counties with a majority of its demand in Bastrop County. Aqua WSC obtains its water supply from groundwater from the Carrizo-Wilcox Aquifer.

5.22.2 City of Giddings

5.22.2.1 Description of Supply

The City of Giddings obtains its water supply from groundwater from the Carrizo-Wilcox Aquifer at 1,743 acft/yr. The City of Giddings sells water to Lee County Manufacturing at 14 acft/yr in 2030 to 18 acft/yr in 2080. There are surpluses projected through 2080.

5.22.2.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended for the City of Giddings. The entities' water usage utilized for demand projections is 188 gpcd. The RWPG recommends conservation to reduce usage to a goal of 140 gpcd.

1. Conservation:

a. Cost Source: Volume II.
b. Date to be Implemented: 2030.
c. Annual Cost: maximum of $179,208 in 2050.
d. Unit Cost: $684/acft.

Table 5.22-2 Recommended Plan Costs by Decade for City of Giddings

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	562	549	565	585	607	634
Conservation						
Supply From Plan Element (acft/yr)	88	204	262	258	252	245
Annual Cost ($/yr)	$60,192	$139,536	$179,208	$176,472	$172,368	$167,580
Projected Surplus/(Shortage) after Conservation (acft/yr)	650	753	827	843	859	879

5.22.3 Lee County WSC

Lee County WSC is located in Lee, Bastrop (Region K) and Fayette (Region K) counties. The majority of water demand is located in Lee County. The WSC obtains its water supply from groundwater from the Queen City Aquifer at 83 acft/yr in 2030 to 94 acft/yr in 2080, the Carrizo Wilcox at 3,934 acft/yr, and the Sparta Aquifer at 272 acft/yr. Balance and strategies represented in the table below are for the entire WSC in all counties and regions. No shortages are projected for the planning period.

5.22.4 City of Lexington

5.22.4.1 Description of Supply

The City of Lexington obtains its water supply from the Carrizo-Wilcox Aquifer at 667 acft/yr. No shortages are projected for the City of Lexington, surpluses are projected through 2080.

5.22.4.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended for the City of Lexington. The entities' water usage utilized for demand projections is 177 gpcd. The RWPG recommends conservation to reduce usage to a goal of 140 gpcd.

1. Conservation:
    a. Cost Source: Volume II.
    b. Date to be Implemented: 2030.
    c. Annual Cost: maximum of $48,564 in 2040.
    d. Unit Cost: $684/acft.

Table 5.22-3 Recommended Plan Costs by Decade for City of Lexington

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*291*	*286*	*292*	*299*	*308*	*316*
Conservation						
Supply From Plan Element (acft/yr)	29	71	69	68	66	65
Annual Cost ($/yr)	$19,836	$48,564	$47,196	$46,512	$45,144	$44,460
Projected Surplus/(Shortage) after Conservation (acft/yr)	*320*	*357*	*361*	*367*	*374*	*381*

5.22.5 Lee County-Other

5.22.5.1 Description of Supply

Lee County-Other receive supplies from the Carrizo-Wilcox Aquifer at 156 acft/yr. County-Other is projected to have a water supply shortage of 115 acft/yr beginning in 2030, decreasing to 33 acft/yr by 2080.

5.22.5.1 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended for Lee County-Other. Conservation was considered; however, the entity’s current per capita use rate is below the selected target rate of 140 gpcd.

1. Conservation:
   a. Cost Source: Volume II.
   b. Date to be Implemented: 2030.
   c. Annual Cost: maximum of $45,144 in 2070.
   d. Unit Cost: $426/acft.
2. Queen City Aquifer Development:
   a. Cost Source: Volume II.
   b. Date to be Implemented: 2030.
   c. Project Cost: $1,364,000.
   d. Unit Cost: $1,081/acft.
3. Sparta Aquifer Development:
   a. Cost Source: Volume II.
   b. Date to be Implemented: 2030.
   c. Project Cost: $1,271,000.
   d. Unit Cost: $1,081/acft.

Table 5.22-4 Recommended Plan Costs by Decade for Lee County-Other

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	(115)	(111)	(94)	(76)	(55)	(33)
Water Loss Reduction						
Supply From Plan Element (acft/yr)	7	7	6	5	5	5
Annual Cost ($/yr)	$2,986	$2,985	$1,800	$1,500	$45,144	$44,460
Unit Cost ($/acft)	$426	$426	$300	$300	$300	$300
Projected Surplus/(Shortage) after Water Loss Reduction (acft/yr)	(108)	(104)	(88)	(71)	(50)	(28)
Queen City Aquifer Development						
Supply From Plan Element (acft/yr)	99	99	99	99	99	99
Annual Cost ($/yr)	$107,000	$107,000	$11,000	$11,000	$11,000	$11,000
Unit Cost ($/acft)	$1,081	$1,081	$111	$111	$111	$111
Sparta Aquifer Development						
Supply From Plan Element (acft/yr)	10	10	10	10	10	10
Annual Cost ($/yr)	$97,000	$97,000	$8,000	$8,000	$8,000	$8,000
Unit Cost ($/acft)	$9,700	$9,700	$800	$800	$800	$800
Projected Surplus/(Shortage) after recommended WMS (acft/yr)	1	5	21	38	59	81

5.22.6 Manufacturing

Manufacturing is supplied from City of Giddings at 14 to 18 acft/yr and is projected to have a surplus of water through the year 2080 and no changes in water supply are recommended.

5.22.7 Steam-Electric

No Steam-Electric demand exists nor is there a water supply surplus or shortage projected for the county.

5.22.8 Mining

5.22.8.1 Description of Supply

Mining operations in Lee County are supplied water from the Carrizo-Wilcox at 3,011 to 3,324 acft/yr from 2030 to 2080 and is projected to have a surplus of water through the year 2080No changes in water supply are recommended.

5.22.9 Irrigation

Lee County Irrigation is supplied from run-of-the river water rights at 1 acft/yr, the Carrizo-Wilcox Aquifer at 780 to 783 acft/yr from 2030 to 2080, and the Queen City Aquifer at 518 to 591 acft/yr from 2030 to 2080. Irrigation is projected to have a surplus of water through the year 2080 and no changes in water supply are recommended.

5.22.10 Livestock

Livestock water supply is projected to meet demands through 2080 and no changes in water supply are recommended.

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5.23 Limestone County Water Supply Plan

Table 5.23-1 lists each water user group in Limestone County and their corresponding surplus or shortage in years 2030 and 2080. A brief summary of the water user groups and the plan for the selected water user are presented in the following subsections.

Table 5.23-1 Limestone County Surplus (Shortage)

Water User Group	Surplus/(Shortage)		Comment
	2040 (acft/yr)	2070 (acft/yr)	
Birome WSC			See Hill County
Bistone MWSD	32	(192)	Projected shortage – see plan below.
City of Coolidge	229	123	Projected surplus
City of Groesbeck	(585)	(499)	Projected shortage - see plan below.
City of Mart			See McLennan County
City of Mexia	(987)	(785)	Projected shortage - see plan below.
Point Enterprise WSC	0	0	Region C
Post Oak SUD			See Hill County
Prairie Hill WSC	(102)	(57)	Projected shortages – see plan below.
SLC WSC	99	92	Projected surplus
Tri-County SUD	590	674	Projected surplus
White Rock WSC	108	163	Projected surplus
County-Other	29	69	Projected surplus
Manufacturing	(227)	(273)	Projected shortage - see plan below.
Steam-Electric	(989)	(3,877)	Projected shortage - see plan below.
Mining	(3,029)	(2,228)	Projected shortage - see plan below.
Irrigation	21	21	Projected surplus
Livestock	235	235	Projected surplus

5.23.1 Bistone Municipal Water Supply District

5.23.1.1 Description of Supply

Bistone Municipal Water Supply District obtains its water supply through groundwater production from the Carrizo-Wilcox Aquifer with a production capacity of 1,052 acft/yr and has been MAG limited 292 acft/yr in 2030 and 391 acft/yr in 2080, through diversions of surface water from Lake Mexia under water rights held by the District, and through purchases of treated surface water under contract with the City of Mexia. Available supply through treated water purchases from the City of Mexia is projected at 28 acft/yr. Water supply obtained through surface water diversions by the District is projected to have an availability of 1,002 acft/yr at the beginning of the planning period, which will decrease to 502 acft/yr by 2080.

Bistone Municipal Water Supply District also provides sales of treated surface water under contract with the City of Coolidge, White Rock Water SUD, and Mexia State School which is grouped within the Limestone County-Other WUG. Additionally, the Bistone Municipal Water Supply District provides sales of Carrizo-Wilcox groundwater produced by the District to the City of Mexia. Shortages in water supply are projected for Bistone Municipal Water Supply District starting in 2040.

5.23.1.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended for the Bistone Municipal Water Supply District. The entities' water usage utilized for demand projections is 419 gpcd. The RWPG recommends conservation to reduce usage to a goal of 140 gpcd. The remaining unmet need in 2040 through 2080 results from contracts not being fully allocated is a result of the conservative methodology of determining source supply volumes. Additionally, the MAG in Limestone County is much lower for this planning round due to an error that did not account for existing pumping in the county when the MAG was derived. Unmet needs resulting from MAG-limited existing supplies originating from Limestone County are, for the purposes of this plan, not considered a true unmet need due to the error.

1. Conservation:
   a. Cost Source: Volume II.
   b. Date to be Implemented: 2030.
   c. Annual Cost: maximum of $80,028 in 2080.
   d. Unit Cost: $684/acft.

Table 5.23-2 Recommended Plan Costs by Decade for Bistone Municipal Water Supply District

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*32*	*(55)*	*(139)*	*(143)*	*(122)*	*(192)*
Conservation						
Supply From Plan Element (acft/yr)	23	45	66	86	102	117
Annual Cost ($/yr)	$15,732	$30,780	$45,144	$58,824	$69,768	$80,028
Projected Surplus/(Shortage) after Conservation (acft/yr)	*55*	*(10)*	*(73)*	*(57)*	*(20)*	*(75)*

5.23.2 City of Coolidge

5.23.2.1 Description of Supply

The City of Coolidge obtains its water supply through purchases of treated surface water under contracts with the Bistone Municipal Water Supply District at 225 acft/yr and Post Oak SUD at 191 acft/yr in 2030 to 239 acft/yr in 2080; water provided by Post Oak SUD is sourced within Region C. Total treated water supplies available to the City are projected to range between 263 acft/yr in 2080 to 430 acft/yr in 2040. No shortages are projected for the City of Coolidge during the planning period and no change is recommended to water supply.

5.23.2.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, and in coordination with Region C, the following water management strategies are recommended for the City of Coolidge. The entities' water usage utilized for demand projections is 174 gpcd. The RWPG recommends conservation to reduce usage to a goal of 140 gpcd.

1. Conservation:
   a. Cost Source: Volume II.
   b. Date to be Implemented: before 2030.
   c. Annual Cost: maximum of $15,732 in 2040.
   d. Unit Cost: $684/acft.

Table 5.23-3 Recommended Plan Costs by Decade for City of Coolidge

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*229*	*254*	*252*	*173*	*125*	*123*
Conservation						
Supply From Plan Element (acft/yr)	10	23	23	22	21	20
Annual Cost ($/yr)	$6,840	$15,732	$15,732	$15,048	$14,364	$13,680
Projected Surplus/(Shortage) after Conservation (acft/yr)	*239*	*277*	*275*	*195*	*146*	*143*

5.23.3 City of Groesbeck

5.23.3.1 Description of Supply

The City of Groesbeck obtains its water supply through diversions from the Navasota River; however, no surface water supplies are projected as being available to the City during the planning period. The City owns senior water rights (priority date of 1921) on the Navasota River and has limited storage available from Springfield Lake. The City has purchased a quarry to temporarily store water supply to manage the most recent drought. However; until a permanent solution is identified, the City of Groesbeck is projected to have shortages.

5.23.3.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to meet the projected water shortage for the City of Groesbeck. Conservation was considered; however, the entity's usage is below the selected goal of 140 gpcd. Needs remain unmet in 2030. These needs will only occur during a drought equivalent or worse than the drought of record. While not a strategy recommended by the Brazos G RWPG, the impacts of the unmet needs can be mitigated through demand management in the event of a serious drought prior to the recommended strategies coming online.

1. Conservation:
   a. Cost Source: Volume II.
   b. Date to be Implemented: 2030.
   c. Annual Cost: maximum of $51,300 in 2040
   d. Unit Cost: $684/acft
2. Water Loss Reduction:
   a. Cost Source: Volume II.
   b. Date to be Implemented: 2030.
   c. Annual Cost: maximum of $7,495 in 2030
   d. Unit Cost: $1,589/acft
3. Groesbeck Off-Channel Reservoir:
   a. Cost Source: Volume II.
   b. Date to be Implemented: 2030.
   c. Project Cost: $35,278,000.
   d. Unit Cost: maximum of $1,624/acft.

Table 5.23-4 Recommended Plan Costs by Decade for City of Groesbeck

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*(585)*	*(569)*	*(551)*	*(534)*	*(517)*	*(499)*
Conservation						
Supply From Plan Element (acft/yr)	43	75	73	71	69	66
Annual Cost ($/yr)	$29,412	$51,300	$49,932	$48,564	$47,196	$45,144
Water Loss Reduction						
Supply From Plan Element (acft/yr)	5	5	5	5	5	5
Annual Cost ($/yr)	$7,945	$7,945	$1,500	$1,500	$1,500	$1,500
Unit Cost ($/acft)	$1,589	$1,589	$300	$300	$300	$300
Projected Surplus/(Shortage) after Conservation and Water Loss Reduction (acft/yr)	*(537)*	*(489)*	*(473)*	*(458)*	*(443)*	*(428)*
Groesbeck OCR						
Supply From Plan Element (acft/yr)	—	1,750	1,750	1,750	1,750	1,750
Annual Cost ($/yr)	—	$2,842,000	$2,842,000	$1,186,000	$1,186,000	$641,000
Unit Cost ($/acft)	—	$1,624	$1,624	$678	$678	$366
Projected Surplus/(Shortage) after recommended WMS (acft/yr)	*(537)*	*1,261*	*1,277*	*1,292*	*1,307*	*1,322*

5.23.4 City of Mexia

5.23.4.1 Description of Supply

The City of Mexia obtains its water supply through contracted purchases of Carrizo-Wilcox groundwater produced by the Bistone Municipal Water Supply District, which is projected to provide 2,067 acft/yr of available supply at the beginning of the planning period and decreasing to 1,615 acft/yr in 2080. The City also provides sales of treated water to the Bistone Municipal Water Supply District, White Rock Water SUD, Manufacturing entities in Limestone County, and the City of Wortham (Region C). Additionally, the City sells Carrizo-Wilcox groundwater purchased from the Bistone Municipal Water District to County-Other users in Limestone County, including the City of Shiloh and the 84 West WSC. Shortages in available water supply for the City are projected to start in 2030.

5.23.4.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to meet the projected water shortage for the City of Mexia. Conservation is not recommended because the entity's usage is 133 gpcd, which is below the selected goal of 140 gpcd. The City’s contractual supply is sufficient to meet demands in all decades. The remaining unmet need reported, results from contracts not being fully allocated as a result of the conservative methodology of determining source supply volumes. Specifically, the MAG in Limestone County is much lower for this planning round due to an error that did not account for existing pumping in the county when the MAG was derived. Unmet needs resulting from MAG limited existing supplies originating from Limestone County are, for the purposes of this plan, not considered a true unmet need due to the error.

1. Water Loss Reduction:
   a. Cost Source: Volume II.
   b. Date to be Implemented: 2030.
   c. Annual Cost: maximum of $286,599 in 2030
   d. Unit Cost: $1,332/acft
2. Carrizo Aquifer Development – Bistone MWSD:
   a. Cost Source: Volume II, Chapter 14.
      i. Project requires Bistone Municipal Water Supply District to develop additional Carrizo-Wilcox groundwater supply.
   b. Date to be Implemented: before 2060.
   c. Annual Cost: maximum of $130,680.
   d. Unit Cost: $359/acft.

Table 5.23-5 Recommended Plan Costs by Decade for City of Mexia

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*(987)*	*(942)*	*(890)*	*(855)*	*(826)*	*(785)*
Water Loss Reduction						
Supply From Plan Element (acft/yr)	220	213	205	198	190	182
Annual Cost ($/yr)	$286,599	$283,639	$86,673	$83,714	$80,331	$76,949
Unit Cost ($/acft)	$1,303	$1,332	$423	$423	$423	$423
Projected Surplus/(Shortage) after Water Loss Reduction (acft/yr)	*(767)*	*(729)*	*(685)*	*(657)*	*(636)*	*(603)*

5.23.5 Point Enterprise WSC

Point Enterprise WSC's service area includes portions of Limestone and Freestone Counties (Region C). Point Enterprise WSC obtains water supply through groundwater production from the Carrizo-Wilcox Aquifer. The full water plan for Point Enterprise WSC is discussed in the 2026 Region C Water Plan.

5.23.6 Prairie Hill WSC

5.23.6.1 Description of Supply

Prairie Hill WSC obtains its water supply solely through groundwater production from the Carrizo-Wilcox Aquifer, which is has the capacity to provide 406 acft/yr of supply. Prairie Hill WSC's production capacity is sufficient to meet projected demands throughout the planning horizon, however, due to MAG limitations the projected supply is 62 acft/yr in 2030 to 95 acft/yr in 2080. Considerable shortages are projected for Prairie Hill WSC.

Various entities are dealing with elevated levels of arsenic in groundwater supplies and have been pursuing water management strategies through the FHLM WSC. Through a TWDB sponsored study coordinated by FHLM WSC, these entities have considered a regional brackish RO WTP in Limestone County, Carrizo-Wilcox Regional Groundwater in Limestone County, Tehuacana Reservoir, and supplies from City of Marlin (Brushy Creek Reservoir), and City of Waco. The recommended strategy is to provide arsenic treatment for individual entities. This strategy does not provide new supplies.

5.23.6.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to meet the projected water shortage for Prairie Hill WSC. The entities' water usage utilized for demand projections is 183 gpcd. The RWPG recommends conservation to reduce usage to a goal of 140 gpcd. The MAG in Limestone County is much lower for this planning round due to an error that did not account for existing pumping in the county when the MAG was derived. Unmet needs resulting from MAG limited existing supplies originating from Limestone County are, for the purposes of this plan, not considered a true unmet need due to the error.

1. Conservation:
    a. Cost Source: Volume II.
    b. Date to be Implemented: before 2030.
    c. Annual Cost: maximum of $53,352 in 2080.
    d. Unit Cost: $684/acft.
2. Upgrade Treatment for Arsenic:
    a. Cost Source: Volume II.
    b. Date to be Implemented: before 2030.
    c. Project Cost: $1,538,000.
    d. Unit Cost: maximum of $1,164/acft.

Table 5.23-6 Recommended Plan Costs by Decade for Prairie Hill WSC

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*(215)*	*(226)*	*(230)*	*(240)*	*(250)*	*(272)*
Conservation						
Supply From Plan Element (acft/yr)	21	53	65	71	74	78
Annual Cost ($/yr)	$14,364	$36,252	$44,460	$48,564	$50,616	$53,352
Projected Surplus/(Shortage) after Conservation (acft/yr)	*(194)*	*(173)*	*(165)*	*(169)*	*(176)*	*(194)*
Upgrade Treatment for Arsenic						
Supply From Plan Element (acft/yr)	0	0	0	0	0	0
Annual Cost ($/yr)	$312,000	$312,000	$204,000	$204,000	$204,000	$204,000
Unit Cost[1] ($/acft)	$1,164	$1,164	$761	$761	$761	$761
Projected Surplus/(Shortage) after recommended WMS (acft/yr)	*(194)*	*(173)*	*(165)*	*(169)*	*(176)*	*(194)*

5.23.7 SLC WSC

SLC WSC obtains its water supply through purchases of raw surface water under contract from the Brazos River Authority. The surface water purchases are projected to provide a constant 200 acft/yr. No shortages in water supply are projected for SLC WSC through the planning period and no change in supply is recommended. Conservation was also considered; however, the entity's usage of 95 gpcd is below the selected goal of 140 gpcd.

[1] Unit cost based on strategy treatment capacity of 268 acft/yr of existing supply.

5.23.8 Tri-County SUD

5.23.8.1 Description of Supply

Tri-County SUD sources its water supply through groundwater production from the Trinity and Carrizo-Wilcox Aquifers in Falls County, and from the Carrizo-Wilcox Aquifer in Robertson County. The total groundwater supply available for production by the SUD is projected to be 1,032 acre-feet per year during the planning period, with 575 acre-feet per year from the Carrizo-Wilcox Aquifer and 457 acre-feet per year from the Trinity Aquifer No water supply shortages are projected and no change in supply is recommended for Tri-County SUD.

5.23.8.1 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended for Tri-County SUD. The most recent water loss audit report shows a water loss of approximately 24% and recommends water loss mitigation. Conservation is not recommended because the entity's usage is 116 gpcd, which is below the selected goal of 140 gpcd.

1. Water Loss Reduction:
    a. Cost Source: Volume II.
    b. Date to be Implemented: 2030.
    c. Annual Cost: maximum of $302,519 in 2030
    d. Unit Cost: $7,195/acft

Table 5.23-7 Recommended Plan Costs by Decade for City of Coolidge

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*590*	*605*	*623*	*639*	*656*	*674*
Water Loss Reduction						
Supply From Plan Element (acft/yr)	43	42	40	38	37	35
Annual Cost ($/yr)	$302,519	$302,183	$13,456	$12,783	$12,447	$11,774
Unit Cost ($/acft)	$7,035	$7,195	$336	$336	$336	$336
Projected Surplus/(Shortage) after Conservation (acft/yr)	*633*	*647*	*663*	*677*	*693*	*709*

5.23.9 White Rock Water SUD

White Rock Water SUD obtains its water supply through purchases of treated water under contracts with the Bistone Municipal Water Supply District at 274 acft/yr and the City of Mexia at 487 acft/yr. These contracts are projected to provide a constant 761 acft/yr of supply through the planning period. Shortages in water supply are projected for White Rock Water SUD during the planning period. The City’s contractual supply is sufficient to meet demands in all decades. The remaining unmet need reported, results from contracts not being fully allocated as a result of the conservative methodology of determining source supply volumes. Specifically, the MAG in Limestone County is much lower for this planning round due to an error that did not account for existing pumping in the county when the MAG was derived. Unmet needs resulting from MAG limited existing supplies originating from Limestone County are, for the purposes of this plan, not considered a true unmet need due to the error.

Conservation was considered and is not recommended because the entity's usage is 101 gpcd, which is below the selected goal of 140 gpcd.

Table 5.23-8 Unmet Needs for White Rock Water SUD

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*(217)*	*(210)*	*(201)*	*(193)*	*(185)*	*(176)*

5.23.10 County-Other

5.23.10.1 Description of Supply

Entities in County-Other obtain water supply through local groundwater production from the Carrizo-Wilcox Aquifer, through purchases of groundwater from the City of Mexia by 84 West WSC and the City of Shiloh, and through purchases of treated surface water from the Bistone Municipal Water Supply District by the Mexia State School. Groundwater supplies available for local production are projected at 39 acft/yr in 2030, increasing to 59 acft/yr by 2080. Purchases of groundwater and treated surface water are projected to provide 280 acft/yr in 2030, decreasing to 279 acft/yr by 2080. No supply shortages are projected and no change in water supply is recommended. Conservation was also considered; however, the entity’s usage is below the selected goal of 140 gpcd.

5.23.11 Manufacturing

5.23.11.1 Description of Supply

Limestone County Manufacturing obtains its water supply through purchases of treated water from the City of Mexia and City of Groesbeck and through purchases of groundwater from the City of Coolidge. Manufacturing in the County is projected to experience water supply shortages beginning in 2030 at 227 acft/yr, increasing to 273 acft/yr by 2080. The remaining unmet need reported, results from contracts not being fully allocated as a result of the conservative methodology of determining source supply volumes. Specifically, the MAG in Limestone County is much lower for this planning round due to an error that did not account for existing pumping in the county when the MAG was derived. Unmet needs resulting from MAG limited existing supplies originating from Limestone County are, for the purposes of this plan, not considered a true unmet need due to the error.

5.23.11.2 Recommended Strategy

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended for Limestone County-Manufacturing. Conservation is recommended.

1. Conservation:
   a. Cost Source: Volume II.
   b. Date to be Implemented: before 2030.
   c. Annual Cost: not determined.

2. Carrizo-Wilcox Aquifer Development:
   a. Cost Source: Volume II.
   b. Date to be Implemented: before 2030.
   c. Project Cost: $2,347,000.
   d. Unit Cost: maximum of $758/acft.

Table 5.23-9 Recommended Plan Costs by Decade for the Limestone County - Manufacturing

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*(227)*	*(236)*	*(245)*	*(253)*	*(262)*	*(273)*
Conservation						
Supply From Plan Element (acft/yr)	7	13	19	19	21	22
Annual Cost ($/yr)	ND	ND	ND	ND	ND	ND
Projected Surplus/(Shortage) after Conservation	*(220)*	*(223)*	*(226)*	*(234)*	*(241)*	*(251)*
Groundwater Development – Carrizo-Wilcox Aquifer						
Supply From Plan Element (acft/yr)	0	0	0	0	0	0
Annual Cost ($/yr)	$238,000	$238,000	$73,000	$73,000	$73,000	$73,000
Unit Cost[2] ($/acft)	$758	$758	$232	$232	$232	$232
Projected Surplus/(Shortage) after recommended WMS (acft/yr)	*(220)*	*(223)*	*(226)*	*(234)*	*(241)*	*(251)*

Notes:
(1) ND – Not determined. Costs to implement industrial conservation technologies will vary based on each location.

5.23.12 Steam-Electric

5.23.12.1 Description of Supply

Steam-Electric water demand in Limestone County is associated with the NRG (formerly Reliant Energy) power plant located at Lake Limestone. NRG has contracted with the Brazos River Authority for up to 21,837 acft/yr of raw water supply through purchases of raw water from Lake Limestone. Additionally, NRG utilizes local groundwater produced from the Carrizo-Wilcox Aquifer; this supply is projected to provide an additional 110 acft/yr of water supply in 2030, increasing to 171 acft/yr by 2080. Limestone County Steam-Electric is projected to have shortages from 2030 through the year 2080. The remaining unmet need reported, results from contracts not being fully allocated as a result of the conservative methodology of determining source supply volumes. Specifically, the MAG in Limestone County is much lower for this planning round due to an error that did not account for existing pumping in the county when the MAG was derived. Unmet needs resulting from MAG limited existing supplies originating from Limestone County are, for the purposes of this plan, not considered a true unmet need due to the error.

[2] Unit cost is based on strategy yield of 314 acft/yr, however strategy is MAG limited.

5.23.12.2 Recommended Strategy

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to meet water needs for Limestone County-Mining. The Brazos G RWPG does not recommend conservation for Steam-Electric use.

1. Carrizo-Wicox Aquifer Development:
   a. Cost Source: Volume II.
   b. Date to be Implemented: before 2030.
   c. Project Cost: $2,281,000.
   d. Unit Cost: maximum of $534/acft.

Table 5.23-10 Recommended Plan Costs by Decade for Limestone County - Steam-Electric

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*(989)*	*(1,173)*	*(1,904)*	*(2,594)*	*(3,244)*	*(3,877)*
Groundwater Development - Carrizo-Wilcox Aquifer						
Supply From Plan Element (acft/yr)	0	0	0	0	0	0
Annual Cost ($/yr)	$207,000	$207,000	$46,000	$46,000	$46,000	$46,000
Unit Cost[3] ($/acft)	$534	$534	$119	$119	$119	$119

5.23.13 Mining

5.23.13.1 Description of Supply

Mining operations in Limestone County are supplied by Carrizo-Wilcox groundwater. Demands for Mining exceed current supplies resulting in shortages beginning in 2030.

5.23.13.2 Recommended Strategy

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to meet water needs for Limestone County-Mining. Conservation is recommended.

1. Conservation:
   a. Cost Source: Volume II.
   b. Date to be Implemented: before 2030.
   c. Annual Cost: not determined.
2. Leave Needs Unmet:
   a. Mining activity in Limestone County has slowed down since the release of the most recent demand projections and current mine operations are focused on reclamation. Projected demands and corresponding shortages are not anticipated to be realized during the planning period.
   b. Cost Source: Cost of not meeting needs – see Appendix G.
   c. Date to be Implemented: before 2030.

[3] Unit cost is based on strategy yield of 388 acft/yr, however strategy is MAG limited.

Table 5.23-11 Recommended Plan Costs by Decade for Limestone County - Mining

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*(3,029)*	*(3,073)*	*(3,120)*	*(3,146)*	*(2,157)*	*(2,228)*
Conservation						
Supply From Plan Element (acft/yr)	106	181	262	268	204	209
Annual Cost ($/yr)	ND	ND	ND	ND	ND	ND
Projected Surplus/(Shortage) after Conservation (acft/yr)	*(2,923)*	*(2,892)*	*(2,858)*	*(2,878)*	*(1,953)*	*(2,019)*
Leave Needs Unmet (acft/yr)	(2,923)	(2,892)	(2,858)	(2,878)	(1,953)	(2,019)

Notes:
(1) ND – Not determined. Costs to implement industrial conservation technologies will vary based on each location.

5.23.14 Irrigation

Irrigation in Limestone County obtains water supply through local groundwater production from the Carrizo-Wilcox Aquifer and through purchases of surface water from Limestone County-Other entities. Irrigation is projected to have a surplus of water supply throughout the planning period. No change in water supply is recommended.

5.23.15 Livestock

Water supply for Livestock in Limestone County is obtained from local stock surface water impoundments, which are projected to meet demands through the planning period. No change in water supply is recommended.

5.24 McLennan County Water Supply Plan

Table 5.24-1 lists each water user group in McLennan County and their corresponding surplus or shortage in years 2030 and 2080. A brief summary of the water user groups and the plan for the selected water user are presented in the following subsections.

Table 5.24-1 McLennan County Surplus (Shortage)

Water User Group	Surplus/Shortage		Comment
	2030 (acft/yr)	2080 (acft/yr)	
Axtell WSC	(16)	(228)	Projected shortage – see plan below.
City of Bellmead	1,605	1,708	Projected surplus
Birome WSC			See Hill County
Bold Springs WSC	827	766	Projected surplus
City of Bruceville-Eddy	(89)	(555)	Projected shortage – see plan below.
Central Bosque WSC	101	109	Projected surplus
Chalk Bluff WSC	125	(270)	Projected shortage – see plan below.
Coryell City Water Supply District			See Coryell County
City of Crawford	(79)	(220)	Projected shortage – see plan below.
Cross Country WSC	32	(359)	Projected shortage – see plan below.
East Crawford WSC	(116)	(197)	Projected shortage – see plan below.
Elm Creek WSC			See Bell County
EOL WSC	140	36	Projected surplus
Gholson WSC	81	(287)	Projected shortage – see plan below.
H&H WSC	100	59	Projected surplus
City of Hewitt	(740)	(729)	Projected shortage – see plan below.
Highland Park WSC			See Bosque County
Hilltop WSC	308	291	Projected surplus
Hog Creek WSC	(128)	(116)	Projected shortage – see plan below.
City of Lacy-Lakeview	98	0	Projected surplus
Leroy Tours Gerald WSC	190	140	Projected surplus
Levi WSC	27	(73)	Projected shortage – see plan below.
City of Lorena	409	292	Projected surplus
City of Mart	(268)	(98)	Projected shortage – see plan below.
City of McGregor	(253)	(1,011)	Projected shortage – see plan below.
McLennan County WCID 2	483	586	Projected surplus
City of Moody	324	133	Projected surplus
North Bosque WSC	121	(370)	Projected shortage – see plan below.
Prairie Hill WSC			See Limestone County
City of Riesel	150	99	Projected surplus

Water User Group	Surplus/Shortage		Comment
	2030 (acft/yr)	2080 (acft/yr)	
City of Robinson	454	(2,623)	Projected shortage – see plan below.
Ross WSC	382	187	Projected surplus
Spring Valley WSC	20	(298)	Projected shortage – see plan below.
Texas State Technical College	(336)	(335)	Projected shortage – see plan below.
City of Valley Mills			See Bosque County
City of Waco	(5,925)	(26,900)	Projected shortage – see plan below.
City of West	982	897	Projected surplus
West Brazos WSC			See Falls County
Windsor Water	126	97	Projected surplus
City of Woodway	(545)	411	Projected shortage – see plan below.
County-Other	47	(376)	Projected shortage – see plan below.
Manufacturing	(1,111)	(747)	Projected shortage – see plan below.
Steam-Electric	27,818	27,758	Projected surplus
Mining	375	266	Projected surplus
Irrigation	(265)	(265)	Projected shortage – see plan below.
Livestock	453	453	Projected surplus

5.24.1 Axtell WSC

5.24.1.1 Description of Supply

Axtell WSC obtains its water supply from the Trinity Aquifer at 287 acft/yr. A shortage is projected beginning in 2030 of 16 acft/yr, increasing to 228 acft/yr by 2080.

5.24.1.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended for Axtell WSC. The entities' water usage utilized for demand projections is 157 gpcd. The RWPG recommends conservation to reduce usage to a goal of 140 gpcd. To reduce arsenic concentrations, Axtell plans to purchase treated water to blend with water purchased from the City of Waco. This purchase may be made through the FHLM WSC.

1. Conservation:
    a. Cost Source: Volume II.
    b. Date to be Implemented: 2030.
    c. Annual Cost: maximum of $28,044 in 2080
    d. Unit Cost: $684/acft
2. Purchase water from City of Waco to blend to reduce arsenic concentrations:
    a. Cost Source: Volume II.
    b. Date to be Implemented: 2030.

   c. Unit Cost: assumed unit cost of $3,273/acft ($10.15/1,000 gallons) for wholesale treated water, including transmission costs.

3. Groundwater Development – Trinity Aquifer:
   a. Cost Source: Volume II.
   b. Date to be Implemented: 2060.
   c. Project Cost: $3,484,000
   d. Unit Cost: $2,770/acft

Table 5.24-2 Recommended Plan Costs by Decade for Axtell WSC

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*(16)*	*(58)*	*(100)*	*(143)*	*(186)*	*(228)*
Conservation						
Supply From Plan Element (acft/yr)	25	27	30	34	38	41
Annual Cost ($/yr)	$17,100	$18,468	$20,520	$23,256	$25,992	$28,044
Projected Surplus/(Shortage) after Conservation (acft/yr)	*9*	*(31)*	*(70)*	*(109)*	*(148)*	*(187)*
Purchase water from the City of Waco for Arsenic Blending						
Supply From Plan Element (acft/yr)	86	90	94	99	104	104
Annual Cost ($/yr)	$281,478	$294,570	$307,662	$324,027	$340,392	$340,392
Unit Cost ($/acft)	$3,273	$3,273	$3,273	$3,273	$3,273	$3,273
Groundwater Development – Trinity Aquifer						
Supply From Plan Element (acft/yr)	–	–	–	100	50	83
Annual Cost ($/yr)	–	–	–	$277,000	$277,000	$32,000
Unit Cost ($/acft)	–	–	–	$2,770	$5,540	$386
Projected Surplus/(Shortage) after recommended WMS (acft/yr)	*9*	*(31)*	*(70)*	*90*	*6*	*0*

5.24.2 City of Bellmead

5.24.2.1 Description of Supply

The City of Bellmead obtains its water supply from the Trinity Aquifer at 1,702 acft/yr beginning in 2030, increasing to 2,000 acft/yr by 2080. The City of Bellmead also has contracted with the City of Waco at 1,344 acft/yr for supplemental surface water supply from Lake Waco, but has no plans to utilize the contract. No shortages are projected for the City of Bellmead; however, the City of Waco and the City of Bellmead are considering alternative water supplies in order to reduce Bellmead's dependence on Trinity Aquifer groundwater. The purchase of supplemental reuse water from WMARSS is recommended to reduce demands on the Trinity Aquifer.

5.24.2.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended for the City of Bellmead. Conservation is not recommended because the entity's usage is 120 gpcd, which is below the selected goal of 140 gpcd.

1. Purchase reuse water from WMARSS (Bellmead/Lacy-Lakeview Reuse). The reuse supply will reduce demands for landscape irrigation at existing or future parks, schools, ball fields, and other green spaces. Reuse water may also potentially supply existing or future industrial customers.
   a. Cost Source: Volume II.
   b. Date to be Implemented: by 2030.
   c. Project Cost: None. City of Waco is the project sponsor. Entity will purchase from the City.
   d. Unit Cost: $731/acft.

Table 5.24-3 Recommended Plan Costs by Decade for City of Bellmead

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*559*	*518*	*475*	*444*	*407*	*364*
WMARSS Bellmead/Lacy Lakeview Reuse						
Supply From Plan Element (acft/yr)	1,121	1,121	1,121	1,121	1,121	1,121
Annual Cost ($/yr)	$1,637,000	$1,637,000	$383,000	$383,000	$383,000	$383,000
Unit Cost ($/acft)	$731	$731	$171	$171	$171	$171
Projected Surplus/(Shortage) after recommended WMS (acft/yr)	*1,680*	*1,639*	*1,596*	*1,565*	*1,528*	*1,485*

5.24.3 Bold Springs WSC

Bold Springs WSC obtains its water supply from the Trinity Aquifer at 613 acft/yr and surface water from the City of Waco at 560 acft/yr. No shortages are projected for Bold Springs WSC and no change in water supply is recommended. Conservation is not recommended because the entity's usage is 135 gpcd, which is below the selected goal of 140 gpcd.

5.24.4 City of Bruceville-Eddy

5.24.4.1 Description of Supply

The City of Bruceville-Eddy obtains its water supply from the Trinity Aquifer (832 acft/yr) and has a contract for surface water from Bluebonnet WSC at 938 acft/yr which supplies 908 acft/yr in 2030 and 878 acft/yr in 2080. A shortage is projected beginning in 2030 of 41 acft/yr, increasing to 744 acft/yr by 2080. This WUG is located in multiple counties (McLennan and Falls). The shortages shown in the table below represent the cumulative totals for the City of Bruceville-Eddy.

5.24.4.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended for Bruceville-Eddy. The entities' water usage utilized for demand projections is 245 gpcd. The RWPG recommends conservation to reduce usage to a goal of 140 gpcd.

2. Conservation:
   a. Cost Source: Volume II.
   b. Date to be Implemented: 2030.
   c. Annual Cost: maximum of $698,364 in 2080.
   d. Unit Cost: $684/acft.

Table 5.24-4 Recommended Plan Costs by Decade for City of Bruceville-Eddy

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*(41)*	*(162)*	*(296)*	*(438)*	*(589)*	*(744)*
Conservation						
Supply From Plan Element (acft/yr)	142	344	570	833	956	1,021
Annual Cost ($/yr)	$97,128	$235,296	$389,880	$569,772	$653,904	$698,364
Projected Surplus/(Shortage) after Conservation	*101*	*182*	*274*	*395*	*367*	*277*

5.24.5 Central Bosque WSC

5.24.5.1 Description of Supply

Central Bosque WSC obtains its water supply at 135 acft/yr in 2030 to 164 acft/yr in 2080 from a contract with McGregor and 112 acft/yr from a contract with Waco. No shortages are projected for Central Bosque WSC.

5.24.5.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended for Central Bosque WSC. The entities' water usage utilized for demand projections is 161 gpcd. The RWPG recommends conservation to reduce usage to a goal of 140 gpcd.

1. Conservation:
   a. Cost Source: Volume II.
   b. Date to be Implemented: 2030.
   c. Annual Cost: maximum of $11,628 in 2070.
   d. Unit Cost: $684/acft.

Table 5.24-5 Recommended Plan Costs by Decade for Central Bosque WSC

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*101*	*101*	*104*	*110*	*113*	*109*
Conservation						
Supply From Plan Element (acft/yr)	10	15	15	15	17	17
Annual Cost ($/yr)	$6,840	$10,260	$10,260	$10,260	$11,628	$11,628
Projected Surplus/(Shortage) after Conservation	*111*	*116*	*119*	*125*	*130*	*126*

5.24.6 Chalk Bluff WSC

5.24.6.1 Description of Supply

Chalk Bluff WSC obtains its water supply from the Trinity Aquifer at 715 acft/yr. A shortage is projected beginning in 2050 of 31 acft/yr, increasing to 270 acft/yr by 2080.

5.24.6.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended for Chalk Bluff WSC. The entities' water usage utilized for demand projections is 147 gpcd. The RWPG recommends conservation to reduce usage to a goal of 140 gpcd.

1. Conservation:
   a. Cost Source: Volume II.
   b. Date to be Implemented: 2030.
   c. Annual Cost: maximum of $8,892 in 2080.
   d. Unit Cost: $684/acft.
2. Groundwater Development – Trinity Aquifer:
   a. Cost Source: Volume II.
   b. Date to be Implemented: by 2050.
   c. Project Cost: $2,471,000.
   d. Unit Cost: $733/acft.

Table 5.24-6 Recommended Plan Costs by Decade for Central Bosque WSC

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*125*	*48*	*(31)*	*(111)*	*(190)*	*(270)*
Conservation						
Supply From Plan Element (acft/yr)	10	9	9	11	12	13
Annual Cost ($/yr)	$6,840	$6,156	$6,156	$7,524	$8,208	$8,892
Projected Surplus/(Shortage) after Conservation	*135*	*57*	*(22)*	*(100)*	*(178)*	*(257)*
Groundwater Development – Trinity Aquifer						
Supply From Plan Element (acft/yr)	–	–	100	100	300	257
Annual Cost ($/yr)	–	–	$232,000	$232,000	$58,000	$58,000
Unit Cost ($/acft)	–	–	$2,320	$2,320	$193	$226
Projected Surplus/(Shortage) after recommended WMS (acft/yr)	*135*	*57*	*78*	*0*	*2*	*0*

5.24.7 City of Crawford

5.24.7.1 Description of Supply

The City of Crawford obtains its water supply from the Trinity Aquifer at 126 acft/yr. A shortage is projected beginning in 2030 of 79 acft/yr, increasing to 220 acft/yr by 2080.

5.24.7.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended for the City of Crawford. The entities' water usage utilized for demand projections is 212 gpcd. The RWPG recommends conservation to reduce usage to a goal of 140 gpcd.

1. Conservation:
   a. Cost Source: Volume II.
   b. Date to be Implemented: before 2030.
   c. Annual Cost: maximum of $75,924 in 2080.
   d. Unit Cost: $684/acft.
2. Groundwater Development – Trinity Aquifer:
   a. Cost Source: Volume II.
   b. Date to be Implemented: by 2030.
   c. Project Cost: $1,018,000.
   d. Unit Cost: $818/acft.

Table 5.24-7 Recommended Plan Costs by Decade for City of Crawford

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*(79)*	*(106)*	*(130)*	*(157)*	*(187)*	*(220)*
Conservation						
Supply From Plan Element (acft/yr)	16	41	72	91	100	111
Annual Cost ($/yr)	$10,944	$28,044	$49,248	$62,244	$68,400	$75,924
Projected Surplus/(Shortage) after Conservation	*(63)*	*(65)*	*(58)*	*(66)*	*(87)*	*(109)*
Groundwater Development – Trinity Aquifer						
Supply From Plan Element (acft/yr)	*110*	*110*	*110*	*110*	*110*	*109*
Annual Cost ($/yr)	$90,000	$90,000	$18,000	$18,000	$18,000	$18,000
Unit Cost ($/acft)	$818	$818	$164	$164	$164	$164
Projected Surplus/(Shortage) after recommended WMS (acft/yr)	*47*	*45*	*52*	*44*	*3*	*0*

5.24.8 Cross Country WSC

5.24.8.1 Description of Supply

Cross Country WSC obtains its water supply from groundwater from the Trinity Aquifer at 678 acft/yr. Cross Country WSC is projected to have a a shortage beginning in 2040 of 44 acft/yr, increasing to 375 acft/yr by 2080. This WUG is located in McLennan and Bosque Counties. The shortages shown in the table below represent the cumulative totals for Cross Country WSC.

5.24.8.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended to meet water needs for the Cross Country WSC. The entities' water usage utilized for demand projections is 178 gpcd. The RWPG recommends conservation to reduce usage to a goal of 140 gpcd.

1. Conservation:
   a. Cost Source: Volume II.
   b. Date to be Implemented: before 2030.
   c. Annual Cost: maximum of $137,484 in 2080.
   d. Unit Cost: $684/acft.
2. Groundwater Development – Trinity Aquifer:
   a. Cost Source: Volume II.
   b. Date to be Implemented: by 2030.
   c. Project Cost: $2,243,000.
   d. Unit Cost: $1,990/acft.

Table 5.24-8 Recommended Plan Costs by Decade for Cross County WSC

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*35*	*(44)*	*(112)*	*(190)*	*(278)*	*(375)*
Conservation						
Supply From Plan Element (acft/yr)	50	137	151	165	182	201
Annual Cost ($/yr)	$34,200	$93,708	$103,284	$112,860	$124,488	$137,484
Projected Surplus/(Shortage) after Conservation	*85*	*93*	*39*	*(25)*	*(96)*	*(174)*
Groundwater Development – Trinity Aquifer						
Supply From Plan Element (acft/yr)	–	–	–	25	100	38
Annual Cost ($/yr)	–	–	–	$199,000	$199,000	$41,000
Unit Cost ($/acft)	–	–	–	$7,960	$1,990	$1,079
Projected Surplus/(Shortage) after recommended WMS (acft/yr)	*85*	*93*	*39*	*0*	*4*	*(136)*

5.24.9 East Crawford WSC

East Crawford WSC obtains its water supply from groundwater from the Trinity Aquifer at 215 acft/yr. A shortage is projected beginning in 2030 of 116 acft/yr, increasing to 197 acft/yr by 2080.

5.24.9.1 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to meet water needs for the East Crawford WSC. The entities' water usage utilized for demand projections is 304 gpcd. The RWPG recommends conservation to reduce usage to a goal of 140 gpcd.

1. Conservation:
   a. Cost Source: Volume II.
   b. Date to be Implemented: by 2030.
   c. Annual Cost: maximum of $149,796 in 2080.
   d. Unit Cost: $684/acft.
2. Purchase water from the City of Waco:
   a. Cost Source: Volume II.
   b. Date to be Implemented: 2030.
   c. Unit Cost: assumed unit cost of $3,273/acft ($10.15/1,000 gallons) for wholesale treated water, including transmission costs.

Table 5.24-9 Recommended Plan Costs by Decade for East Crawford WSC

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	(116)	(133)	(148)	(162)	(179)	(197)
Conservation						
Supply From Plan Element (acft/yr)	29	65	104	147	194	219
Annual Cost ($/yr)	$19,836	$44,460	$71,136	$100,548	$132,696	$149,796
Projected Surplus/(Shortage) after Conservation	(87)	(68)	(44)	(15)	15	22
Purchase from Waco						
Supply From Plan Element (acft/yr)	105	93	81	68	55	55
Annual Cost ($/yr)	$369,849	$343,665	$304,389	$265,113	$222,564	$100,815
Unit Cost ($/acft)	$3,273	$3,273	$3,273	$3,273	$3,273	$1,833
Projected Surplus/(Shortage) after recommended WMS (acft/yr)	18	25	37	53	70	77

5.24.10 EOL WSC

The EOL WSC obtains its water supply from groundwater from the Trinity Aquifer at 368 acft/yr. A surplus is projected through the year 2080. To reduce arsenic concentrations, Axtell plans to purchase treated water to blend with water purchased from the City of Waco. This purchase may be made through the FHLM WSC.

5.24.10.1 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended for EOL WSC. Conservation is not recommended because the entity's usage is 113 gpcd, which is below the selected goal of 140 gpcd. To reduce arsenic concentrations, EOL WSC plans to purchase treated water to blend with water purchased from the City of Waco.

1. Purchase water from City of Waco to blend to reduce arsenic concentrations:
   a. Cost Source: Volume II.
   b. Date to be Implemented: 2030.

c. Unit Cost: assumed unit cost of $3,273/acft ($10.15/1,000 gallons) for wholesale treated water, including transmission costs.

Table 5.24-10 Recommended Plan Costs by Decade for EOL WSC

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	140	120	99	78	57	36
Purchase water from the City of Waco for Arsenic Blending						
Supply From Plan Element (acft/yr)	120	125	131	131	138	138
Annual Cost ($/yr)	$392,760	$409,125	$428,763	$428,763	$451,674	$451,674
Unit Cost ($/acft)	$3,273	$3,273	$3,273	$3,273	$3,273	$3,273
Projected Surplus/(Shortage) after Conservation	260	245	230	209	195	174

5.24.11 Gholson WSC

5.24.11.1 Description of Supply

The Gholson WSC obtains its water supply from groundwater from the Trinity Aquifer at 766 acft/yr. Gholson WSC is split between Hill and McLennan counties, with primary demands in the McLennan County. Gholson WSC is projected to have a water supply shortage beginning in 2060 of 72 acft/yr, increasing to 246 acfr/yr by 2080.

5.24.11.1 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended for Gholson WSC. Conservation is not recommended because the entity's usage is 127 gpcd, which is below the selected goal of 140 gpcd.

1. Groundwater Development – Trinity Aquifer:
    a. Cost Source: Volume II.
    b. Date to be Implemented: by 2030.
    c. Project Cost: $2,254,000.
    d. Unit Cost: $820/acft.

Table 5.24-11 Recommended Plan Costs by Decade for Gholson WSC

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*139*	*65*	*1*	*(72)*	*(154)*	*(246)*
Groundwater Development – Trinity Aquifer						
Supply From Plan Element (acft/yr)	–	–	–	250	250	250
Annual Cost ($/yr)	–	–	–	$205,000	$205,000	$46,000
Unit Cost ($/acft)	–	–	–	$820	$820	$184
Projected Surplus/(Shortage) after recommended WMS (acft/yr)	*139*	*65*	*1*	*178*	*96*	*4*

5.24.12 H & H WSC

The H & H WSC obtains its water supply from groundwater from the Trinity Aquifer at 383 acft/yr. A surplus is projected through the year 2080; and, there are no changes recommended to the water supply. Conservation is not recommended because the entity's usage is 125 gpcd, which is below the selected goal of 140 gpcd.

5.24.13 City of Hewitt

5.24.13.1 Description of Supply

The City of Hewitt obtains its water supply from groundwater from the Trinity Aquifer at 1,429 acft/yr and has a contract with the City of Waco at 2,352 acft/yr for a supplemental supply from Lake Waco.

5.24.13.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to meet water needs for the City of Hewitt. Associated costs are included for each strategy. The entities' water usage utilized for demand projections is 176 gpcd. The RWPG recommends conservation to reduce usage to a goal of 140 gpcd.

1. Conservation:
    a. Cost Source: Volume II.
    b. Date to be Implemented: 2030.
    c. Annual Cost: maximum of $404,928 in 2040.
    d. Unit Cost: $684/acft.
2. Purchase reuse water from WMARSS (Bulhide Creek Reuse). The reuse supply will reduce demands for landscape irrigation at existing or future parks, schools, ball fields, and other green spaces. Reuse water may also potentially supply existing or future industrial customers.
    a. Cost Source: Volume II.
    b. Date to be Implemented: 2030.
    c. Project Cost: None. City of Waco is the project sponsor. Entity will purchase from the City.
    d. Unit Cost: $826/acft.
    e. Purchase additional water from City of Waco:
3. Cost Source: Volume II.
    a. Date to be Implemented: 2050.
    b. Unit Cost: assumed unit cost of $2,164/acft ($6.64/1,000 gallons) for wholesale treated water.

Table 5.24-12 Recommended Plan Costs by Decade for City of Hewitt

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*(740)*	*(729)*	*(729)*	*(729)*	*(729)*	*(729)*
Conservation						
Supply From Plan Element (acft/yr)	258	592	592	592	592	592
Annual Cost ($/yr)	$176,472	$404,928	$404,928	$404,928	$404,928	$404,928
Projected Surplus/(Shortage) after Conservation (acft/yr)	*(482)*	*(137)*	*(137)*	*(137)*	*(137)*	*(137)*
WMARSS – Bullhide Creek Reuse						
Supply From Plan Element (acft/yr)	1,233	1,233	1,233	1,233	1,233	1,233
Annual Cost ($/yr)	$1,388,000	$1,388,000	$410,000	$410,000	$410,000	$410,000
Unit Cost ($/acft)	$826	$826	$244	$244	$244	$244
Projected Surplus/(Shortage) after Reuse (acft/yr)	*751*	*1,096*	*1,096*	*1,096*	*1,096*	*1,096*
Purchase Water from City of Waco						
Supply From Plan Element (acft/yr)	–	–	62	420	771	771
Annual Cost ($/yr)	–	–	$147,000	$909,000	$1,668,000	$1,668,000
Unit Cost ($/acft)	–	–	$2,164	$2,164	$2,164	$2,164
Projected Surplus/(Shortage) after recommended WMS (acft/yr)	*751*	*1,096*	*1,158*	*1,516*	*1,867*	*1,867*

5.24.14 Hilltop WSC

The Hilltop WSC obtains its water supply from groundwater from the Trinity Aquifer at 329 acft/yr and a contract with Waco at 97 acft/yr. A surplus is projected through the year 2080; and there are no changes recommended to the water supply. Conservation is not recommended because the entity's usage is 143 gpcd, which is approximately equal to the selected goal of 140 gpcd.

5.24.15 Hog Creek WSC

5.24.15.1 Description of Supply

Hog Creek WSC obtains its water supply from the Trinity Aquifer at 268 acft/yr. Shortages are projected for Hog Creek WSC throughout the planning period.

5.24.15.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended for the Hog Creek WSC. The entities' water usage utilized for demand projections is 962 gpcd. The RWPG recommends conservation to reduce usage to a goal of 140 gpcd.

1. Conservation
    a. Cost Source: See Volume II

b. Date to be Implemented: 2030
c. Annual Cost: Maximum of $156,636 in 2080
d. Unit Cost: $684/acft

Table 5.24-13 Recommended Plan Costs by Decade for the Hog Creek WSC

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	(128)	(129)	(130)	(124)	(119)	(116)
Conservation						
Supply From Plan Element (acft/yr)	37	77	118	155	192	229
Annual Cost ($/yr)	$25,308	$52,668	$80,712	$106,020	$131,328	$156,636
Projected Surplus/(Shortage) after Conservation (acft/yr)	(91)	(52)	(12)	31	73	113

5.24.16 City of Lacy-Lakeview

5.24.16.1 Description of Supply

The City of Lacy-Lakeview obtains its water supply from the City of Waco at 2,352 acft/yr. Based on the current contracted amount; the City of Lacy-Lakeview is projected to have a surplus of supplies. Supplemental reuse water from WMARSS is recommended to reduce demands on water supplied by the City of Waco.

5.24.16.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended for the City of Lacy-Lakeview. Purchase reuse water from WMARSS (Bellmead/Lacy-Lakeview Reuse). The reuse supply will reduce demands for landscape irrigation at existing or future parks, schools, ball fields, and other green spaces. Reuse water may also potentially supply existing or future industrial customers. Conservation is not recommended because the entity's usage is 125 gpcd, which is below the selected goal of 140 gpcd.

1. WMARSS – Bellmead/Lacy-Lakeview Reuse
   a. Cost Source: See Volume II
   b. Date to be Implemented: 2030
   c. Project Cost: None. City of Waco is the project sponsor. Entity will purchase from the City.
   d. Unit Cost: $731/acft.

Table 5.24-14 Recommended Plan Costs by Decade for City of Lacy-Lakeview

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*98*	*25*	*0*	*0*	*0*	*0*
WMARSS – Bellmead/Lacy-Lakeview Reuse						
Supply From Plan Element (acft/yr)	745	745	745	745	745	745
Annual Cost ($/yr)	$544,600	$544,600	$127,400	$127,400	$127,400	$127,400
Unit Cost ($/acft)	$731-	$731-	$171-	$171-	$171-	$171-
Projected Surplus/(Shortage) after recommended WMS (acft/yr)	*843*	*770*	*745*	*745*	*745*	*745*

5.24.17 Leroy Tours Gerald WSC

5.24.17.1 Description of Supply

The Leroy Tours Gerald WSC obtains its water supply from groundwater from the Trinity Aquifer at 383 acft/yr. This entity also has a contract with City of Waco which supplies 224 acft/yr. A surplus is projected through the year 2080; and, there are no changes recommended to the water supply except to pursue a strategy to reduce arsenic levels.

5.24.17.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended for Leroy Tours Gerald WSC. An alternative strategy is to treat for arsenic at each well head. Conservation is not recommended because the entity's usage is 115 gpcd, which is below the selected goal of 140 gpcd.

1. Purchase Water from Waco for Arsenic Blending:
    a. Cost Source: See Volume II.
    b. Date to be Implemented: by 2030.
    c. Project Cost: None; delivered by FHLM WSC.
    d. Unit Cost: $3,273/acft.

Table 5.24–15 Recommended Plan Costs by Decade for Leroy Tours Gerald WSC

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	190	179	166	153	141	140
Purchase Water from Waco for Arsenic Blending						
Supply From Plan Element (acft/yr)	72	74	78	82	86	86
Annual Cost ($/yr)	-$229,110	$235,656	$242,202	$255,294	$268,386	$281,478
Unit Cost ($/acft)	-$3,273	$3,273	$3,273	$3,273	$3,273	$3,273
Projected Surplus/(Shortage) after recommended WMS (acft/yr)	262	253	244	235	227	226

5.24.18 Levi WSC

5.24.18.1 Description of Supply

The Levi WSC obtains its water supply from groundwater from the Trinity Aquifer at 498 acft/yr. A water supply shortage is projected beginning 2030 of 76 acft/yr, increasing to 303 acft/yr by 2080.

5.24.18.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended for Levi WSC. The entities' water usage utilized for demand projections is 238 gpcd. The RWPG recommends conservation to reduce usage to a goal of 140 gpcd.

1. Conservation:
    a. Cost Source: See Volume II.
    b. Date to be Implemented: 2030.
    c. Annual Cost: Maximum of $218,880 in 2080.
    d. Unit Cost: $684/acft.
2. Groundwater Development – Trinity Aquifer:
    a. Cost Source: See Volume II.
    b. Date to be Implemented: by 2030.
    c. Annual Cost: $178,000.
    d. Unit Cost: $5,933.

Table 5.24–16Recommended Plan Costs by Decade for Levi WSC

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*(76)*	*(128)*	*(180)*	*(218)*	*(259)*	*(303)*
Conservation						
Supply From Plan Element (acft/yr)	49	114	192	285	301	320
Annual Cost ($/yr)	$33,516	$77,976	$131,328	$194,940	$205,884	$218,880
Projected Surplus/(Shortage) after Conservation	*(27)*	*(14)*	*12*	*67*	*42*	*17*
Groundwater Development – Trinity Aquifer						
Supply From Plan Element (acft/yr)	*30*	*30*	*30*	*30*	*30*	*0*
Annual Cost ($/yr)	*$178,000*	*$178,000*	*$24,000*	*$24,000*	*$24,000*	*$24,000*
Unit Cost ($/acft)	*$5,933*	*$5,933*	*$800*	*$800*	*$800*	*$800*
Projected Surplus/(Shortage) after recommended WMS (acft/yr)	3	16	42	97	72	17

5.24.19 City of Lorena

5.24.19.1 Description of Supply

The City of Lorena obtains its water supply from a contract with the City of Robinson at 560 acft/yr, and Brazos River Authority at 2,500 acft/yr. They also have a groundwater supply from Trinity Aquifer at 383 acft/yr. No shortages are projected for the City of Lorena; however, purchase of supplemental reuse water from WMARSS is recommended to reduce demands on groundwater from the Trinity Aquifer.

5.24.19.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended for the City of Lorena. The most recent water loss audit report shows a water loss of approximately 37% and recommends water loss mitigation. The entities' water usage utilized for demand projections is 171 gpcd. The RWPG recommends conservation to reduce usage to a goal of 140 gpcd.

1. Conservation
    a. Cost Source: See Volume II
    b. Date to be Implemented: 2030
    c. Annual Cost: Maximum of $69,084 in 2080
    d. Unit Cost: $684/acft
2. Water Loss Reduction
    a. Cost Source: See Volume II
    b. Date to be Implemented: 2030
    c. Annual Cost: Maximum of $141,702 in 2040
    d. Unit Cost: $1,144/acft
3. Purchase reuse water from WMARSS (Bull Hide Creek Reuse). The reuse supply will reduce demands for landscape irrigation at existing or future parks, schools, ball fields, and other green spaces. Reuse water may also potentially supply existing or future industrial customers.
    a. Cost Source: See Volume II
    b. Date to be Implemented: 2030
    c. Project Cost: None. City of Waco is the project sponsor. Entity will purchase from the City.
    d. Unit Cost: $826/acft

Table 5.24–17Recommended Plan Costs by Decade for the City of Lorena

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*409*	*386*	*363*	*343*	*319*	*292*
Conservation						
Supply From Plan Element (acft/yr)	40	86	90	93	97	101
Annual Cost ($/yr)	$27,360	$58,824	$61,560	$63,612	$66,348	$69,084
Water Loss Reduction						
Supply From Plan Element (acft/yr)	122	127	133	137	143	149
Annual Cost ($/yr)	$139,565	$141,702	$56,866	$58,576	$61,142	$63,707

Plan Element	2030	2040	2050	2060	2070	2080
Unit Cost ($/acft)	$1,144	$1,116	$428	$428	$428	$428
Projected Surplus/(Shortage) after Conservation and Water Loss Reduction (acft/yr)	571	599	586	573	559	542
WMARSS – Bullhide Creek Reuse						
Supply From Plan Element (acft/yr)	448	448	448	448	448	448
Annual Cost ($/yr)	$370,100	$370,100	$109,300	$109,300	$109,300	$109,300
Unit Cost ($/acft)	$826	$826	$244	$244	$244	$244
Projected Surplus/(Shortage) after recommended WMS (acft/yr)	1,019	1,047	1,034	1,021	1,007	990

5.24.20 City of Mart

5.24.20.1 Description of Supply

The City of Mart obtains its water supply from the Trinity Aquifer at 192 acft/yr. Based on the available groundwater supply and no firm yield from Lake Mart, the City of Mart is projected to have a shortage through the year 2080. The City is located in multiple counties (McLennan and Limestone). The shortages shown in the table below represent the cumulative totals for the City of Mart.

5.24.20.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended for the City of Mart. The entities' water usage utilized for demand projections is 233 gpcd. The RWPG recommends conservation to reduce usage to a goal of 140 gpcd. Needs remain unmet in 2030. These needs will only occur during a drought equivalent or worse than the drought of record. While not a strategy recommended by the Brazos G RWPG, the impacts of the unmet needs can be mitigated through demand management in the event of a serious drought prior to the recommended strategies coming online.

1. Conservation
    a. Cost Source: See Volume II
    b. Date to be Implemented: by 2030
    c. Annual Cost: Maximum of $97,812 in 2080
    d. Unit Cost: $684/acft
2. Purchase water from the City of Waco
    a. Cost Source: See Volume II
    b. Date to be Implemented: by 2030
    c. Unit Cost: assumed unit cost of $2,164/acft ($6.64/1,000 gallons) for wholesale treated water.

Table 5.24–18Recommended Plan Costs by Decade for the City of Mart

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*(268)*	*(240)*	*(217)*	*(180)*	*(141)*	*(98)*
Conservation						
Supply From Plan Element (acft/yr)	37	79	116	143	128	111
Annual Cost ($/yr)	$25,308	$54,036	$79,344	$97,812	$87,552	$75,924
Projected Surplus/(Shortage) after Conservation (acft/yr)	(231)	(161)	(101)	(37)	(13)	13
Purchase Water Supply from City of Waco						
Supply From Plan Element (acft/yr)	165	180	199	220	243	243
Annual Cost ($/yr)	$357,060	$389,520	$432,800	$478,244	$528,016	$528,016
Unit Cost ($/acft)	$2,164	$2,164	$2,164	$2,164	$2,164	$2,164
Projected Surplus/(Shortage) after recommended WMS (acft/yr)	(66)	19	98	183	230	256

5.24.21 City of McGregor

5.24.21.1 Description of Supply

The City of McGregor has contracted for 810 acft/yr of surface water supplies from the Brazos River Authority, which can supply 675 acft/yr in 2030 and 654 acft/yr in 2080, based on water availability analyses prescribed under water planning guidelines. The City also has a contract with Bluebonnet WSC for 2,139 acft/yr, which supplies 2,071 acft/yr in 2030 and 2,003 acft/yr in 2080. The City also sells water to Central Bosque WSC and Manufacturing entities in McLennan County. The City of McGregor is projected to experience water supply shortages beginning in 2030 of 253 acft/yr, increasing to 1,011 acft/yr by 2080.

5.24.21.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended for the City of McGregor. The entities' water usage utilized for demand projections is 238 gpcd. The RWPG recommends conservation to reduce usage to a goal of 140 gpcd. Needs remain unmet in 2030. These needs will only occur during a drought equivalent or worse than the drought of record. While not a strategy recommended by the Brazos G RWPG, the impacts of the unmet needs can be mitigated through demand management in the event of a serious drought prior to the recommended strategies coming online.

1. Conservation
    a. Cost Source: See Volume II
    b. Date to be Implemented: 2030
    c. Annual Cost: Maximum of $891,936 in 2080
    d. Unit Cost: $684/acft

Table 5.24–19Recommended Plan Costs by Decade for the City of McGregor

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*(253)*	*(411)*	*(558)*	*(698)*	*(856)*	*(1,011)*
Conservation						
Supply From Plan Element (acft/yr)	214	502	808	1,188	1,243	1,304
Annual Cost ($/yr)	$146,376	$343,368	$552,672	$812,592	$850,212	$891,936
Projected Surplus/(Shortage) after Conservation (acft/yr)	*(39)*	*91*	*250*	*490*	*387*	*293*

5.24.22 McLennan County WCID 2

5.24.22.1 Description of Supply

McLennan County WCID 2 obtains its water supply from the Trinity Aquifer at 778 acft/yr. No shortages are projected for the McLennan County WCID 2.

5.24.22.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended for the McLennan County WCID 2. The entities' water usage utilized for demand projections is 172 gpcd. The RWPG recommends conservation to reduce usage to a goal of 140 gpcd.

a. Conservation

- Cost Source: See Volume II
- Date to be Implemented: 2030
- Annual Cost: Maximum of $21,888 in 2040
- Unit Cost: $684/acft

Table 5.24–20Recommended Plan Costs by Decade for the McLennan County WCID 2

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*483*	*501*	*515*	*537*	*560*	*586*
Conservation						
Supply From Plan Element (acft/yr)	16	32	30	27	23	19
Annual Cost ($/yr)	$10,944	$21,888	$20,520	$18,468	$15,732	$12,996
Projected Surplus/(Shortage) after Conservation (acft/yr)	*499*	*533*	*545*	*564*	*583*	*605*

5.24.23 City of Moody

The City of Moody obtains its water supply from the Trinity Aquifer at 211 acft/yr. They also have a contract with Bluebonnet WSC at 401 acft/yr. No shortages are projected for the City of Moody.

5.24.23.1 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended for the City of Moody. Conservation is not recommended because the entity's usage is 135 gpcd, which is below the selected goal of 140 gpcd. The most recent water loss audit report shows a water loss of approximately 43% and recommends water loss mitigation.

a. Water Loss Reduction

- Cost Source: See Volume II
- Date to be Implemented: 2030
- Annual Cost: Maximum of $86,453 in 2040
- Unit Cost: $1,066/acft

Table 5.24–21Recommended Plan Costs by Decade for the City of Moody

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	324	286	248	209	169	133
Water Loss Reduction						
Supply From Plan Element (acft/yr)	77	87	97	107	118	128
Annual Cost ($/yr)	$82,047	$86,453	$42,733	$47,139	$51,985	$56,390
Unit Cost ($/acft)	$1,066	$994	$441	$441	$441	$441
Projected Surplus/(Shortage) after recommended WMS (acft/yr)	401	373	345	316	287	261

5.24.24 North Bosque WSC

5.24.24.1 Description of Supply

North Bosque WSC obtains its water supply from the Trinity Aquifer at 759 acft/yr. Based on the available groundwater supply; North Bosque WSC is projected to have a shortage through the year 2050.

5.24.24.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended for North Bosque WSC. Associated costs are included for each strategy. The entities' water usage utilized for demand projections is 279 gpcd. The RWPG recommends conservation to reduce usage to a goal of 140 gpcd.

a. Conservation

- Cost Source: See Volume II
- Date to be Implemented: 2030
- Annual Cost: Maximum of $377,568 in 2080
- Unit Cost: $684/acft

Table 5.24–22Recommended Plan Costs by Decade for North Bosque WSC

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*121*	*45*	*(42)*	*(139)*	*(247)*	*(370)*
Conservation						
Supply From Plan Element (acft/yr)	55	133	231	351	492	552
Annual Cost ($/yr)	$37,620	$90,972	$158,004	$240,084	$336,528	$377,568
Projected Surplus/(Shortage) after Conservation (acft/yr)	176	178	189	212	245	182

5.24.25 City of Riesel

5.24.25.1 Description of Supply

The City of Riesel obtains its water supply from the Trinity Aquifer at 181 acft/yr. This WUG also have a contract with County-Other McLennan at 125 acft/yr. Based on the available groundwater supply, the City of Riesel is projected to have a surplus through the year 2080.

5.24.25.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended for the City of Riesel. Associated costs are included for each strategy. The most recent water loss audit report shows a water loss of approximately 27% and recommends water loss mitigation. Conservation is not recommended because the entity's usage is 118 gpcd, which is below the selected goal of 140 gpcd.

a. Water Loss Reduction

- Cost Source: See Volume II
- Date to be Implemented: 2030
- Annual Cost: Maximum of $21,304 in 2040
- Unit Cost: $684/acft

Table 5.24–23Recommended Plan Costs by Decade for City of Riesel

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*150*	*141*	*131*	*120*	*110*	*99*
Water Loss Reduction						
Supply From Plan Element (acft/yr)	19	20	21	22	24	25
Annual Cost ($/yr)	$20,937	$21,304	$7,688	$8,054	$8,786	$9,152
Unit Cost ($/acft)	$1,102	$1,065	$366	$366	$366	$366
Projected Surplus/(Shortage) after Conservation	*169*	*161*	*152*	*142*	*134*	*124*

5.24.26 City of Robinson

5.24.26.1 Description of Supply

The City of Robinson sources its water supply from the Trinity Aquifer, with an annual yield of 1,101 acft/yr. Additionally, the City receives surface water from the Brazos River, totaling 3,621 acft/yr in 2030 and 3,421 acft/yr in 2080. City of Robinson holds contracts with the Brazos River Authority for 2,323 acft/yr and the City of Waco for 561 acft/yr. Furthermore, Robinson has a 560 acft/yr contract to provide treated water to the City of Lorena, utilizing Lorena's contract with the BRA. Based on the constrained supply amounts, the City of Robinson is projected to have shortages. Although the City has sufficient raw water supply to meet its future needs, the City's water treatment plant has an annual average capacity of 1,125 acft.

5.24.26.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended for the City of Robinson. Associated costs are included for each strategy. The entities' water usage utilized for demand projections is 200 gpcd. The RWPG recommends conservation to reduce usage to a goal of 140 gpcd.

a. Conservation
    - Cost Source: See Volume II
    - Date to be Implemented: 2030
    - Annual Cost: Maximum of $1,103,976 in 2080
    - Unit Cost: $684/acft
b. Expand Water Treatment Plant (4 MGD)
    - Cost Source: See Volume II
    - Date to be Implemented: by 2030

- Project Cost: $20,410,000
- Unit Cost[1]: $582/acft

Table 5.24–24Recommended Plan Costs by Decade for City of Robinson

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*454*	*23*	*(533)*	*(1,152)*	*(1,845)*	*(2,623)*
Conservation						
Supply From Plan Element (acft/yr)	234	605	1,086	1,238	1,413	1,614
Annual Cost ($/yr)	$160,056	$413,820	$742,824	$846,792	$966,492	$1,103,976
Projected Surplus/(Shortage) after Conservation	*688*	*628*	*553*	*86*	*(432)*	*(1,009)*
Expand WTP (4 MGD)						
Supply From Plan Element (acft/yr)	3,621	3,581	3,541	3,498	3,295	3,295
Annual Cost ($/yr)	$2,610,000	$2,610,000	$1,174,000	$1,174,000	$1,174,000	$1,174,000
Unit Cost ($/acft)	$721	$729	$332	$336	$356	$356
Projected Surplus/(Shortage) after recommended WMS (acft/yr)	*4,309*	*4,209*	*4,094*	*3,584*	*2,863*	*2,286*

5.24.27 Ross WSC

The Ross WSC obtains its water supply from the Trinity Aquifer at 421 acft/yr and surface water from the City of Waco at 336 acft/yr. No shortages are projected for the Ross WSC, and no changes in water supply are recommended. Conservation is not recommended because the entity's usage is 140 gpcd, which is not above the selected goal of 140 gpcd.

5.24.28 Spring Valley WSC

The Spring Valley WSC obtains its water supply from the Trinity Aquifer at 166 acft/yr. This entity also has a contract with Bluebonnet WSC for 301 acft/yr, which supplies 291 acft/yr in 2030 and 282 acft/yr in 2080. Spring Valley WSC is projected to experience a water supply shortage beginning in 2040 of 42 acft/yr, increasing to 298 acft/yr by 2080.

[1] Unit cost based on treatment capacity of 4,481 acft/yr

5.24.28.1 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended for Spring Valley WSC The entities' water usage utilized for demand projections is 160 gpcd. The RWPG recommends conservation to reduce usage to a goal of 140 gpcd.

a. Conservation
   - Cost Source: See Volume II
   - Date to be Implemented: 2030
   - Annual Cost: Maximum of $49,248 in 2080
   - Unit Cost: $684/acft

b. Groundwater Development – Trinity Aquifer
   - Cost Source: See Volume II
   - Date to be Implemented: by 2030
   - Project Cost: $2,006,000
   - Unit Cost: $704/acft

Table 5.24–25Recommended Plan Costs by Decade for Spring Valley WSC

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*20*	*(42)*	*(95)*	*(157)*	*(225)*	*(298)*
Conservation						
Supply From Plan Element (acft/yr)	43	49	53	59	66	72
Annual Cost ($/yr)	$29,412	$33,516	$36,252	$40,356	$45,144	$49,248
Projected Surplus/(Shortage) after Conservation	*63*	*7*	*(42)*	*(98)*	*(159)*	*(226)*
Groundwater Development – Trinity Aquifer						
Supply From Plan Element (acft/yr)	-	-	*250*	*250*	*250*	*250*
Annual Cost ($/yr)	-	-	*$176,000*	*$176,000*	*$35,000*	*$35,000*
Unit Cost ($/acft)	-	-	*$140*	*$140*	*$140*	*$140*
Projected Surplus/(Shortage) after recommended WMS (acft/yr)	63	7	208	152	1	0

5.24.29 Texas State Technical College

Texas State Technical College obtains its water supply from the City of Waco at 1,680 acft/yr throughout the planning period. Texas State Technical College is projected to have shortages beginning in 2030 at 336 acft/yr. Needs remain unmet in 2030. These needs will only occur during a drought equivalent or worse than the drought of record. While not a strategy recommended by the Brazos G RWPG, the impacts of the unmet needs can be mitigated through demand management in the event of a serious drought prior to the recommended strategies coming online.

5.24.29.1 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended for Texas State Technical College. Associated costs are included for each strategy. The entities' water usage utilized for demand projections is 1,804 gpcd. The RWPG recommends conservation to reduce usage to a goal of 140 gpcd.

a. Conservation
    - Cost Source: See Volume II
    - Date to be Implemented: by 2030
    - Annual Cost: Maximum of $824,904 in 2080
    - Unit Cost: $684/acft

Table 5.24–26Recommended Plan Costs by Decade for Texas State Technical College

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*(336)*	*(335)*	*(335)*	*(335)*	*(335)*	*(335)*
Conservation						
Supply From Plan Element (acft/yr)	197	399	600	803	1,005	1,206
Annual Cost ($/yr)	$134,748	$272,916	$410,400	$549,252	$687,420	$824,904
Projected Surplus/(Shortage) after Conservation (acft/yr)	*(139)*	*64*	*265*	*468*	*670*	*871*

5.24.30 City of Waco

The City of Waco secures its water supply from various sources to ensure reliable service in the coming decades. The Brazos River provides a consistent supply of 5,600 acft/yr from 2030 to 2080, while Direct Reuse contributes 16,802 acft/yr throughout the same period. City also has groundwater supplies from the Trinity Aquifer which adds an additional 245 acft/yr. Waco Lake remains a significant source, with its supply gradually decreasing from 44,882 acft/yr in 2030 to 43,138 acft/yr in 2080, for which the City holds water rights. The City supplies several neighboring communities with treated water.

A portion of the City's treated wastewater is also contracted to steam-electric and manufacturing customers in the County. The City is projected to have a shortage of supplies starting in 2030.

Needs remain unmet in 2030, 2040, 2070 and 2080. These needs will only occur during a drought equivalent or worse than the drought of record. While not a strategy recommended by the Brazos G RWPG, the impacts of the unmet needs can be mitigated through demand management in the event of a serious drought prior to the recommended strategies coming online.

5.24.30.1 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended for the City of Waco. Associated costs are included for each strategy. The entities' water usage utilized for demand projections is 222 gpcd. The RWPG recommends conservation to reduce usage to a goal of 140 gpcd. Waco plans to expand the Riverside WTP, which will cost an inflation-adjusted $15.7 million and utilize Brazos River water at the Riverside WTP, which will cost an additional $18.1 million. Those strategies are not shown here.

a. Conservation
   - Cost Source: See Volume II
   - Date to be Implemented: by 2030
   - Annual Cost: Maximum of $13,496,688 in 2080
   - Unit Cost: $684/acft
b. Waco WMARSS Reuse Projects McLennan I-84
   - Cost Source: See Volume II
   - Date to be Implemented: by 2030
   - Project Cost: $33,311,000
   - Unit Cost: $2,604/acft
c. Reuse WMARSS Bellmead/Lacy-Lakeview
   - Cost Source: See Volume II
   - Date to be Implemented: by 2030
   - Project Cost: $17,870,000
   - Unit Cost: $731/acft
d. Waco WMARSS Reuse Projects North-China Spring
   - Cost Source: Volume II
   - Date to be Implemented: by 2030
   - Project Cost: $44,298,000

- Unit Cost: $3,705/acft

e. Lake Waco Reallocation

- Cost Source: Volume II
- Date to be Implemented: by 2050
- Project Cost: $31,219,000
- Unit Cost: $963/acft

Table 5.24–27Recommended Plan Costs by Decade for City of Waco

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*(5,925)*	*(10,128)*	*(13,987)*	*(18,040)*	*(22,634)*	*(26,900)*
Conservation						
Supply From Plan Element (acft/yr)	3,008	7,396	12,685	16,949	18,261	19,732
Annual Cost ($/yr)	$2,057,472	$5,058,864	$8,676,540	$11,593,116	$12,490,524	$13,496,688
Projected Surplus/(Shortage) after Conservation	*(2,917)*	*(2,732)*	*(1,302)*	*(1,091)*	*(4,373)*	*(7,168)*
Additional Demands from Recommended Strategies from Others						
Increase Contract Amount to East Crawford WSC (acft/yr)	105	93	81	68	55	55
Increase Contract Amount to City of Hewitt (acft/yr)	–	–	62	420	771	771
Increase Contract Amount to City of Mart (acft/yr)	165	180	200	221	244	244
New Contract with Axtel WSC	86	90	94	99	104	104
New Contract with EOL WSC	120	125	131	131	138	138
Total Surplus/(Shortage) Including Recommended Strategies	(3,393)	(3,220)	(1,870)	(2,030)	(5,685)	(8,480)
Waco WMARSS Reuse Projects – McLennan I-84						
Supply From Plan Element (acft/yr)	1,400	1,400	1,680	1,680	1,680	1,680
Annual Cost ($/yr)	$3,645,600	$3,645,600	$2,032,800	$2,032,800	$2,032,800	$2,032,800
Unit Cost ($/acft)	$2,604	$2,604	$1,210	$1,210	$1,210	$1,210

Plan Element	2030	2040	2050	2060	2070	2080
Waco WMARSS Reuse Projects – Bellmead/Lacy-Lakeview						
Supply From Plan Element (acft/yr)	374	374	374	374	374	374
Annual Cost ($/yr)	$273,400	$273,400	$64,000	$64,000	$64,000	$64,000
Unit Cost ($/acft)	$731	$731	$171	$171	$171	$171
Waco WMARSS Reuse Projects – North-China Spring						
Supply From Plan Element (acft/yr)	1,120	1,120	1,120	1,120	1,120	1,120
Annual Cost ($/yr)	$4,146,600	$4,146,600	$1,034,880	$1,034,880	$1,034,880	$1,034,880
Unit Cost ($/acft)	$3,705	$3,705	$924	$924	$924	$924
Projected Surplus/(Shortage) after Reuse	(499)	(326)	1,304	1,144	(2,511)	(5,306)
Lake Waco Reallocation						
Supply From Plan Element (acft/yr)	-	-	1,860	1,860	1,860	1,860
Annual Cost ($/yr)	-	-	$1,792,000	$1,792,000	$1,792,000	$1,792,000
Unit Cost ($/acft)	-	-	$963	$963	$963	$963
Projected Surplus/(Shortage) after recommended WMS (acft/yr)	*(499)*	*(326)*	*3,164*	*3,004*	*(651)*	*(3,446)*

5.24.31 City of West

5.24.31.1 Description of Supply

The City of West obtains its water supply from the Trinity Aquifer at 371 acft/yr. City of West also has contract with City of Waco for 1,120 acft/yr. Surpluses are projected through 2080.

5.24.31.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended for the City of West. The entities' water usage utilized for demand projections is 165 gpcd. The RWPG recommends conservation to reduce usage to a goal of 140 gpcd.

a. Conservation

- Cost Source: See Volume II
- Date to be Implemented: by 2030
- Annual Cost: Maximum of $49,932 in 2080

- Unit Cost: $684/acft

Table 5.24–28Recommended Plan Costs by Decade for City of West

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*982*	*968*	*951*	*934*	*916*	*897*
Conservation						
Supply From Plan Element (acft/yr)	36	64	66	68	70	73
Annual Cost ($/yr)	$24,624	$43,776	$45,144	$46,512	$47,880	$49,932
Projected Surplus/(Shortage) after Conservation (acft/yr)	*1,018*	*1,032*	*1,017*	*1,002*	*986*	*970*

5.24.32 Windsor Water

5.24.32.1 Description of Supply

Windsor Water obtains its water supply from the Trinity Aquifer at 245 acft/yr. Shortages are projected for Windsor Water throughout the planning period.

5.24.32.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended for the City of West. The entities' water usage utilized for demand projections is 148 gpcd. The RWPG recommends conservation to reduce usage to a goal of 140 gpcd.

a. Conservation
    - Cost Source: See Volume II
    - Date to be Implemented: by 2030
    - Annual Cost: Maximum of $2,052 in 2030
    - Unit Cost: $684/acft

Table 5.24–29Recommended Plan Costs by Decade for Windsor Water

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*(104)*	*(109)*	*(114)*	*(120)*	*(126)*	*(133)*
Conservation						
Supply From Plan Element (acft/yr)	3	2	2	2	2	3
Annual Cost ($/yr)	$2,052	$1,368	$1,368	$1,368	$1,368	$2,052
Projected Surplus/(Shortage) after Conservation (acft/yr)	*(101)*	*(107)*	*(112)*	*(118)*	*(124)*	*(130)*

5.24.33 City of Woodway

5.24.33.1 Description of Supply

The City of Woodway obtains its water supply from the Trinity Aquifer at 2,456 acft/yr. This entity also has contract with City of Waco for 1,120 acft/yr. Moreover, they also receive supplies from Bluebonnet WSC at 1,362 acft/yr, which supplies 1,319 acft/yr in 2030 and 1,275 acft/yr in 2080. The City provides 2 acft/yr for McLennan County Manufacturing. They have projected shortages throughout the planning period and under drought conditions, Bluebonnet WSC may not be able to provide the full contract amount to all of its customers, including Woodway.

5.24.33.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended for the City of Woodway. The entities' water usage utilized for demand projections is 351 gpcd. The RWPG recommends conservation to reduce usage to a goal of 140 gpcd.

a. Conservation
   - Cost Source: See Volume II
   - Date to be Implemented: by 2030
   - Annual Cost: Maximum of $1,614,924 in 2080
   - Unit Cost: $684/acft

b. Groundwater Development – Trinity Aquifer
   - Cost Source: See Volume II
   - Date to be Implemented: by 2030
   - Project Cost: $2,351,000
   - Unit Cost: $1,055/acft

Table 5.24–30Recommended Plan Costs by Decade for City of Woodway

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*(3,973)*	*(3,967)*	*(3,967)*	*(3,967)*	*(3,967)*	*(3,967)*
Conservation						
Supply From Plan Element (acft/yr)	348	744	1,145	1,547	1,948	2,361
Annual Cost ($/yr)	$238,032	$508,896	$783,180	$1,058,148	$1,332,432	$1,614,924
Projected Surplus/(Shortage) after Conservation	*(3,625)*	*(3,223)*	*(2,822)*	*(2,420)*	*(2,019)*	*(1,606)*
Groundwater Development – Trinity Aquifer						
Supply From Plan Element (acft/yr)	*200*	*200*	*200*	*200*	*200*	*0*

Plan Element	2030	2040	2050	2060	2070	2080
Annual Cost ($/yr)	*$211,000*	*$211,000*	*$45,000*	*$45,000*	*$45,000*	*$45,000*
Unit Cost ($/acft)	*$1,055*	*$1,055*	*$225*	*$225*	*$225*	*$225*
Projected Surplus/(Shortage) after recommended WMS (acft/yr)	(3,425)	(3,023)	(2,622)	(2,220)	(1,819)	(1,606)

5.24.34 County-Other

5.24.34.1 Description of Supply

McLennan County-Other entities obtain water supply from groundwater from the Trinity Aquifer at 781 acft/yr beginning in 2030, increasing to 799 acft/yr by 2080. Entities in County-Other provide additional supply to Riesel and provide supply to steam-electric power and manufacturing customers in McLennan County.

Various entities are dealing with elevated levels of arsenic in groundwater supplies and have been pursuing water management strategies through the FHLM WSC. A shortage is projected to begin in 2040 at 169 acft/yr, increasing to 376 acft/yr by 2080.

5.24.34.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended for McLennan County-Other. Conservation was considered; however, the entity’s usage is below the selected goal of 140 gpcd.

a. Groundwater Development – Trinity Aquifer
   - Cost Source: See Volume II
   - Date to be Implemented: by 2070
   - Project Cost: $1,058,000
   - Unit Cost: $620/ac-ft

b. Upgrade Treatment for Arsenic

   This is a treatment strategy and does not increase the supply available to these entities. Total treatment is estimated at 917 acft/yr.

   - Cost Source: See Volume II
   - Date to be Implemented: by 2030
   - Project Cost: $4,832,000
   - Unit Cost: $2,231/acft

Table 5.24–31Recommended Plan Costs by Decade for the McLennan County - Other

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*47*	*(169)*	*(214)*	*(232)*	*(274)*	*(376)*
Upgrade Treatment for Arsenic						
Supply From Plan Element (acft/yr)	250	250	250	250	250	250
Annual Cost ($/yr)	$557,750	$557,750	$465,000	$465,000	$465,000	$465,000
Unit Cost ($/acft)	$2,231	$2,231	$1,860	$1,860	$1,860	$1,860
Groundwater Development – Trinity Aquifer						
Supply From Plan Element (acft/yr)	0	0	0	0	150	126
Annual Cost ($/yr)	-	-	-	-	$93,000	$78,120
Unit Cost ($/acft)	-	-	-	-	$620	$620
Projected Surplus/(Shortage) after recommended WMS (acft/yr)	297	81	36	18	126	0

5.24.35 Manufacturing

5.24.35.1 Description of Supply

Water supply for manufacturing in McLennan County is obtained by purchase from a city or water supply corporation, from Trinity Aquifer wells operated by the manufacturing entity, and from run-of-river rights. McLennan County Manufacturing is projected to have shortages beginning in 2030 of 1,111 acft/yr, decreasing to 747 acft/yr by 2080.

5.24.35.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to meet water needs for McLennan County Manufacturing. Conservation is recommended.

a. Conservation
    - Cost Source: See Volume II
    - Date to be Implemented: by 2030
b. Groundwater Development – Cross Timbers Aquifer
    - Cost Source: See Volume II
    - Date to be Implemented: by 2030

Table 5.24–32Recommended Plan Costs by Decade for McLennan County - Manufacturing

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*(1,111)*	*(964)*	*(817)*	*(717)*	*(500)*	*(747)*
Conservation						
Supply From Plan Element (acft/yr)	172	298	433	449	465	483
Annual Cost ($/yr)	ND	ND	ND	ND	ND	ND
Projected Surplus/(Shortage) after Conservation (acft/yr)	*939*	*(666)*	*(384)*	*(268)*	*(35)*	*(264)*
Groundwater Development – Cross Timbers Aquifer						
Supply From Plan Element (acft/yr)	10	10	10	10	10	10
Annual Cost ($/yr)	$875,000	$875,000	$340,000	$340,000	$340,000	$340,000
Unit Cost ($/acft)	$350	$350	$136	$136	$136	$136
Projected Surplus/(Shortage) after recommended WMS (acft/yr)	949	(656)	(374)	(258)	(25)	(254)

ND – Not Determined. Costs to implement industrial conservation technologies will vary based on each location.

5.24.36 Steam-Electric

McLennan County Steam-Electric obtains its water supply from Tradinghouse Reservoir, Lake Creek Reservoir, the Trinity Aquifer, and from WMARSS reuse. No shortage is projected for McLennan County Steam-Electric and no changes in water supply are recommended.

5.24.37 Mining

5.24.37.1 Description of Supply

Mining operations in McLennan County are supplied by Brazos River Alluvium groundwater at 735 acft/yr. No shortage is projected for McLennan County Mining.

5.24.38 Irrigation

5.24.38.1 Description of Supply

McLennan County Irrigation is supplied by groundwater from the Trinity Aquifer at 561 acft/yr and the Brazos River Alluvium at 4,259 acft/yr and run of the river water rights at 37 acft/yr from 2030 to 2080. McLennan County Irrigation is projected to have shortages beginning in 2030 at 265 acft/yr which will be held constant throughout the planning horizon.

5.24.38.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to meet water needs for McLennan Irrigation. Associated costs are included for each strategy. Conservation is recommended.

a. Conservation

- Cost Source: See Volume II
- Date to be Implemented: by 2030
  Annual Cost: Not determined

Table 5.24–33 Recommended Plan Costs by Decade for McLennan County Irrigation

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*(265)*	*(265)*	*(265)*	*(265)*	*(265)*	*(265)*
Conservation						
Supply From Plan Element (acft/yr)	154	256	359	359	359	359
Annual Cost ($/yr)	ND	ND	ND	ND	ND	ND
Projected Surplus/(Shortage) after Conservation	*(111)*	*(9)*	*94*	*94*	*94*	*94*
ND – Not Determined. Costs to implement irrigation conservation technologies will vary based on each location.						

5.24.39 Livestock

Livestock water supply is projected to meet demands through 2080 and no changes in water supply are recommended.

5.25 Milam County Water Supply Plan

Table 5.25-1 lists each water user group in Milam County and their corresponding surplus or shortage in years 2030 and 2080. For each water user group with a projected shortage, a water supply plan has been developed and is presented in the following subsections.

Table 5.25-1 Milam County Surplus/(Shortage)

Water User Group	Surplus/(Shortage)		Comment
	2030 (acft/yr)	2080 (acft/yr)	
Bell-Milam Falls WSC			See Bell County
City of Cameron	1,350	1,536	Projected surplus
Milano WSC	113	114	Projected surplus
North Milam WSC	119	148	Projected surplus
City of Rockdale	36	(17)	Projected shortage - see plan below.
Salem Elm Ridge WSC	254	280	Projected surplus
Southwest Milam WSC	350	8	Projected surplus
City of Thorndale	(63)	(157)	Projected shortage - see plan below.
County-Other	3,474	(10,241)	Projected shortage – see plan below.
Manufacturing	0	0	No projected surplus/(shortage)
Steam-Electric	0	0	No projected shortage/(shortage)
Mining	(768)	(767)	Projected shortage – see plan below.
Irrigation	586	783	Projected surplus
Livestock	1,515	1,515	Projected surplus

5.25.1 City of Cameron

5.25.1.1 Description of Supply

The City of Cameron obtains its water supply from Brazos run-of-the-river rights at 2,792 acft/yr. The city provides supply to North Milam WSC at 38 acft/yr, and Salem Elm Ridge WSC at 125 acft/yr. No shortages are projected for the City of Cameron.

5.25.1.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended for the City of Cameron. The entities' water usage utilized for demand projections is 217 gpcd. The RWPG recommends conservation to reduce usage to a goal of 140 gpcd.

a. Conservation:
   i. Cost Source: Volume II.
   ii. Date to be Implemented: 2030.

   iii. Annual Cost: maximum of $268,812 in 2060.
   iv. Unit Cost: $684/acft.

b. New Little River Intake and Raw Water Pipeline:

   i. Cost Source: Volume II.
   ii. Date to be Implemented: 2030.
   iii. Project Cost: $14,785,000.
   iv. Unit Cost: $462/acft

Table 5.25-2 Recommended Plan Costs by Decade for City of Cameron

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*1,350*	*1,373*	*1,415*	*1,454*	*1,494*	*1,536*
Conservation						
Supply From Plan Element (acft/yr)	103	221	338	393	380	365
Annual Cost ($/yr)	$70,452	$151,164	$231,192	$268,812	$259,920	$249,660
Projected Surplus/(Shortage) after Conservation	*1,453*	*1,594*	*1,753*	*1,847*	*1,874*	*1,901*
New Little River Intake and Raw Water Pipeline						
Supply From Plan Element (acft/yr)	2,615	2,615	2,615	2,615	2,615	2,615
Annual Cost ($/yr)	$1,289,000	$1,289,000	$250,000	$250,000	$250,000	$250,000
Unit Costt ($/acft)	$462	$462	$90	$90	$90	$90
Projected Surplus/(Shortage) after recommended WMS (acft/yr)	*4,068*	*4,209*	*4,368*	*4,462*	*4,489*	*4,516*

5.25.2 Milano WSC

5.25.2.1 Description of Supply

Milano WSC obtains its water supply from the Carrizo-Wilcox Aquifer at 724 acft/yr. This WUG is located in Milam and Burleson Counties. No shortages are projected for Milano WSC and no changes in water supply are recommended.

5.25.2.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended for the Milano WSC. The entities' water usage utilized for demand projections is 167 gpcd. The RWPG recommends conservation to reduce usage to a goal of 140 gpcd.

a. Conservation:

   i. Cost Source: Volume II.
   ii. Date to be Implemented: 2030.
   iii. Annual Cost: maximum of $268,812 in 2060.
   iv. Unit Cost: $684/acft.

Table 5.25-3 Recommended Plan Costs by Decade for Milano WSC

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	213	216	223	228	234	241
Conservation						
Supply From Plan Element (acft/yr)	38	68	67	67	66	65
Annual Cost ($/yr)	$25,992	$46,512	$45,828	$45,828	$45,144	$44,460
Projected Surplus/(Shortage) after Conservation	251	284	290	295	300	306

5.25.3 North Milam WSC

5.25.3.1 Description of Supply

North Milam WSC obtains its water supply from the Carrizo-Wilcox Aquifer at 636 acft/yr. They also have contracts with Cameron for 38 acft/yr. This WUG is located in multiple counties (Milam and Burleson). The surplus shown in the table below represents the cumulative total for North Milam WSC. No shortages are projected for North Milam WSC.

5.25.3.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended for the North Milam WSC. The entities' water usage utilized for demand projections is 173 gpcd. The RWPG recommends conservation to reduce usage to a goal of 140 gpcd.

a. Conservation:

   i. Cost Source: Volume II.
   ii. Date to be Implemented: 2030.
   iii. Annual Cost: maximum of $20,520 in 2040.
   iv. Unit Cost: $684/acft.

b. New Little River Intake and Raw Water Pipeline:

   i. Cost Source: Volume II.
   ii. Date to be Implemented: 2030.
   iii. Project Cost: $14,785,000.

iv. Unit Cost: $462/acft

Table 5.25-4 Recommended Plan Costs by Decade for North Milam WSC

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*120*	*125*	*132*	*138*	*144*	*151*
Conservation						
Supply From Plan Element (acft/yr)	13	30	28	27	26	26
Annual Cost ($/yr)	$8,892	$20,520	$19,152	$18,468	$17,784	$17,784
Projected Surplus/(Shortage) after Conservation	*133*	*155*	*160*	*165*	*170*	*177*
City of Cameron Little River Intake						
Supply From Plan Element (acft/yr)	38	38	38	38	38	38
Annual Cost ($/yr)	$1,289,000	$1,289,000	$250,000	$250,000	$250,000	$250,000
Unit Cost ($/acft)	$462	$462	$90	$90	$90	$90
Projected Surplus/(Shortage) after recommended WMS (acft/yr)	*171*	*193*	*198*	*203*	*208*	*215*

5.25.4 City of Rockdale

5.25.4.1 Description of Supply

The City of Rockdale obtains its water supply from groundwater from the Carrizo-Wilcox Aquifer at 1,645 acft/yr. Shortage are projected for the City of Rockdale in 2070 and 2080.

5.25.4.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended for the City of Rockdale. The entities' water usage utilized for demand projections is 198 gpcd. The RWPG recommends conservation to reduce usage to a goal of 140 gpcd.

a. Conservation:
   i. Cost Source: Volume II.
   ii. Date to be Implemented: 2030.
   iii. Annual Cost: maximum of $311,904 in 2080.
   iv. Unit Cost: $684/acft.

b. Water Supply from Lee County Carrizo-Wilcox Wells:
   i. Cost Source: Volume II.
   ii. Date to be Implemented: 2040.
   iii. Project Cost: $7,720,000.
   iv. Unit Cost: $1,513/acft.

Table 5.25-5 Recommended Plan Costs by Decade for City of Rockdale

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*36*	*29*	*18*	*6*	*(5)*	*(17)*
Conservation						
Supply From Plan Element (acft/yr)	128	292	446	449	452	456
Annual Cost ($/yr)	$87,552	$199,728	$305,064	$307,116	$309,168	$311,904
Projected Surplus/(Shortage) after Conservation	*164*	*321*	*464*	*455*	*447*	*439*
Water Supply from Lee County Carrizo Wilcox Wells						
Supply From Plan Element (acft/yr)		366	360	360	400	400
Annual Cost ($/yr)		$655,000	$655,000	$112,000	$112,000	$112,000
Unit Cost ($/acft)		$1,513	$1,513	$259	$259	$259
Projected Surplus/(Shortage) after recommended WMS (acft/yr)	*164*	*687*	*824*	*815*	*847*	*839*

5.25.5 Salem Elm Ridge WSC

5.25.5.1 Description of Supply

Salem Elm Ridge WSC obtains its water supply from Cameron at 125 acft/yr and Central Texas WSC at 347 acft/yr. No shortages are projected for Salem Elm Ridge WSC and no changes in water supply are recommended. Conservation was considered; however, the entity's current per capita use rate is below the selected target rate of 140 gpcd.

5.25.5.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended for the Salem Elm Ridge WSC. The entities' water usage utilized for demand projections is 175 gpcd. The RWPG recommends conservation to reduce usage to a goal of 140 gpcd.

a. Conservation:
   i. Cost Source: Volume II.
   ii. Date to be Implemented: 2030.
   iii. Annual Cost: maximum of $19,836 in 2040.
   iv. Unit Cost: $684/acft.
b. New Little River Intake and Raw Water Pipeline:
   i. Cost Source: Volume II.
   ii. Date to be Implemented: 2030.
   iii. Project Cost: $14,785,000.
   iv. Unit Cost: $462/acft

Table 5.25-6 Recommended Plan Costs by Decade for Salem Elm Ridge WSC

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*304*	*308*	*314*	*319*	*325*	*330*
Conservation						
Supply From Plan Element (acft/yr)	*13*	*29*	*28*	*27*	*26*	*25*
Annual Cost ($/yr)	$8,892	$19,836	$19,152	$18,468	$17,784	$17,100
Projected Surplus/(Shortage) after Conservation	*317*	*337*	*342*	*346*	*351*	*355*
New Little River Intake and Raw Water Pipeline						
Supply From Plan Element (acft/yr)	125	125	125	125	125	125
Annual Cost ($/yr)	$1,289,000	$1,289,000	$250,000	$250,000	$250,000	$250,000
Unit Costt ($/acft)	$462	$462	$90	$90	$90	$90
Projected Surplus/(Shortage) after recommended WMS (acft/yr)	*442*	*462*	*467*	*471*	*476*	*480*

5.25.6 Southwest Milam WSC

5.25.6.1 Description of Supply

at 2,528 acft/yr. This WUG is located in multiple counties (Milam, Lee, Williamson, and Burleson). This WUG sells water to the City of Thorndale for 202 acft/yr. The surplus/shortages shown in the table below represent the cumulative totals for Southwest Milam WSC. Southwest Milam WSC is projected to have a surplus from 2030 to 2080.

5.25.6.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended for Southwest Milam WSC. The entities' water usage utilized for demand projections is 190 gpcd. The RWPG recommends conservation to reduce usage to a goal of 140 gpcd.

c. Conservation:
   i. Cost Source: Volume II.
   ii. Date to be Implemented: 2030.
   iii. Annual Cost: maximum of $383,040 in 2080.
   iv. Unit Cost: $684/acft.

d. Water Supply from Milam County Carrizo Wilcox Wells:
   i. Cost Source: Volume II.
   ii. Date to be Implemented: 2030.
   iii. Project Cost: $3,852,000.
   iv. Unit Cost: $429/acft.

Table 5.25-7 Recommended Plan Costs by Decade for Southwest Milam WSC

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	539	456	368	268	153	20
Conservation						
Supply From Plan Element (acft/yr)	140	331	475	499	527	560
Annual Cost ($/yr)	$95,760	$226,404	$324,900	$341,316	$360,468	$383,040
Projected Surplus/(Shortage) after Conservation	679	787	843	767	680	580
Water Supply from Lee County Carrizo-Wilcox Wells						
Supply From Plan Element (acft/yr)	300	609	625	692	834	834
Annual Cost ($/yr)	$358,000	$358,000	$87,000	$87,000	$87,000	$87,000
Unit Cost ($/acft)	$1,193	$588	$139	$126	$104	$104
Projected Surplus/(Shortage) after recommended WMS (acft/yr)	979	1,396	1,468	1,459	1,514	1,414

5.25.7 City of Thorndale

The City of Thorndale is located in Milam and partially in Williamson County. The city obtains its water supply from Southwest Milam WSC at 202 acft/yr. Shortages are projected for the City of Thorndale from 2030 to 2080.

5.25.7.1 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended. Conservation is not recommended because the entity's usage is 138 gpcd, which is below the selected goal of 140 gpcd.

a. Groundwater Development Carrizo-Wilcox – Milam:
   i. Cost Source: Volume II.
   ii. Date to be Implemented: 2030.
   iii. Project Cost: $14,940,000.
   iv. Unit Cost: Not Determined.

5.25.8 County-Other

5.25.8.1 Description of Supply

Entities in County-Other obtain supplies from Brazos River Alluvium Aquifer at 160 acft/yr, along with surface water from Lake Alcoa and a contract for 5,000 acft/yr with BRA which can supply 4,167 acft/yr. County Other Milam contains a new development, Sandow Lakes Ranch (SLR), which is planning significant growth in the region. County Other is projected to have a shortage beginning in 2040 at 1,274 acft/yr, increasing to 10,241 by 2080. Conservation was considered; however, the entity's current per capita use rate is below the selected target rate of 140 gpcd.

5.25.8.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended. Conservation was considered; however, the entity's current per capita use rate is below the selected target rate of 140 gpcd.

a. Groundwater Development Carrizo-Wilcox – Milam:
   i. Cost Source: Volume II.
   ii. Date to be Implemented: 2040.
   iii. Project Cost: $26,000,000.
   iv. Unit Cost: $257/acft at 10,500 acfy/yr.

Table 5.25-8 Recommended Plan Costs by Decade for Milam County-Other

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*3,718*	*(1,030)*	*(4,601)*	*(9,945)*	*(9,971)*	*(9,997)*
Groundwater Development Carrizo-Wilcox						
Supply From Plan Element (acft/yr)	0	1,350	5,000	10,500	10,500	10,500
Annual Cost ($/yr)	-	$2,702,000	$2,702,000	$873,000	$873,000	$873,000
Unit Cost ($/acft)	-	$2,001	$540	$83	$83	$83

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) after recommended WMS (acft/yr)	*3,474*	320	399	555	529	503

5.25.9 Manufacturing

Presently no manufacturing demands exist.

5.25.10 Steam-Electric

No Steam-Electric demands exists nor is projected for the County

5.25.11 Mining

5.25.11.1 Description of Supply

Milam County Mining obtains its water supply from the Carrizo-Wilcox Aquifer at 64 to 71 acft/yr, from 2030 to 2080, used for mine reclamation. Milam County Mining is projected to have a shortage beginning in 2030 at 768 acft/yr, decreasing to 767 acft/yr by 2080.

5.25.11.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended.

a. Conservation:
   i. Cost Source: Volume II.
   ii. Date to be Implemented: by 2030.
   iii. Annual Cost: Not determined.
b. Groundwater Development – Queen City Aquifer
   i. Cost Source: Volume II.
   ii. Date to be Implemented: by 2030.
   iii. Project Cost:
   iv. Unit Cost:

Table 5.25-9 Recommended Plan Costs by Decade for Milam County – Mining

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*(768)*	*(772)*	*(767)*	*(765)*	*(766)*	*(767)*
Conservation						
Supply From Plan Element (acft/yr)	*25*	*42*	*58*	*59*	*59*	*59*
Annual Cost ($/yr)	ND	ND	ND	ND	ND	ND
Projected Surplus/(Shortage) after Conservation (acft/yr)	*(743)*	*(730)*	*(709)*	*(706)*	*(707)*	*(708)*

Plan Element	2030	2040	2050	2060	2070	2080
Groundwater Development – Queen City Aquifer						
Supply From Plan Element (acft/yr)	800	800	800	800	800	800
Annual Cost ($/yr)	*$576,000*	*$576,000*	*$60,000*	*$60,000*	*$60,000*	*$60,000*
Unit Cost ($/acft)	*$720*	*$720*	*$75*	*$75*	*$75*	*$75*
Projected Surplus/(Shortage) after recommended WMS (acft/yr)	*57*	*70*	*91*	*94*	*93*	*92*

5.25.12 Irrigation

Milam County Irrigation is supplied by groundwater from the Carrizo-Wilcox, Queen City and Brazos River Alluvium Aquifers as well as run of the river water rights. Irrigation is projected to have a surplus throughout the planning period.

5.25.13 Livestock

Livestock water supply is projected to meet demands through 2080 and no changes in water supply are recommended.

5.26 Nolan County Water Supply Plan

Table 5.26 1 lists each water user group in Nolan County and their corresponding surplus or shortage in years 2030 and 2080. For each water user group with a projected shortage, a water supply plan has been developed and is presented in the following subsections.

Table 5.26-1 Nolan County Surplus/(Shortage)

Water User Group	Surplus/(Shortage)		Comment
	2030 (acft/yr)	2080 (acft/yr)	
Bitter Creek WSC	(138)	(199)	Projected shortage - see plan below.
City of Roscoe	(107)	(83)	Projected shortage - see plan below.
City of Sweetwater	(145)	(1)	Projected shortage - see plan below.
County-Other	4	103	Projected surplus
Manufacturing	(42)	(154)	Projected shortage - see plan below.
Steam-Electric	-	-	No projected demand
Mining	(4)	(5)	Projected shortage – see plan below.
Irrigation	(9,634)	(8,847)	Projected shortage – see plan below
Livestock	7	7	Projected surplus

5.26.1 Bitter Creek WSC

5.26.1.1 Description of Supply

The Bitter Creek WSC obtains its water supply from the Dockum Aquifer at 109 acft/yr. This WUG is located in Nolan and Fisher Counties. The totals shown in the table below represent the cumulative totals for Bitter Creek WSC in both counties. Shortages are projected through 2080.

5.26.1.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended to meet water needs for Bitter Creek WSC. The most recent water loss audit report shows a water loss of approximately 63% and water loss mitigation is recommended. Conservation was considered; however, the entity's current per capita use rate of 140 is equal to the selected target rate of 140 gpcd

1. Water Loss Reduction:
    a. Cost Source: Volume II.
    b. Date to be Implemented: before 2040.
    c. Annual Cost: maximum of $3,297,483 in 2040.
2. Groundwater Development – Blaine Aquifer:
    a. Cost Source: Volume II.

b. Date to be Implemented: before 2030.
c. Project Cost: $2,488,000.
d. Unit Cost: $4,100/acft.

Table 5.26-2 Recommended Plan Costs by Decade for Bitter Creek WSC

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*(138)*	*(145)*	*(155)*	*(167)*	*(180)*	*(199)*
Water Loss Reduction						
Supply From Plan Element (acft/yr)	120	124	129	136	142	151
Annual Cost ($/yr)	$3,295,627	$3,297,483	$59,855	$63,103	$65,887	$70,063
Projected Surplus/(Shortage) after Water Loss Reduction n (acft/yr)	*(18)*	*(21)*	*(26)*	*(31)*	*(38)*	*(48)*
Blaine Aquifer Development						
Supply From Plan Element (acft/yr)	50	50	50	50	50	50
Annual Cost ($/yr)	$205,000	$205,000	$30,000	$30,000	$30,000	$30,000
Unit Cost ($/acft)	$4,100	$4,100	$600	$600	$600	$600
Projected Surplus/(Shortage) after Recommended WMS (acft/yr)	32	29	24	19	12	2

5.26.2 City of Roscoe

5.26.2.1 Description of Supply

The City of Roscoe obtains groundwater from the Dockum Aquifer at 115 acft/yr. A need is projected for the City of Roscoe through 2080.

5.26.2.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to meet water needs for the City of Roscoe. The entities' water usage utilized for demand projections is 186 gpcd. The RWPG recommends conservation to reduce usage to a goal of 140 gpcd.

1. Conservation:
   a. Cost Source: Volume II.
   b. Date to be Implemented: before 2030.
   c. Annual Cost: maximum of $31,464 in 2050.
   d. Unit Cost: $684/acft.
2. Cedar Ridge Reservoir (Purchase Water from Sweetwater):
   a. Cost Source: Sweetwater Wholesale Water Rate.
   b. Date to be Implemented: before 2040.
   c. Project Cost: Existing infrastructure assumed sufficient.
   d. Unit Cost: $2,463/acft ($7.56/1,000 gallons).

3. Groundwater Development – Edwards Aquifer:
    a. Cost Source: Volume II.
    b. Date to be Implemented: before 2030.
    c. Project Cost: $11,866,000.
    d. Unit Cost: $10,618/acft.

Table 5.26-3 Recommended Plan Costs by Decade for Roscoe

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*(107)*	*(99)*	*(92)*	*(87)*	*(84)*	*(83)*
Conservation						
Supply From Plan Element (acft/yr)	18	37	46	45	45	44
Annual Cost ($/yr)	$12,312	$25,308	$31,464	$30,780	$30,780	$30,096
Projected Surplus/(Shortage) after Conservation (acft/yr)	*(89)*	*(62)*	*(46)*	*(42)*	*(39)*	*(39)*
Cedar Ridge Reservoir (Purchase Water from Sweetwater)						
Supply From Plan Element (acft/yr)	-	90	96	101	107	107
Annual Cost ($/yr)	-	$221,700	$236,400	$248,800	$263,500	$263,500
Unit Cost ($/acft)	-	$2,463	$2,463	$2,463	$2,463	$2,463
Edwards Aquifer Development						
Supply From Plan Element (acft/yr)	89	-	-	-	-	-
Annual Cost ($/yr)	$945,000	-	-	-	-	-
Unit Cost ($/acft)	$10,618	-	-	-	-	-
Projected Surplus/(Shortage) after Recommended WMS (acft/yr)	0	28	50	59	68	68

5.26.3 City of Sweetwater

5.26.3.1 Description of Supply

The City of Sweetwater obtains 2,329 acft/yr of groundwater from the Dockum Aquifer throughout the planning period. The City of Sweetwater supplies water to County Other-Taylor, Manufacturing-Nolan, and Roby. A shortage is projected for the City of Sweetwater through 2080.

5.26.3.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended to meet water needs for the City of Sweetwater. The most recent water loss audit report shows a water loss of approximately 15% and water loss mitigation is recommended. Conservation was considered; however, the entity's current per capita use rate is below the selected target rate of 140 gpcd.

1. Water Loss Audit:
    a. Cost Source: Volume II.

   b. Date to be Implemented: before 2030.
   c. Annual Cost: maximum of $13,156 in 2030.

2. Purchase from Abilene (Cedar Ridge Reservoir):
   a. The City of Abilene is pursuing the Cedar Ridge Reservoir project to develop the supplies necessary to meet Abilene's future municipal demands and contractual sales.
   b. Cost Source: Abilene Water Rate.
   c. Date to be Implemented: before 2040.
   d. Project Cost: $90,373,000.
   e. Unit Cost: $6,378/acft (includes cost to purchase water from Abilene).

3. Additional water from Oak Creek Reservoir Conjunctive use:
   a. Cost Source: Volume II.
   b. Date to be Implemented: before 2030.
   c. Project Cost: None infrastructure is in place.

Table 5.26-4 Recommended Plan Costs by Decade for Sweetwater

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*(145)*	*(119)*	*(91)*	*(62)*	*(32)*	*(1)*
Water Loss Reduction						
Supply From Plan Element (acft/yr)	15	15	14	14	14	14
Annual Cost ($/yr)	$13,156	$13,156	$4,200	$4,200	$4,200	$4,200
Projected Surplus/(Shortage) after Water Loss Reduction (acft/yr)	*(130)*	*(104)*	*(77)*	*(48)*	*(18)*	*13*
Purchase from Abilene (Cedar Creek Reservoir)						
Supply From Plan Element (acft/yr)	-	1,668	1,731	1,787	1,839	1,839
Annual Cost ($/yr)	-	$10,639,000	$11,040,000	$5,218,000	$5,370,000	$5,370,000
Unit Cost ($/acft)	-	$6,378	$6,378	$2,920	$2,920	$2,920
Additional Water from Oak Creek Conjunctive Use (Brazos G) and Subordination (Region F)						
Supply From Plan Element (acft/yr)	1,015	1,015	1,017	1,017	1,017	1,053
Annual Cost ($/yr)	–	–	–	–	–	–
Unit Cost ($/acft)	–	–	–	–	–	–
Projected Surplus/(Shortage) after Recommended WMS (acft/yr)	885	2,579	2,671	2,756	2,838	2,905

5.26.4 County-Other

5.26.4.1 Description of Supply

Entities in Nolan County-Other obtain 140 acft/yr of water from the Edwards-Trinity Aquifer. A surplus is projected through 2080. Conservation was considered; however, the entity's current per capita use of 105 is below the selected target rate of 140 gpcd. No changes are recommended to the Water Supply Plan.

5.26.5 Manufacturing

5.26.5.1 Description of Supply

Nolan County Manufacturing obtains its water supply from the Dockum Aquifer, City of Sweetwater and from the Edwards-Trinity (Plateau) Aquifer. Manufacturing is projected to have a shortage beginning in year 2030.

5.26.5.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to meet water needs for Nolan County-Manufacturing. Conservation is recommended.

1. Conservation:
    a. Cost Source: Volume II.
    b. Date to be Implemented: by 2030.
    c. Annual Cost: not determined.
2. Groundwater Development – Edwards Aquifer:
    a. Cost Source: Volume II.
    b. Date to be Implemented: before 2030.
    c. Project Cost: $3,349,000.
    d. Unit Cost: $2,173 /acft.

Table 5.26-5 Recommended Plan Costs by Decade for Nolan County - Manufacturing

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*(42)*	*(64)*	*(87)*	*(109)*	*(131)*	*(154)*
Conservation						
Supply From Plan Element (acft/yr)	13	26	37	37	37	37
Annual Cost ($/yr)	ND	ND	ND	ND	ND	ND
Projected Surplus/(Shortage) after Conservation (acft/yr)	*(29)*	*(38)*	*(50)*	*(72)*	*(94)*	*(117)*
Edwards Aquifer Development						
Supply From Plan Element (acft/yr)	34	133	133	133	133	133
Annual Cost ($/yr)	$74,000	$289,000	$53,000	$53,000	$53,000	$53,000
Unit Cost ($/acft)	$2,173	$2,173	$398	$398	$398	$398
Projected Surplus/(Shortage) after Recommended WMS (acft/yr)	5	95	83	61	36	16
ND – Not determined. Costs to implement industrial conservation technologies will vary based on each location.						

5.26.6 Steam-Electric

No Steam-Electric demand exists or is projected for the county.

5.26.7 Mining

5.26.7.1 Description of Supply

Nolan County Mining obtains its water supply from the Blaine and Edwards-Trinity (Plateau) Aquifers. Based on the available groundwater supply, Nolan County Mining is projected to have a shortage between 2030 and 2080.

5.26.7.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to meet water needs for Nolan County-Mining. Conservation is recommended.

1. Conservation:
    a. Cost Source: Volume II.
    b. Date to be Implemented: by 2030.
    c. Annual Cost: not determined.
2. Cedar Ridge Reservoir (Purchase Water Supply from Sweetwater):
    a. Cost Source: Sweetwater Wholesale Water Rate.
    b. Date to be Implemented: before 2040.
    c. Project Cost: Existing infrastructure assumed sufficient.
    d. Unit Cost: $1,031/acft (Sweetwater Wholesale Rate).
3. Groundwater Development – Edwards Aquifer:
    a. Cost Source: Volume II.
    b. Date to be Implemented: before 2030.
    c. Project Cost: $789,000.
    d. Unit Cost: $7,100/acft.

Table 5.26-6 Recommended Plan Costs by Decade for Nolan County – Mining

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*(4)*	*(4)*	*(4)*	*(4)*	*(5)*	*(5)*
Conservation						
Supply From Plan Element (acft/yr)	3	5	6	5	5	4
Annual Cost ($/yr)	ND	ND	ND	ND	ND	ND
Projected Surplus/(Shortage) after Conservation (acft/yr)	*(81)*	*1*	*2*	*1*	*0*	*(1)*
Additional Water from Sweetwater						

Plan Element	2030	2040	2050	2060	2070	2080
Supply From Plan Element (acft/yr)	-	186	166	147	131	131
Annual Cost ($/yr)	-	$458,100	$408,900	$362,100	$322,700	$322,700
Unit Cost ($/acft)	-	$2,463	$2,463	$2,463	$2,463	$2,463
Edwards Aquifer Development						
Supply From Plan Element (acft/yr)	10	-	-	-	-	-
Annual Cost ($/yr)	$71,100	-	-	-	-	-
Unit Cost ($acft)	$71,100	-	-	-	-	-
Projected Surplus/(Shortage) after Recommended WMS (acft/yr)	9	187	168	148	131	130
ND – Not determined. Costs to implement industrial conservation technologies will vary based on each location						

5.26.8 Irrigation

5.26.8.1 Description of Supply

Nolan County Irrigation obtains its water supply from the Dockum and Edwards-Trinity Aquifers and run-of-river diversions from the Brazos River. Based on the available supply, Nolan County Irrigation is projected to have a shortage between 2030 and2080.

5.26.8.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to meet water needs for Nolan County-Irrigation. Conservation is recommended.

1. Conservation:
    a. Cost Source: Volume II.
    b. Date to be Implemented: before 2030.
    c. Annual Cost: max $988,600 in 2050.
    d. Unit Cost: $1,222 /acft.
2. Leave Needs Unmet:
    a. New supplies for irrigation would be cost prohibitive to develop and most farms would switch to dry-land crops or allow fields to go fallow during a prolonged drought.
    b. Cost Source: Cost of not meeting needs – will be provided by TWDB.
    c. Date to be Implemented: 2030.

Table 5.26-7 Recommended Plan Costs by Decade for Nolan County – Irrigation

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*(9,634)*	*(9,634)*	*(9,250)*	*(9,008)*	*(8,847)*	*(8,847)*
Conservation						
Supply From Plan Element (acft/yr)	347	578	809	809	809	809

Plan Element	2030	2040	2050	2060	2070	2080
Annual Cost ($/yr)	$424,000	$706,300	$988,600	$988,600	$988,600	$988,600
Projected Surplus/(Shortage) after Conservation (acft/yr)	*(9,287)*	*(9,056)*	*(8,441)*	*(8,199)*	*(8,038)*	*(8,038)*
Leave Needs Unmet (acft/yr)	*(9,287)*	*(9,056)*	*(8,441)*	*(8,199)*	*(8,038)*	*(8,038)*

5.26.9 Livestock

Livestock demand is met by local water supply and Blaine and Edwards-Trinity Aquifer groundwater. Nolan County Livestock is projected to meet demands through 2080 and no changes in water supply are recommended.

5.27 Palo Pinto County Water Supply Plan

Table 5.27-1 lists each water user group in Palo Pinto County and their corresponding surplus or shortage in years 2030 and 2080. For each water user group with a projected shortage, a water supply plan has been developed and is presented in the following subsections.

Table 5.27-1 Palo Pinto County Surplus/(Shortage)

Water User Group	Surplus/Shortage		Comment
	2030 (acft/yr)	2080 (acft/yr)	
Double Diamond Utilities			See Hill County
City of Gordon	(166)	(161)	Projected shortage - see plan below.
Lake Palo Pinto Area WSC	0	0	No projected surplus or shortage
City of Mineral Wells	(920)	(2,315)	Projected shortage - see plan below.
North Rural WSC	0	0	No projected surplus or shortage
Palo Pinto WSC	77	78	Projected surplus
Parker County SUD			See Region C
Possum Kingdom WSC	151	173	Projected surplus.
Santo SUD	40	25	Projected surplus.
Sportsmans World MUD	14	16	Projected surplus.
Stephens Regional SUD			See Stephens County
City of Strawn	(14)	(10)	Projected shortage - see plan below.
Sturdivant Progress WSC	68	77	Projected surplus
County-Other	(167)	(160)	Projected shortage - see plan below.
Manufacturing	(18)	(23)	Projected shortage - see plan below.
Steam-Electric	1	1	Projected surplus
Mining	(25)	(29)	Projected shortage – see plan below.
Irrigation	(1,492)	(1.583)	Projected shortage - see plan below.
Livestock	18	(144)	Projected shortage - see plan below.

5.27.1 City of Gordon

5.27.1.1 Description of Supply

The City of Gordon is split between Erath and Palo Pinto Counties; however, the majority of the City's demand is located in Palo Pinto County. Gordon receives 50 acft/yr of water supply from the City of Strawn, the City also sells water to Erath County-Other entities. Water shortages are projected throughout the planning period. The projected municipal unmet needs result from limited source availability as determined by using the Brazos G RWPG's adopted methodology for the purposes of the 2026 Brazos G RWP, which is consistent with the specific assumptions and methods required for regional water planning.

These needs will only occur during a drought equivalent to or worse than the drought of record. While not a strategy recommended by the Brazos G RWPG, the impacts of the unmet needs can be mitigated through demand management in the event of a serious drought prior to the recommended strategies coming online.

5.27.1.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to meet water needs for the City of Gordon. The most recent water loss audit report shows a water loss of approximately 24% and water loss mitigation is recommended. The entities' water usage utilized for demand projections is 230 gpcd. The RWPG recommends conservation to reduce usage to a goal of 140 gpcd.

1. Conservation:
    a. Cost Source: Volume II.
    b. Date to be Implemented: by 2030.
    c. Annual Cost: $42,208 in 2060.
    d. Unit Cost: $684/acft.
2. Water Loss Reduction:
    a. Cost Source: Volume II.
    b. Date to be Implemented: by 2030.
    c. Annual Cost: maximum of $16,280 in 2030.
3. Groundwater Development – Trinity Aquifer:
    a. Cost Source: Volume II.
    b. Date to be Implemented: by 2030.
    c. Annual Cost: $1,946,000.
    d. Unit Cost: $1,427/acft.

Table 5.27-2 Recommended Plan Costs by Decade for City of Gordon

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*(166)*	*(166)*	*(164)*	*(164)*	*(163)*	*(161)*
Conservation						
Supply From Plan Element (acft/yr)	14	30	46	63	80	60
Annual Cost ($/yr)	$9,576	$20,520	$31,464	$42,408	$42,408	$41,040
Water Loss Reduction						
Supply From Plan Element (acft/yr)	16	16	16	16	16	16
Annual Cost ($/yr)	$16,280	$16,280	$5,401	$5,401	$5,401	$5,401
Projected Surplus/(Shortage) after Conservation and Water Loss Reduction (acft/yr)	*(136)*	*(120)*	*(102)*	*(85)*	*(67)*	*(85)*
Trinity Aquifer Development (Purchase Water from Strawn)						
Supply From Plan Element (acft/yr)	113	120	124	118	121	121
Annual Cost ($/yr)	$161,000	$171,000	$40,000	$38,000	$39,000	$39,000
Unit Cost ($/acft)	$1,427	$1,427	$323	$323	$323	$323
Projected Surplus/(Shortage) after recommended WMS (acft/yr)	*(23)*	*0*	*22*	*33*	*54*	*36*

5.27.2 Lake Palo Pinto Area WSC

Lake Palo Pinto Area WSC obtains its water supply from Palo Pinto County MWD #1. The WSC has enough projected supply throughout the planning period, and no changes to water supply are recommended. Conservation was considered; however, the current per capita use of 112 gpcd is below the target rate of 140 gpcd.

5.27.3 City of Mineral Wells

5.27.3.1 Description of Supply

The City of Mineral Wells is split between Parker County in Region C and Palo Pinto County (Brazos G); however, the majority of demand lies within Palo Pinto County. The City obtains water supply from Palo Pinto County MWD #1. Mineral Wells provides water to Palo Pinto WSC, Santo SUD, Sturdivant Progress WSC, North Rural WSC, Palo Pinto County-Other and Manufacturing entities, and to various users in Region C. Due to a prorated reduction in treated surface water supply form Palo Pinto County MWD #1, water shortages are projected for the City of Mineral Wells from 2030 through 2080. Balances shown are for the entire City, including areas in Parker County and Region C. Water conservation and water loss reduction as recommended water management strategies are shown for both the Brazos G and Region C portions.

5.27.3.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to meet water needs for the City of Mineral Wells. The City has also requested that an 8 MGD expansion of the existing Hilltop WTP be included in the plan. This expansion is not shown below because the water supply will come from the Turkey Peak WMS (below); the expansion project is included in Volume II of the Regional Water Plan. The most recent water loss audit report shows a water loss of approximately 39% and water loss mitigation is recommended. The entities' water usage utilized for demand projections is 180 gpcd. The RWPG recommends conservation to reduce usage to a goal of 140 gpcd.

1. Conservation:
    a. Cost Source: Volume II.
    b. Date to be Implemented: 2030.
    c. Annual Cost: maximum of $578,664 in 2060.
    d. Unit Cost: $684/acft.
2. Water Loss Reduction:
    a. Cost Source: Volume II.
    b. Date to be Implemented: by 2030.
    c. Annual Cost: maximum of $1,375,942 in 2040.
3. Turkey Peak Reservoir – Lake Palo Pinto Enlargement:
    a. Cost Source: Palo Pinto County MWD #1 Water Rate.
    b. Date to be Implemented: by 2030.
    c. Annual Cost: $4,141,000.
    d. Unit Cost: $2,988/acft ($9.17/1000 gal).
4. Indirect Potable Reuse
    a. Cost Source: Volume II.
    b. Date to be implemented: before 2040
    c. Project Cost: $17,799,000
    d. Unit Cost: $1,352

Table 5.27-3 Recommended Plan Costs by Decade for City of Mineral Wells

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*(920)*	*(1246)*	*(1583)*	*(1922)*	*(2088)*	*(2315)*
Conservation						
Supply From Plan Element (acft/yr) (Brazos G)	276	766	806	846	846	846
Supply From Plan Element (acft/yr) (Region C portion)	6	9	3	4	5	6
Annual Cost ($/yr) (Brazos G portion only)	$188,784	$523,944	$551,304	$578,664	$578,664	$578,664
Water Loss Reduction						
Supply From Plan Element (acft/yr) (Brazos G)	914	962	1,011	1,062	1,062	1,062
Supply From Plan Element (acft/yr) (Region C portion)	2	2	—	—	—	—
Annual Cost ($/yr) (Brazos G portion only)	$1,355,152	$1,375,942	$437,903	$459,993	$459,993	$459,993
Projected Surplus/(Shortage) after Conservation and Water Loss Reduction (acft/yr)	*278*	*493*	*237*	*(10)*	*(175)*	*(401)*
Additional Demands from Recommended Strategies from Others						
Increase Contract Amount to County-Other (acft/yr)	(190)	(187)	(187)	(184)	(177)	(177)
Increase Contract Amount to Palo Pinto Manufacturing (acft/yr)	(18)	(19)	(20)	(21)	(22)	(23)
Total Surplus/(Shortage) Including Recommended Strategies (acft/yr)	*70*	*287*	*30*	*(215)*	*(374)*	*(601)*
Turkey Peak Reservoir						
Supply From Plan Element (acft/yr)	543	778	983	1,186	1,386	1,386
Annual Cost ($/yr)	$1,622,000	$2,325,000	$2,937,000	$3,544,000	$4,141,000	$4,141,000
Unit Cost ($/acft)	$2,988	$2,988	$2,988	$2,988	$2,988	$2,988
Indirect Potable Reuse						
Supply From Plan Element (acft/yr)	—	1,120	1,120	1,120	1,120	1,120
Annual Cost ($/yr)	—	$1,514,000	$1,514,000	$264,000	$264,000	$264,000
Unit Cost ($/acft)	—	$1,352	$1,352	$236	$236	$236
Projected Surplus/(Shortage) after recommended WMS (acft/yr)	613	2,185	2,133	2,091	2,132	1,905

5.27.4 North Rural WSC

North Rural WSC is split between Parker County in Region C and Palo Pinto County (Brazos G); however, the majority of demand lies within Palo Pinto County in the earlier decades with a shift of increased demand in Parker County later in the planning period. North Rural WSC obtains its water supply from the City of Mineral Wells. No shortages are projected for the WSC and no changes in water supply are recommended throughout the planning period. Conservation was considered; however, the current per capita use rate of 100 gpcd is below the targeted rate of 140 gpcd.

5.27.5 Palo Pinto WSC

Palo Pinto obtains its water supply from the City of Mineral Wells. No shortages are projected for the WSC and no changes in water supply are recommended throughout the planning period. Conservation was considered; however, the current per capita use rate of 127 gpcd is below the targeted rate of 140 gpcd.

5.27.6 Possum Kingdom WSC

5.27.6.1 Description of Supply

Possum Kingdom WSC is split between Stephens and Palo Pinto County. The WSC receives supply from the Brazos River Authority. No water shortages are projected throughout the planning period.

5.27.6.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended to supplement water needs for Possum Kingdom WSC. The entity's water usage utilized for demand projections is 384 gpcd. The RWPG recommends conservation to reduce usage to a goal of 140 gpcd.

1. Conservation:
    a. Cost Source: Volume II.
    b. Date to be Implemented: by 2030.
    c. Annual Cost: $233,928 in 2080.
    d. Unit Cost: $684/acft.

Table 5.27-4 Recommended Plan Costs by Decade for Possum Kingdom WSC

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*151*	*153*	*162*	*165*	*169*	*173*
Conservation						
Supply From Plan Element (acft/yr)	51	113	169	228	286	342
Annual Cost ($/yr)	$34,884	$77,292	$115,596	$155,952	$195,624	$233,928
Projected Surplus/(Shortage) after Conservation (acft/yr)	*202*	*266*	*331*	*393*	*455*	*515*
Projected Surplus/(Shortage) after recommended WMS (acft/yr)	*202*	*266*	*331*	*393*	*455*	*515*

5.27.7 Santo SUD

Santo SUD is split between Hood and Palo Pinto counties as well as Parker County in Region C, however the majority of the SUD's demand lies within Palo Pinto County. Santo SUD obtains treated surface water supply from the City of Mineral Wells.

No shortages are projected for the SUD and no changes in water supply are recommended throughout the planning period. Conservation was considered; however, the current per capita use rate of 125 is below the targeted rate of 140 gpcd.

5.27.8 Sportsmans World MUD

Sportsman World MUD is supplied by surface water from the main stem of the Brazos River. The MUD has no projected shortages throughout the planning period. Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended to supplement water supply for Sportsman World MUD. The entity's water usage utilized for demand projections is 890 gpcd. The RWPG recommends conservation to reduce usage to a goal of 140 gpcd.

1. Conservation:
   a. Cost Source: Volume II
   b. Date to be Implemented: 2030
   c. Annual Cost: maximum of $29,412 in 2080
   d. Unit Cost: $684/acft.

Table 5.27-5 Recommended Plan Costs by Decade for Sportsmans World MUD

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*14*	*14*	*15*	*15*	*16*	*16*
Conservation						
Supply From Plan Element (acft/yr)	7	14	22	29	36	43
Annual Cost ($/yr)	$4,788	$9,576	$15,048	$19,836	$24,624	$29,412
Projected Surplus/(Shortage) after Conservation (acft/yr)	*21*	*28*	*37*	*44*	*52*	*59*
Projected Surplus/(Shortage) after recommended WMS (acft/yr)	*21*	*28*	*37*	*44*	*52*	*59*

5.27.9 City of Strawn

5.27.9.1 Description of Supply

The City of Strawn is supplied by surface water from Lake Tucker and is projected to have shortages through 2080. The City also sells 50 acft/yr of water to the City of Gordon.

5.27.9.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended for the City of Strawn. The most recent water loss audit report shows a water loss of approximately 32%, and water loss mitigation is recommended. The entity's water usage utilized for demand projections is 207 gpcd. The RWPG recommends conservation to reduce usage to a goal of 140 gpcd

1. Conservation:
   a. Cost Source: Volume II.
   b. Date to be Implemented: 2030.
   c. Annual Cost: $25,308 in 2060.
   d. Unit Cost: $684/acft.
2. Water Loss Reduction:
   a. Cost Source: Volume II.
   b. Date to be Implemented: by 2030.
   c. Annual Cost: maximum of $62,288 in 2030.
3. Groundwater Development – Trinity Aquifer (Erath County):
   a. Cost Source: Volume II.
   b. Date to be Implemented: by 2030.
   c. Project Cost: $7,732,000.
   d. Unit Cost: $21,759/acft.

Table 5.27-6 Recommended Plan Costs by Decade for City of Strawn

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*(14)*	*(14)*	*(12)*	*(12)*	*(11)*	*(10)*
Conservation						
Supply From Plan Element (acft/yr)	10	22	34	37	37	37
Annual Cost ($/yr)	$6,840	$15,048	$23,256	$25,308	$25,308	$25,308
Water Loss Reduction						
Supply Contract to Gordon (acft/yr)	22	22	22	22	22	21
Annual Cost ($/yr)	$62,288	$62,288	$8,967	$8,967	$8,559	$8,559
Projected Surplus/(Shortage) after Conservation and Water Loss Reduction (acft/yr)	*18*	*30*	*44*	*47*	*47*	*48*
Groundwater Development – Trinity Aquifer (Erath County)						
Supply From Plan Element (acft/yr)	27	28	29	28	29	29
Annual Cost ($/yr)	$587,000	$609,000	$87,000	$84,000	$87,000	$87,000
Unit Cost ($/acft)	$21,759	$21,759	$3,000	$3,000	$3,000	$3,000
Projected Surplus/(Shortage) after recommended WMS (acft/yr)	*45*	*58*	*73*	*75*	*76*	*77*

5.27.10 Sturdivant Progress WSC

Sturdivant Progress WSC purchases treated water from the City of Mineral Wells. The WSC's contract is projected to provide sufficient supply throughout the planning period. Conservation was considered; however, the current per capita use rate of 97 gpcd is below the targeted rate of 140 gpcd. No changes in water supply are recommended.

5.27.11 County-Other

5.27.11.1 Description of Supply

Entities in Palo Pinto County-Other obtain treated surface water from the City of Mineral Wells and water from the Brazos River Authority. There is a projected shortage for County-Other from 2030 through 2080.

5.27.11.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following plan is recommended for Palo-Pinto County-Other entities. Conservation was also considered; however, the current per capita use rate of 84 gpcd is below the targeted rate of 140 gpcd.

1. Purchase Additional Water from the City of Mineral Wells:
   a. Cost Source: Mineral Wells Water Rate
   b. Date to be Implemented: by 2030
   c. Annual Cost: Maximum of $1,187,000 in 2030
   d. Unit Cost: $6,247/acft ($19.17/1000 gal)

Table 5.27-7 Recommended Plan Costs by Decade for Palo Pinto – County-Other

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*(167)*	*(166)*	*(164)*	*(162)*	*(162)*	*(160)*
Purchase Additional Water from the City of Mineral Wells						
Supply From Plan Element (acft/yr)	190	187	187	184	177	177
Annual Cost ($/yr)	$1,187,000	$1,168,000	$1,168,000	$1,149,000	$1,106,000	$1,106,000
Unit Cost ($/acft)	$6,247	$6,247	$6,247	$6,247	$6,247	$6,247
Projected Surplus/(Shortage) after recommended WMS (acft/yr)	*23*	*21*	*23*	*22*	*15*	*17*

5.27.12 Manufacturing

5.27.12.1 Description of Supply

Palo Pinto County Manufacturing obtains its water supply from the City of Mineral Wells and the Trinity Aquifer. Palo Pinto County Manufacturing has projected needs throughout the planning horizon.

5.27.12.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended for Palo Pinto Manufacturing.

1. Purchase Additional Supply from the City of Mineral Wells
   a. Cost Source: Mineral Wells Water Rate.
   b. Date to be Implemented: by 2030.
   c. Annual Cost: Maximum of $144,000 in 2030.
   d. Unit Cost: $6,247/acft ($19.17/1000 gal).

Table 5.27-8 Recommended Plan Costs by Decade for Palo Pinto – Manufacturing

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*(18)*	*(19)*	*(20)*	*(21)*	*(22)*	*(23)*
Purchase Additional Supply from the City of Mineral Wells						
Supply From Plan Element (acft/yr)	18	19	20	21	22	23
Annual Cost ($/yr)	$112,000	$119,000	$125,000	$131,000	$137,000	$144,000
Unit Cost ($/acft)	$6,247	$6,247	$6,247	$6,247	$6,247	$6,247
Projected Surplus/(Shortage) after recommended WMS (acft/yr)	0	0	0	0	0	0

5.27.13 Steam-Electric

Palo Pinto County Steam-Electric obtains its water supply from Palo Pinto County MWD #1 and from Palo Pinto County-Other entities. Steam-Electric is projected to have surplus of supply through the planning period, and no change to water supply is recommended.

5.27.14 Mining

5.27.14.1 Description of Supply

Palo Pinto County Mining obtains its water supply from Palo Pinto County-Other entities. Mining operations have a projected shortage throughout the planning period.

5.27.14.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following plan is recommended for Palo-Pinto County-Other entities. Conservation is recommended.

1. Conservation:
   a. Cost Source: Volume II.
   b. Date to be Implemented: by 2030.
   c. Unit Cost: Not determined (ND). Costs to implement industrial conservation technologies will vary based on each location.

2. Groundwater Development – Trinity Aquifer (Erath County):
    a. Cost Source: Volume II.
    b. Date to be Implemented: by 2030.
    c. Project Cost: $14,768,000.
    d. Unit Cost: $1,872/acft.

Table 5.27-9 Recommended Plan Costs by Decade for Palo Pinto – Mining

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*(25)*	*(26)*	*(27)*	*(28)*	*(28)*	*(29)*
Conservation						
Supply From Plan Element (acft/yr)	1	1	2	2	2	2
Annual Cost ($/yr)	ND	ND	ND	ND	ND	ND
Projected Surplus/(Shortage) after Conservation (acft/yr)	*(24)*	*(25)*	*(25)*	*(26)*	*(26)*	*(27)*
Trinity Aquifer Development (Erath County)						
Supply From Plan Element (acft/yr)	649	502	399	265	189	189
Annual Cost ($/yr)	$1,215,000	$940,000	$109,000	$72,000	$52,000	$52,000
Unit Cost ($/acft)	$1,872	$1,872	$273	$273	$273	$273
Projected Surplus/(Shortage) after recommended WMS (acft/yr)	*625*	*477*	*374*	*239*	*163*	*162*
Note: ND – Not determined. Costs to implement industrial conservation technologies will vary based on each location.						

5.27.15 Irrigation

5.27.15.1 Description of Supply

Palo Pinto County Irrigation obtains its water supply from the Trinity Aquifer and the BRA. Based on the available supply, Palo Pinto County Irrigation is projected to have a shortage between 2030 and 2080.

5.27.15.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to meet water needs for Palo Pinto County-Irrigation. Conservation is recommended.

1. Conservation:
    a. Cost Source: Volume II.
    b. Date to be Implemented: by 2030.
    c. Annual Cost: maximum of $269,900 in 2050.
    d. Unit Cost: $1,279/acft.
2. Groundwater Development – Trinity Aquifer (Erath County):
    a. Cost Source: Volume II.
    b. Date to be Implemented: by 2030.
    c. Project Cost: $39,990,000.
    d. Unit Cost: $1,911/acft.

Table 5.27-10 Recommended Plan Costs by Decade for Palo Pinto – Irrigation

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*(1,492)*	*(1,498)*	*(1,521)*	*(1,543)*	*(1,564)*	*(1,583)*
Conservation						
Supply From Plan Element (acft/yr)	90	151	211	211	211	211
Annual Cost ($/yr)	$115,100	$193,100	$269,900	$269,900	$269,900	$269,900
Projected Surplus/(Shortage) after Conservation (acft/yr)	*(1,402)*	*(1,347)*	*(1,310)*	*(1,332)*	*(1,353)*	*(1,372)*
Groundwater Development – Trinity Aquifer (Erath County)						
Supply From Plan Element (acft/yr)	1,672	1,708	1,768	1,684	1,725	1,725
Annual Cost ($/yr)	$3,195,000	$3,264,000	$569,000	$542,000	$555,000	$555,000
Unit Cost ($/acft)	$1,911	$1,911	$322	$322	$322	$322
Turkey Peak Reservoir						
Supply From Plan Element (acft/yr)	2,175	2,115	2,115	2,115	2,115	2,115
Annual Cost ($/yr)	$6,499,000	$6,320,000	$6,320,000	$6,320,000	$6,320,000	$6,320,000
Unit Cost ($/acft)	$2,988	$2,988	$2,988	$2,988	$2,988	$2,988
Projected Surplus/(Shortage) after recommended WMS (acft/yr)	2,445	2,476	2,573	2,467	2,487	2,468

5.27.16 Livestock

Palo Pinto County Livestock water is supplied through local water supplies and the Brazos River Authority. Livestock shortages are projected throughout the planning horizon. Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended for Irrigation. The projected unmet needs result from contracts not being fully allocated due to limited source availability as determined by using the Brazos G RWPG's adopted methodology for the purposes of the 2026 Brazos G RWP, which is consistent with the specific assumptions and methods required for regional water planning. These needs will only occur during a drought equivalent to or worse than the drought of record, with the full implementation of all existing water rights in the basin. While not a strategy recommended by the Brazos G RWPG, the impacts of the unmet needs can be mitigated through demand management in the event of a serious drought prior to the recommended strategies coming online. Notably, BRA contract supplies are reported by BRA as firm supplies.

1. Leave Needs Unmet:
    a. Cost Source: Cost of not meeting needs – see Appendix G.
    b. Date to be Implemented: before 2030.

Table 5.27-11 Recommended Plan Costs by Decade for Palo Pinto – Livestock

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*18*	*7*	*(34)*	*(73)*	*(109)*	*(144)*
Leave Needs Unmet	*18*	*7*	*(34)*	*(73)*	*(109)*	*(144)*

5.28 Robertson County Water Supply Plan

Table 5.28-1 lists each water user group in Robertson County and their corresponding surplus or shortage in years 2040 and 2070. A brief summary of the water user groups and the plan for the selected water user are presented in the following subsections.

Table 5.28-1 Robertson County Surplus/(Shortage)

Water User Group	Surplus/(Shortage)		Comment
	2040 (acft/yr)	2070 (acft/yr)	
City of Bremond	235	262	Projected surplus
City of Calvert	260	309	Projected surplus
City of Franklin	966	1,012	Projected surplus
City of Hearne	1,614	1,775	Projected surplus
Robertson County WSC	86	111	Projected surplus
Twin Creek WSC	467	508	Projected surplus
Wellborn SUD	239	(6,553)	See Brazos County (total projected shortage includes both Brazos and Robertson Counties)
Wickson Creek SUD	623	(2,697)	See Brazos County (total projected shortage includes both Brazos and Robertson Counties)
County-Other	(55)	52	Projected shortage
Manufacturing	4,557	4,546	Projected surplus
Steam-Electric	(4,900)	(8,038)	Projected shortage – see plan below.
Mining	12,087	15,087	Projected surplus
Irrigation	(13,417)	(13,886)	Projected shortage - see plan below.
Livestock	1,654	1,654	Projected surplus

5.28.1 City of Bremond

5.28.1.1 Description of Supply

The City of Bremond obtains its water supply from the Carrizo-Wilcox Aquifer at 391 acft/yr. No shortages are projected for the City.

5.28.1.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended for the City of Bremond. The entities' water usage utilized for demand projections is 183 gpcd. The RWPG recommends conservation to reduce usage to a goal of 140 gpcd.

1. Conservation:
    a. Cost Source: See Volume II (Section 2.0).
    b. Date to be Implemented: 2030.
    c. Annual Cost: Maximum of $21,204 in 2050.
    d. Unit Cost: $684/acft.

Table 5.28-2 Recommended Plan Costs by Decade for City of Bremond

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*235*	*239*	*244*	*250*	*256*	*262*
Conservation						
Supply From Plan Element (acft/yr)	12	27	31	30	29	28
Annual Cost ($/yr)	$8,208	$18,468	$21,204	$20,520	$19,836	$19,152
Projected Surplus/(Shortage) after Conservation (acft/yr)	*247*	*266*	*275*	*280*	*285*	*290*

5.28.2 City of Calvert

5.28.2.1 Description of Supply

The City of Calvert obtains its water supply from the Carrizo-Wilcox Aquifer at 529 acft/yr. No shortages are projected for the City.

5.28.2.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended for the City of Calvert. The entities' water usage utilized for demand projections is 235 gpcd. The RWPG recommends conservation to reduce usage to a goal of 140 gpcd.

1. Conservation:
    a. Cost Source: See Volume II (Section 2.0).
    b. Date to be Implemented: 2030.
    c. Annual Cost: Maximum of $64,296 in 2060.
    d. Unit Cost: $684/acft.

Table 5.28-3 Recommended Plan Costs by Decade for City of Calvert

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*260*	*268*	*276*	*287*	*298*	*309*
Conservation						
Supply From Plan Element (acft/yr)	22	47	71	94	90	86
Annual Cost ($/yr)	$15,048	$32,148	$48,564	$64,296	$61,560	$58,824
Projected Surplus/(Shortage) after Conservation (acft/yr)	*282*	*315*	*347*	*381*	*388*	*395*

5.28.3 City of Franklin

The City of Franklin obtains its water supply from the Carrizo-Wilcox Aquifer at 1,247 acft/yr. No shortages are projected for the City of Franklin. Conservation is not recommended because the entity's usage is 133 gpcd, which is below the selected goal of 140 gpcd.

5.28.4 City of Hearne

5.28.4.1 Description of Supply

The City of Hearne obtains its water supply from the Carrizo-Wilcox Aquifer at 2,843 acft/yr. The City also provides supplies to Robertson County Manufacturing. No shortages are projected for the City of Hearne.

5.28.4.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended for the City of Hearne. The entities' water usage utilized for demand projections is 152 gpcd. The RWPG recommends conservation to reduce usage to a goal of 140 gpcd.

1. Conservation:
   a. Cost Source: See Volume II (Section 2.0).
   b. Date to be Implemented: 2030.
   c. Annual Cost: Maximum of $29,412 in 2030.
   d. Unit Cost: $684/acft.

Table 5.28-4 Recommended Plan Costs by Decade for City of Hearne

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*1,614*	*1,640*	*1,668*	*1,702*	*1,737*	*1,775*
Conservation						
Supply From Plan Element (acft/yr)	43	39	37	36	35	32
Annual Cost ($/yr)	$29,412	$26,676	$25,308	$24,624	$23,940	$21,888
Projected Surplus/(Shortage) after Conservation (acft/yr)	*1,657*	*1,679*	*1,705*	*1,738*	*1,772*	*1,807*

5.28.5 Robertson County WSC

5.28.5.1 Description of Supply

Robertson County WSC obtains its water supply from the Carrizo-Wilcox Aquifer at 614 acft/yr. The entity also provides supplies to Robertson County Steam and Electric. Robertson County WSC has no projected shortage throughout the planning period.

5.28.5.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended for Robertson County WSC. Conservation is not recommended because the entity's usage is 143 gpcd, which is below the selected goal of 140 gpcd.

1. Groundwater Development – Carrizo-Wilcox Aquifer
    a. Cost Source: See Volume II (Section 13.3.22).
    b. Date to be Implemented: 2030.
    c. Project Cost: $5,477,000.
    d. Unit Cost: $442/acft.

Table 5.28-5 Recommended Plan Costs by Decade for Robertson County WSC

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*86*	*100*	*107*	*113*	*115*	*111*
Groundwater Development – Carrizo-Wilcox Aquifer						
Supply From Plan Element (acft/yr)	71	135	198	262	325	325
Annual Cost ($/yr)	-	-	-	-	-	-
Unit Cost ($/acft)	-	-	-	-	-	-
Projected Surplus/(Shortage) after recommended WMS (acft/yr)	157	235	305	375	440	436

5.28.6 Twin Creek WSC

5.28.6.1 Description of Supply

Twin Creek WSC obtains its water supply from the Carrizo-Wilcox Aquifer at 692 acft/yr. A surplus is projected for Twin Creek WSC throughout the planning period.

5.28.6.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended for the Twin Creek WSC. The entities' water usage utilized for demand projections is 223 gpcd. The RWPG recommends conservation to reduce usage to a goal of 140 gpcd.

1. Conservation:
    a. Cost Source: See Volume II (Section 2.0).
    b. Date to be Implemented: 2030.
    c. Annual Cost: Maximum of $49,932 in 2060.
    d. Unit Cost: $684/acft.

Table 5.28-6 Recommended Plan Costs by Decade for Twin Creek WSC

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*467*	*473*	*480*	*489*	*498*	*508*
Conservation						
Supply From Plan Element (acft/yr)	17	40	60	73	69	66
Annual Cost ($/yr)	$11,628	$27,360	$41,040	$49,932	$47,196	$45,144
Projected Surplus/(Shortage) after Conservation (acft/yr)	*484*	*513*	*540*	*562*	*567*	*574*

5.28.7 County-Other

5.28.7.1 Description of Supply

Robertson County-Other entities obtain water supply from groundwater from the Carrizo-Wilcox Aquifer. No shortages are projected for Robertson County-Other. Conservation was considered; however, the entity’s usage is below the selected goal of 140 gpcd.

5.28.8 Manufacturing

Water supply for manufacturing in Robertson County is obtained by purchase from the City of Hearne and from Carrizo-Wilcox wells operated by the manufacturing entity. Manufacturing is projected to have a surplus of 4,555 acft/yr in 2030, decreasing to 4,549 acft/yr by 2080. No changes in water supply are recommended.

5.28.9 Steam-Electric

5.28.9.1 Description of Supply

Robertson County Steam-Electric entities obtain water supply from the Carrizo-Wilcox Aquifer, contracts with the Brazos River Authority, and groundwater purchased from Robertson County WSC. Steam-Electric is projected to experience a water supply shortage beginning in 2030 of 4,900 acft/yr and increasing to 8,038 acft/yr by 2080.

5.28.9.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended to meet water needs for Robertson County Steam-Electric.

1. Purchase from Walnut Creek Mine Reuse:
    a. Cost Source: See Volume II (Section 3.0 & 3,2).
    b. Date to be Implemented: by 2050.
    c. Annual Cost: $4,500,000.
    d. Unit Cost: $500/acft.

Table 5.28-7 Recommended Plan Costs by Decade for Robertson County Steam-Electric

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*(4,900)*	*(5,084)*	*(5,743)*	*(6,458)*	*(7,225)*	*(8,038)*
Purchase Water from Walnut Creek Mine - Reuse						
Supply From Plan Element (acft/yr)	-	-	9,000	9,000	9,000	9,000
Annual Cost ($/yr)	-	-	$4,500,000	$4,500,000	$4,500,000	$4,500,000
Projected Surplus/(Shortage) after Conservation (acft/yr)	*(4,900)*	*(5,084)*	*3,257*	*2,542*	*1,775*	*962*

5.28.10 Mining

Mining operations in Robertson County are supplied by Carrizo-Wilcox Groundwater. Surpluses are projected for Robertson County Mining throughout the planning period.

5.28.11 Irrigation

5.28.11.1 Description of Supply

Robertson County Irrigation is supplied by the Carrizo-Wilcox, Queen City, Sparta, and Brazos River Alluvium Aquifers. Current pumping in the Brazos River Alluvium greatly exceeds the MAG for Robertson County. Irrigation is projected to have shortages beginning in 2030 and continuing through 2080.

5.28.11.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to meet water needs for Robertson County-Irrigation. Conservation is recommended.

1. Conservation:
   a. Cost Source: See Volume II (Section 2.0).
   b. Date to be Implemented: by 2030.
   c. Unit Cost: $684/acft.
2. Leave Needs Unmet:
   a. New supplies for irrigation would be cost prohibitive to develop and most farms would switch to dry-land crops or allow fields to go fallow during a prolonged drought.
   b. Cost Source: Cost of not meeting needs – see Appendix G.
   c. Date to be Implemented: by 2030.

Table 5.28-8 Recommended Plan Costs by Decade for Robertson County – Irrigation

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*(13,417)*	*(13,405)*	*(13,665)*	*(13,781)*	*(13,886)*	*(13,886)*
Conservation						
Supply From Plan Element (acft/yr)	2,198	3,664	5,129	5,129	5,129	5,129
Annual Cost ($/yr)	$1,503,432	$2,506,176	$3,508,236	$3,508,236	$3,508,236	$3,508,236
Projected Surplus/(Shortage) after Conservation (acft/yr)	*(11,219)*	*(9,741)*	*(8,536)*	*(8,652)*	*(8,757)*	*(8,757)*
Leave Needs Unmet (acft/yr)	(11,219)	(9,741)	(8,536)	(8,652)	(8,757)	(8,757)

5.28.12 Livestock

Livestock water supply is projected to meet demands through 2080 and no changes in water supply are recommended.

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5.29 Shackelford County Water Supply Plan

Table 5.29-1 lists each water user group in Shackelford County and their corresponding surplus or shortage in decades 2030 and 2080. For each water user group with a projected shortage, a water supply plan has been developed and is presented in the following subsections.

Table 5.29-1 Shackelford County Surplus/(Shortage)

Water User Group	Surplus/(Shortage)		Comment
	2040 (acft/yr)	2070 (acft/yr)	
City of Albany	193	437	Projected surplus.
Fort Griffin SUD			See Stephens County
Hamby WSC			See Jones County
Stephens Regional SUD			See Stephens County
Callahan County WSC			See Callahan County
County-Other	3	20	Projected surplus
Manufacturing	–	–	No projected demand
Steam-Electric	–	–	No projected demand
Mining	–	–	No projected demand
Irrigation	156	156	Projected surplus
Livestock	136	136	Projected surplus

5.29.1 City of Albany

5.29.1.1 Description of Supply

Water supply for the City of Albany is from Hubbard Creek Reservoir, owned by the West Central Texas MWD at 1,333 to 1,400 acft/yr and from Lake McCarty at 75 to 0 acft/yr based on yields from 2030 to 2080, respectively. The City of Albany sells water to Fort Griffin SUD.

5.29.1.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended. The most recent water loss audit report shows a water loss of approximately 37% and water loss mitigation is recommended. The entity's water usage utilized for demand projections is 276 gpcd. The RWPG recommends conservation to reduce usage to a goal of 140 gpcd.

1. Conservation:
   a. Cost Source: Volume II.
   b. Date to be Implemented: before 2030.
   c. Annual Cost: maximum of $116,280 in 2070.
   d. Unit Cost $684/acft.
2. Water Loss Reduction:

a. Cost Source: Volume II.
b. Date to be Implemented: before 2030.
c. Annual Cost: maximum of $158,102 in 2030.

Table 5.29-2 Recommended Plan Costs by Decade for the City of Albany

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*193*	*250*	*306*	*344*	*387*	*437*
Conservation						
Supply From Plan Element (acft/yr)	47	89	124	152	170	145
Annual Cost ($/yr)	$32,148	$60,876	$84,816	$103,968	$116,280	$99,180
Water Loss Reduction						
Supply From Plan Element (acft/yr)	121	109	96	88	78	67
Annual Cost ($/yr)	$158,102	$152,992	$40,881	$37,474	$33,216	$28,532
Projected Surplus/(Shortage) after Conservation and Water Loss Reduction (acft/yr)	*361*	*448*	*526*	*584*	*635*	*649*

5.29.2 County-Other

Water supplies for entities within County-Other include 25 acft/yr from a minor unnamed aquifer and water from Moran Lake ranging from 50 to 0 acft/yr from 2030 to 2080, respectively. Projections indicate sufficient water supply for County-Other, and no change in water supply is recommended. Conservation was considered; however, the entity's current per capita use rate of 90 gpcd is below the selected target rate of 140 gpcd.

5.29.3 Manufacturing

No Manufacturing demand is projected for the county.

5.29.4 Steam-Electric

No Steam-Electric demand is projected for the county.

5.29.5 Mining

No Mining demand is projected for the county.

5.29.6 Irrigation

Irrigation obtains water supply from the Cross Timbers Aquifer at 350 acft/yr. There are some irrigation rights located along the Clear Fork of the Brazos River; however, there is no surface water availability for those rights during a repeat of the drought of record. Supplies are projected to be sufficient to meet demands, and no water supply changes or conservation are recommended.

5.29.7 Livestock

Livestock demand is met by local water supply, Cross Timbers Aquifer groundwater, and local Brazos run of the river rights. Supply is projected to meet needs through 2080. No changes in Shackelford County Livestock water supply are recommended.

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5.30 Somervell County Water Supply Plan

Table 5.30-1 lists each water user group in Shackelford County and their corresponding surplus or shortage in years 2030 and 2080. For each water user group with a projected shortage, a water supply plan has been developed and is presented in the following subsections.

Table 5.30-1 Somervell County Surplus/(Shortage)

Water User Group	Surplus/(Shortage)		Comment
	2030 (acft/yr)	2080 (acft/yr)	
City of Glen Rose	(211)	(226)	Projected shortage - see plan below
Somervell County Water District	262	234	Projected surplus
County-Other	246	243	Projected shortage - see plan below
Manufacturing	0	0	No projected surplus or shortage
Steam-Electric	(9,364)	(14,897)	Projected shortage - see plan below
Mining	(866)	(1,197)	Projected shortage - see plan below
Irrigation	387	340	Projected surplus
Livestock	(21)	(21)	Projected shortage - see plan below.

5.30.1 City of Glen Rose

5.30.1.1 Description of Supply

The City of Glen Rose obtains its water supply from groundwater from the Trinity Aquifer. Based on the available groundwater supply, the City of Glen Rose is projected to have a shortage from 2030 through year 2080. No additional local groundwater supply from the Trinity Aquifer is projected to be available to the City.

5.30.1.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to meet the projected water shortage for City of Glen Rose. The entity's water usage utilized for demand projections is 199 gpcd. The RWPG recommends conservation to reduce usage to a goal of 140 gpcd.

1. Conservation:
    a. Cost Source: Volume II.
    b. Date to be Implemented: before 2030.
    c. Annual Cost: maximum of $118,332 in 2050.
    d. Unit Cost: $684/acft.
2. Purchase Supply from Somervell County Water Supply Project:
    a. The project will treat raw water from the Wheeler Branch Off-Channel Reservoir and transmit the treated water to customers of the Somervell County Water District. Phases 1-4 of the project are complete and are located in the immediate vicinity of Glen Rose.

b. Cost Source: Somervell County Water District Water Rate.
c. Date to be Implemented: before 2030.
d. Annual Cost: maximum of $175,000.
e. Unit Cost: $1,059/acft ($3.25/1000 gal).

Table 5.30-2 Recommended Plan Costs by Decade for City of Glen Rose

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*(211)*	*(229)*	*(237)*	*(234)*	*(230)*	*(226)*
Conservation						
Supply From Plan Element (acft/yr)	46	111	173	173	172	171
Annual Cost ($/yr)	$31,464	$75,924	$118,332	$118,332	$117,648	$116,964
Projected Surplus/(Shortage) after Conservation (acft/yr)	*(165)*	*(118)*	*(64)*	*(61)*	*(58)*	*(55)*
Somervell County Water Supply Project						
Supply From Plan Element (acft/yr)	165	118	64	61	58	55
Annual Cost ($/yr)	$175,000	$125,000	$68,000	$65,000	$61,000	$58,000
Unit Cost ($/acft)	$1,059	$1,059	$1,059	$1,059	$1,059	$1,059
Projected Surplus/(Shortage) after recommended WMS (acft/yr)	*0*	*0*	*0*	*0*	*0*	*0*

5.30.2 Somervell County Water District

5.30.2.1 Description of Supply

Somervell County Water District obtains its supply through groundwater from the Trinity Aquifer and from the Wheeler Off-Channel Reservoir. No shortages are projected for the Somervell County Water District.

5.30.2.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended for Somervell County Water District to help meet the needs of adjacent water users, including County-Other entities and the City of Glen Rose. The entity's water usage utilized for demand projections is 240 gpcd. The RWPG recommends conservation to reduce usage to a goal of 140 gpcd.

1. Conservation:
   a. Cost Source: Volume II.
   b. Date to be Implemented: before 2030.
   c. Annual Cost: maximum of $432,396 in 2070.
   d. Unit Cost: $684/acft.
2. Somervell County Water Supply Project:
   a. The project will treat raw water from the Wheeler Branch Off-Channel Reservoir and transmit the treated water to customers of the Somervell County Water District. Phases 1 – 4 are complete and provide 1,400 acft/yr of supply. Remaining phases will supply an additional 600 acft/yr.
   b. Cost Source: Volume II.

c. Date to be Implemented: by 2030.
d. Total Project Cost (Phases 7A and 9 – 17): $47,015,000.
e. Annual Cost: $4,224,000.

Costs are shown for the additional supply of water made available by the remaining phases, which are planned for completion by 2035. Costs shown are for new infrastructure only, and do not include existing debt service for existing phases of the project or for costs for supply from Wheeler Branch Reservoir.

Table 5.30-3 Recommended Plan Costs by Decade for Somervell County Water District

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*262*	*215*	*195*	*207*	*220*	*234*
Conservation						
Supply From Plan Element (acft/yr)	125	282	444	598	619	614
Annual Cost ($/yr)	$85,500	$192,888	$303,696	$409,032	$423,396	$419,976
Projected Surplus/(Shortage) after Conservation (acft/yr)	*387*	*497*	*639*	*805*	*839*	*848*
Additional Demands from Recommended Strategies from Others						
Glen Rose - Somervell County Water Supply Project	(165)	(118)	(64)	(61)	(58)	(55)
Somervell Steam-Electric - Somervell County Water Supply Project	(183)	(183)	(183)	(183)	(183)	(183)
Somervell County Water District - Somervell County Water Supply Project	(600)	(600)	(600)	(600)	(600)	(600)
Total Surplus/(Shortage) Including Recommended Strategies (acft/yr)	*(561)*	*(404)*	*(208)*	*(39)*	*(2)*	*10*
Somervell County Water Supply Project						
Supply From Plan Element (acft/yr)	600	600	600	600	600	600
Annual Cost ($/yr)	—	$4,224,000	$4,224,000	$916,000	$916,000	$916,000
Unit Cost ($/acft)	—	$7,040	$7,040	$1,527	$1,527	$1,527
Projected Surplus/(Shortage) after recommended WMS (acft/yr)	*39*	*196*	*392*	*561*	*598*	*610*

5.30.3 County-Other

5.30.3.1 Description of Supply

Somervell County-Other obtains its water supply from groundwater from the Trinity Aquifer. Supply is projected to meet County-Other demands in Somervell County, and no changes are recommended to the water supply. Conservation was considered; however, the entity's per capita usage of 109 gpcd is below the selected goal of 140 gpcd.

5.30.4 Manufacturing

Somervell County Manufacturing obtains its water supply from groundwater from the Trinity Aquifer. Supply is projected to meet Manufacturing demands in Somervell County, and no changes are recommended to the water supply.

5.30.5 Steam-Electric

5.30.5.1 Description of Supply

Somervell County Steam-Electric obtains water supply from the Squaw Creek Reservoir, the Trinity Aqufier, and the Brazos River Authority through Lake Granbury. Somervell County Steam-Electric is projected to have shortages beginning in year 2030 and continuing through year 2080. Local groundwater currently supplies potable water for plant staff and high-quality process water for boiler feed at the Comanche Peak Steam Electric Station.

5.30.5.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to meet water needs for Somervell County Steam-Electric. Conservation was not applied to this plan because the steam-electric facilities are assumed to be built with technologies minimizing water use as much as practicable.

1. Somervell County Water Supply Project:
   a. Cost Source: Somervell County Water District Water Rate.
   b. Date to be Implemented: before 2030.
   c. Annual Cost: $194,000.
   d. Unit Cost: $1,059/acft ($3.25/1000 gal).
2. Leave Needs Unmet:
   a. Significant demand is associated with the plan to expand the Comanche Peak Steam Electric Station; however, there are no longer plans to move forward with this expansion. Therefore, these needs are left unmet.
   b. Cost Source: Cost of not meeting needs – see Appendix G.
   c. Date to be Implemented: 2030.

Table 5.30-4 Recommended Plan Costs by Decade for Somervell County – Steam-Electric

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*(9,364)*	*(9,720)*	*(10,948)*	*(12,235)*	*(13,576)*	*(14,897)*
Somervell County Water Supply Project						
Supply From Plan Element (acft/yr)	183	183	183	183	183	183
Annual Cost ($/yr)	$194,000	$194,000	$194,000	$194,000	$194,000	$194,000
Unit Cost ($/acft)	$1,509	$1,509	$1,509	$1,509	$1,509	$1,509
Leave Needs Unmet (acft/yr)	*(9,181)*	*(9,537)*	*(10,765)*	*(12,052)*	*(13,393)*	*(14,714)*

5.30.6 Mining

5.30.6.1 Description of Supply

Mining operations in Somervell County are supplied by Trinity Aquifer groundwater and water from the Brazos River Authority. Demands for Mining are projected to increase significantly resulting in shortages beginning in 2030.

5.30.6.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to meet water needs for Somervell County-Mining. Conservation is recommended.

1. Conservation:
   a. Cost Source: Volume II.
   b. Date to be Implemented: before 2030.
   c. Annual Cost: not determined.
2. Leave Needs Unmet:
   a. Cost Source: Cost of not meeting needs – see Appendix G.
   b. Date to be Implemented: 2030.

Table 5.30-5 Recommended Plan Costs by Decade for Somervell County – Mining

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*(866)*	*(962)*	*(1,039)*	*(1,105)*	*(1,159)*	*(1,197)*
Conservation						
Supply From Plan Element (acft/yr)	33	64	80	74	70	68
Annual Cost ($/yr)	ND	ND	ND	ND	ND	ND
Projected Surplus/(Shortage) after Conservation (acft/yr)	*(833)*	*(898)*	*(959)*	*(1,031)*	*(1,089)*	*(1,129)*
Leave Needs Unmet (acft/yr)	*(833)*	*(898)*	*(959)*	*(1,031)*	*(1,089)*	*(1,129)*
ND – Not determined. Costs to implement industrial conservation technologies will vary based on each location						

5.30.7 Irrigation

Somervell County Irrigation water is supplied by purchases from the Brazos River Authority and Trinity Aquifer groundwater and is projected to have a surplus throughout the planning period. No changes in water supply are recommended.

5.30.8 Livestock

Livestock water is obtained through local livestock supplies and Trinity Aquifer groundwater and is projected to have a shortage throughout the planning period. No additional local groundwater supply from the Trinity Aquifer is projected to be available. Needs remain unmet in the planning period. These needs will only occur during a drought equivalent to or worse than the drought of record. While not a strategy recommended by the Brazos G RWPG, the impacts of the unmet needs may be mitigated through demand management in the event of a serious drought.

1. Leave Needs Unmet:
    a. Cost Source: Cost of not meeting needs – see Appendix G.
    b. Date to be Implemented: 2030.

Table 5.30-6 Recommended Plan Costs by Decade for Somervell County – Livestock

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*(21)*	*(21)*	*(21)*	*(21)*	*(21)*	*(21)*
Leave Needs Unmet (acft/yr)	*(21)*	*(21)*	*(21)*	*(21)*	*(21)*	*(21)*

5.31 Stephens County Water Supply Plan

Table 5.31-1 lists each water user group in Stephens County and their corresponding surplus or shortage in years 2030 and 2080. A brief summary of the water user groups and the plan for the selected water user are presented in the following subsections.

Table 5.31-1 Stephens County Surplus/(Shortage)

Water User Group	Surplus/(Shortage) 2030 (acft/yr)	Surplus/(Shortage) 2080 (acft/yr)	Comment
City of Breckenridge	774	1,071	Projected surplus
Fort Belknap WSC			See Young County
Fort Griffin SUD	2	2	Projected shortage (2040-2070) - see plan below.
Possum Kingdom WSC			See Palo Pinto County
Staff WSC			See Eastland County
Stephens Regional SUD	(42)	(121)	Projected shortage - see plan below.
County-Other	23	42	Projected surplus
Manufacturing	0	0	No projected surplus or shortage
Steam-Electric	0	0	No projected demand
Mining	1,139	1,063	Projected surplus
Irrigation	(122)	(122)	Projected shortage - see plan below.
Livestock	121	121	Projected surplus

5.31.1 City of Breckenridge

5.31.1.1 Description of Supply

The City of Breckenridge obtains water from Hubbard Creek Reservoir through the West Central Texas Municipal Water District and from Lake Daniel. Projections indicate a surplus of water for the City of Breckenridge, and no change in supply is recommended.

5.31.1.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended for the City of Breckenridge. The entities' water usage utilized for demand projections is 161 gpcd. The RWPG recommends conservation to reduce usage to a goal of 140 gpcd.

1. Conservation
    a. Cost Source: Volume II
    b. Date to be Implemented: by 2030
    c. Annual Cost: maximum of $62,244 in 2040
    d. Unit Cost: $684/acft.

Table 5.31-2 Recommended Plan Costs by Decade for City of Breckenridge

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*774*	*830*	*905*	*956*	*1,005*	*1,071*
Conservation						
Supply From Plan Element (acft/yr)	69	91	83	79	74	66
Annual Cost ($/yr)	$47,196	$62,244	$56,772	$54,036	$50,616	$45,144
Projected Surplus/(Shortage) after Conservation	*843*	*921*	*988*	*1,035*	*1,079*	*1,137*

5.31.2 Fort Griffin SUD

5.31.2.1 Description of Supply

Fort Griffin SUD purchases treated surface water from the City of Albany and distributes to a number of counties. Of those counties, Stephens has the highest demand and is considered the SUD's primary county. The projections in Table 5.31-3 represent cumulative water supply shortages. Fort Griffin SUD also has a contract for 353 acft/yr from the BRA, but does not have infrastructure to utilize that supply.

5.31.2.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended for Fort Griffin SUD. The entities' water usage utilized for demand projections is 171 gpcd. The RWPG recommends conservation to reduce usage to a goal of 140 gpcd.

1. Conservation:
   a. Cost Source: Volume II
   b. Date to be Implemented: 2030
   c. Annual Cost: maximum of $25,308 in 2060
   d. Unit Cost: $684/acft
2. Alternative: Build Infrastructure to Utilize BRA Supply:
   a. Cost: Not determined
   b. Date to be Implemented: by 2030.

Table 5.31-3. Recommended Plan Costs by Decade for Fort Griffin SUD

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*2*	*(5)*	*(15)*	*(20)*	*(1)*	*2*
Conservation						
Supply From Plan Element (acft/yr)	16	33	34	37	33	33
Annual Cost ($/yr)	$10,944	$22,572	$23,256	$25,308	$22,572	$22,572
Projected Surplus/(Shortage) after Conservation	*18*	*28*	*19*	*17*	*32*	*35*
Alternative: Build Infrastructure to Utilize BRA Supply						

5.31.3 Stephens Regional SUD

5.31.3.1 Description of Supply

Stephens Regional SUD is located in multiple counties (Eastland, Shackelford, Palo Pinto, Stephens and Throckmorton and Stephens). The values shown in Table 5.31-4 represent the cumulative totals for Stephens Regional SUD in all the pcounties it serves. The current supply comes through the Brazos River Authority for supply from Possum Kingdom Reservoir. The WUG also provides supply to the City of Woodson (Throckmorton County-Other).

5.31.3.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended for Stephens Regional SUD. The entities' water usage utilized for demand projections is 178 gpcd. The RWPG recommends conservation to reduce usage to a goal of 140 gpcd.

1. Conservation
    a. Cost Source: Volume II
    b. Date to be Implemented: 2030
    c. Annual Cost: maximum of $82,764 in 2080
    d. Unit Cost: $684/acft.

Table 5.31-4. Recommended Plan Costs by Decade for Stephens Regional SUD

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*(42)*	*(106)*	*(107)*	*(109)*	*(114)*	*(121)*
Conservation						
Supply From Plan Element (acft/yr)	42	106	107	109	114	121
Annual Cost ($/yr)	$28,728	$72,504	$73,188	$74,556	$77,976	$82,764
Projected Surplus/(Shortage) after Conservation	*0*	*0*	*0*	*0*	*0*	*0*

5.31.4 County-Other

Water supply for county-other entities is obtained from local groundwater. Projections indicate adequate water supply and no changes are recommended. Conservation was considered; however, the entity's per capita usage of 97 is below the selected goal of 140 gpcd.

5.31.5 Manufacturing

The City of Breckenridge provides supply to meet Stephens County Manufacturing needs. No shortages are projected throughout the planning period and no changes in water supply are recommended.

5.31.6 Steam-Electric

Stephens County has no projected demand for Steam-Electric.

5.31.7 Mining

Mining operations in Stephens County obtain supply from Possum Kingdom Reservoir through the Brazos River Authority and from the Cross Timbers Aquifer. No shortage is projected and no changes in water supply are recommended.

5.31.8 Irrigation

5.31.8.1 Description of Supply

Stephens County Irrigation obtains 31 acft/yr of groundwater supply from the Cross Timbers Aquifer. Irrigation is projected to have a shortage of supply through 2080.

5.31.8.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to meet water needs for Stephens County-Irrigation. Conservation is recommended.

1. Conservation:
    a. Cost Source: Volume II
    b. Date to be Implemented: by 2030
    c. Annual Cost: maximum of $17,800 in 2050
    d. Unit Cost: 1,618/acft
2. Groundwater Development – Other Aquifer:
    a. Cost Source: Volume II
    b. Date to be Implemented: by 2030
    c. Project Cost: $277,000
    d. Unit Cost: $733/acft
3. Leave Needs Unmet:
    a. Cost Source: Cost of not meeting needs – see Appendix G
    b. Date to be Implemented: 2030.

Table 5.31-5. Recommended Plan Costs by Decade for Stephens County – Irrigation

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	(122)	(122)	(122)	(122)	(122)	(122)
Conservation						
Supply From Plan Element (acft/yr)	5	8	11	11	11	11
Annual Cost ($/yr)	$8,100	$12,900	$17,800	$17,800	$17,800	$17,800
Projected Surplus/(Shortage) after Conservation (acft/yr)	(117)	(114)	(111)	(111)	(111)	(111)
Groundwater Development – Other Aquifer						
Supply From Plan Element (acft/yr)	30	30	30	30	30	30
Annual Cost ($/yr)	$22,000	$22,000	$3,000	$3,000	$3,000	$3,000
Unit Cost ($/acft)	$733	$733	$100	$100	$100	$100
Leave Needs Unmet (acft/yr)	(87)	(84)	(81)	(81)	(81)	(81)

5.31.9 Livestock

Stephens County Livestock obtains water from local supply and is projected to meet demands through 2080. No changes in water supply are recommended.

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5.32 Stonewall County Water Supply Plan

Table 5.32-1 lists each water user group in Stonewall County and their corresponding surplus or shortage in years 2030 and 2080. A brief description of each water user group has been developed and is presented in the following subsections.

Table 5.32-1. Stonewall County Surplus/(Shortage)

Water User Group	Surplus/(Shortage)		Comment
	2030 (acft/yr)	2080 (acft/yr)	
City of Aspermont	(37)	18	Projected shortage - see plan below.
County-Other	17	33	Projected surplus
Manufacturing	–	–	No projected demand
Steam-Electric	–	–	No projected demand
Mining	174	174	Projected surplus
Irrigation	16	14	Projected surplus
Livestock	55	55	Projected surplus

5.32.1 City of Aspermont

5.32.1.1 Description of Supply

The City of Aspermont obtains water through the purchase of treated surface water under contract from the North Central Texas Municipal Water Authority (NCTMWA) and through local groundwater production from the Seymour Aquifer. The City is contracted to purchase up to 118 acft/yr from the NCTMWA; however, due to availability of supplies, this contract is prorated to provide a maximum of only 23 acft/yr during the planning period. Additionally, no additional local groundwater supply from the Seymour Aquifer is projected to be available to the City. Needs remain unmet in the 2030 decade. These needs will only occur during a drought equivalent or worse than the drought of record. While not a strategy recommended by the Brazos G RWPG, the impacts of the unmet needs may be mitigated through demand management in the event of a serious drought prior to recommended strategies coming online.

5.32.1.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended for City of Aspermont. Associated costs are included for each strategy. The entities' water usage utilized for demand projections is 331 gpcd. The RWPG recommends conservation to reduce usage to a goal of 140 gpcd.

1. Conservation:
   a. Cost Source: Volume II
   b. Date to be Implemented: before 2030
   c. Annual Cost: maximum of $66,348 in 2080
   d. Unit Cost: $684/acft.

Table 5.32-2. Recommended Plan Costs by Decade for the City of Aspermont

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*(37)*	*(28)*	*(19)*	*(8)*	*4*	*18*
Conservation						
Supply From Plan Element (acft/yr)	21	42	60	77	90	97
Annual Cost ($/yr)	$14,364	$28,728	$41,040	$52,668	$61,560	$66,348
Projected Surplus/(Shortage) after Conservation (acft/yr)	*(16)*	*14*	*41*	*69*	*94*	*115*
Projected Surplus/(Shortage) after recommended WMS (acft/yr)	*(16)*	*14*	*41*	*69*	*94*	*115*

5.32.2 County-Other

Stonewall County-Other entities obtain their groundwater supply from the Blaine Aquifer. A surplus is projected throughout the planning period and no changes in water supply are recommended. Conservation was considered; however, the entity's per capita usage of 107 is below the selected goal of 140 gpcd.

5.32.3 Manufacturing

No Manufacturing demand exists or is projected for the county.

5.32.4 Steam-Electric

No Steam-Electric demand exists or is projected for the county.

5.32.5 Mining

5.32.5.1 Description of Supply

Groundwater supply for Mining in Stonewall County is obtained from the Blaine Aquifer. Projections indicate a decrease in water demand for Mining, and no shortages are projected during the planning period.

5.32.5.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to supplement water supply for Mining. Associated costs are included for each strategy.

1. Groundwater Development (Blaine Aquifer):
   a. Cost Source: Volume II
   b. Date to be Implemented: by 2030
   c. Project Cost: $1,394,000
   d. Unit Cost: Max of $374/acft.

Table 5.32-3. Recommended Plan Costs by Decade for Stonewall County – Mining

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*174*	*174*	*174*	*174*	*174*	*174*
Groundwater Well Development – Blaine Aquifer						
Supply From Plan Element (acft/yr)	372	372	372	372	372	372
Annual Cost ($/yr)	$139,000	$139,000	$41,000	$41,000	$41,000	$41,000
Unit Cost ($/acft)	$374	$374	$110	$110	$110	$110
Projected Surplus/(Shortage) after recommended WMS (acft/yr)	546	546	546	546	546	546

5.32.6 Irrigation

Stonewall County Irrigation entities obtain groundwater supply from the Blaine and Seymour Aquifers and run of the river supplies from the Brazos River Authority. A surplus in supply is projected and no changes in water supply are recommended.

5.32.7 Livestock

Livestock demand is met by local water supply and Blaine Aquifer groundwater and is projected to meet needs through 2080. No changes in Stonewall County Livestock water supply are recommended.

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5.33 Taylor County Water Supply Plan

Table 5.33-1 lists each water user group in Taylor County and their corresponding surplus or shortage in years 2030 and 2080. A brief summary of the water user groups and the plan for the selected water user are presented in the following subsections.

Table 5.33-1 Taylor County Surplus/(Shortage)

Water User Group	Surplus/(Shortage)		Comment
	2030 (acft/yr)	2080 (acft/yr)	
City of Abilene	5,429	(10,934)	Projected shortage - see plan below.
Hamby WSC			See Jones County
Hawley WSC			See Jones County
City of Lawn	0	(4)	Projected shortage - see plan below.
City of Merkel	0	0	No projected surplus or shortage
North Runnels WSC			See Region F Plan
Potosi WSC	(857)	(1,682)	Projected shortage - see plan below.
S U N WSC	(14)	(124)	Projected shortage - see plan below.
Steamboat Mountain WSC	(653)	(1,951)	Projected shortage - see plan below.
City of Tye	0	0	No projected surplus or shortage
View Caps WSC	(120)	(238)	Projected shortage - see plan below.
County-Other	371	181	Projected surplus.
Manufacturing	(49)	(865)	No projected surplus or shortage
Steam-Electric	–	–	No projected demand
Mining	(380)	(437)	Projected shortage - see plan below.
Irrigation	(1,057)	(1,057)	Projected shortage - see plan below.
Livestock	154	154	Projected surplus

5.33.1 City of Abilene

5.33.1.1 Description of Supply

The City of Abilene obtains its water supply from surface water from Fort Phantom Hill Reservoir, Fort Phantom Hill Indirect Reuse, BRA Main Stem System (Possum Kingdom Reservoir), Hubbard Creek Reservoir and O.H. Ivie (Region F) Reservoir. Abilene also has a wastewater reuse system for non-potable use with water stored in Lake Kirby. The City supplies several neighboring communities, and projected demands indicate shortages beginning in 2060. This WUG is located in Taylor and Jones Counties. Abilene's water usage utilized for demand projections is 183 gallons per capita per day (gpcd). The RWPG recommends conservation to reduce usage to a goal of 140 gpcd.

5.33.1.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water supply plan is recommended to meet water needs for the City of Abilene and the entities supplied by the City.

1. Conservation:
   a. Cost Source: Volume II.
   b. Date to be Implemented: before 2030.
   c. Annual Cost: maximum of $5,305,104 in 2080
   d. Unit Cost: $684/acft.
2. West Texas Water Partnership:
   a. Cost Source: See 2026 Region F Regional Water Plan.
   b. Date to be Implemented: before 2040.
   c. Project Cost: see Region F Water Plan.
   d. Unit Cost: maximum of $3,310/acft
3. Cedar Ridge Reservoir:
   a. Cost Source: Volume II.
   b. Date to be Implemented: 2040.
   c. Project Cost: $540,102,000.
   d. Unit Cost: $1,654/acft.

Table 5.33-2 City of Abilene Demands and Supplies

Projected Demands	Year (acft/yr)					
Major Water Contract Holders	2030	2040	2050	2060	2070	2080
City of Abilene	26,848	28,860	30,633	32,411	34,391	36,611
Existing Contractual Sales						
City of Ballinger	1,250	1,250	1,250	1,250	1,250	1,250
City of Baird	77	77	77	77	77	77
Blair WSC (Taylor County-Other)	77	77	77	77	77	77
City of Buffalo Gap (Taylor County-Other)	153	153	153	153	153	153
City of Clyde	307	307	307	307	307	307
City of Lawn	153	153	153	153	153	153
City of Merkel	353	353	353	353	353	353
City of Tye	184	184	184	184	184	184
Eula WSC	61	61	61	61	61	61
Hamby WSC	308	308	308	308	308	308
Hawley WSC	384	384	384	384	384	384
Potosi WSC	307	307	307	307	307	307
Steamboat Mountain WSC	307	307	307	307	307	307
S.U.N. WSC (Taylor County-Other)	230	230	230	230	230	230

Projected Demands	Year (acft/yr)					
Major Water Contract Holders	2030	2040	2050	2060	2070	2080
Tuscola-Taylor County WCID No. 1 (Taylor County-Other)	92	92	92	92	92	92
View Caps WSC	199	199	199	199	199	199
Taylor County Manufacturing	671	671	671	671	671	671
Total Contract Demands	**5,113**	**5,113**	**5,113**	**5,113**	**5,113**	**5,113**
Total Existing Demands	**31,961**	**33,973**	**35,746**	**37,524**	**39,504**	**41,724**
Recommended Strategies[1]						
Baird (Purchase Additional Supply)	206	173	142	139	137	134
Clyde (Purchase Additional Supply)	100	–	–	–	–	–
Potosi WSC (Purchase Additional Supply)	857	1,012	1,149	1,309	1,485	1,682
S U N WSC (Purchase Additional Supply)	14	29	49	68	92	124
Steamboat Mountain WSC (Purchase Additional Supply)	653	893	1,103	1,358	1,641	1,951
View Caps WSC (Purchase Additional Supply)	109	133	153	174	198	225
Jones County-Other (Purchase Additional Supply)	167	122	102	112	121	121
Taylor County-Manufacturing (Purchase Additional Supply)	49	76	775	402	308	865
Roscoe (Cedar Ridge)	–	90	96	101	107	107
Sweetwater (Cedar Ridge)	–	1,668	1,731	1,787	1,839	1,839
Taylor County-Other (Cedar Ridge)	–	96	113	125	197	197
Taylor County-Irrigation (Cedar Ridge)	–	1,152	1,152	1,152	1,152	1,152
Taylor County-Mining (Cedar Ridge)	–	206	188	172	159	159
Nolan County-Mining (Cedar Ridge)	–	186	166	147	131	131
Total Recommended Strategies	**2,155**	**5,836**	**6,919**	**7,046**	**7,567**	**8,687**
Total Demands	**34,116**	**39,809**	**42,665**	**44,570**	**47,071**	**50,411**
Supply Source						
Lake Abilene[2]	0	0	0	0	0	0
Lake Kirby[3]	0	0	0	0	0	0
BRA Main Stem System[4]	19,418	19,242	18,579	17,952	17,358	16,795
Lake O.H. Ivie (Colorado River MWD)[5]	4,721	4,588	4,456	4,324	4,191	4,059
Fort Phantom Hill[6]	2,888	2,884	2,880	2,875	2,871	2,867
Fort Phantom Hill Reuse[7]	7,840	7,840	7,840	7,840	7,840	7,840
West Central Texas MWD (Hubbard)	10,720	8,360	6,000	3,640	1,300	1,300
Total Supply	**45,587**	**42,914**	**39,755**	**36,631**	**33,560**	**32,861**

Projected Demands	Year (acft/yr)					
Major Water Contract Holders	2030	2040	2050	2060	2070	2080
Projected Balance						
Potential Water Balance/(Shortage) (current contracts and supplies)[8]	*11,471*	*3,105*	*(2,910)*	*(7,939)*	*(13,511)*	*(17,550)*

Notes:
(1) WUG needs after conservation and/or Water Loss Reduction.
(2) Lake Abilene is not considered a dependable supply by the City and is currently not used.
(3) Lake Kirby is used primarily to store reuse water for the City's reuse customers. Reuse demands are not included in the water demand projections for the City.
(4) BRA supplies to Abilene are reduced by 11% from contracted amounts for advanced treatment (RO) required for this water source. Supplies are assumed to be reduced by 24% beginning in the 2050 decade to account for reductions in supply due to increased future severe droughts.
(5) Updated yields with subordination, 16.54% of the projected yield of Ivie. Reduced by 6% for RO efficiency. 2030-2040 are the supply numbers provided by Region F while 2050-2080 are from the City's Purpose and Need memorandum supporting the permitting of Cedar Ridge Reservoir.
(6) Fort Phantom Hill Reservoir Supply is 2-year safe yield less 2,500 acft/yr (Clyde Water Right).
(7) Fort Phantom Hill Reuse is indirect potable reuse into the reservoir from Abilene's advanced treatment plant, the Hamby Water Reclamation Facility.
(8) Potential Water Balance/(Shortage) values show the potential water balance if the City was fulfilling the total demands of all contracts and was able to access all supplies granted under the City's existing supply contracts. Due to the water availability analyses prescribed under water planning guidelines Table 5.33 3 shows the water balance used in the Brazos G Regional Water Plan and the Texas Water Development Board's Data Base 27 (DB27).

Table 5.33-3 Recommended Plan Costs by Decade for the City of Abilene

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)[1]	*5,429*	*4,993*	*1,466*	*(1,460)*	*(6,907)*	*(10,934)*
Conservation						
Supply From Plan Element (acft/yr)	1,995	5,139	6,489	6,866	7,285	7,756
Annual Cost ($/yr)	$1,365,000	$3,515,000	$4,438,000	$4,696,000	$4,983,000	$5,305,000
West Texas Water Partnership Supply						
Supply From Plan Element (acft/yr)	–	8,212	8,185	8,217	8,250	8,278
Annual Cost ($/yr)	–	$27,182,000	$27,092,000	$3,747,000	$3,762,000	$3,775,000
Unit Cost ($/acft)	–	$3,310	$3,310	$456	$456	$456
Cedar Ridge Reservoir						
Supply From Plan Element (acft/yr)	–	18,889	16,300	13,200	10,100	10,100
Annual Cost ($/yr)	–	$31,242,000	$26,960,000	$21,833,000	$16,705,000	$3,788,000
Unit Cost ($/acft)	–	$1,654	$1,654	$1,654	$1,654	$375

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) after recommended WMS (acft/yr)	*7,424*	*37,233*	*32,440*	*26,823*	*18,728*	*15,200*
Notes: (1) WUG The Projected Surplus/(Shortage) shown here are used in the Texas Water Development Board's Data Base 27 (DB27). The values differ from Table 5.33 2 due to the water availability analyses prescribed under water planning guidelines.						

5.33.2 City of Lawn

5.33.2.1 Description of Supply

The City of Lawn obtains its water from a contract with the City of Abilene at 153 acft/yr. Shortages are projected beginning in 2050.

5.33.2.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water supply plan is recommended to meet water needs for the City of Lawn. The entity's water usage utilized for demand projections is 277 gpcd. The RWPG recommends conservation to reduce usage to a goal of 140 gpcd.

1. Conservation:
   a. Cost Source: Volume II.
   b. Date to be Implemented: before 2030.
   c. Annual Cost: maximum of $4,788 in 2040
   d. Unit Cost: $684/acft.

Table 5.33-4 Recommended Plan Costs by Decade for City of Lawn

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*0*	*0*	*(7)*	*(6)*	*(5)*	*(4)*
Conservation						
Supply From Plan Element (acft/yr)	4	7	7	6	5	4
Annual Cost ($/yr)	$2,736	$4,788	$4,788	$4,104	$3,420	$2,736
Projected Surplus/(Shortage) after Conservation	*4*	*7*	*0*	*0*	*0*	*0*

5.33.3 City of Merkel

The City of Merkel obtains surface water from local sources and from the City of Abilene at 353 acft/yr. No shortages are projected, and no change in water supply is recommended. Conservation was considered; however, the entity's per capita usage of 117 gpcd is below the selected goal of 140 gpcd.

5.33.4 North Runnels WSC

See the Region F plan.

5.33.5 Potosi WSC

5.33.5.1 Description of Supply

Potosi WSC purchases water from the City of Abilene at 307 acft/yr, and shows a projected shortage starting in 2030. This WUG is located in multiple counties (Taylor and Callahan). The shortages shown in the table below represent the cumulative totals for Potosi WSC.

5.33.5.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended to meet water needs for Potosi WSC. Conservation was considered; however, the entity's current per capita use rate of 139 gpcd is below the selected target rate of 140 gpcd.

1. Purchase Additional Supply from Abilene:
    a. Cost Source: Abilene Water Rate.
    b. Date to be Implemented: before 2030.
    c. Project Cost: $0 (Current infrastructure assumed to be adequate).
    d. Unit Cost: $2,314/acft ($7.10/1,000 gal).

Table 5.33-5 Recommended Plan Costs by Decade for Potosi WSC

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*(857)*	*(1,012)*	*(1,149)*	*(1,309)*	*(1,485)*	*(1,682)*
Purchase Additional Supply from Abilene						
Supply From Plan Element (acft/yr)	857	1,012	1,149	1,309	1,485	1,682
Annual Cost ($/yr)	$1,983,100	$2,341,800	$2,658,800	$3,029,000	$3,436,300	$3,892,100
Unit Cost ($/acft)	$2,314	$2,314	$2,314	$2,314	$2,314	$2,314
Projected Surplus/(Shortage) after recommended WMS (acft/yr)	*0*	*0*	*0*	*0*	*0*	*0*

5.33.6 S U N WSC

5.33.6.1 Description of Supply

S U N WSC purchases water from the City of Abilene at 230 acft/yr and shows a projected shortage starting in 2030. This WUG is located in multiple counties (Fisher, Jones, and Taylor). The shortages shown in the table below represent the cumulative totals for S U N WSC.

5.33.6.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended to meet water needs for S U N WSC. Conservation was considered; however, the entity's current per capita use rate of 97 gpcd is below the selected target rate of 140 gpcd.

1. Purchase Additional Water Supply from Abilene:
    a. Cost Source: Abilene Water Rate.
    b. Date to be Implemented: before 2030.
    c. Project Cost: $0 (Current infrastructure assumed to be adequate).
    d. Unit Cost: $2,314/acft ($7.10/1,000 gal).

Table 5.33-6 Recommended Plan Costs by Decade for S U N WSC

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*(14)*	*(29)*	*(49)*	*(68)*	*(92)*	*(124)*
Purchase Additional Supply from Abilene						
Supply From Plan Element (acft/yr)	14	29	49	68	92	124
Annual Cost ($/yr)	$32,400	$67,100	$113,400	$157,400	$212,900	$286,900
Unit Cost ($/acft)	$2,314	$2,314	$2,314	$2,314	$2,314	$2,314
Projected Surplus/(Shortage) after recommended WMS (acft/yr)	*0*	*0*	*0*	*0*	*0*	*0*

5.33.7 Steamboat Mountain WSC

5.33.7.1 Description of Supply

Steamboat Mountain WSC purchases water from the City of Abilene at 307 acft/yr and shows a projected shortage starting in 2030.

5.33.7.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended to meet water needs for Steamboat Mountain WSC. Conservation was considered; however, the entity's current per capita use rate of 123 gpcd is below the selected target rate of 140 gpcd.

1. Purchase Additional Supply from Abilene:
    a. Cost Source: Abilene Water Rate.

b. Date to be Implemented: before 2030.
c. Project Cost: $0 (Current infrastructure assumed to be adequate).
d. Unit Cost: $2,314/acft ($7.10/1,000 gal).

Table 5.33-7 Recommended Plan Costs by Decade for Steamboat Mountain WSC

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*(653)*	*(893)*	*(1,103)*	*(1,158)*	*(1,641)*	*(1,951)*
Purchase Additional Supply from Abilene						
Supply From Plan Element (acft/yr)	653	893	1,103	1,158	1,641	1,951
Annual Cost ($/yr)	$1,511,000	$2,066,400	$2,552,300	$2,679,600	$3,797,300	$4,514,600
Unit Cost ($/acft)	$2,314	$2,314	$2,314	$2,314	$2,314	$2,314
Projected Surplus/(Shortage) after recommended WMS /9acft/yr)	*0*	*0*	*0*	*0*	*0*	*0*

5.33.8 City of Tye

The City of Tye purchases water from the City of Abilene at 184 acft/yr, and this is sufficient to meet the City's projected demands throughout the planning horizon. No change in water supply is recommended. Conservation was considered; however, the entity's current per capita use rate is below the selected target rate of 140 gpcd.

5.33.9 View Caps WSC

5.33.9.1 Description of Supply

View Caps WSC purchases water from the City of Abilene at 199 acft/yr and shows a projected shortage starting in 2030.

5.33.9.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended for View Caps WSC. The entity's water usage utilized for demand projections is 150 gpcd. The RWPG recommends conservation to reduce usage to a goal of 140 gpcd.

1. Conservation:
    a. Cost Source: Volume II.
    b. Date to be Implemented: before 2030.
    c. Project Cost: maximum of $8,892 in 2070.
    d. Unit Cost: $684/acft.
2. Water Supply from Abilene (BRA System Operations Supply):
    a. Cost Source: Abilene Water Rate.
    b. Date to be Implemented: before 2020.
    c. Project Cost: $0 (Current infrastructure assumed to be adequate).
    d. Unit Cost: $2,314/acft ($7.10/1,000 gal).

Table 5.33-8 Recommended Plan Costs by Decade for the View Caps WSC

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*(120)*	*(143)*	*(164)*	*(186)*	*(211)*	*(238)*
Conservation						
Supply From Plan Element (acft/yr)	11	10	11	12	13	13
Annual Cost ($/yr)	$7,524	$6,840	$7,524	$8,208	$8,892	$8,892
Projected Surplus/(Shortage) after Conservation	*(109)*	*(133)*	*(153)*	*(174)*	*(196)*	*(225)*
Purchase Additional Supply from Abilene						
Supply From Plan Element (acft/yr)	109	133	153	175	198	225
Annual Cost ($/yr)	$252,200	$307,800	$354,000	$405,000	$458,200	$520,700
Unit Cost ($/acft)	$2,314	$2,314	$2,314	$2,314	$2,314	$2,314
Projected Surplus/(Shortage) after recommended WMS (acft/yr)	*0*	*0*	*0*	*0*	*0*	*0*

5.33.10 County-Other

5.33.10.1 Description of Supply

County-Other Taylor obtains water supply from Abilene, Steamboat Mountain WSC, and Sweetwater. The water supply entities for Taylor County-Other show a projected surplus throughout the planning period.

5.33.10.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended to supplement supply for County-Other entities. Conservation was considered; however, the entities' current per capita use rate of 104 gpcd is below the selected target rate of 140 gpcd.

1. Water Supply from Abilene (Cedar Ridge Reservoir):
    a. Cost Source: Abilene Water Rate.
    b. Date to be Implemented: before 2030.
    c. Project Cost: $0 (Current infrastructure assumed to be adequate).
    d. Unit Cost: $2,314/acft ($7.10/1,000 gal).

Table 5.33-9 Recommended Plan Costs by Decade for Taylor County-Other

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*371*	*325*	*252*	*206*	*174*	*181*
Purchase from Abilene (Cedar Ridge Reservoir)						
Supply From Plan Element (acft/yr)	–	96	113	125	197	197
Annual Cost ($/yr)	–	$222,100	$261,500	$289,300	$455,900	$455,900
Unit Cost ($/acft)	–	$2,314	$2,314	$2,314	$2,314	$2,314
Projected Surplus/(Shortage) after recommended WMS (acft/yr)	*371*	*421*	*365*	*331*	*371*	*378*

5.33.11 Manufacturing

5.33.11.1 Description of Supply

Taylor County-Manufacturing receives water at 671 acft/yr from the City of Abilene in 2030 and 2040 and supply from the Edwards-Trinity Plateau Aquifer. Shortages are projected for Manufacturing in Taylor County throughout the planning period.

5.33.11.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended to meet water needs for Taylor County-Manufacturing. Associated costs are included for each strategy.

1. Purchase Additional Supply from Abilene:
    a. Cost Source: Abilene Water Rate.
    b. Date to be 2030.
    c. Project Cost: Not enough information to cost delivery.
    d. Unit Cost: $2,314/acft ($7.10/1,000 gal).
2. Leave Needs Unmet.

Table 5.33-10 Recommended Plan Costs by Decade for Taylor County-Manufacturing

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*(49)*	*(76)*	*(775)*	*(804)*	*(834)*	*(865)*
Purchase Additional Supply from Abilene						
Supply From Plan Element (acft/yr)	49	76	775	402	308	865
Annual Cost ($/yr)	$113,400	$175,900	$1,793,400	$930,200	$712,700	$2,001,600
Unit Cost ($/acft)	$2,314	$2,314	$2,314	$2,314	$2,314	$2,314
Leave Needs Unmet (acft/yr)	*0*	*0*	*0*	*(402)*	*(526)*	*0*

5.33.12 Steam-Electric

The water supply entities for Taylor County Steam-Electric show no projected demand.

5.33.13 Mining

5.33.13.1 Description of Supply

Mining operations in Taylor County obtain water from the Edwards-Trinity Plateau Aquifer at 134 acft/yr. Mining is projected to have shortages beginning in 2030.

5.33.13.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to meet water needs for Taylor County-Mining. Associated costs are included for each strategy. Conservation is recommended.

1. Conservation:
   a. Cost Source: Volume II.
   b. Date to be Implemented: before 2030.
   c. Annual Cost: not determined.
2. Purchase from Abilene Cedar Ridge Reservoir):
   a. Cost Source: Abilene Water Rate.
   b. Date to be Implemented: 2040.
   c. Project Cost: Not enough information to cost delivery.
   d. Unit Cost: $2,314/acft ($7.10/1,000 gal).
3. Leave Needs Unmet

Table 5.33-11 Recommended Plan Costs by Decade for Taylor County – Mining

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*(380)*	*(398)*	*(413)*	*(424)*	*(432)*	*(437)*
Conservation						
Supply From Plan Element (acft/yr)	12	20	26	24	23	22
Annual Cost ($/yr)	ND	ND	ND	ND	ND	ND
Projected Surplus/(Shortage) after Conservation (acft/yr)	*(368)*	*(378)*	*(387)*	*(400)*	*(409)*	*(415)*
Purchase from Abilene (Cedar Ridge)						
Supply From Plan Element (acft/yr)	–	206	188	172	159	159
Annual Cost ($/yr)	–	$476,700	$435,000	$398,000	$367,900	$367,900
Unit Cost ($/acft)	–	$2,314	$2,314	$2,314	$2,314	$2,314
Leave Needs Unmet (acft/yr)	*(368)*	*(172)*	*(199)*	*(228)*	*(250)*	*(256)*
ND – Not determined. Costs to implement industrial conservation technologies will vary based on each location.						

5.33.14 Irrigation

5.33.14.1 Description of Supply

Taylor County Irrigation is supplied by groundwater from the Edwards-Trinity Aquifer at 355 acft/yr and Trinity Aquifer at 14 acft/yr. Irrigation is projected to have shortages beginning in 2030.

5.33.14.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to meet water needs for Taylor County-Irrigation. Conservation is recommended.

1. Conservation:
   a. Cost Source: Volume II.
   b. Date to be Implemented: before 2030.
   c. Annual Cost: maximum of $196,000 in 2050.
   d. Unit Cost: $1,719/acft.

2. Purchase from Abilene (Cedar Ridge Reservoir):
   a. Cost Source: Abilene Water Rate.
   b. Date to be Implemented: 2040.
   c. Project Cost: Not enough information to cost delivery.
   d. Unit Cost: $2,314/acft ($7.10/1,000 gal).
3. Leave Needs Unmet

Table 5.33-12 Recommended Plan Costs by Decade for Taylor County – Irrigation

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*(1,057)*	*(1,057)*	*(1,057)*	*(1,057)*	*(1,057)*	*(1,057)*
Conservation						
Supply From Plan Element (acft/yr)	49	82	114	114	114	114
Annual Cost ($/yr)	$84,200	$141,000	$196,000	$196,000	$196,000	$196,000
Projected Surplus/(Shortage) after Conservation (acft/yr)	*(1,008)*	*(975)*	*(943)*	*(943)*	*(943)*	*(943)*
Purchase from Abilene (Cedar Ridge)						
Supply From Plan Element (acft/yr)	–	1,152	1,152	1,152	1,152	1,152
Annual Cost ($/yr)	–	$2,665,700	$2,665,700	$2,665,700	$2,665,700	$2,665,700
Unit Cost ($/acft)	–	$2,314	$2,314	$2,314	$2,314	$2,314
Projected Surplus/(Shortage) after recommended WMS (acft/yr)	*(1,008)*	*177*	*209*	*209*	*209*	*209*

5.33.15 Livestock

Livestock demand is met by local water supply and Trinity Aquifer groundwater and is projected to meet needs through 2080. No changes in Taylor County Livestock water supply are recommended.

5.34 Throckmorton County Water Supply Plan

Table 5.34-1 lists each water user group in Throckmorton County and their corresponding surplus or shortage in years 2030 and 2080. For each water user group with a projected shortage, a water supply plan has been developed and is presented in the following subsections.

Table 5.34-1 Throckmorton County Surplus/(Shortage)

Water User Group	Surplus/(Shortage)		Comment
	2030 (acft/yr)	2080 (acft/yr)	
Fort Belknap WSC			See Young County
Fort Griffin SUD			See Stephens County
Stephens Regional SUD			See Stephens County
City of Throckmorton	(96)	(105)	Projected shortage - see plan below.
County-Other	85	88	Projected surplus
Manufacturing	—	—	No projected demand
Steam-Electric	—	—	No projected demand
Mining	(8)	(8)	Projected shortage - see plan below.
Irrigation	0	0	No projected surplus or shortage
Livestock	120	120	Projected surplus

5.34.1 City of Throckmorton

5.34.1.1 Description of Supply

The City of Throckmorton obtains its water supply through diversions from Lake Throckmorton authorized under a water right held by the City; projected availability of supply under this water right is limited to 50 acft/yr at the beginning of the planning period and decreases to zero by 2080. Should Lake Throckmorton become unreliable, the City is connected to receive supply from Graham through Fort Belknap WSC. Water supply shortages are projected for the City of Throckmorton throughout the planning period.

5.34.1.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and the TWDB, the following water supply plan is recommended for the City of Throckmorton. The entities' water usage utilized for demand projections is 216 gpcd. The RWPG recommends conservation to reduce usage to a goal of 140 gpcd. Needs remain unmet in 2030 and 2040. These needs will only occur during a drought equivalent or worse than the drought of record. While not a strategy recommended by the Brazos G RWPG, the impacts of the unmet needs can be mitigated through demand management in the event of a serious drought prior to the recommended strategies coming online.

1. Conservation:
   a. Cost Source: Volume II.
   b. Date to be Implemented: before 2030.

c. Annual Cost: maximum of $26,676 in 2060.
d. Unit Cost: $684/acft.

2. Water Supply from New Throckmorton Reservoir:
    a. Cost Source: Volume II.
        i. Project requires a subordination agreement with the BRA.
    b. Date to be Implemented: before 2050.
    c. Project Cost: $102,539,000.
    d. Unit Cost: maximum of $2,781/acft.

Table 5.34-2 Recommended Plan Costs by Decade for the City of Throckmorton

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*(96)*	*(95)*	*(97)*	*(99)*	*(103)*	*(105)*
Conservation						
Supply From Plan Element (acft/yr)	12	24	36	39	38	35
Annual Cost ($/yr)	$8,208	$16,416	$24,624	$26,676	$25,992	$23,940
Projected Surplus/(Shortage) after Conservation (acft/yr)	*(84)*	*(71)*	*(61)*	*(60)*	*(65)*	*(70)*
New Throckmorton Reservoir						
Supply From Plan Element (acft/yr)	—	—	731	731	731	731
Annual Cost ($/yr)	—	—	$2,033,000	$2,033,000	$2,033,000	$2,033,000
Unit Cost ($/acft)	—	—	$2,781	$2,781	$2,781	$2,781
Projected Surplus/(Shortage) after recommended WMS (acft/yr)	(84)	(71)	670	671	666	661

5.34.2 County-Other

The entities in Throckmorton County-Other receive their water supply through groundwater production from the Cross Timbers Aquifer, through diversions of local surface water authorized under a water right, and through purchases of treated surface water supplies under contract from Stephens Regional SUD. Future water supply is projected to be available from Stephens Regional SUD, only, in the amount of 99 acft/yr. No shortages are projected and no change in water supply is recommended. Conservation was also considered; however, the entity’s per capita usage of 86 is below the selected goal 140 gpcd.

5.34.3 Manufacturing

No Manufacturing demand exists or is projected for the county.

5.34.4 Steam-Electric

No Steam-Electric demand exists or is projected for the county.

5.34.5 Mining

5.34.5.1 Description of Supply

Mining in Throckmorton County obtains water supply through groundwater production from the Cross Timbers and Seymour local aquifers. Projections show Mining will experience water supply shortages in each decade of the planning period.

5.34.5.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to meet water needs for Mining. Conservation is recommended. Associated costs are included for each strategy.

1. Conservation:
    a. Cost Source: Volume II.
    b. Date to be Implemented: before 2030.
    c. Unit Cost: not determined.
2. Cross Timbers Aquifer Development:
    a. Cost Source: Volume II.
    b. Date to be Implemented: before 2030.
    c. Project Cost: $510,000.
    d. Unit Cost: maximum of $476/acft.

Table 5.34-3 Recommended Plan Costs by Decade for Throckmorton County – Mining

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*(8)*	*(8)*	*(8)*	*(8)*	*(8)*	*(8)*
Conservation						
Supply From Plan Element (acft/yr)	6	10	12	11	9	8
Annual Cost ($/yr)	ND	ND	ND	ND	ND	ND
Projected Surplus/(Shortage) after Conservation (acft/yr)	*(2)*	*2*	*4*	*3*	*1*	*0*
Groundwater Development – Cross Timbers Aquifer						
Supply From Plan Element (acft/yr)	84	84	84	84	84	84
Annual Cost ($/yr)	$40,000	$40,000	$4,000	$4,000	$4,000	$4,000
Unit Cost ($/acft)	$476	$476	$48	$48	$48	$48
Projected Surplus/(Shortage) after recommended WMS (acft/yr)	82	86	88	87	85	84
ND – Not determined. Costs to implement industrial conservation technologies will vary based on each location.						

5.34.6 Irrigation

5.34.6.1 Description of Supply

Irrigation in Throckmorton County is supplied by Seymour Aquifer water. Water demands for irrigation are projected to remain constant throughout the planning period and no water supply shortages are projected.

5.34.6.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to supplement water supplies for Mining. Conservation is recommended. Associated costs are included for each strategy:

1. Conservation:
   a. Cost Source: Volume II.
   b. Date to be Implemented: before 2030.
   c. Annual Cost: maximum of $28,800 in 2050.
   d. Unit Cost: $2,619/acft.
2. Cross Timbers Aquifer Development:
   a. Cost Source: Volume II.
   b. Date to be Implemented: before 2030.
   c. Project Cost: $565,000.
   d. Unit Cost: maximum of $303/acft.

Table 5.34-4 Recommended Plan Costs by Decade for Throckmorton County – Irrigation

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*0*	*0*	*0*	*0*	*0*	*0*
Conservation						
Supply From Plan Element (acft/yr)	5	8	11	11	11	11
Annual Cost ($/yr)	$13,100	$21,000	$28,800	$28,800	$28,800	$28,800
Projected Surplus/(Shortage) after Conservation (acft/yr)	*5*	*8*	*11*	*11*	*11*	*11*
Groundwater Development – Cross Timbers Aquifer						
Supply From Plan Element (acft/yr)	152	152	152	152	152	152
Annual Cost ($/yr)	$46,000	$46,000	$6,000	$6,000	$6,000	$6,000
Unit Cost ($/acft)	$303	$303	$39	$39	$39	$39
Projected Surplus/(Shortage) after recommended WMS (acft/yr)	157	160	163	163	163	163

5.34.7 Livestock

Livestock demand is met by local water supply and is projected to meet needs through 2080. No changes in Throckmorton County Livestock water supply are recommended.

5.35 Washington County Water Supply Plan

Table 5.35-1 lists each water user group in Washington County and their corresponding surplus or shortage in years 2030 and 2080. A brief summary of the water user groups and the plan for the selected water user are presented in the following subsections.

Table 5.35-1 Washington County Surplus/(Shortage)

Water User Group	Surplus/(Shortage)		Comment
	2030 (acft/yr)	2080(acft/yr)	
City of Brenham	482	(234)	Projected shortage - see plan below.
Central Washington County WSC	125	17	Projected surplus
Chappell Hill WSC	159	164	Projected surplus
Corix Utilities Texas, Inc	149	47	Projected surplus
West End WSC	0	0	See Region H Plan
County-Other	19	383	Projected surplus
Manufacturing	(119)	(259)	Projected shortage - see plan below.
Steam-Electric	-	-	No projected demand
Mining	(650)	(650)	Projected shortage - see plan below.
Irrigation	258	258	Projected surplus
Livestock	220	220	Projected surplus

5.35.1 City of Brenham

5.35.1.1 Description of Supply

The City of Brenham obtains its water supply through a contract with the Brazos River Authority for 974 acft/yr of water supply from Lake Somerville.

5.35.1.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended for Brenham. The entities' water usage utilized for demand projections is 230 gpcd. The RWPG recommends conservation to reduce usage to a goal of 140 gpcd.

1. Conservation:
   a. Cost Source: Volume II.
   b. Date to be Implemented: 2030.
   c. Annual Cost: maximum of $1,112,184 in 2080.
   d. Unit Cost: $684/acft.
2. Groundwater Development – Gulf Coast Aquifer:
   a. Cost Source: Volume II.
   b. Date to be Implemented: 2030.

c. Project Cost: $7,827,000.
d. Unit Cost: $1,229 acft/yr.

Table 5.35-2 Recommended Plan Costs by Decade for City of Brenham

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*482*	*389*	*236*	*71*	*(86)*	*(234)*
Conservation						
Supply From Plan Element (acft/yr)	342	778	1,217	1,622	1,624	1,626
Annual Cost ($/yr)	$233,928	$532,152	$832,428	$1,109,448	$1,110,816	$1,112,184
Projected Surplus/(Shortage) after Conservation	*824*	*1,167*	*1,453*	*1,693*	*1,538*	*1,392*
Groundwater Development – Gulf Coast Aquifer						
Supply From Plan Element (acft/yr)	559	365	167	0	33	33
Annual Cost ($/yr)	$688,000	$688,000	$137,000	$137,000	$137,000	$137,000
Unit Cost ($/acft)	$1,229	$1,229	$245	$245	$245	$245
Projected Surplus/(Shortage) after Recommended WMS (acft/yr)	1,383	1,532	1,620	1,693	1,571	1,425

5.35.2 Central Washington County WSC

Central Washington County WSC obtains water from the Gulf Coast Aquifer System at 605 acft/yr. It is projected to have a surplus through the year 2080 and no changes in water supply are recommended.

5.35.2.1 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to meet water needs for Central Washington County WSC. The most recent water loss audit report shows a water loss of approximately 24% and recommends water loss mitigation. Conservation is not recommended because the entity's usage is 123 gpcd, which is below the selected goal of 140 gpcd.

1. Water Loss Reduction:
   a. Cost Source: Volume II.
   b. Date to be Implemented: 2030.
   c. Annual Cost: maximum of $96,272 in 2040.
   d. Unit Cost: $684/acft.
2. Gulf Coast Aquifer Development:
   a. Cost Source: Volume II.
   b. Date to be Implemented: 2040.
   c. Project Cost: $1,080,000.
   d. Unit Cost: $1,075/acft.

Table 5.35-3 Recommended Plan Costs by Decade for Central Washington County WSC

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*125*	*103*	*129*	*95*	*58*	*17*
Water Loss Reduction						
Supply From Plan Element (acft/yr)	46	48	46	49	52	56
Annual Cost ($/yr)	$95,606	$96,272	$15,314	$16,312	$17,311	$18,643
Projected Surplus/(Shortage) after Conservation	*171*	*151*	*175*	*144*	*110*	*73*
Groundwater Development - Gulf Coast Aquifer						
Supply From Plan Element (acft/yr)	*0*	*80*	*80*	*80*	*80*	*80*
Annual Cost ($/yr)	$0	$86,000	$86,000	$10,000	$10,000	$10,000
Unit Cost ($/acft)	$0	$1,075	$1,075	$125	$125	$125
Projected Surplus/(Shortage) after Recommended WMS (acft/yr)	171	231	255	224	190	153

5.35.3 Chappell Hill WSC

Chappell Hill WSC obtains water from the Gulf Coast Aquifer System at 268 ac-ft/yr. It is projected to have a surplus through the year 2080 and no changes in water supply are recommended.

5.35.3.1 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended for Chappell Hill WSC. The entities' water usage utilized for demand projections is 198 gpcd. The RWPG recommends conservation to reduce usage to a goal of 140 gpcd.

1. Conservation:
   a. Cost Source: Volume II.
   b. Date to be Implemented: 2030.
   c. Annual Cost: maximum of $20,520 in 2050.
   d. Unit Cost: $684/acft.

Table 5.35-4 Recommended Plan Costs by Decade for Chappell Hill WSC

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	159	159	158	160	162	164
Conservation						
Supply From Plan Element (acft/yr)	9	19	30	29	28	28
Annual Cost ($/yr)	$6,156	$12,996	$20,520	$19,836	$19,152	$19,152
Projected Surplus/(Shortage) after Water Loss Reduction (acft/yr)	168	178	188	189	190	192

5.35.4 Corix Utilities

5.35.4.1 Description of Supply

Corix Utilities Texas Inc. obtains its water supply from surface water from LCRA at 1,140 acft/yr and other groundwater sources at 175 acft/yr from Ellenberger-San Saba, 1,063 acft/yr from Gulf Coast Aquifer, and other alluvial sources. Shortages are projected for Corix Utilities from 2030 to 2080 in Region G.

5.35.4.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended to meet needs for Corix Utilities. The entities' water usage utilized for demand projections is 170 gpcd. The RWPG recommends conservation to reduce usage to a goal of 140 gpcd.

1. Conservation:
   a. Cost Source: Volume II.
   b. Date to be Implemented: 2030.
   c. Annual Cost: maximum of $452,808 in 2080.
   d. Unit Cost: $684/acft.

Table 5.35-5 Recommended Plan Costs by Decade for Corix Utilities

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	(745)	(892)	(997)	(1,097)	(1,212)	(1,333)
Conservation						
Supply From Plan Element (acft/yr)	278	590	611	624	643	662
Annual Cost ($/yr)	$190,152	$403,560	$417,924	$426,816	$439,812	$452,808
Unit Cost ($/acft)						
Projected Surplus/(Shortage) after Water Loss Reduction (acft/yr)	(467)	(302)	(386)	(473)	(569)	(671)

5.35.5 County-Other

Washington County-Other is projected to have a surplus through the year 2080 and no changes in water supply are recommended. Conservation was considered; however, the entity's current per capita use rate is below the selected target rate of 140 gpcd.

5.35.6 Manufacturing

5.35.6.1 Description of Supply

Water supply for manufacturing in Washington County is obtained by from the Gulf Coast Aquifer at 369 acft/yr and from Brenham at 208 acft/yr. Washington County Manufacturing is projected to have shortages beginning in 2030.

5.35.6.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to meet water needs for Washington County Manufacturing. Conservation is recommended.

1. Conservation:
   a. Cost Source: Volume II.
   b. Date to be Implemented:2030.
   c. Annual Cost: Not determined.

Table 5.35-6 Recommended Plan Costs by Decade for Washington County – Manufacturing

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*(119)*	*(145)*	*(172)*	*(200)*	*(229)*	*(259)*
Conservation						
Supply From Plan Element (acft/yr)	21	36	52	54	56	59
Annual Cost ($/yr)	ND	ND	ND	ND	ND	ND
Projected Surplus/(Shortage) after Conservation	*(98)*	*(109)*	*(120)*	*(146)*	*(173)*	*(200)*
Groundwater Development – Gulf Coast Aquifer						
Supply From Plan Element (acft/yr)	*300*	*300*	*300*	*300*	*300*	*300*
Annual Cost ($/yr)	*$202,000*	*$202,000*	*$26,000*	*$26,000*	*$26,000*	*$26,000*
Unit Cost ($/acft)	*$673*	*$673*	*$87*	*$87*	*$87*	*$87*
Projected Surplus/(Shortage) after Recommended WMS (acft/yr)	*202*	*191*	*180*	*154*	*127*	*100*
ND – Not determined. Costs to implement industrial conservation technologies will vary based on each location						

5.35.7 Steam-Electric

No Steam-Electric demand exists nor is projected for the county.

5.35.8 Mining

5.35.8.1 Description of Supply

Mining operations in Washington County are supplied by Brazos River Alluvium groundwater at 78 acft/yr. Demands for Mining are projected to increase significantly resulting in shortages beginning in 2030.

5.35.8.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to meet water needs for Washington County-Mining. Conservation is recommended.

1. Conservation:
   a. Cost Source: Volume II.
   b. Date to be Implemented: 2030.
   c. Annual Cost: not determined.
2. Groundwater Development – Gulf Coast Aquifer:
   a. Cost Source: Volume II.
   b. Date to be Implemented:2030.
   c. Project Cost: $3,554,000.
   d. Unit Cost: $252 /acft.

Table 5.35-7. Recommended Plan Costs by Decade for Washington County – Mining

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*(650)*	*(650)*	*(650)*	*(650)*	*(650)*	*(650)*
Conservation						
Supply From Plan Element (acft/yr)	22	36	51	51	51	51
Annual Cost ($/yr)	ND	ND	ND	ND	ND	ND
Projected Surplus/(Shortage) after Conservation (acft/yr)	*(628)*	*(614)*	*(599)*	*(599)*	*(599)*	*(599)*
Groundwater Development – Gulf Coast Aquifer						
Supply From Plan Element (acft/yr)	745	1,076	922	769	668	668
Annual Cost ($/yr)	$314,000	$314,000	$64,000	$64,000	$64,000	$64,000
Unit Cost ($/acft)	$252	$252	$51	$51	$51	$51
Projected Surplus/(Shortage) after Recommended WMS (acft/yr)	117	462	323	170	69	69
ND – Not determined. Costs to implement industrial conservation technologies will vary based on each location.						

5.35.9 Irrigation

Irrigation obtains water from the Gulf Coast Aquifer at 416 acft/yr and Brazos River Alluvial Aquifer at 93 acft/yr. There is a projected surplus of water supplies and no changes in water supply are recommended.

5.35.10 Livestock

Livestock water supply is projected to meet demands through 2080 and no changes in water supply are recommended.

5.36 Williamson County Water Supply Plan

Table 5.36-1 lists each water user group in Williamson County and their corresponding surplus or shortage in years 2030 and 2080. A brief summary of the water user groups and the plan for the selected water user are presented in the following subsections.

Table 5.36-1 Williamson County Surplus/(Shortage)

Water User Group	Surplus/(Shortage)[1]		Comment
	2030 (acft/yr)	2080 (acft/yr)	
City of Bartlett	(1)	8	Projected shortage - see plan below.
Bell-Milam Falls WSC			See Bell County
Block House MUD	290	420	Projected surplus
Brushy Creek MUD	(790)	(914)	Projected shortage - see plan below.
City of Cedar Park	(2,575)	(2,921)	Projected shortage - see plan below.
Fern Bluff MUD	(2)	(111)	Projected shortage – see plan below.
City of Florence	(112)	(209)	Projected shortage - see plan below.
City of Georgetown	(7,370)	(158,402)	Projected shortage - see plan below.
City of Granger	59	(26)	Projected shortage - see plan below.
City of Hutto	(1,400)	(12,601)	Projected shortage - see plan below.
Jarrell-Schwertner	(3,289)	(5,958)	Projected shortage – see plan below.
Jonah Water SUD	(2,201)	(19,652)	Projected shortage – see plan below.
City of Leander	(9,578)	(17,375)	Projected shortage - see plan below.
City of Liberty Hill	842	(1,416)	Projected shortage
Manville WSC	0	0	No projected surplus or shortage
Noack WSC	0	0	No projected surplus or shortage
Paloma Lake MUD 1	(128)	(138)	Projected shortage – see plan below.
Paloma Lake MUD 2	(103)	(111)	Projected shortage – see plan below.
City of Pflugerville	3,040	(11,602)	Projected shortage - see plan below.
City of Round Rock	3,400	(11,964)	Projected shortage – see plan below.
Sonterra MUD	(1,019)	(4,897)	Projected shortage - see plan below.
Southwest Milam WSC			See Milam County
City of Taylor	(2,090)	(10,996)	Projected shortage – see plan below.
Vista Oaks MUD	117	105	Projected surplus
Walsh Ranch MUD	68	66	Projected surplus
Williamson County MUD 10	133	129	Projected surplus
Williamson County MUD 11	(106)	(2,714)	Projected shortage – see plan below.
Williamson County WSID 3	(107)	(1,940)	Projected shortage – see plan below.
Williamson-Travis Counties MUD 1	170	160	Projected surplus
County-Other	(3,034)	(29,043)	Projected shortage - see plan below.

Water User Group	Surplus/(Shortage)[1]		Comment
	2030 (acft/yr)	2080 (acft/yr)	
Manufacturing	(862)	(1,272)	Projected shortage – see plan below.
Steam-Electric	—	—	No projected demand
Mining			Region K
Irrigation	(224)	(226)	Projected shortage - see plan below.
Livestock	14	14	Projected surplus – see plan below.

5.36.1 City of Bartlett

5.36.1.1 Description of Supply

The City of Bartlett obtains its water supply from groundwater from the Trinity Aquifer which is projected to provide a supply of 326 acft/yr through the planning period. Based on the available groundwater supply, the City of Bartlett is projected to have shortages through the year 2030. This WUG is located in multiple counties (Williamson and Bell). The shortages shown in Table 5.36-1 represent the cumulative totals for the City of Bartlett.

5.36.1.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended for the City of Bartlett. The most recent water loss audit report shows a water loss of approximately 44% and recommends water loss mitigation. For this planning process the entity's per capita usage is estimated to be 183 gpcd which is above the 120 gpcd target adopted for Williamson County WUGs.

1. Conservation:
   a. Cost Source: Volume II.
   b. Date to be Implemented: before 2030.
   c. Annual Cost: Maximum of $71,136 in 2060.
   d. Unit Cost: $684/acft.
2. Water Loss Reduction:
   a. Cost Source: Volume II.
   b. Date to be Implemented: before 2030.
   c. Annual Cost: maximum of $125,920 in 2030.
   d. Unit Cost: $1,321/acft.
3. Alternative: Purchase Supply from Jarrell-Schwertner WSC:
   a. Cost Source: Volume II.
   b. Date to be Implemented: before 2030.
   c. Annual Cost: $672,375.
   d. Unit Cost: $2,445/acft.
4. Alternative: Trinity Aquifer Development (Bell County):
   a. Cost Source: Volume II.

b. Date to be Implemented: before 2030.
c. Annual Cost: $248,000.
d. Unit Cost: $902/acft.

Table 5.36-2 Recommended Plan Costs by Decade for City of Bartlett

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*(2)*	*3*	*5*	*7*	*10*	*12*
Conservation						
Supply From Plan Element (acft/yr)	25	57	89	104	103	103
Annual Cost ($/yr)	$17,100	$38,988	$60,876	$71,136	$70,452	$70,452
Water Loss Reduction						
Supply From Plan Element (acft/yr)	96	95	94	94	92	93
Annual Cost ($/yr)	$125,920	$125,478	$41,614	$41,614	$40,728	$41,171
Unit Cost ($/acft)	$1,312	$1,321	$443	$443	$443	$443
Projected Surplus/(Shortage) after Conservation	*119*	*155*	*188*	*205*	*205*	*208*

5.36.2 Blockhouse MUD

5.36.2.1 Description of Supply

Blockhouse MUD obtains its water supply from the City of Cedar Park at 1,098 acft/yr. No shortages are projected for Blockhouse MUD and no changes in the water supply are recommended.

5.36.2.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended for Blockhouse MUD. The entities' water usage utilized for demand projections is 130 gpcd. The RWPG recommends conservation to reduce usage to a goal of 120 gpcd for Williamson County WUGs.

1. Conservation:
   a. Cost Source: Volume II.
   b. Date to be Implemented: before 2030.
   c. Annual Cost: maximum of $23,940 in 2030.
   d. Unit Cost: $684/acft.

Table 5.36-3 Recommended Plan Costs by Decade for Blockhouse MUD

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*290*	*321*	*347*	*372*	*396*	*420*
Conservation						
Supply From Plan Element (acft/yr)	*35*	*30*	*29*	*28*	*28*	*26*
Annual Cost ($/yr)	$23,940	$20,520	$19,836	$19,152	$19,152	$17,784
Projected Surplus/(Shortage) after Conservation	*325*	*351*	*376*	*400*	*424*	*446*

5.36.3 Brushy Creek MUD

5.36.3.1 Description of Supply

Brushy Creek MUD obtains its water supply from a contract with the Brazos River Authority for water from Stillhouse Hollow Reservoir and from local groundwater. Brushy Creek MUD has a projected shortage in 2030 and 2040. Brushy Creek MUD has contracted for 4,000 acft/yr of surface water supplies from the Brazos River Authority, which can supply 3,334 acft/yr in 2030 and 3,229 acft/yr in 2080, based on water availability analyses prescribed under water planning guidelines.

5.36.3.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended for Brushy Creek MUD. The entities' water usage utilized for demand projections is 185 gpcd. The RWPG recommends conservation to reduce usage to a goal of 120 gpcd for Williamson County WUGs.

1. Conservation:
   a. Cost Source: Volume II.
   b. Date to be Implemented: before 2030.
   c. Unit Cost: $684/acft.
   d. Annual Cost: maximum of $903,564 in 2060.
2. Increase Contract with BRA – Contingent on WWP WMSs:
   a. Cost Source: Volume II.
   b. Date to be Implemented: before 2030.
   c. Annual Cost: Cost of water purchase.
   d. Unit Cost: $912/acft.

Table 5.36-4 Recommended Plan Costs by Decade for Brushy Creek MUD

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*(790)*	*(819)*	*(851)*	*(872)*	*(893)*	*(914)*
Conservation						
Supply From Plan Element (acft/yr)	298	704	1,101	1,321	1,321	1,321
Annual Cost ($/yr)	$203,832	$481,536	$753,084	$903,564	$903,564	$903,564
Projected Surplus/(Shortage) after Conservation	*(492)*	*(115)*	*250*	*449*	*428*	*407*
Increase contract with BRA						
Supply From Plan Element (acft/yr)	500	500	-	-	-	-
Annual Cost ($/yr)	$456,000	$456,000	-	-	-	-
Unit Cost ($/acft)	$912	$912	-	-	-	-
Projected Surplus/(Shortage) after recommended WMS (acft/yr)	8	385	*250*	*449*	*428*	*407*

5.36.4 City of Cedar Park

5.36.4.1 Description of Supply

The City of Cedar Park is located in Williamson County and part of Travis County (Region K) and provides wholesale water to entities in Williamson and Travis Counties. The City has a 23,000 acft/yr contract from LCRA for Highland Lakes supply. Cedar Park is a participant in the Brushy Creek Regional Utility Authority to develop additional supplies from the Highland Lakes in Region K. The project is under construction and the remaining phases are under development. Based on the available surface water supply and contractual commitments to supply water to wholesale customers, the City of Cedar Park is projected to have a shortage throughout the planning period. Table 5.36-4 includes additional information on existing contracts and water supplies for the City of Cedar Park. Table 5.36-5 presents the water supply plan for the portion of Cedar Park in Brazos G.

5.36.4.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to meet the projected water shortage for the City of Cedar Park. The entities' water usage utilized for demand projections is 191 gpcd. The RWPG recommends conservation to reduce usage to a goal of 120 gpcd for Williamson County WUGs.

1. Conservation:
    a. Cost Source: Volume II.
    b. Date to be Implemented: before 2030.
    c. Annual Cost: Maximum of $5,297,580 in 2060.
    d. Unit Cost: $560/acft.
2. Brushy Creek RUA Water Supply Project:
    a. Cost Source: Volume II.
    b. Date to be Implemented: before 2030.
    c. Total Project Cost: $16,397,000 (city's portion of cost for Phase 3).
    d. Unit Cost: $642/acft.
3. Reuse:
    a. Cost Source: Volume II.
    b. Date to be Implemented: before 2030.
    c. Project Cost: $15,412,000.
    d. Unit Cost: maximum of $1,111/acft.

Table 5.36-5 Recommended Plan Costs by Decade for the City of Cedar Park

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*(2,575)*	*(2,803)*	*(2,921)*	*(2,921)*	*(2,921)*	*(2,921)*
Conservation						
Supply From Plan Element (acft/yr)	1,690	3,859	6,106	7,745	7,745	7,745
Annual Cost ($/yr)	$1,155,960	$2,639,556	$4,176,504	$5,297,580	$5,297,580	$5,297,580
Projected Surplus/(Shortage) after Conservation	*(885)*	*1,056*	*3,185*	*4,824*	*4,824*	*4,824*

Plan Element	2030	2040	2050	2060	2070	2080
Brushy Creek RUA Water Supply Project(1)						
Supply From Plan Element (acft/yr)	1,677	1,677	1,677	1,677	1,677	1,677
Annual Cost ($/yr)	$1,977,000	$1,977,000	$823,000	$823,000	$823,000	$823,000
Unit Cost ($/acft)	$642	$642	$267	$267	$267	$267
Reuse						
Supply From Plan Element (acft/yr)	1,120	1,120	1,120	1,120	1,120	1,120
Annual Cost ($/yr)	$1,267,000	$1,267,000	$184,000	$184,000	$184,000	$184,000
Unit Cost ($/acft)	$1,111	$1,111	$161	$161	$161	$161
Projected Surplus/(Shortage) after recommended WMS (acft/yr)	*1,912*	*3,853*	*5,982*	*7,621*	*7,621*	*7,621*

Notes:

(1) The LCRA contract is shown as a current supply to Cedar Park. This strategy provides additional flexibility to take supplies during drought by a deep water intake in Lake Travis.

5.36.5 Fern Bluff MUD

5.36.5.1 Description of Supply

Fern Bluff MUD has a contract from the Round Rock which can supply 1,175 acft/yr in 2030 and 1,161 acft/yr in 2080.

5.36.5.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended for the Fern Bluff MUD. The entities’ water usage utilized for demand projections is 194 gpcd. The RWPG recommends conservation to reduce usage to a goal of 120 gpcd for Williamson County WUGs.

1. Conservation:
    a. Cost Source: Volume II.
    b. Date to be Implemented: 2030.
    c. Annual Cost: maximum of $317,376 in 2070.
    d. Unit Cost: $684/acft.

Table 5.36-6 Recommended Plan Costs by Decade for Fern Bluff MUD

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*(2)*	*(53)*	*(107)*	*(110)*	*(111)*	*(111)*
Conservation						
Supply From Plan Element (acft/yr)	90	220	356	463	464	464
Annual Cost ($/yr)	$61,560	$150,480	$243,504	$316,692	$317,376	$317,376
Projected Surplus/(Shortage) after Conservation	88	167	249	353	353	353

5.36.6 City of Florence

5.36.6.1 Description of Supply

The City of Florence obtains its water supply from groundwater from the Trinity Aquifer, which provides a supply of 96 acft/yr throughout the planning period. Based on the City's available groundwater supply, the City of Florence is projected to have a shortage through the year 2080.

5.36.6.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended for the City of Florence. For this planning process the entity's per capita usage is estimated to be 136 gpcd which is above the 120 gpcd target adopted for Williamson County WUGs for Williamson County WUGs.

1. Conservation:
   - i. Cost Source: Volume II.
   - ii. Date to be Implemented: 2030.
   - iii. Annual Cost: maximum of $17,100 in 2080.
   - iv. Unit Cost: $684/acft.
2. Purchase from Georgetown – Contingent on WWP WMSs:
   - a. Cost Source: Volume II.
   - b. Date to be Implemented: 2030.
   - c. Annual Cost: maximum of $56,304.
   - d. Unit Cost: $782/acft.

Table 5.36-7 Recommended Plan Costs by Decade for the City of Florence

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*(112)*	*(126)*	*(144)*	*(163)*	*(185)*	*(209)*
Conservation						
Supply From Plan Element (acft/yr)	18	18	20	21	23	25
Annual Cost ($/yr)	$12,312	$12,312	$13,680	$14,364	$15,732	$17,100
Projected Surplus/(Shortage) after Conservation	*(94)*	*(108)*	*(124)*	*(142)*	*(162)*	*(184)*
Purchase from Georgetown						
Supply From Plan Element (acft/yr)	94	108	124	142	162	184
Annual Cost ($/yr)	$73,508	$84,456	$96,968	$111,044	$126,684	$143,888
Unit Cost ($/acft)	$782	$782	$782	$782	$782	$782
Projected Surplus/(Shortage) after recommended WMS (acft/yr)	*0*	*0*	*0*	*0*	*0*	*0*

5.36.7 City of Georgetown

5.36.7.1 Description of Supply

The City of Georgetown obtains its water supply from groundwater from the Edwards-BFZ (Northern Segment) Aquifer and contracts with the Brazos River Authority for water from Lake Georgetown and Stillhouse Hollow Reservoir. The City of Georgetown has contracted for 46,907 acft/yr of surface water supplies from the Brazos River Authority, which can supply 38,092 acft/yr in 2030 and 36,895 acft/yr in 2080, based on water availability analyses prescribed under water planning guidelines. 1,200 acft/yr of the water contracted with BRA is from the Colorado Basin (Highland Lakes, HB1437). The City also has a contract with Leander for additional supplies of 1,200 acft/yr. City of Georgetown supplies 163 acft/yr to Manufacturing Williamson. Based on the available surface water and groundwater supplies, the City of Georgetown is projected to have a shortage from 2030 through the year 2080.

5.36.7.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended for The City of Georgetown. Associated costs are included for each strategy. For this planning process the entity's per capita usage is estimated to be 173 gpcd which is above the 120 gpcd target adopted for Williamson County WUGs.

Georgetown has identified that the 120 gpcd target is not obtainable, requesting to use 140 gpcd as the target conservation rate and using the target gpcds identified in Georgetown's water plan for conservation goals in 2030 through 2050. The remaining unmet need beginning in 2040 results from contracts not being fully allocated and MAG limitations resulting from the conservative methodology of determining source supply volumes. See Chapter 3.2.5 for additional information regarding BRA supplies. These needs will only occur during a drought equivalent or worse than the drought of record. While not a strategy recommended by the Brazos G RWPG, the impacts of the unmet needs can be mitigated through demand management in the event of a serious drought prior to the recommended strategies coming online that will firm up supplies from the BRA.

1. Conservation:
   a. Cost Source: Volume II.
   b. Date to be Implemented: before 2030.
   c. Annual Cost: maximum of $22,725,216 in 2080.
   d. Unit Cost: $684/acft.
2. Regional Groundwater Supply System – Carrizo-Wilcox Aquifer Robertson County:
   a. Cost Source: Volume II.
   b. Date to be Implemented: before 2030.
   c. Project Cost: $462,725,000.
   d. Unit Cost: $968/acft.
3. Lake Georgetown ASR – Trinity Aquifer:
   a. Cost Source: Volume II.
   b. Date to be Implemented: before 2040.
   c. Project Cost: $460,083,000.

   d. Unit Cost: maximum of $5,441/acft.

4. Reuse – Dove Springs:
   a. Cost Source: Volume II.
   b. Date to be Implemented: before 2030.
   c. Project Cost: $12,953,000.
   d. Unit Cost: maximum of $715/acft.
5. Lake Whitney Reallocation (Purchase from BRA).
   a. Cost Source: Volume II.
   b. Date to be Implemented: 2060.
   c. Project Cost: $678,755,000 (BRA in conjunction with customers).
   d. Unit Cost: maximum of $2,563/acft.
6. Lee County Groundwater Project:
   a. Cost Source: Volume II.
   b. Date to be Implemented: before 2030.
   c. Project Cost: $441,548,000.
   d. Unit Cost: maximum of $1,962/acft.
7. Groundwater Development – Trinity Hosston:
   a. Cost Source: Volume II.
   b. Date to be Implemented: before 2030.
   c. Project Cost: $46,116,000.
   d. Unit Cost: maximum of $513/acft.
8. Water Reclamation:
   a. Cost Source: Georgetown Integrated Water Plan
   b. Date to be Implemented: before 2030.
   c. Project Cost: $494,826,000
   d. Unit Cost: $1,791/acft.
9. Alternative: Additional Groundwater Development - Carrizo-Wilcox Aquifer Lee County:
   a. Cost Source: Volume II.
   b. Date to be Implemented: before 2030.
   c. Project Cost: $462,725,000.
   d. Unit Cost: $968/acft.

Table 5.36-8 Recommended Plan Costs by Decade for City of Georgetown

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*(7,370)*	*(42,619)*	*(73,464)*	*(99,937)*	*(130,799)*	*(158,402)*
Conservation						
Supply From Plan Element (acft/yr)	—	—	—	6,865	18,497	33,224
Annual Cost ($/yr)	$0	$0	$0	$4,695,660	$12,651,948	$22,725,216
Projected Surplus/(Shortage) after Conservation	*(7,370)*	*(42,619)*	*(73,464)*	*(93,072)*	*(112,302)*	*(125,178)*
Additional Demands from Strategies Recommended for Others						

Plan Element	2030	2040	2050	2060	2070	2080
Supply to Florence (acft/yr)	94	108	124	142	162	184
Total Needs Including Recommended Strategies (acft/yr)	*(7,464)*	*(42,727)*	*(73,588)*	*(93,214)*	*(112,464)*	*(125,362)*
Regional Groundwater Supply System						
Supply From Plan Element (acft/yr)	6,149	11,626	17,103	22,579	28,055	28,055
Annual Cost	$38,153,000	$38,153,000	$5,616,000	$5,616,000	$5,616,000	$5,616,000
Unit Cost ($/acft)	$6,205	$3,282	$328	$249	$241	$241
Lake Georgetown ASR						
Supply From Plan Element (acft/yr)	—	8,645	8,645	8,645	8,645	8,645
Annual Cost	—	$47,035,000	$47,035,000	$14,674,000	$14,674,000	$14,674,000
Unit Cost ($/acft)	—	$5,441	$5,441	$1,697	$1,697	$1,697
Reuse – Dove Springs						
Supply From Plan Element (acft/yr)	1,456	1,456	1,456	1,456	1,456	1,456
Annual Cost ($/yr)	$1,041,000	$1,041,000	$130,000	$130,000	$130,000	$130,000
Unit Cost ($/acft)	$715	$715	$89	$89	$89	$89
Lake Whitney Reallocation (Purchase from BRA)						
Supply From Plan Element (acft/yr)	—	—	1,000	1,000	1,000	1,000
Annual Cost ($/yr)	—	—	$2,563,000	$2,563,000	$729,000	$729,000
Unit Cost ($/acft)	—	—	$2,563	$2,563	$729	$729
Lone Star RWA Gatehouse Project						
Supply From Plan Element (acft/yr)	7,000	7,000	7,000	7,000	7,000	5,800
Annual Cost ($/yr)	$36,292,000	$36,292,000	$5,245,000	$5,245,000	$5,245,000	$5,245,000
Unit Cost ($/acft)	$5,185	$5,185	$749	$749	$749	$904
Groundwater Development – Trinity Hosston						
Supply From Plan Element (acft/yr)	0	0	0	0	0	0
Annual Cost ($/yr)	$4,431,000	$4,431,000	$1,186,000	$1,186,000	$1,186,000	$1,186,000
Unit Cost ($/acft)	$521	$521	$140	$140	$140	$140
Water Reclamation						
Supply From Plan Element (acft/yr)	3,071	12,900	12,900	12,900	25,010	25,010
Annual Cost ($/yr)	$44,778,000	$44,778,000	$9,962,000	$9,962,000	$9,962,000	$9,962,000
Unit Cost ($/acft)	$1,791	$1,791	$398	$398	$398	$398
Projected Surplus/(Shortage) after recommended WMS (acft/yr)	10,306	(992)	(25,360)	(39,492)	(41,136)	(55,212)

Table 5.36-9 Alternative Plan Costs by Decade for City of Georgetown

Plan Element	2030	2040	2050	2060	2070	2080
Regional Groundwater Supply System						
Supply From Plan Element (acft/yr)	39,399	39,399	39,399	39,399	39,399	39,399

Plan Element	2030	2040	2050	2060	2070	2080
Annual Cost	$38,153,000	$38,153,000	$5,616,000	$5,616,000	$5,616,000	$5,616,000
Unit Cost ($/acft)	$968	$968	$143	$143	$143	$143
Lone Star RWA Gatehouse Project						
Supply From Plan Element (acft/yr)	18,500	18,500	18,500	18,500	18,500	18,500
Annual Cost	$36,292,000	$36,292,000	$5,245,000	$5,245,000	$5,245,000	$5,245,000
Unit Cost ($/acft)	$1,962	$1,962	$284	$284	$284	$284
Groundwater Development – Trinity Hosston						
Supply From Plan Element (acft/yr)	8,645	8,645	8,645	8,645	8,645	8,645
Annual Cost ($/yr)	$4,431,000	$4,431,000	$1,186	$1,186	$1,186	$1,186
Unit Cost ($/acft)	$513	$513	$137	$137	$137	$137
Additional Groundwater Development - Carrizo-Wilcox Aquifer Robertson County						
Supply From Plan Element (acft/yr)	—	1,456	1,456	1,456	1,456	1,456
Annual Cost ($/yr)	—	$508,144	$508,144	$66,976	$66,976	$66,976
Unit Cost ($/acft)	—	$349	$349	$46	$46	$46

5.36.8 City of Granger

5.36.8.1 Description of Supply

The City of Granger obtains its water supply from groundwater from the Trinity Aquifer. Based on the available groundwater supply, the City of Granger is projected to have no shortages.

5.36.8.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended for the City of Granger. The entities' water usage utilized for demand projections is 145 gpcd. The RWPG recommends conservation to reduce usage to a goal of 120 gpcd for Williamson County WUGs.

1. Conservation:
    a. Cost Source: Volume II.
    b. Date to be Implemented: 2030.
    c. Annual Cost: maximum of $26,676 in 2080.
    d. Unit Cost: $684/acft.

Table 5.36-10 Recommended Plan Costs by Decade for City of Granger

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*59*	*44*	*29*	*11*	*(6)*	*(26)*
Conservation						
Supply From Plan Element (acft/yr)	13	29	32	34	36	39
Annual Cost ($/yr)	$8,892	$19,836	$21,888	$23,256	$24,624	$26,676

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) after Conservation (acft/yr)	*72*	*73*	*61*	*45*	*30*	*13*

5.36.9 City of Hutto

5.36.9.1 Description of Supply

The City of Hutto obtains its water supply from Manville WSC (462 acft/yr), City of Taylor (336 acft/yr), and a groundwater system supply from Edwards-BFZ Aquifer, which supplies 505 acft/yr in 2030 and 461 acft/yr in 2080. The current supply from the groundwater system is limited by the MAG in Williamson County. Based on the available supplies, the City of Hutto is projected to have shortages starting in 2030.

5.36.9.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended for the City of Hutto. Associated costs are included for each strategy. Conservation is not recommended because the entity's usage is 107 gpcd, which is below the selected goal of 120 gpcd for Williamson County WUGs.

1. Carrizo-Wilcox Aquifer – Purchase from Vista Ridge:
    a. Cost Source: Volume II.
    b. Date to be Implemented: before 2030.
    c. Project Cost: Cost of purchase.
    d. Unit Cost: assume $1,000/acft.

Table 5.36-11 Recommended Plan Costs by Decade for City of Hutto

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	(1,400)	(2,457)	(3,921)	(5,932)	(8,724)	(12,601)
Carrizo-Wilcox Aquifer Development						
Supply From Plan Element (acft/yr)	648	1,226	1,803	2,380	2,958	2,958
Annual Cost ($/yr)	$648,000	$1,226,000	$1,803,000	$2,380,000	$2,958,000	$2,958,000
Unit Cost ($/acft)	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000
Projected Surplus/(Shortage) after recommended WMS (acft/yr)	(752)	(1,231)	(2,118)	(3,552)	(5,766)	(9,643)

Table 5.36-12 Alternative Plan Costs by Decade for City of Hutto

Plan Element	2030	2040	2050	2060	2070	2080
Carrizo-Wilcox Aquifer Development						
Supply From Plan Element (acft/yr)	5,000	5,000	5,000	5,000	5,000	5,000
Annual Cost ($/yr)	$5,000,000	$5,000,000	$5,000,000	$5,000,000	$5,000,000	$5,000,000
Unit Cost ($/acft)	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000

5.36.10 Jarrell-Schwertner WSC

5.36.10.1 Description of Supply

Jarrell-Schwertner WSC obtains its water supply from the Edwards-BFZ (Northern Segment) Aquifer. The WSC also has a contract with BRA for supplies from Stillhouse Hollow Lake, Central Texas WSC, and Salado WSC. Jarrell-Schwertner WSC has contracted for 5,386 acft/yr of surface water supplies from the Brazos River Authority, which can supply 5,386 acft/yr in 2030 and 5,217 acft/yr in 2080, based on water availability analyses prescribed under water planning guidelines. Additionally, Jarrell-Schwertner WSC holds a contract with Central Texas WSC for 1,500 acft/yr, with availability projected to decrease to 826 acft/yr in 2030 and 804 acft/yr in 2080. A smaller contract with Salado WSC provides an additional 55 acft/yr, contributing to the corporation's diversified water supply portfolio. Based on the available water supply, Jarrell-Schwertner WSC is projected to have a shortage throughout the planning period. This WUG is located in multiple counties (Williamson and Bell) and the surplus/shortages shown represent the cumulative totals for Jarrell-Schwertner WSC.

5.36.10.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB and in coordination with Region K, the following water management strategy is recommended for the Jarrell-Schwertner WSC. The most recent water loss audit report shows a water loss of approximately 21% and recommends water loss mitigation. The entities' water usage utilized for demand projections is 125 gpcd. The RWPG recommends conservation to reduce usage to a goal of 120 gpcd for Williamson County WUGs.

1. Conservation:
    a. Cost Source: Volume II.
    b. Date to be Implemented: 2030.
    c. Annual Cost: maximum of $25,308 in 2030.
    d. Unit Cost: $684/acft.
2. Water Loss Reduction:
    a. Cost Source: Volume II.
    b. Date to be Implemented: 2030.
    c. Annual Cost: maximum of $293,676 in 2040.
    d. Unit Cost: $500/acft.

Table 5.36-13 Recommended Plan Costs by Decade for Jarrell-Schwertner WSC

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	(2,911)	(3,677)	(4,158)	(4,652)	(5,175)	(5,708)
Conservation						
Supply From Plan Element (acft/yr)	37	0	0	0	0	0
Annual Cost ($/yr)	$25,308	—	—	—	—	—
Water Loss Reduction						
Supply From Plan Element (acft/yr)	560	605	631	660	689	719
Annual Cost ($/yr)	$280,176	$293,676	$189,300	$198,000	$206,700	$215,700
Unit Cost ($/acft)	$500	$485	$300	$300	$300	$300

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) after Conservation	(2,314)	(3,072)	(3,527)	(3,992)	(4,486)	(4,989)

5.36.11 Jonah Water SUD

5.36.11.1 Description of Supply

Jonah Water SUD obtains its water supply from groundwater from the Edwards-BFZ (Northern Segment) Aquifer at 946 acft/yr in 2030 and 864 acft/yr in 2080. This WUG also has a contract with the BRA for treated supply through the East Williamson County WTP which has contracts for 6,238 acft/yr in 2030 and 23,510 in 2080 which provides 3,091 acft/yr in 2030 and 2,994 acft/yr in 2080. Based on the available groundwater and surface water supply, Jonah Water SUD is projected to have a shortage throughout the planning period.

5.36.11.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended for Jonah Water SUD. Associated costs are included for each strategy. Conservation is recommended to reduce usage to a goal of 140 gpcd. The most recent water loss audit report shows a water loss of approximately 17% and recommends water loss mitigation. The entities' water usage utilized for demand projections is 188 gpcd. The RWPG recommends conservation to reduce usage to a goal of 120 gpcd for Williamson County WUGs. The remaining unmet need resulting from contracts not being fully allocated is a result of the conservative methodology of determining source supply volumes. Contract supplies from the BRA are firm supplies.

1. Conservation:
   a. Cost Source: Volume II.
   b. Date to be Implemented: 2030.
   c. Annual Cost: maximum of $5,574,600 in 2080.
   d. Unit Cost: $684/acft.
2. Water Loss Reduction:
   a. Cost Source: Volume II.
   b. Date to be Implemented: 2030.
   c. Annual Cost: maximum of $183,300 in 2080.
   d. Unit Cost: $893/acft.

Table 5.36-14 Recommended Plan Costs by Decade for Jarrell-Schwertner WSC

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	(2,201)	(4,898)	(8,060)	(11,480)	(15,326)	(19,652)
Conservation						
Supply From Plan Element (acft/yr)	511	1,625	3,370	5,331	6,658	8,150
Annual Cost ($/yr)	$349,524	$1,111,500	$2,305,080	$3,646,404	$4,554,072	$5,574,600
Water Loss Reduction						
Supply From Plan Element (acft/yr)	162	230	311	400	499	611

Plan Element	2030	2040	2050	2060	2070	2080
Annual Cost ($/yr)	$144,587	$164,987	$93,300	$120,000	$149,700	$183,300
Unit Cost ($/acft)	$893	$717	$300	$300	$300	$300
Projected Surplus/(Shortage) after Conservation	*(1,528)*	*(3,043)*	*(4,379)*	*(5,749)*	*(8,169)*	*(10,891)*

5.36.12 City of Leander

5.36.12.1 Description of Supply

The City of Leander is located in Williamson and Travis (Region K) County. This WUG obtains its water supply from contracts with the Lower Colorado River Authority for water from the Highland Lakes (Lake Travis and Lake Buchanan) at 31,000 acft/yr which is limited by treatment capacity.

Based on the available surface water supply and treatment capacity, the City of Leander is projected to have a shortage from 2030 to 2080. Leander is a participant in the Brushy Creek RUA project with Cedar Park and Round Rock and will obtain future supplies from the Highland Lakes.

5.36.12.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB and in coordination with Region K, the following water management strategy is recommended for the City of Leander. The entities' water usage utilized for demand projections is 124 gpcd. The RWPG recommends conservation to reduce usage to a goal of 120 gpcd for Williamson County WUGs.

1. Conservation:
   a. Cost Source: Volume II.
   b. Date to be Implemented: 2030.
   c. Annual Cost: maximum of $690,156 in 2050.
   d. Unit Cost: $684/acft.
2. Brushy Creek RUA Water Supply Project:
   a. Cost Source: Volume II.
   b. Date to be Implemented: 2030.
   c. Project Cost $52,855,469 (city's portion of project Phase 3 shared with Liberty Hill).
   d. Unit Cost: $642/acft.
3. Contract Amendment with LCRA or Redistribution of Supplies through BCRUA:
   a. Cost Source: Region K.
   b. Date to be Implemented: 2070.
   c. Project Cost: None. Existing infrastructure assumed sufficient.
   d. Unit Cost: $844/acft.

Table 5.36-15 Recommended Plan Costs by Decade for the City of Leander

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*(9,578)*	*(15,839)*	*(17,359)*	*(17,375)*	*(17,375)*	*(17,375)*
Conservation						

Plan Element	2030	2040	2050	2060	2070	2080
Supply From Plan Element (acft/yr)	756	958	1,009	1,008	1,009	1,009
Annual Cost ($/yr)	$517,104	$655,272	$690,156	$689,472	$690,156	$690,156
Projected Surplus/(Shortage) after Conservation	*(8,822)*	*(14,881)*	*(16,350)*	*(16,367)*	*(16,366)*	*(16,366)*
Brushy Creek RUA Water Supply Project						
Supply From Plan Element (acft/yr)	15,323	15,323	15,323	15,323	15,323	15,323
Annual Cost ($/yr)	$6,373,500	$6,373,500	$2,654,300	$2,654,300	$2,654,300	$2,654,300
Unit Cost ($/acft)	$642	$642	$267	$267	$267	$267
Contract Amendment with LCRA (Region K)						
Supply From Plan Element (acft/yr)	0	1,400	1,400	2,600	2,600	4,041
Annual Cost ($/yr)	—	—	—	—	—	—
Unit Cost ($/acft)	—	—	—	—	—	—
Projected Surplus/(Shortage) after recommended WMS (acft/yr)	6,501	1,842	373	1,556	1,557	2,998

5.36.13 Liberty Hill

5.36.13.1 Description of Supply

The City of Liberty Hill obtains its water supply from groundwater from the Trinity Aquifer at 105 acft/yr. They also have a BRA contract for 2,572 acft/yr out of the Highland Lakes (HB1437) and another contract with Leander for 600 acft/yr. Highland Lake supplies are treated by the City of Leander, with a contracted 1,500 acft/yr treatment capacity. The City of Liberty Hill is projected to have shortages beginning in 2060.

5.36.13.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB and in coordination with Region K, the following water management strategy is recommended for the City of Leander. The most recent water loss audit report shows a water loss of approximately 23% and the Brazos G RWPG recommends water loss mitigation. Conservation is not recommended because the entity's usage is 111 gpcd, which is below the selected goal of 120 gpcd for Williamson County WUGs.

1. Water Loss Reduction:
    a. Cost Source: Volume II.
    b. Date to be Implemented: 2030.
    c. Annual Cost: maximum of $79,276 in 2080.
    d. Unit Cost: $1,014/acft.
2. Reuse DPR – Liberty Hill:
    a. Cost Source: Volume II.
    b. Date to be Implemented: 2030.
    c. Project Cost.
    d. Unit Cost: $642/acft.
3. Brushy Creek RUA Water Supply Project:

a. Cost Source: Volume II.
b. Date to be Implemented: 2030.
c. Project Cost $1,802,000 (city's portion of project Phase 3 shared with Leander).
d. Unit Cost: $642/acft.

Table 5.36-16 Recommended Plan Costs by Decade for the City of Liberty Hill

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*842*	*500*	*92*	*(352)*	*(853)*	*(1,416)*
Water Loss Reduction						
Supply From Plan Element (acft/yr)	64	93	128	165	207	255
Annual Cost ($/yr)	$64,891	$73,907	$39,794	$51,297	$64,354	$79,276
Unit Cost ($/acft)	$1,014	$795	$311	$311	$311	$311
Projected Surplus/(Shortage) after Conservation (acft/yr)	*906*	*593*	*220*	*(187)*	*(646)*	*(1,161)*
Brushy Creek RUA Water Supply Project						
Supply From Plan Element (acft/yr)	1,672	1,672	1,672	1,672	1,672	1,672
Annual Cost ($/yr)	$217,300	$217,300	$90,500	$90,500	$90,500	$90,500
Unit Cost ($/acft)	$642	$642	$267	$267	$267	$267
Direct Potable Reuse						
Supply From Plan Element (acft/yr)	2,684	2,684	2,684	2,684	2,684	2,684
Annual Cost ($/yr)	$7,161,000	$7,161,000	$2,991,000	$2,991,000	$2,991,000	$2,991,000
Unit Cost ($/acft)	$2,668	$2,668	$1,114	$1,114	$1,114	$1,114
Projected Surplus/(Shortage) after recommended WMS (acft/yr)	*5,262*	*4,949*	*4,576*	*4,169*	*3,710*	*3,195*

5.36.14 Manville WSC

Manville WSC is mostly located in Travis County (Region K); however a portion of the service area is in Williamson County. The WSC obtains its water supply from groundwater from the Edwards and Trinity Aquifers as well as other minor aquifers. The full water plan for Manville WSC is discussed in the 2021 Region K Plan.

5.36.15 Noack WSC

5.36.15.1 Description of Supply

The Noack WSC obtains its water supply from City of Taylor at 152 acft/yr in 2030 and 175 acft/yr in 2080. Based on the available supplies, the Noack WSC is projected to have no shortages through 2080.

5.36.15.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to meet water needs for the Noack WSC. The entities' water usage utilized for demand projections is 189 gpcd. The RWPG recommends conservation to reduce usage to a goal of 120 gpcd for Williamson County WUGs.

1. Conservation:
    a. Cost Source: Volume II.
    b. Date to be Implemented: 2030.
    c. Annual Cost: maximum of $41,724 in 2080.
    d. Unit Cost: $684/acft.

Table 5.36-17 Recommended Plan Costs by Decade for Noack WSC

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*0*	*0*	*0*	*0*	*0*	*0*
Conservation						
Supply From Plan Element (acft/yr)	11	28	45	58	59	61
Annual Cost ($/yr)	$7,524	$19,152	$30,780	$39,672	$40,356	$41,724
Projected Surplus/(Shortage) after Conservation (acft/yr)	11	28	45	58	59	61

5.36.16 Paloma Lake MUD 1

5.36.16.1 Description of Supply

Paloma Lake MUD 1 receives its water supply from a “needs met” contract with the City of Round Rock at 409 acft/yr. Based on the available supplies, Paloma Lake MUD 1 is projected to have shortages through the year 2030. This entity will be a beneficiary of recommended seller strategy for City of Round Rock.

5.36.16.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to meet water needs for the Paloma Lake MUD 1. The entities' water usage utilized for demand projections is 139 gpcd. The RWPG recommends conservation to reduce usage to a goal of 120 gpcd for Williamson County WUGs.

1. Conservation:
    a. Cost Source: Volume II.
    b. Date to be Implemented: 2030.
    c. Annual Cost: maximum of $50,616 in 2040.
    d. Unit Cost: $684/acft.

Table 5.36-18 Recommended Plan Costs by Decade for Paloma Lake MUD 1

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*(128)*	*(134)*	*(137)*	*(138)*	*(138)*	*(138)*
Conservation						
Supply From Plan Element (acft/yr)	54	74	74	74	74	74
Annual Cost ($/yr)	$36,936	$50,616	$50,616	$50,616	$50,616	$50,616

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) after Conservation (acft/yr)	*(74)*	*(60)*	*(63)*	*(64)*	*(64)*	*(64)*

5.36.17 Paloma Lake MUD 2

5.36.17.1 Description of Supply

Paloma Lake MUD 2 receives its water supply from a "needs met" contract with the City of Round Rock which supplies 287 acft/yr in 2030 and 279 acft/yr in 2080. Based on the available supplies, Paloma Lake MUD 2 is projected to have shortages through the year 2030. This entity will be a beneficiary of recommended seller strategy for City of Round Rock.

5.36.17.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to meet water needs for the Paloma Lake MUD 2. The entities' water usage utilized for demand projections is 139 gpcd. The RWPG recommends conservation to reduce usage to a goal of 120 gpcd for Williamson County WUGs.

1. Conservation:
    a. Cost Source: Volume II.
    b. Date to be Implemented: 2030.
    c. Annual Cost: maximum of $36,252 in 2040.
    d. Unit Cost: $684/acft.

Table 5.36-19 Recommended Plan Costs by Decade for Paloma Lake MUD 2

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*(103)*	*(108)*	*(110)*	*(111)*	*(111)*	*(111)*
Conservation						
Supply From Plan Element (acft/yr)	39	53	53	53	53	53
Annual Cost ($/yr)	$26,676	$36,252	$36,252	$36,252	$36,252	$36,252
Projected Surplus/(Shortage) after Conservation (acft/yr)	*(64)*	*(55)*	*(57)*	*(58)*	*(58)*	*(58)*

5.36.18 City of Round Rock

5.36.18.1 Description of Supply

The City of Round Rock obtains its water supply from groundwater from the Edwards-BFZ (Northern Segment) Aquifer and contracts with the Brazos River Authority for water from Lake Georgetown and Stillhouse Hollow Reservoir. The City of Round Rock has contracted for a total of 45,782 acft/yr of surface water supplies from the Brazos River Authority, 20,928 acft/yr originates from Brushy Creek RUA, the remainder from Lakes Georgetown and Stillhouse Hollow. In total BRA can supply 41,641 acft/yr in 2030 and 40,990 acft/yr in 2080, based on water availability analyses prescribed under water planning guidelines. In addition, the city utilizes Direct Reuse supplies and receives out of region supply from LCRA at 4,320 acft/yr. Based on the available groundwater and surface water supply, existing contractual demands, and existing infrastructure the City of Round Rock is projected to have shortages from 2040 to 2080.

5.36.18.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to meet water needs for the City of Round Rock. The entities' water usage utilized for demand projections is 139 gpcd. The RWPG recommends conservation to reduce usage to a goal of 120 gpcd for Williamson County WUGs.

1. Conservation:
    a. Cost Source: Volume II.
    b. Date to be Implemented: before 2030.
    c. Annual Cost: maximum of $3,453,516 in 2080.
    d. Unit Cost: $684 / acft.
2. Brushy Creek RUA Water Supply Project:
    a. Cost Source: Volume II.
    b. Date to be Implemented: Before 2030.
    c. Project Cost: $44,600,000 (city's portion Phase 3).
    d. Unit Cost: $642 / acft.

Table 5.36-20 Recommended Plan Costs by Decade for City of Round Rock

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*3,400*	*(2,226)*	*(7,892)*	*(9,432)*	*(10,894)*	*(11,964)*
Conservation						
Supply From Plan Element (acft/yr)	2,320	3,887	4,617	4,775	4,921	5,049
Annual Cost ($/yr)	$1,586,880	$2,658,708	$3,158,028	$3,266,100	$3,365,964	$3,453,516
Projected Surplus/(Shortage) after Conservation	*5,720*	*1,661*	*(3,275)*	*(4,657)*	*(5,973)*	*(6,915)*
Brushy Creek RUA Project						
Supply From Plan Element (acft/yr)	11,025	6,233	3,441	10,980	11,405	10,669
Annual Cost	$5,378,000	$5,378,000	$2,240,000	$2,240,000	$2,240,000	$2,240,000
Unit Cost ($/acft)	$642	$642	$267	$267	$267	$267
Projected Surplus/(Shortage) after recommended WMS (acft/yr)	*16,745*	*7,894*	*166*	*6,323*	*5,432*	*3,754*

5.36.19 Sonterra MUD

5.36.19.1 Description of Supply

Sonterra MUD obtains its water supply from groundwater from Edwards BFZ Aquifer at 221 acft/yr in 2030 and 201 acft/yr in 2080 . They also have surface water contract of 2,744 acft/yr from the Brazos River Authority, which can supply 1,137 acft/yr in 2030 and 2,744 acft/yr in 2080, based on water availability analyses prescribed under water planning guidelines. Based on the available supplies, Sonterra MUD is projected to have shortages throughout the planning horizon.

5.36.19.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended. Conservation is not recommended because the entity's usage is 108 gpcd, which is below the selected goal of 120 gpcd. The remaining unmet need resulting from contracts not being fully allocated in 2030 is a result of the conservative methodology of determining source supply volumes. Contract supplies from the BRA are firm supplies, however current contracts are not sufficient to meet projected demands. It is recommended to increase existing contracts for additional supplies.

Table 5.36-21 Projected Surplus/Shortage by Decade for Sonterra MUD

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*(936)*	*(2,267)*	*(3,843)*	*(5,551)*	*(7,474)*	*(9,638)*

5.36.20 City of Taylor

5.36.20.1 Description of Supply

The City of Taylor obtains its water supply from a contract with the Brazos River Authority for water from Lake Granger through the East Williamson County WTP. Shortages are projected for the City of Taylor from 2030 through 2080. The Brazos River Authority has set aside 3,452 acft/yr in 2030 and 4,729 acft/yr in 2080 of surface water supplies for the City of Taylor, which can supply 2,054 acft/yr in 2030 and 1,988 acft/yr in 2080, based on water availability analyses prescribed under water planning guidelines.

5.36.20.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended for the City of Taylor. The remaining unmet need resulting from contracts not being fully allocated in 2040 is a result of the conservative methodology of determining source supply volumes. Contract supplies from the BRA are firm supplies. Conservation is not recommended because the entity's usage is 120 gpcd, which is equal to the selected goal of 120 gpcd for Williamson County WUGs.

1. Conservation:
    a. Cost Source: Volume II.
    b. Date to be Implemented: before 2030.
    c. Annual Cost: maximum of $304,137 in 2080.
    d. Unit Cost: $684/acft.

Table 5.36-22 Recommended Plan Costs by Decade for the City of Taylor

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*(2,090)*	*(3,651)*	*(5,425)*	*(7,078)*	*(8,929)*	*(10,996)*
Conservation						
Supply From Plan Element (acft/yr)	289	413	555	687	835	1,001

Plan Element	2030	2040	2050	2060	2070	2080
Annual Cost ($/yr)	$201,364	$239,039	$168,628	$208,734	$253,701	$304,137
Projected Surplus/(Shortage) after Conservation	*(1,801)*	*(3,238)*	*(4,870)*	*(6,391)*	*(8,094)*	*(9,995)*

5.36.21 Vista Oaks MUD

5.36.21.1 Description of Supply

Vista Oaks MUD receives its water supply from a "needs met" contract with the City of Round Rock. Based on the available supplies, Vista Oaks MUD is projected to have no shortages through the year 2080.

5.36.21.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended for Vista Oaks MUD. The entities' water usage utilized for demand projections is 139 gpcd. The RWPG recommends conservation to reduce usage to a goal of 120 gpcd for Williamson County WUGs.

1. Conservation:
    a. Cost Source: Volume II.
    b. Date to be Implemented: before 2030.
    c. Annual Cost: maximum of $40,356 in 2040.
    d. Unit Cost: $684/acft.

Table 5.36-23 Recommended Plan Costs by Decade for Vista Oaks MUD

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*117*	*110*	*107*	*105*	*105*	*105*
Conservation						
Supply From Plan Element (acft/yr)	44	59	59	59	59	59
Annual Cost ($/yr)	$30,096	$40,356	$40,356	$40,356	$40,356	$40,356
Projected Surplus/(Shortage) after Conservation	*161*	*169*	*166*	*164*	*164*	*164*

5.36.22 Walsh Ranch MUD

5.36.22.1 Description of Supply

Walsh Ranch MUD receives its water supply from a "needs met" contract with the City of Round Rock which provides 196 acft/yr in 2030 and 194 acft/yr in 2080. Based on the available supplies, Walsh Ranch MUD is projected to have adequate supplies through the year 2080.

5.36.22.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended for Vista Oaks MUD. The entities' water usage utilized for demand projections is 139 gpcd. The RWPG recommends conservation to reduce usage to a goal of 120 gpcd for Williamson County WUGs.

1. Conservation:
    a. Cost Source: Volume II.
    b. Date to be Implemented: before 2030.
    c. Annual Cost: maximum of $11,628 in 2040.
    d. Unit Cost: $684/acft.

Table 5.36-24 Recommended Plan Costs by Decade for Walsh Ranch MUD

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*68*	*67*	*67*	*66*	*66*	*66*
Conservation						
Supply From Plan Element (acft/yr)	13	17	17	17	17	17
Annual Cost ($/yr)	$8,892	$11,628	$11,628	$11,628	$11,628	$11,628
Projected Surplus/(Shortage) after Conservation	*81*	*84*	*84*	*83*	*83*	*83*

5.36.23 Williamson County MUD 10

5.36.23.1 Description of Supply

Williamson County MUD 10 obtains its water supply from the City of Round Rock at 722 acft/yr in 2030 and 718 acft/yr in 2080. Based on the available supplies, Williamson County MUD 10 is projected to have shortages through the year 2080.

5.36.23.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended for Williamson County MUD 10. The entities' water usage utilized for demand projections is 139 gpcd. The RWPG recommends conservation to reduce usage to a goal of 120 gpcd for Williamson County WUGs.

1. Conservation:
    a. Cost Source: Volume II.
    b. Date to be Implemented: before 2030.
    c. Annual Cost: maximum of $55,404 in 2040.
    d. Unit Cost: $684/acft.

Table 5.36-25 Recommended Plan Costs by Decade for Williamson County MUD 10

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*(589)*	*(589)*	*(589)*	*(589)*	*(589)*	*(589)*
Conservation						
Supply From Plan Element (acft/yr)	60	81	81	81	81	81
Annual Cost ($/yr)	$41,040	$55,404	$55,404	$55,404	$55,404	$55,404

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) after Conservation	*(529)*	*(508)*	*(508)*	*(508)*	*(508)*	*(508)*

5.36.24 Williamson County MUD 11

5.36.24.1 Description of Supply

Williamson County MUD 11 obtains its water supply from the City of Round Rock for 816 acft/yr in 2030 and 820 acft/yr in 2080. Based on the available supplies, Williamson County MUD 11 is projected to have shortages through the year 2080.

5.36.24.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended for Williamson County MUD 11. The entities' water usage utilized for demand projections is 139 gpcd. The RWPG recommends conservation to reduce usage to a goal of 120 gpcd for Williamson County WUGs.

1. Conservation:
    a. Cost Source: Volume II.
    b. Date to be Implemented: before 2030.
    c. Annual Cost: maximum of $330,372 in 2080.
    d. Unit Cost: $684/acft.
2. Brushy Creek RUA- Existing Contracts

Table 5.36-26 Recommended Plan Costs by Decade for Williamson County MUD 11

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*(922)*	*(1,321)*	*(1,791)*	*(2,305)*	*(2,884)*	*(3,534)*
Conservation						
Supply From Plan Element (acft/yr)	93	181	245	315	394	483
Annual Cost ($/yr)	$63,612	$123,804	$167,580	$215,460	$269,496	$330,372
Projected Surplus/(Shortage) after Conservation	*(829)*	*(1,140)*	*(1,546)*	*(1,990)*	*(2,490)*	*(3,051)*
Brushy Creek RUA- Existing Contracts						
Supply From Plan Element (acft/yr)	106	505	974	1,487	2,064	2,714
Annual Cost ($/yr)	-	-	-	-	-	-
Unit Cost ($/acft)	-	-	-	-	-	-
Projected Surplus/(Shortage) after recommended WMS (acft/yr)	(723)	(635)	(572)	(503)	(426)	(337)

5.36.25 Williamson County WSID 3

5.36.25.1 Description of Supply

Williamson County WSID 3 obtains its water supply from Manville WSC at 884 acft/yr. Based on the available supplies, Williamson County WSID 3 is projected to have shortages through the year 2080.

5.36.25.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended for Williamson County WSID 3. The entities' water usage utilized for demand projections is 184 gpcd. The RWPG recommends conservation to reduce usage to a goal of 120 gpcd for Williamson County WUGs.

1. Conservation:
    a. Cost Source: Volume II.
    b. Date to be Implemented: before 2030.
    c. Annual Cost: maximum of $330,372 in 2080.
    d. Unit Cost: $684/acft.

Table 5.36-27 Recommended Plan Costs by Decade for Williamson County WSID 3

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*(1,002)*	*(1,273)*	*(1,603)*	*(1,968)*	*(2,380)*	*(2,847)*
Conservation						
Supply From Plan Element (acft/yr)	74	225	444	646	779	933
Annual Cost ($/yr)	$50,616	$153,900	$303,696	$441,864	$532,836	$638,172
Projected Surplus/(Shortage) after Conservation	*(928)*	*(1,048)*	*(1,159)*	*(1,322)*	*(1,601)*	*(1,914)*

5.36.26 Williamson-Travis Counties MUD 1

5.36.26.1 Description of Supply

Williamson-Travis Counties MUD 1 has demand in Williamson and Travis (Region K) counties and obtains its water supply from the City of Cedar Park for 989 acft/yr. Shortages are projected through the year 2080.

5.36.26.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended for Williamson-Travis Counties MUD 1. The entities' water usage utilized for demand projections is 141 gpcd the RWPG recommends conservation to reduce usage to a goal of 120 gpcd for Williamson County WUGs.

1. Conservation:
    a. Cost Source: Volume II.
    b. Date to be Implemented: before 2030.

c. Annual Cost: maximum of $330,372 in 2080.
d. Unit Cost: $684/acft.

Table 5.36-28 Recommended Plan Costs by Decade for Williamson-Travis Counties MUD 1

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*(766)*	*(767)*	*(770)*	*(773)*	*(776)*	*(779)*
Conservation						
Supply From Plan Element (acft/yr)	51	88	89	90	89	90
Annual Cost ($/yr)	$34,884	$60,192	$60,876	$61,560	$60,876	$61,560
Projected Surplus/(Shortage) after Conservation	*(715)*	*(679)*	*(681)*	*(683)*	*(687)*	*(689)*

5.36.27 County-Other

5.36.27.1 Description of Supply

Entities in Williamson County-Other obtain water supply from groundwater from the Trinity and Edwards (BFZ) Aquifers as well as other minor aquifers. Williamson County-Other also obtains a portion of its water supply from the City of Round Rock, the City of Taylor, City of Austin, and run-of-river rights. A portion of County-Other demand is located in the Region K portion of Williamson County. Entities in Williamson County Other have contracted for 310 acft/yr of surface water supplies from the Brazos River Authority, which can supply 258 acft/yr in 2030 and 250 acft/yr in 2080, based on water availability analyses prescribed under water planning guidelines. Based on the available groundwater and surface water supply, Williamson County-Other is projected to have a shortage from 2030 through year 2080. Balance and strategies represented in Table 5.36-29 represent the cumulative totals for Williamson County-Other in both regions.

5.36.27.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, and in coordination with Region K, the following water management strategies are recommended for Williamson County - Other.

1. Conservation:
   a. Cost Source: Volume II.
   b. Date to be Implemented: before 2030.
   c. Unit Cost: $560/acft.
   d. Annual Cost: maximum of $2,397,334 in 2070.
2. Lake Granger ASR :
   a. Cost Source: Volume II.
   b. Date to be Implemented: 2030.
   c. Annual Cost: Costs borne by BRA.
   d. Unit Cost: maximum of $1,617/acft .

3. Lake Whitney Reallocation (Purchase from BRA): These are project costs for intake, water treatment plant, pump station, and pipeline, but do not include BRA's costs for the reallocation water management strategy.
    a. Cost Source: Volume II.
    b. Date to be Implemented: 2060.
    c. Project Cost: $306,683,000.
    d. Unit Cost: maximum of $1,617/acft.
4. Groundwater Development – Trinity Aquifer:
    a. Cost Source: Volume II.
    b. Date to be Implemented: 2030.
    c. Project Cost: $703,000
    d. Unit Cost: $10,800/acft.
5. BRA Highland Lake to County-Other
    a. Cost Source: Volume II.
    b. Date to be Implemented: 2030.
    c. Annual Cost: $300,000.
    d. Unit Cost: assumed $1,000/acft.
6. Brushy Creek RUA-Existing Contracts.

Table 5.36-29 Recommended Plan Costs by Decade for Williamson County – Other

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*(3,034)*	*(9,962)*	*(13,981)*	*(18,311)*	*(23,215)*	*(29,043)*
Conservation						
Supply From Plan Element (acft/yr)	590	1,788	2,237	2,778	3,433	4,255
Annual Cost ($/yr)	$403,560	$1,222,992	$1,530,108	$1,900,152	$2,348,172	$2,910,420
Projected Surplus/(Shortage) after Conservation and Water Loss Reduction (acft/yr)	*(2,444)*	*(8,174)*	*(11,744)*	*(15,533)*	*(19,782)*	*(24,788)*
Lake Granger ASR						
Supply From Plan Element (acft/yr)	54	1,164	2,940	3,404	3,477	3,477
Annual Cost ($/yr)	$87,318	$1,882,188	$4,753,980	$5,504,268	$5,622,309	$5,622,309
Unit Cost ($/acft)	$1,617	$1,617	$1,617	$1,617	$1,617	$1,617
Storage Reallocation of Lake Whitney						
Supply From Plan Element (acft/yr)	0	0	0	12,000	26,000	26,000
Annual Cost ($/yr)	-	-	-	$19,404,000	$42,042,000	$42,042,000
Unit Cost ($/acft)	-	-	-	$1,617	$1,617	$1,617
BRA Highland Lake to County-Other						
Supply From Plan Element (acft/yr)	300	300	300	300	300	300
Annual Cost ($/yr)	$300,000	$300,000	$300,000	$300,000	$300,000	$300,000
Unit Cost ($/acft)	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000

Trinity Aquifer Development						
Supply From Plan Element (acft/yr)	5	5	5	5	5	5
Annual Cost ($/yr)	$54,000	$54,000	$5,000	$5,000	$5,000	$5,000
Unit Cost ($/acft)	$10,800	$10,800	$1,000	$1,000	$1,000	$1,000
Brushy Creek RUA-Existing Contracts						
Supply From Plan Element (acft/yr)	2,662	6,973	9,217	1,085	0	0
Annual Cost ($/yr)	$2,427,700	$6,359,400	$8,405,900	$989,500	-	-
Unit Cost ($/acft)	$912	$912	$912	$912	-	-
Projected Surplus/(Shortage) after recommended WMS (acft/yr)	*577*	*268*	*718*	*1,261*	*10,000*	*4,994*

5.36.28 Manufacturing

5.36.28.1 Description of Supply

Williamson County Manufacturing entities obtain water supply from groundwater from the Edwards-BFZ (Northern Segment) Aquifer and the Trinity Aquifer, as well as from several municipal WUGs, including Cedar Park, Georgetown, Round Rock, and Taylor. Based on the available supplies, Williamson County Manufacturing is projected to experience a water supply shortage beginning in 2030 of 862 acft/yr, increasing to 1,272 acft/yr by 2080.

5.36.28.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended for Williamson County - Manufacturing. Conservation is recommended to reduce usage to a goal of 140 gpcd.

1. Conservation:
   a. Cost Source: Volume II.
   b. Date to be Implemented: before 2030.
   c. Annual Cost: Not determined.

Table 5.36-30 Recommended Plan Costs by Decade for Williamson County – Manufacturing

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*(862)*	*(944)*	*(1,023)*	*(1,103)*	*(1,186)*	*(1,272)*
Conservation						
Supply From Plan Element (acft/yr)	58	101	147	152	158	164
Annual Cost ($/yr)	ND	ND	ND	ND	ND	ND
Projected Surplus/(Shortage) after Conservation	*(804)*	*(843)*	*(876)*	*(951)*	*(1,028)*	*(1,108)*
Unmet Need	804	843	876	951	1,028	1,108
ND – Not Determined. Costs to implement industrial conservation technologies will vary based on location.						

5.36.29 Steam-Electric

There is no Steam-Electric demand or supply in Williamson County.

5.36.30 Mining

There is no Mining demand or supply in Williamson County within Region G.

5.36.31 Irrigation

5.36.31.1 Description of Supply

Williamson County Irrigation is supplied by groundwater from the Trinity and Edwards Aquifers and surface water from run of the river water rights. Williamson County Irrigation has contracted for 15 acft/yr of surface water supplies from the Brazos River Authority, which can supply 13 acft/yr in 2030 and 12 acft/yr in 2080, based on water availability analyses prescribed under water planning guidelines. Irrigation is projected to have shortages beginning in 2030.

5.36.31.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to meet water needs for Williamson County-Irrigation.

1. Conservation:
   a. Cost Source: Volume II, Chapter 2.
   b. Date to be Implemented: before 2030.
   c. Annual Cost: Not determined.
2. Leave Needs Unmet:
   a. Cost Source: Cost of not meeting needs – see Appendix G.
   b. Date to be Implemented: 2050 – 2070.

Table 5.36-31 Recommended Plan Costs by Decade for Williamson County – Irrigation

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*(224)*	*(226)*	*(226)*	*(226)*	*(226)*	*(226)*
Conservation						
Supply From Plan Element (acft/yr)	12	20	28	28	28	28
Annual Cost ($/yr)	ND	ND	ND	ND	ND	ND
Projected Surplus/(Shortage) after Conservation (acft/yr)	*(212)*	*(206)*	*(198)*	*(198)*	*(198)*	*(198)*
Leave Needs Unmet (acft/yr)	212	206	198	*198*	*198*	*198*
ND – Not determined. Costs to implement irrigation conservation technologies will vary based on location.						

5.36.32 Livestock

Livestock water supply is projected to meet demands through 2080 and no changes in water supply are recommended.

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5.37 Young County Water Supply Plan

Table 5.37-1 lists each water user group in Young County and their corresponding surplus or shortage in years 2030 and 2080. A brief summary of the water user groups and the plan for the selected water user are presented in the following subsections.

Table 5.37-1 Young County Surplus/(Shortage)

Water User Group	Surplus/(Shortage)		Comment
	2030 (acft/yr)	2080 (acft/yr)	
Fort Belknap WSC	(126)	(335)	Projected shortage - see plan below.
City of Graham	(1,470)	(1,585)	Projected shortage - see plan below.
County-Other	(156)	(122)	Projected shortage - see plan below.
Manufacturing	(9)	(6)	Projected shortage - see plan below.
Steam-Electric	(610)	(628)	Projected shortage - see plan below.
Mining	9	9	Projected surplus.
Irrigation	(614)	(614)	Projected shortage - see plan below.
Livestock	185	185	Projected surplus.

5.37.1 Fort Belknap WSC

5.37.1.1 Description of Supply

Fort Belknap WSC obtains its water supply through purchases of treated surface water under contract from the City of Graham for 419 acft/yr; however, due to the estimated availability of supplies developed for the purposes of regional water planning, this contract is prorated to provide a maximum of only 389 acft/yr during the planning period. This WUG is located in multiple counties (Young, Palo Pinto, Throckmorton, and Stephens). The quantities shown in Table 5.37-2 represents the cumulative totals for Fort Belknap WSC. Water supply shortages are projected for Fort Belknap WSC throughout the planning period and a portion of these municipal needs remain unmet from 2060 to 2080. These needs will only occur during a drought equivalent or worse than the drought of record. While not a strategy recommended by the Brazos G RWPG, the impacts of the unmet needs may be mitigated through demand management in the event of a serious drought.

5.37.1.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to meet the projected water shortage for Fort Belknap WSC. The most recent water loss audit report shows a water loss of approximately 45% and water loss mitigation is recommended. Conservation was also considered, but the entity's per capita usage of 124 is less than the selected goal of 140 gpcd.

1. Water Loss Reduction:
    a. Cost Source: Volume II.

   b. Date to be Implemented: before 2030.
   c. Annual Cost: maximum of $1,814,603 in 2040.

2. Purchase Additional Water from City of Graham:
   a. Strategy requires implementation of New Throckmorton Reservoir (see City of Throckmorton) project and Treated Water Purchase and Conveyance project (see City of Graham).
   b. Cost Source: Volume II.
   c. Date to be Implemented: before 2030.
   d. Annual Cost: $214,000.
   e. Unit Cost: $2,248/acft.

Table 5.37-2 Recommended Plan Costs by Decade for Fort Belknap WSC

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*(126)*	*(170)*	*(226)*	*(277)*	*(286)*	*(335)*
Water Loss Reduction						
Supply From Plan Element (acft/yr)	159	160	164	167	169	173
Annual Cost ($/yr)	—	—	—	—	—	—
Projected Surplus/(Shortage) after Conservation (acft/yr)	*33*	*(10)*	*(62)*	*(110)*	*(117)*	*(162)*
Purchase Additional Water from City of Graham						
Supply From Plan Element (acft/yr)	95	95	95	95	95	95
Annual Cost ($/yr)	$214,000	$214,000	$214,000	$214,000	$214,000	$214,000
Unit Cost ($/acft)	$2,248	$2,248	$2,248	$2,248	$2,248	$2,248
Projected Surplus/(Shortage) after recommended WMS (acft/yr)	128	85	33	(15)	(22)	(67)

5.37.2 City of Graham

5.37.2.1 Description of Supply

The City of Graham obtains its water supply through diversions of surface water from Lake Graham and Lake Eddleman authorized under water rights held by the City; these diversions are projected to provide 789 acft/yr in available supply at the beginning of the planning period and then decreasing to 366 acft/yr at the end. The City also contracts with the Brazos River Authority to purchase raw surface water which is projected to provide up to 1,000 acft/yr of water supply, based on water availability analyses prescribed under water planning guidelines. The City contracts to sell treated and raw water supply to Fort Belknap WSC, the City of Newcastle and Graham-East WSC (Young County-Other), the City of Bryson (Jack County-Other), and Young County Manufacturing and Steam-Electric entities. Supply shortages are projected during the planning period. Projected municipal needs remain unmet from 2030 to 2060. These needs will only occur during a drought equivalent or worse than the drought of record. While not a strategy recommended by the Brazos G RWPG, the impacts of the unmet needs may be mitigated through demand management in the event of a serious drought prior to the recommended strategies coming online.

5.37.2.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended to meet the projected water shortage for the City of Graham. Conservation is recommended to reduce the entity's usage to a goal of 140 gpcd. Water loss reduction was also considered, but the entity's efficiency meets or exceeds the selected goal of 15% water loss.

1. Conservation:
   a. Cost Source: Volume II.
   b. Date to be Implemented: before 2030.
   c. Annual Cost: maximum of $822,168 in 2080.
   d. Unit Cost: $684/acft.
2. Treated Water Purchase and Conveyance (from Throckmorton):
   a. Strategy requires implementation of New Throckmorton Reservoir.
   b. Cost Source: Volume II.
   c. Date to be Implemented: before 2050.
   d. Project Cost: $30,875,000.
   e. Unit Cost: maximum $2,520/acft.

Table 5.37-3 Recommended Plan Costs by Decade for the City of Graham

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*(1,470)*	*(1,451)*	*(1,381)*	*(1,448)*	*(1,580)*	*(1,585)*
Conservation						
Supply From Plan Element (acft/yr)	209	449	674	905	1,130	1,202
Annual Cost ($/yr)	$142,956	$307,116	$461,016	$619,020	$772,920	$822,168
Projected Surplus/(Shortage) after Conservation (acft/yr)	*(1,261)*	*(1,002)*	*(707)*	*(543)*	*(450)*	*(383)*
Additional Needs in Recommended Strategies for Others						
Increase Contract to Fort Belknap WSC (acft/yr)	(95)	(95)	(95)	(95)	(95)	(95)
Projected Surplus/(Shortage) Including Recommended Strategies	*(1,356)*	*(1,097)*	*(802)*	*(638)*	*(545)*	*(478)*
Treated Water Purchase and Conveyance from Throckmorton (New Throckmorton Reservoir)						
Supply From Plan Element (acft/yr)	—	—	549	549	549	549
Annual Cost ($/yr)	—	—	$1,383,000	$1,383,000	$1,383,000	$1,383,000
Unit Cost ($/acft)	—	—	$2,520	$2,520	$2,520	$2,520
Projected Surplus/(Shortage) after recommended WMS (acft/yr)	*(1,356)*	*(1,097)*	*(253)*	*(89)*	*4*	*71*

5.37.3 County-Other

5.37.3.1 Description of Supply

Entities in Young County-Other obtain their water supply through groundwater production from the Cross Timbers Aquifer and through purchases of treated surface water from the City of Graham. Projected supplies available through local groundwater production range from 251 acft/yr at the beginning of the planning period to 281 acft/yr at the end, while purchased supply availability ranges between 130 acft/yr and 134 acft/yr. Supply shortages are projected throughout the planning period. Needs remain unmet from 2030 to 2080. These needs will only occur during a drought equivalent or worse than the drought of record. While not a strategy recommended by the Brazos G RWPG, the impacts of the unmet needs may be mitigated through demand management in the event of a serious drought prior to the recommended strategies coming online.

5.37.3.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended to meet the projected water shortage for entities in Young County-Other. Conservation was also considered, but the entity's per capita usage of 110 is less than the selected goal of 140 gpcd; however, there is a small portion of Conservation from the Region B portion of Young County-Other.

1. Cross Timber Aquifer Development:
    a. Cost Source: Volume II.
    b. Date to be Implemented: before 2030.
    c. Project Cost: $5,679,000.
    d. Unit Cost: maximum $3,133/acft.

Table 5.37-4 Recommended Plan Costs by Decade for Young County-Other

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*(156)*	*(173)*	*(185)*	*(203)*	*(207)*	*(222)*
Conservation (Region B)						
Supply From Plan Element (acft/yr)	0	1	2	4	4	4
Projected Surplus/(Shortage) after Conservation (acft/yr)	*(156)*	*(172)*	*(183)*	*(199)*	*(203)*	*(218)*
Cross Timbers Aquifer Development						
Supply From Plan Element (acft/yr)	150	150	150	150	150	150
Annual Cost ($/yr)	$378,000	$378,000	$378,000	$378,000	$378,000	$378,000
Unit Cost ($/acft)	$3,133	$3,133	$467	$467	$467	$467
Projected Surplus/(Shortage) after recommended WMS (acft/yr)	*(6)*	*(22)*	*(33)*	*(49)*	*(53)*	*(68)*

5.37.4 Manufacturing

5.37.4.1 Description of Supply

Young County Manufacturing is supplied through purchases of treated surface water under contract from the City of Graham and the City of Olney and through purchases of groundwater produced by entities in Young County-Other. Supply shortages are projected throughout the planning period.

5.37.4.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended to meet the projected water shortage for Manufacturing entities in Young County. Conservation is recommended.

1. Cross Timber Aquifer Development:
   a. Cost Source: Volume II.
   b. Date to be Implemented: before 2030.
   c. Project Cost: E.
   d. Unit Cost: maximum $8,300/acft.

Table 5.37-5 Recommended Plan Costs by Decade for Young County Manufacturing

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*(9)*	*(8)*	*(9)*	*(6)*	*(2)*	*(6)*
Cross Timbers Aquifer Development						
Supply From Plan Element (acft/yr)	10	10	10	10	10	10
Annual Cost ($/yr)	$83,000	$83,000	$17,000	$17,000	$17,000	$17,000
Unit Cost ($/acft)	$8,300	$8,300	$1,700	$1,700	$1,700	$1,700
Projected Surplus/(Shortage) after recommended WMS (acft/yr)	*1*	*2*	*1*	*4*	*8*	*4*

5.37.5 Steam-Electric

Young County Steam-Electric entities obtain their water supply through purchases of raw surface water under contract from the City of Graham and the Brazos River Authority. Shortages are projected and needs remain unmet throughout the planning period. No additional supply is available for Steam-Electric entities.

Table 5.37-6 Recommended Plan Costs by Decade for Young County Steam-Electric

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*(610)*	*(633)*	*(659)*	*(633)*	*(596)*	*(628)*
Leave Needs Unmet (acft/yr)	*(610)*	*(633)*	*(659)*	*(633)*	*(596)*	*(628)*

5.37.6 Mining

Mining in Young County obtains water supply through local groundwater production from the Seymour and Cross Timbers Aquifers and is projected to meet demands through 2080. No changes in Young County Mining water supply are recommended.

5.37.7 Irrigation

5.37.7.1 Description of Supply

Irrigation in Young County obtains water supply through groundwater production from the Cross Timbers and Seymour Aquifers, and through purchases of Cross Timbers groundwater sourced from Region B. Supply projections show shortages throughout the planning period.

5.37.7.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following plan is recommended for Young County Irrigation. Associated costs are included for each strategy. Conservation is recommended. Needs remain unmet throughout the planning period.

1. Conservation:
    a. Cost Source: Volume II.
    b. Date to be Implemented: before 2030.
    c. Annual Cost: maximum of $38,700 in 2050.
    d. Unit Cost: $1,170/acft.
2. Groundwater Development – Cross Timbers Aquifer:
    a. Cost Source: Volume II.
    b. Date to be Implemented: before 2030.
    c. Project Cost: $755,000.
    d. Unit Cost: $156/acft.

Table 5.37-7 Recommended Plan Costs by Decade for Young County – Irrigation

Plan Element	2030	2030	2040	2050	2060	2070
Projected Surplus/(Shortage) (acft/yr)	*(614)*	*(614)*	*(614)*	*(614)*	*(614)*	*(614)*
Conservation						
Supply From Plan Element (acft/yr)	15	25	35	35	35	35
Annual Cost ($/yr)	$16,600	$27,700	$38,700	$38,700	$38,700	$38,700
Projected Surplus/(Shortage) after Conservation (acft/yr)	*(599)*	*(589)*	*(579)*	*(579)*	*(579)*	*(579)*
Groundwater Development – Cross Timbers Aquifer						
Supply From Plan Element (acft/yr)	403	403	403	403	403	403
Annual Cost ($/yr)	$162,000	$162,000	$10,000	$10,000	$10,000	$10,000
Unit Cost ($/acft)	$403	$403	$25	$25	$25	$25
Leave Needs Unmet (acft/yr)	(196)	(186)	(176)	(176)	(176)	(176)

5.37.8 Livestock

Livestock water supply in Young County is obtained primarily through local stock surface water impoundments and Cross Timbers Aquifer groundwater. Livestock water supply is projected to meet demands through 2080, and no changes in water supply are recommended.

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5.38 Wholesale Water Provider Supply Plan

Table 5.38-1 lists each wholesale water provider that is not also a WUG in the Brazos G Area and its corresponding surplus or shortage in years 2030 and 2080. A brief summary of the wholesale water provider (WWP) and the plan for the selected WWPs are presented in the following sub chapters. For each wholesale water provider with a projected shortage, a water supply plan has been developed and is presented in the following sub chapters. **Note that shortages shown reflect full contractual commitments compared to existing supplies.**

Table 5.38-1 Wholesale Water Provider Surplus/(Shortage)

Wholesale Water Provider	Surplus/(Shortage)[1,2]		Comment
	2030 (acft/yr)	2080 (acft/yr)	
Brazos River Authority (Lake Aquilla System)	1,453	(1,007)	Projected shortage – see plan below
Brazos River Authority (Little River System)	(41,840)	(48,420)	Projected shortage – see plan below
Brazos River Authority (Main Stem System)[3]	(35,044)	(46,164)	Projected shortage – see plan below
Aquilla Water Supply District	561	35	Projected surplus – see plan below
Bell County WCID No. 1	(8,270)	(9,900)	Projected shortage – see plan below
Bluebonnet WSC	(228)	(454)	Projected shortage – see plan below
Central Texas WSC	(5,953)	(5,869)	Projected surplus – see plan below
Eastland County WSD	(1,012)	(1,170)	Projected shortage – see plan below
FHLM WSC	0	0	See plan below
North Central Texas MWA	(1,722)	(1,678)	Projected shortage – see plan below
Palo Pinto County MWD No. 1	(3,763)	(4,880)	Projected shortage – see plan below
Salt Fork Water Quality Corporation	0	0	See plan below
Upper Leon River MWD	0	0	No projected surplus or shortage – see plan below
West Central Texas MWD	(235)	0	Projected shortage – see plan below

Notes:
(1) From Chapter 4.3 – Water Needs for Wholesale Water Providers
(2) Shortages shown above often include shortages from other WWPs. The shortages shown for individual WWPs should not be summed to a regional total.
(3) Includes demands from Region H.

5.38.1 Brazos River Authority (Lake Aquilla System)

5.38.1.1 Description of Supply

The Brazos River Authority (Lake Aquilla System) obtains water supply from Lake Aquilla. Based on the available surface water supply and contractual demands, the Lake Aquilla System is projected to have a surplus of 1,453 acft/yr in the year 2030 decreasing to a shortage of 1,007 acft/yr by year 2080. Chapter 3 includes additional information on contracts and water supplies for the Lake Aquilla System. The supply from Lake Aquilla is not adequate in 2060 through 2080 to meet the total contractual obligations, and is insufficient to meet all of the projected water demands of customers of the Lake Aquilla System. Contractual demands and supplies are shown in Table 5.38-2.

Table 5.38-2 Supplies and Demands for the BRA Lake Aquilla System

	2020	2030	2040	2050	2060	2070
Existing Contractual Sales						
Cleburne	5,300	5,300	5,300	5,300	5,300	5,300
Hilco United Services	150	150	150	150	150	150
Aquilla WSD	5,953	5,953	5,953	5,953	5,953	5,953
Total Existing Demands	**11,403**	**11,403**	**11,403**	**11,403**	**11,403**	**11,403**
Total Supply	**12,856**	**12,364**	**11,872**	**11,380**	**10,888**	**10,396**
Projected Surplus/(Shortage) (acft/yr)	*1,453*	*961*	*469*	*(23)*	*(515)*	*(1,007)*

5.38.1.2 Water Supply Plan

Brazos G recommends that BRA or another entity pursue reallocation of a portion of the Lake Aquilla flood control storage to conservation storage. At this time BRA encourages Aquilla WSD to pursue this strategy.

5.38.2 Brazos River Authority (Little River System)

5.38.2.1 Description of Supply

The Brazos River Authority Little River System obtains its water supply from Lake Proctor, Lake Belton, Stillhouse Hollow Reservoir, Lake Georgetown, and Lake Granger. Based on the available surface water supply, existing contractual commitments and recommended water management strategies, the Brazos River Authority Little River System is projected to have a shortage of 41,840 acft/yr in the year 2030 and 48,420 acft/yr in the year 2080. Shortages for the BRA Little River System are based on a comparison of supplies and current contractual commitments, not projected demands for those entities holding contracts with the BRA. Contractual demands and supplies are shown in Table 5.38-3.

Supplies from Lake Granger are allocated to meet BRA system demands, except for 13,000 acft/yr specifically allocated to the East Williamson County Water Treatment Plant (EWCWTP), which supplies water to the City of Taylor, Jonah Water SUD, and Lone Star RWA. Currently supply is allocated equally to meet the individual customer demands of:

- Between 3,550 acft/yr and 12,317 acft/yr for the City of Taylor and its wholesale customers,
- 4,386 acft/yr for Jarrell-Schwertner WSC in addition to another 1,000 acft/yr contract Jarrell-Schwertner WSC holds,
- Between 6,238 and 23,510 acft/yr for Jonah Water SUD, and
- Between 2,093 and 10,739 acft/yr for Sonterra MUD.

All of the supply BRA specifically designated to the EWCWTP has been allocated, with customer demands exceeding the supplies in 2030. Chapter 3 includes additional information on contracts and water supplies for the Little River System.

Note that the shortages shown are based on full contractual commitments. Actual full use of those contracts is unlikely to occur until later years of the planning period and the shortages shown are more likely to occur later than shown here.

Table 5.38-3 Wholesale Water Provider Surplus/(Shortage)

Plan Element	2030	2040	2050	2060	2070	2080
Existing Contractual Demands	**251,143**	**251,143**	**251,143**	**251,143**	**251,143**	**251,143**
Supply Sources						
Lake Proctor	14,468	13,914	13,360	12,806	12,252	11,698
Lake Belton	100,257	100,257	100,257	100,257	100,257	100,257
Lake Stillhouse Hollow	65,568	65,282	64,996	64,710	64,424	64,138
Lake Georgetown	11,610	11,586	11,562	11,538	11,514	11,490
Lake Granger	17,400	16,948	16,496	16,044	15,592	15,140
Total Existing Supplies	**209,303**	**207,987**	**206,671**	**205,355**	**204,039**	**202,723**
Projected Surplus/(Shortage) (acft/yr)	*(41,840)*	*(43,156)*	*(44,472)*	*(45,788)*	*(47,104)*	*(48,420)*
Additional Demands from Strategies Recommended for Others						
Supply to Central Texas WSC (acft/yr)			4,400	11,600	13,300	14,800
Projected Surplus/(Shortage) Including Recommended Strategies (acft/yr)	*(41,840)*	*(43,156)*	*(48,872)*	*(57,388)*	*(60,404)*	*(63,220)*
Note: Highland Lakes supplies (25,000 acft/yr) and contracts (24,700 acft/yr) pursuant to HB 1437 are not shown.						

5.38.2.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG, the following water supply plan is recommended to meet the projected shortages for BRA's Little River System. Needs for full contractual commitments remain unmet in 2030. These needs will only occur during a drought equivalent or worse than the drought of record. While not a strategy recommended by the Brazos G RWPG, the impacts of the unmet needs can be mitigated through demand management in the event of a serious drought prior to the recommended strategies coming online that will develop additional supplies for the BRA and their contractual customers.

1. Sell Remaining Highland Lakes Supplies to County-Other entities:

1. Cost Source: Volume II.
    a. Date to be Implemented: before 2030.
    b. Total Project Cost: $0.
    c. Unit Cost: Max of $145/acft in 2030.
    d. Lake Granger ASR:

2. Cost Source: Volume II.
    a. Date to be Implemented: before 2030.
    b. Total Project Cost: $250,881,000 (sum of 3 phases).
    c. Unit Cost: Max of $4,146/acft in 2030.

3. Belton to Stillhouse Pipeline – this strategy is for operational purposes and does not provide additional supply. Unit cost of water from strategy is estimated using a supply of 5,000 acft/yr.
   a. Cost Source: Volume II.
   b. Date to be Implemented: Before 2030.
   c. Total Project Cost: $101,598,000.
   d. Unit Cost: estimated $1,719/acft based on 5,000 acft/yr supplied.
4. Lake Granger Augmentation Phase II: This strategy would overdraft Lake Granger and supplement supplies with an annual average of 15,613 acft/yr of groundwater from Milam, Burleson and/or Lee Counties (58,455 acft/yr maximum groundwater in a single year). Strategy as presented is an Alternative Strategy due to MAG limitations on groundwater supplies.
   a. Cost Source: Volume II.
   b. Date to be Implemented: 2030.
   c. Total Project Cost: $1,429,638,000.
   d. Unit Cost: Max of $2,751/ acft in 2030.

Table 5.38-4 Recommended Plan Costs by Decade for the BRA Little River System

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*(41,840)*	*(43,156)*	*(48,872)*	*(57,388)*	*(60,404)*	*(63,220)*
Sell Remaining Highland Lakes Supply						
Supply From Plan Element (acft/yr)	300	300	300	300	300	300
Annual Cost ($/yr)	$43,500	$43,500	$43,500	$43,500	$43,500	$43,500
Unit Cost ($/acft)	$145	$145	$145	$145	$145	$145
Lake Granger ASR						
Supply From Plan Element (acft/yr)	3,245	11,900	24,915	24,915	24,915	24,915
Annual Cost ($/yr)	$13,453,000	$18,608,000	$15,436,000	$12,052,000	$7,249,000	$7,249,000
Unit Cost ($/acft)	$4,146	$1,564	$620	$484	$291	$291
Belton to Stillhouse Pipeline[1]						
Supply From Plan Element (acft/yr)	—	—	—	—	—	—
Annual Cost ($/yr)	$8,595,000	$8,595,000	$1,451,000	$1,451,000	$1,451,000	$1,451,000
Unit Cost ($/acft)	$1,719	$1,719	$290	$290	$290	$290
Lake Granger Augmentation – Phase II[2]						
Supply From Plan Element (acft/yr)	0	0	0	0	0	0
Annual Cost ($/yr)	$127,257,000	$127,257,000	$37,430,000	$37,430,000	$30,352,000	$30,352,000
Unit Cost ($/acft)	$2,751	$2,751	$809	$809	$656	$656
Projected Surplus/(Shortage) after recommended WMS (acft/yr)	*(38,295)*	*(30,956)*	*(23,657)*	*(32,173)*	*(35,189)*	*(38,005)*

[1] Strategy is for operational purposes and does not provide additional supply. Unit cost of water from strategy is estimated using a supply of 5,000 acft/yr.
[2] Strategy is MAG limited resulting in a recommended strategy supply of zero acft/yr. Unit cost of water based on alternative strategy supply of 46,265 acft/yr.

5.38.3 Brazos River Authority (Main Stem/Lower Basin System)

5.38.3.1 Description of Supply

The Brazos River Authority (Main Stem/Lower Basin System) obtains water supply from Possum Kingdom Reservoir, Lake Granbury, Lake Whitney, Lake Somerville, and Lake Limestone, and the BRA's System Operations Permit. Based on the available surface water supply, the Brazos River Authority Main Stem/Lower Basin System is projected to meet the projected contractual demands on the BRA Main Stem/Lower Basin System from Region O, Region H, Region C and Brazos G. Chapter 3 includes additional information on contracts and water supplies for the Main Stem/Lower Basin System. Contractual demands and supplies are summarized in Table 5.38-5. System yield modeling indicates that the full System Operations yield exceeds the contractual demands but is constrained for regional planning to meet just the contractual demands shown in Table 5.38-6.

Actual full use of the contracts shown is unlikely to occur until later years of the planning period. In addition to the System Operations Permit, the BRA has a System Order that allows BRA to divert from each individual reservoir an annual amount greater than the reservoir's authorized diversion and assign the difference to another reservoir in the system. While this does not increase the authorized supply from the BRA system, it provides operational flexibility within the BRA's system.

Table 5.38-5 Supplies and Demands for the BRA Main Stem/Lower Basin System

Plan Element	2030	2040	2050	2060	2070	2080
Contractual Demands						
System/Lakeside – Region O	961	961	961	961	961	961
System/Lakeside – Region C	2,730	2,730	2,730	2,730	2,730	2,730
System/Lakeside – Brazos G	203,465	203,465	203,465	203,465	203,465	203,465
System/Lakeside – Region H	163,450	163,450	163,450	163,450	163,450	163,450
System Operations – Brazos G	28,109	28,109	28,109	28,109	28,109	28,109
System Operations – Region H	64,977	64,977	64,977	64,977	64,977	64,977
Total Existing Contractual Demands[3]	**463,692**	**463,692**	**463,692**	**463,692**	**463,692**	**463,692**
Supply Sources						
Possum Kingdom Reservoir	151,330	150,466	149,602	148,738	147,874	147,010
Lake Granbury	58,822	57,846	56,870	55,894	54,918	53,942
Lake Whitney	18,336	18,336	18,336	18,336	18,336	18,336
Lake Somerville	42,000	41,616	41,232	40,848	40,464	40,080
Lake Limestone	65,074	65,074	65,074	65,074	65,074	65,074
System Operations	131,384	121,074	110,763	100,453	90,142	79,832
Total Existing Supplies	**466,946**	**454,412**	**441,877**	**429,343**	**416,808**	**404,274**
Projected Surplus/(Shortage) (acft/yr)	*3,254*	*(9,280)*	*(21,815)*	*(34,349)*	*(46,884)*	*(59,418)*
Additional Demands from Strategies Recommended for Others						
Supply to Williamson County-Other (acft/yr)					12,000	26,000
Projected Surplus/(Shortage) Including Recommended Strategies (acft/yr)	*3,254*	*(9,280)*	*(21,815)*	*(34,349)*	*(58,884)*	*(85,418)*

[3] Total of contract demands does not include BRA reserved supplies.

5.38.3.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG, the following water supply plan is recommended to meet the projected shortages for the BRA Main Stem System:

1. Lake Whitney Reallocation: This strategy would reallocate storage in Lake Whitney from hydropower to other uses and would develop a total of 38,480 up to 93,355 acft/yr of additional supply to the BRA.
   a. Cost Source: Volume II.
   b. Date to be Implemented: before 2050.
   c. Total Project Cost: $44,678,000.
   d. Unit Cost: $23/acft.
   e. This includes the reallocation of the power pool and unpermitted storage below elevation 520 ft-msl. Additionally, the supply from Lake Whitney.

Table 5.38-6 Recommended Plan Costs by Decade for the BRA Main Stem System

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	3,254	(9,280)	(21,815)	(34,349)	(58,884)	(85,418)
Lake Whitney Reallocation						
Supply From Plan Element (acft/yr)			93,355	93,355	93,355	93,355
Annual Cost ($/yr)			$2,173,000	$2,173,000	$2,173,000	$2,173,000
Unit Cost ($/acft)			$23	$23	$23	$23
Projected Surplus/(Shortage) after recommended WMS (acft/yr)	*3,254*	*(9,280)*	*71,540*	*59,006*	*24,471*	*7,937*

5.38.4 Aquilla Water Supply District

5.38.4.1 Description of Supply

Aquilla WSD (District) obtains up to 5,953 acft/yr of raw water from Lake Aquilla through a contract with the BRA. The district supplies treated water to five wholesale customers. Chapter 3 includes additional information on contracts and water supplies for Aquilla WSD. Based on contractual commitments, no shortages are projected in the planning horizon. Due to sedimentation reducing the yield of Lake Aquilla there is limited supply for additional contracts beyond 2080. However, the water demands of the five wholesale customers are increasing, with individual customers having projected water supply shortages by 2030. The existing customers of the District may, as part of their water supply development strategies, seek to increase their contracts to purchase water from the District.

5.38.4.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended to develop additional supplies for Aquilla WSD customers.

1. Lake Aquilla reallocation:
   a. Cost Source: Volume II.
   b. Date to be Implemented: Before 2060.
   c. Total Project Cost: $29,173,000.
   d. Unit Cost: $774/acft.

Table 5.38-7 Recommended Plan Costs by Decade for Aquilla WSD

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*561*	*561*	*561*	*549*	*292*	*35*
Lake Aquilla Reallocation						
Supply From Plan Element (acft/yr)	—	—	—	1,950	1,950	1,950
Annual Cost ($/yr)	—	—	—	$1,510,000	$1,510,000	$1,313,000
Unit Cost ($/acft)	—	—	—	$774	$774	$673
Projected Surplus/(Shortage) after recommended WMS (acft/yr)	*561*	*561*	*561*	*2,499*	*2,242*	*1,985*

5.38.5 Bell County WCID No. 1

5.38.5.1 Description of Supply

Bell County WCID No. 1 obtains its water supply from Lake Belton through contracts with the BRA totaling 62,509 acft/yr. Using the Brazos G WAM with the assumptions adopted by the Brazos G RWPG consistent with regional water planning rules and guidelines, the District’s firm reliable supply from BRA is 51,817 acft/yr. This amount is less than District customers’ total projected demands of 75,247 acft/yr by 2080. Notably, BRA contract supplies are reported by BRA as firm supplies. Chapter 4 includes additional information on contracts and water supplies for Bell County WCID No.1.

The district has projected needs for its customers by 2030 based on contractual commitments and in 2080 based on its customers’ projected demands. BRA strategies for the Little River System will firm up contracts to provide the full amount of supply during drought of record conditions, therefore no change in water source is recommended for Bell County WCID No. 1.

The District has entered into a contract to supply reuse supply to the City of Killeen. Bell County WCID is pursuing TCEQ Reclaimed Water Type I permits to utilize treated wastewater from wastewater treatment plants (WWTP) 1 and 2 and the South WWTP. The District has evaluated several wastewater reuse options as part of its Master Plan update. The reuse portion of the Master Plan identifies both near-term potential customers as well as other future customers that would utilize the total available reuse supply generated through the District's regional wastewater system.

5.38.5.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended to meet the projected water shortage for Bell County WCID No.1. Needs for full contractual commitments remain unmet in the planning horizon. These needs will only occur during a drought equivalent or worse than the drought of record. While not a strategy recommended by the Brazos G RWPG, the impacts of the unmet needs can be mitigated through demand management in the event of a serious drought prior to the recommended strategies coming online that will develop additional supplies for the BRA. The entities' water usage utilized for demand projections is 169 gpcd. The RWPG recommends conservation to reduce usage to a goal of 140 gpcd.

The District is developing an ASR project in Bell County in coordination with Fort Cavazos (formerly Fort Hood). Information on this project is under development for incorporation into the final 2026 Brazos G Regional Water Plan.

1. Conservation:
    a. Cost Source: Volume II.
    b. Date to be Implemented: 2030.
    c. Annual Cost: maximum of $38,988 in 2080.
    d. Unit Cost: $684/acft.
2. Water Treatment Plant Expansion (Lake Belton):
    a. Cost Source: Volume II.
    b. Date to be Implemented: 2030 duplicate upgrade in 2060.
    c. Total Project Cost: $17,107,000 (each expansion).
    d. Unit Cost: maximum of $1,332/acft.
3. Reuse – Bell County WCID 1 North:
    a. Cost Source: Volume II, Chapter 3.
    b. Date to be Implemented: 2030.
    c. Total Project Cost: $33,258,000.
    d. Unit Cost: maximum of $1,590/acft.
4. Reuse – Bell County WCID 1 South:
    a. Cost Source: Volume II, Chapter 3.
    b. Date to be Implemented: 2030.
    c. Total Project Cost: $20,221,000.
    d. Unit Cost: maximum of $2,282/acft.

Table 5.38-8 Recommended Plan Costs by Decade for Bell County WCID No.

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*(8,270)*	*(8,596)*	*(8,922)*	*(9,248)*	*(9,574)*	*(9,900)*
Conservation						
Supply From Plan Element (acft/yr)	8	18	28	38	48	57
Annual Cost ($/yr)	$5,472	$12,312	$19,152	$25,992	$32,832	$38,988
Projected Surplus/(Shortage) after conservation (acft/yr)	*(8,262)*	*(8,578)*	*(8,894)*	*(9,210)*	*(9,526)*	*(9,843)*
Water Treatment Plan Expansion (Lake Belton)						
Supply From Plan Element (acft/yr)	1,680	1,680	1,680	3,360	3,360	3,360
Annual Cost ($/yr)	$2,237,000	$2,237,000	$1,033,000	$3,270,000	$3,270,000	$2,066,000
Unit Cost ($/acft)	$1,332	$1,332	$615	$973	$973	$615
Reuse – Bell County WCID 1 North						
Supply From Plan Element (acft/yr)	1,925	1,925	1,925	1,925	1,925	1,925
Annual Cost ($/yr)	$3,060,000	$3,060,000	$722,000	$722,000	$722,000	$722,000
Unit Cost ($/acft)	$1,590	$1,590	$375	$375	$375	$375
Reuse – Bell County WCID 1 South						
Supply From Plan Element (acft/yr)	748	748	748	748	748	748
Annual Cost ($/yr)	$1,707,000	$1,707,000	$286,000	$286,000	$286,000	$286,000
Unit Cost ($/acft)	$2,282	$2,282	$382	$382	$382	$382
Projected Surplus/(Shortage) after recommended WMS (acft/yr)	(3,909)	(4,225)	(4,541)	(3,177)	(3,493)	(3,810)

5.38.6 Bluebonnet Water Supply Corporation

5.38.6.1 Description of Supply

Bluebonnet Water Supply Corporation (WSC) obtains raw water from Lake Belton through contracts with the BRA totaling 8,301 acft; however, the firm supply of those contracts is 7,104 in 2030, and decreases over the planning period, based on water availability analyses prescribed under water planning guidelines. The WSC has projected shortages starting in 2030 based on contractual commitments. However, the BRA contractual amount is sufficient to meet all of Bluebonnet's contractual commitments. Projected customer demands for 2080 total 12,508 acft/yr. Bluebonnet would need to develop additional water supplies should existing customers seek more water supply to meet their needs. Chapter 4 includes additional information on contracts and water supplies for Bluebonnet WSC.

5.38.6.2 Water Supply Plan

Needs for full contractual commitments remain unmet in the planning horizon. These needs result from contracts not being fully allocated due to limited source availability as determined by using the Brazos G RWPG's adopted methodology for the purposes of the 2026 Brazos G RWP, which is consistent with the specific assumptions and methods required for regional water planning. These needs will only occur during a drought equivalent to or worse than the drought of record, with the full implementation of all existing water rights in the basin. While not a strategy recommended by the Brazos G RWPG, the impacts of the unmet needs can be mitigated through demand management in the event of a serious drought prior to the recommended strategies coming online. Notably, BRA contract supplies are reported by BRA as firm supplies.

1. Leave needs unmet:
    a. No infeasible strategy is recommended.

Table 5.38-9 Recommended Plan Costs by Decade for Bluebonnet WSC

Plan Element	2020	2030	2040	2050	2060	2070
Projected Surplus/(Shortage) (acft/yr)	(228)	(271)	(317)	(362)	(408)	(454)
Firm up Supplies through BRA Little River System Strategies						
Supply From Plan Element (acft/yr)		1,447	1,493	1,538	1,584	1,629
Annual Cost ($/yr)		$0	$0	$0	$0	$0
Unit Cost ($/acft)		$0	$0	$0	$0	$0

5.38.7 Central Texas Water Supply Corporation

5.38.7.1 Description of Supply

Central Texas WSC obtains its water supply from Lake Stillhouse Hollow through contracts with the BRA totaling 11,295 acft; however, the firm supply of those contracts is 9,413 acft/yr in 2030, decreasing to 9,117 acft/yr in 2080, based on water availability analyses prescribed under water planning guidelines and as modeled in the Brazos G WAM. See Chapter 3.2.5 for additional information regarding BRA supplies. Central Texas WSC also has two wells in the Trinity Aquifer in Bell County for an estimated supply of 1,571 acft/yr. Based on the available surface water and groundwater supply, currently contracted supplies, and projected demands for its current customers, Central Texas WSC is projected to have shortages beginning 2050, assuming that all demands can be treated and delivered through current infrastructure. Chapter 4 includes additional information on contracts and water supplies for Central Texas WSC.

5.38.7.2 Water Supply Plan

Central Texas WSC provided the Brazos G RWPG a copy of their Master Water Plan published November 2024. Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to improve treatment capacity, water supply transmission and meet the projected water shortages for Central Texas WSC.

1. Water System Expansion:
   a. Cost Source: Volume II.
   b. Date to be Implemented: 2030.
   c. Total Project Cost: $85,082,000.
   d. Unit Cost: already contracted supplies.
2. Purchase additional supplies from BRA
   a. Cost Source: Volume II.
   b. Date to be implemented: 2050.
   c. Total Project Cost: Cost borne by BRA.
   d. Unit Cost: BRA Wholesale Water Contract Cost $100 estimated.

Table 5.38-10 Recommended Plan Costs by Decade for Central Texas WSC

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*8,194*	*1,170*	*(4,377)*	*(11,561)*	*(13,273)*	*(14,742)*
Water System Expansion						
Supply From Plan Element[4] (acft/yr)	7,281	7,281	7,281	7,281	7,281	7,281
Annual Cost ($/yr)	$	$0	$0	$0	$0	$0
Unit Cost ($/acft)	$	$0	$0	$0	$0	$0
Purchase additional supplies from BRA						
Supply From Plan Element (acft/yr)			4,400	11,600	13,300	14,800
Annual Cost ($/yr)			$440,000	$1,160,000	$1,330,000	$1,480,000
Unit Cost ($/acft)			$100	$100	$100	$100
Projected Surplus/(Shortage) after recommended WMS (acft/yr)	*8,194*	*1,170*	*23*	*39*	*27*	*58*

5.38.8 FHLM Water Supply Corporation

Various utilities in Falls, Hill, Limestone and McLennan Counties are dealing with elevated levels of arsenic in groundwater supplies and several have been pursuing water management strategies through FHLM WSC. FHLM WSC has recently contracted with the BRA for 1,934 acft/yr that will eventually be used by member utilities to either replace or blend with existing groundwater supplies. FHLM WSC is also currently negotiating a water supply agreement with the City of Waco on behalf of EOL WSC and Axtel WSC, although the details of the potential agreement are not available. The projects to supply EOL and Axtel from the City of Waco are shown as water management strategies for those WUGs in the McLennan County section of this plan.

[4] Supply from Central Texas WSC Water System Expansion strategy represents additional treatment capacity of existing supplies and not an increase in source water supply.

5.38.9 Eastland County WSD

Eastland County WSD obtains its water supply from Lake Leon and Eastland Lake and provides water to the Cities of Eastland and Ranger, and to manufacturing interests in Eastland County. The supplies from these two sources are not sufficient to meet the District's contractual commitments but are ample to meet the projected demands for Eastland and Ranger, which are only about 20 percent of the contractual supplies. No changes in water supply are recommended. Chapter 4 includes additional information on contracts and water supplies for Eastland County WSD.

5.38.10 North Central Texas Municipal Water Authority

5.38.10.1 Description of Supply

North Central Texas Municipal Water Authority (MWA) owns and obtains its water supply from Millers Creek Reservoir. Based on the available surface water supply, shortages are expected through 2080. Chapter 4 includes additional information on contracts and water supplies for North Central Texas MWA.

5.38.10.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to meet the projected water shortage for the North Central Texas MWA. Needs for full contractual commitments remain unmet in the 2030 and 2040 decades. These needs will only occur during a drought equivalent or worse than the drought of record. While not a strategy recommended by the Brazos G RWPG, the impacts of the unmet needs can be mitigated through demand management in the event of a serious drought prior to the recommended strategies coming online that will develop additional supplies for the BRA.

1. Lake Creek Reservoir:
    a. Cost Source: Volume II. Project requires a subordination agreement with the BRA, and as indicated by both North Central Texas MWA and BRA, this may be difficult to obtain.
    b. Date to be Implemented: 2050.
    c. Total Project Cost: $236,072,000.
    d. Unit Cost: $3,227/acft.

Table 5.38-11 Recommended Plan Costs by Decade for North Central Texas MWA

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	(1,722)	(1,737)	(1,724)	(1,709)	(1,695)	(1,678)
Lake Creek Reservoir						
Supply From Plan Element (acft/yr)			6,090	6,090	6,090	6,090
Annual Cost ($/yr)			$19,652,000	$19,652,000	$4,695,000	$4,695,000
Unit Cost ($/acft)			$3,227	$3,227	$771	$771
Projected Surplus/(Shortage) after recommended WMS (acft/yr)	(1,722)	(1,737)	*4,366*	*4,381*	*4,395*	*4,412*

5.38.11 Palo Pinto County Municipal Water District No. 1

5.38.11.1 Description of Supply

Palo Pinto County Municipal Water District owns and operates Lake Palo Pinto, which is used to supply water to entities in Palo Pinto and Parker Counties. A portion of its supply is used in Region C. The district has rights to 18,500 acft/yr for municipal and steam electric power uses. Treated water is supplied to the City of Mineral Wells (and its customers) and Lake Palo Pinto Area Water Supply Corporation. Projected demands based on contractual commitments indicate shortages through 2080. Chapter 4 includes additional information on contracts and water supplies for Palo Pinto County MWD No.1.

5.38.11.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to meet the projected water shortage for the Palo Pinto County Municipal Water District No.1.

1. Lake Palo Pinto Expansion (Turkey Peak):
    a. Cost Source: Volume II.
    b. Date to be Implemented: 2030.
    c. Total Project Cost: $200,789,000
    d. Unit Cost: Max of $1,202 / acft.

Table 5.38-12 Recommended Plan Costs by Decade for Palo Pinto County Municipal Water District No.1

Plan Element	2030	2040	2050	2060	2070	2080
Projected Surplus/(Shortage) (acft/yr)	*(3,763)*	*(4,004)*	*(4,199)*	*(4,410)*	*(4,622)*	*(4,880)*
Lake Palo Pinto Expansion (Turkey Peak Dam)						
Supply From Plan Element (acft/yr)	5,730	5,730	5,730	5,730	5,730	5,730
Annual Cost ($/yr)	$6,887,000	$6,887,000	$5,713,000	$5,713,000	$917,000	$917,000
Unit Cost ($/acft)	$1,202	$1,202	$997	$997	$160	$160
Projected Surplus/(Shortage) after recommended WMS (acft/yr)	*1,967*	*1,726*	*1,531*	*1,320*	*1,108*	*850*

5.38.12 Salt Fork Water Quality Corporation

The Salt Fork Water Quality Corporation (SFWQC) was formed to develop a project to reduce salinity in the Brazos River Basin by constructing a series of wells to intercept highly saline water that emerges in a series of seeps and springs in the upper Brazos Basin. The project would develop a series of wells, desalt the water captured by the wells, make a commercial application of the resulting salt and sell the fresh water produced to municipal utilities in the area. No progress towards this project or additional information was found regarding the SFWQC, so this project is not recommended for the purposes of the 2026 Brazos G Regional Water Plan.

5.38.13 Upper Leon River Municipal Water District (MWD)

Upper Leon River MWD obtains its water supply through a contract with the Brazos River Authority for 6,437 acft/yr of water from Lake Proctor; however the firm supply of those contracts is 5,365 acft/yr in 2030 and decreases to 5,196 acft/yr by 2080, based on water availability analyses prescribed under water planning guidelines. No shortages are projected for the Upper Leon River MWD and no changes in water supply are recommended. Chapter 4 includes additional information on contracts and water supplies for Upper Leon River MWD.

5.38.14 West Central Texas Municipal Water District

5.38.14.1 Description of Supply

West Central Texas MWD owns and obtains its water supply from Hubbard Creek Reservoir. Based on the available surface water supply constrained to a 2-year safe yield estimate, West Central Texas MWD is projected to have a shortage in 2030. Needs for full contractual commitments remain unmet in 2030. These needs will only occur during a drought equivalent or worse than the drought of record. While not a strategy recommended by the Brazos G RWPG, the impacts of the unmet needs can be mitigated through demand management in the event of a serious drought. Chapter 4 includes additional information on contracts and water supplies for West Central Texas MWD.

Table 5.38-13 Supplies and Demands for the West Central Texas Municipal Water District

	2030	2040	2050	2060	2070	2080
Existing Contractual Sales						
Abilene	10,720	8,360	6,000	3,640	1,300	1,300
Albany	1,400	1,400	1,400	1,400	1,400	1,400
Anson	1,600	1,600	1,600	1,600	1,600	1,600
Breckenridge	1,900	1,900	1,900	1,900	1,900	1,900
Total Existing Demands	**15,620**	**13,260**	**10,900**	**8,540**	**6,200**	**6,200**
Total Supply	**15,385**	**13,260**	**10,900**	**8,540**	**6,200**	**6,200**
Projected Surplus/(Shortage) (acft/yr)	*(235)*	*0*	*0*	*0*	*0*	*0*

5.39 Water Conservation Recommendations

Regional water planning guidelines require each regional water planning group to consider water conservation to meet projected shortages. The Brazos G RWPG adopted the following water conservation recommendations for the 2026 Plan which are further described in Volume II, Section 2.

- Municipal water user groups (WUGs) with per capita rates exceeding 140 gallons per person per day (gpcd) were recommended to reduce per capita consumption by 1% annually through 2080 until a 140 gpcd rate is attained. This recommendation applies to all municipal water user groups with and without projected water supply needs (shortages). For WUGs in Williamson County (excepting the City of Georgetown), a more aggressive conservation goal of 120 gpcd by 2080 is recommended. Conservation can be achieved through a variety of best management practices, many of which are listed in Section 2 of Volume II.
- Irrigation water user groups with identified needs were recommended to reduce water use by voluntary targets of 3% by 2030, 5% by 2040, and 7% from 2050-2080. A list of best management practices is included in Volume II, Section 2.
- Manufacturing and mining water user groups with identified needs were recommended to reduce water use by voluntary targets of 3% by 2030, 5% by 2040, and 7% from 2050-2080. A list of best management practices is included in Volume II, Section 2.
- Conservation recommendations were not made for steam-electric users due to the widely differing water use amongst the different facilities.
- Conservation recommendations were not made for livestock water user groups.

Expected savings from the above water conservation recommendations can be seen for each water user group in the preceding individual county and WWP plans (Sections 5.1 through 5.38) and in Volume II, Section 2.

The Brazos G RWPG suggests that WUGs in the region review the lists of BMPs and look to identify WUGs at a relevant size with similar water supply type and consider voluntary implementation of those best management practices, if applicable.

TCEQ has prepared model water conservation plans (WCPs) for municipal public water suppliers, wholesale providers, industrial and mining entities, and agricultural users to provide guidance and suggestions to entities with regard to the preparation of water conservation plans. Not all items in the model plan will apply to every system's situation, but the overall model plan can be used as a starting point for most entities. For WUGs wishing to develop a new WCP, Brazos G suggests considering best management practices from local water conservation plans for entities similar in size, as discussed previously, in addition to the TCEQ Model WCPs. The TCEQ model water conservation plans can be found on TCEQ's website at the following link:

https://www.tceq.texas.gov/permitting/water_rights/wr_technical-resources/conserve.html

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5.40 Major Projects

Regional water planning guidelines require each regional water planning group to include a new sub-section documenting the implementation status and anticipated timeline for certain types of recommended WMSs. The implementation status must be provided for the following types of recommended WMSs with any online decade:

- All reservoir strategies (including major and minor reservoirs).
- All seawater desalination strategies.
- Direct potable reuse strategies that provide greater than 5,000 acft/yr of supply in any planning decade.
- Brackish groundwater strategies that provide greater than 10,000 acft/yr of supply in any planning decade.
- Aquifer storage and recovery strategies that provide greater than 10,000 acft/yr in any decade.
- All water transfers from out of state.
- Any other innovative technology projects the RWPG considers appropriate.

The sub-section must demonstrate the feasibility, based on key milestones achieved and anticipated timing of future milestones, of each recommended strategy to be fully implemented by the online decade in the regional plan.

Information acquired to date by the Brazos G RWPG has been initially compiled and is presented in Chapter 9 and Appendix M, and included as a digital deliverable in the required TWDB format. This information will be developed in greater detail incorporating SARA Report 124 within this section for the final plan.

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CHAPTER 6 CONSISTENCY WITH LONG-TERM PROTECTION OF THE STATE'S WATER, AGRICULTURAL, AND NATURAL RESOURCES

The 2026 Plan is consistent with long-term protection of the state's water resources, agricultural resources, and natural resources and is developed based on guidance principles outlined in the Texas Administrative Code Chapter 358 – State Water Planning Guidelines. The 2026 Plan was produced with an understanding of the importance of orderly development, management, and conservation of water resources and is consistent with all laws applicable to water use for the state and regional water planning areas. Furthermore, the plan was developed according to principles governing surface water and groundwater rights. Availability of water for new surface water supplies considered environmental flow needs as defined by the environmental flow standards adopted in the Brazos Basin and incorporated into the Texas Commission on Environmental (TCEQ) Brazos Water Availability Model (WAM Run 3), and protection of existing water rights. For groundwater, the 2026 Plan recognizes principles for groundwater management in Texas, and estimates of groundwater availability take into account the Modeled Available Groundwater (MAG) as determined and required by the Texas Water Development Board (TWDB).

The 2026 Plan identifies actions and policies necessary to meet the Brazos G Area's near and long-term water needs by developing and recommending feasible water management strategies to meet needs with reasonable cost, good water quality, and sufficient protection of agricultural and natural resources of the state. The Brazos G RWPG has recommended water management strategies that consider the public interest of the state, wholesale water providers, protection of existing water rights, and opportunities that encourage voluntary transfers of water resources while balancing economic, social, and ecological viability. When needs can not be met economically with feasible water management strategies, socioeconomic impact analyses will be performed by the TWDB and incorporated into the Final Plan. This socioeconomic impact analysis will provide an estimate of the economic loss associated with not meeting these needs. This analysis will be shown in the final plan in (Appendix G).

The 2026 Plan considers environmental information resulting from site-specific studies and ongoing development of water projects when evaluating water management strategies. Cumulative effects of water management strategies on Brazos River instream flows and inflows to the Gulf of Mexico were considered, as documented later in this chapter. A list of endangered and threatened species in the Brazos G Area for each county was obtained from the Texas Parks and Wildlife Department and possible impacts to these species and/or their habitats were considered for each water management strategy evaluated.

The 2026 Plan consists of initiatives to respond to continuing drought conditions in the western part of the region and makes use of relatively low-impact strategies such as reuse of wastewater return flows. As a further drought protection provision, the Brazos G RWPG adopted use of safe yield analyses for purposes of determining water supply for municipal supply reservoirs upstream of Possum Kingdom Reservoir.

The use of safe yield analyses anticipates that a future drought may occur that is greater in severity than the worst drought of record and reserves a certain amount of water in storage (i.e., a 6-month, or 1- or 2-year supply) for such an event. Use of safe yield in the upper Brazos Basin is justified based on the severity of the recent drought. Figure 6.1 presents the cumulative gaged streamflow for the USGS gage located on the Clear Fork of the Brazos River near Nugent, TX. The figure shows how flows during the drought beginning in 1997 are significantly less than those of the previous drought of record (1950's drought). When the drought cumulative streamflows are compared to the 1950s droughts at the 14 years mark from the beginning of the drought, total streamflow is 53 percent of the total streamflow for the 1950s. Additionally, the duration of the drought is more than 4 years longer than the 1950s drought.

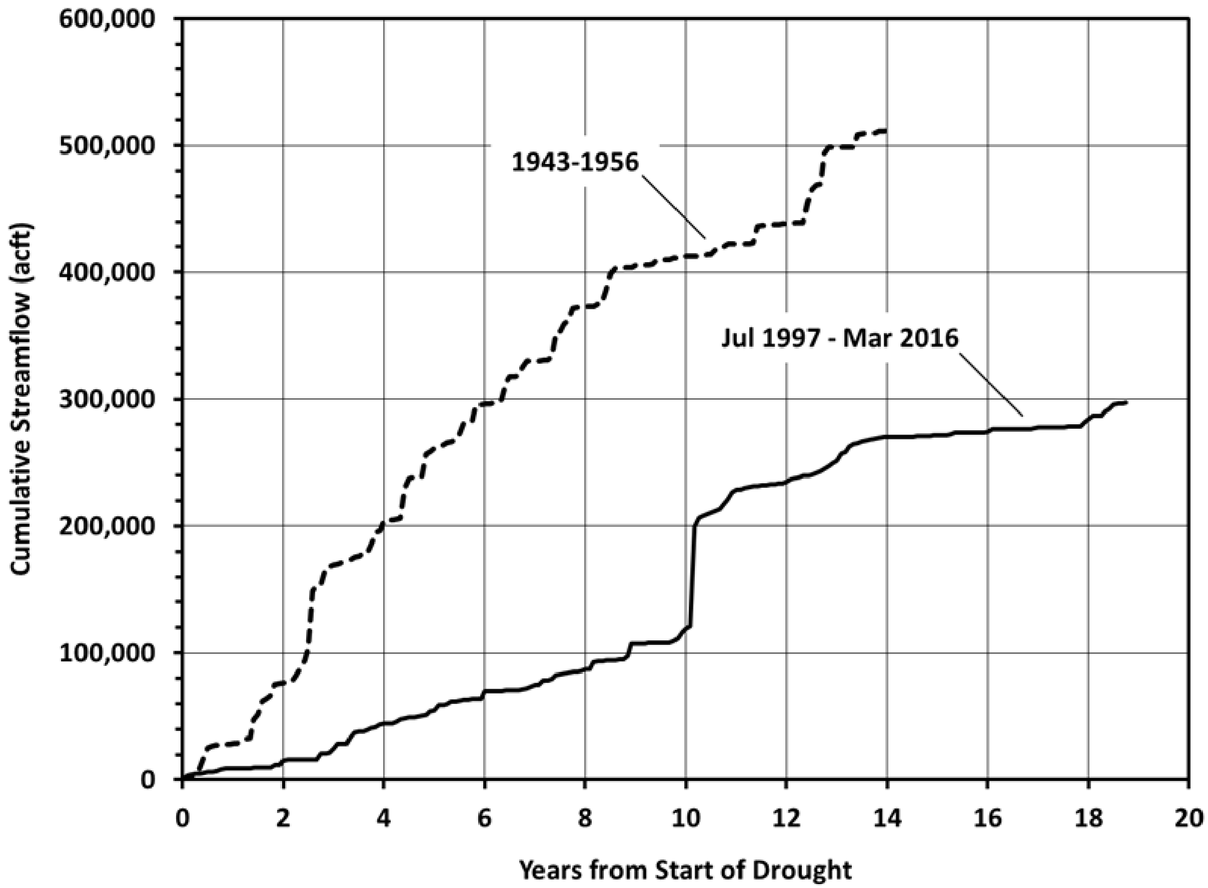

Figure 6.1 Cumulative Gaged Flows at Clear Fork of the Brazos near Nugent

The Brazos G RWPG conducted numerous meetings during the 2026 planning cycle, which were open to the public, and decisions were based on accurate, objective, and reliable information. The Brazos G RWPG coordinated water planning activities with local, regional and state agencies, and was committed to facilitating the initiatives and addressing the concerns of local and regional entities.

The Brazos G RWPG developed policy recommendations regarding State water policy after extensive consideration and deliberation, and these are presented in Chapter 8 of this report. The Brazos G RWPG considered recommendations of stream segments with unique ecological value by Texas Parks and Wildlife and sites of unique value for construction of reservoirs. At this time, the Brazos G RWPG recommends that no stream segments be designated as unique; and recommends that reservoir sites be recommended as unique if recommended as water management strategies and not previously recommended as unique (Chapter 8).

Other than small watercraft used primarily for recreation on lakes and rivers, the BGRWPA includes no use of water for navigation. No water management strategy considered by the BGRWPG will affect navigation, either in the BGRWPA or in adjacent regions.

6.1 Cumulative Hydrologic Effects of Implementing the Brazos G Regional Water Plan

The following sections describe in more detail the hydrologic effects of the recommended water management strategies on surface water and groundwater resources.

6.1.1 Surface Water

Sophisticated hydrologic models have been employed to quantify the cumulative effects of implementation of the 2026 Plan through the year 2080. Surface water effects were quantified using the TCEQ Brazos WAM Run 3. The assumptions of WAM Run 3 include no return flows (unless included as a specific component to a strategy), as-permitted diversions and reservoir contents, BRA System Operations, and the environmental flow standards adopted by the TCEQ for the Brazos Basin.

The cumulative effects of the plan can be quantified by comparing conditions prior to implementation of the plan (base condition) to conditions with the plan in place. The base condition against which to compare conditions with the plan in place was streamflow computed by the Brazos WAM under the Run 3 assumptions.

The conditions with the plan in place include the base condition assumptions, with the addition of any recommended strategies that could measurably affect streamflows, i.e., those that result in development of additional water supply. The recommended water management strategies, shown in Figure 6.2 and listed in Table 6.1, were incorporated into the model. Specific strategies not included in the analysis are direct reuse projects, conservation, strategies transferring water from one entity to another through new or increased purchases, and development of additional groundwater. The base condition assumes full utilization of water rights, and conservation or transfers of water will not impact the assumption of full utilization of water rights. Surface water/groundwater interactions are difficult to quantify, but reductions in streamflow due to increased utilization of groundwater resources are expected to be small. As a result, the Control of Naturally Occurring Salinity recommended strategy in the upper Brazos River Basin is not anticipated to significantly impact streamflow and is not included in the cumulative effects analysis.

The cumulative effects of the 2026 Plan on streamflows were evaluated at the eight locations presented in Table 6.2. Each selected location is in the Brazos G portion of the Brazos River Basin, except the Brazos River at Richmond site. This location was included in the analysis to illustrate the impacts of Brazos G strategies on the lower part of the basin.

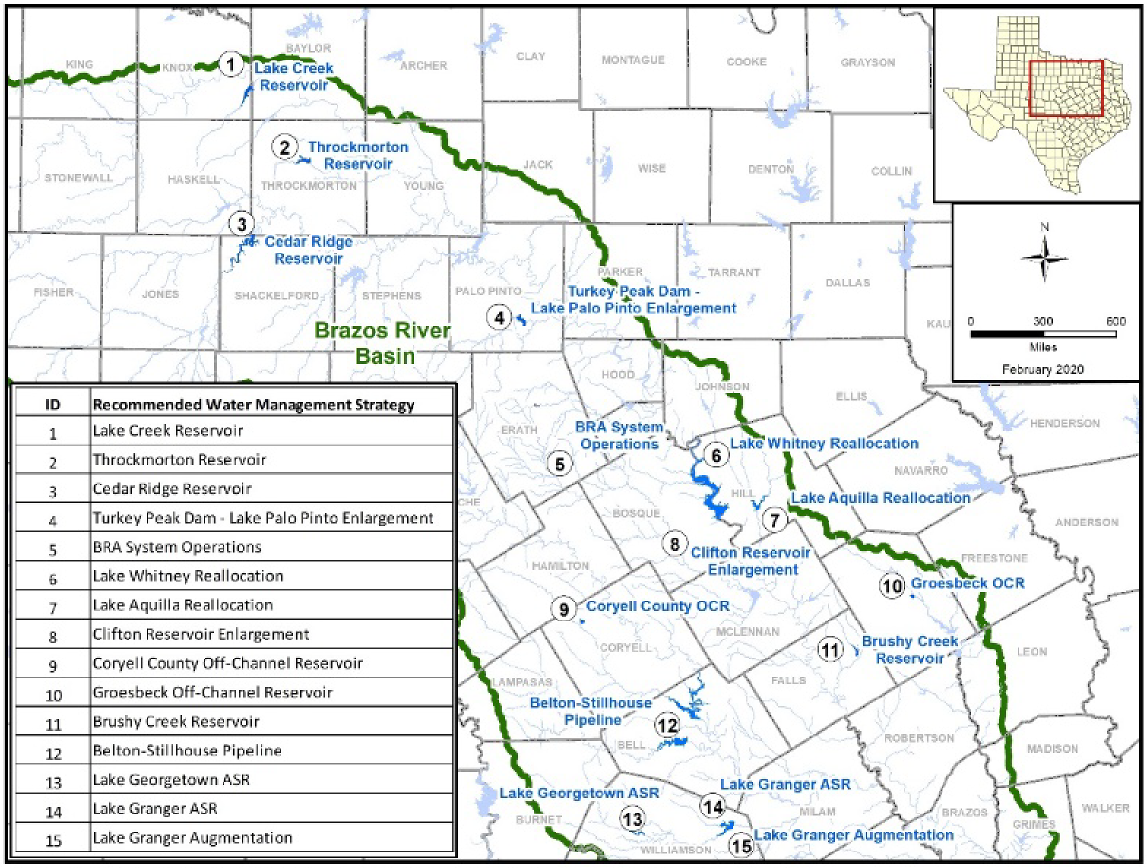

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Figure 6.2 Location of Recommended Water Management Strategies Included in the Cumulative Impacts Analysis

Table 6.1 Recommended Water Management Strategies Included in the Cumulative Impacts Analysis

Recommended Water Management Strategy	WUG or WWP
Lake Creek Reservoir	North Central Texas Municipal Water Authority
Throckmorton Reservoir	City of Throckmorton
Cedar Ridge Reservoir	City of Abilene
Turkey Peak Dam – Lake Palo Pinto Enlargement	Palo Pinto County MWD No.1
Lake Waco Reallocation	City of Waco
Lake Whitney Reallocation	BRA - Multiple
Lake Aquilla Reallocation	BRA – Multiple
Bosque County Regional Project – Clifton Reservoir Enlargement	BRA - Multiple
Coryell County Off-Channel Reservoir	BRA - Multiple
Groesbeck Off-Channel Reservoir	City of Groesbeck
Brushy Creek Reservoir	City of Marlin
Lake Georgetown Aquifer Storage and Recovery	BRA - Multiple
Lake Granger Aquifer Storage and Recovery	BRA - Multiple
Lake Granger Augmentation	BRA - Multiple

Table 6.2 Locations for Evaluating the Effects of Recommended Strategies on Streamflow and Inflows to the Brazos River Estuary

Location	WAM Control Point Identifier	Region Location (G/H)
Brazos River at South Bend	BRSB23	G
Brazos River near Glen Rose	BRGR30	G
Brazos River near Aquilla	BRAQ33	G
Bosque River near Waco	BOWA40	G
Little River near Cameron	LRCA58	G
Brazos River near Bryan	BRBR59	G
Brazos River near Hempstead	BRHE68	H
Brazos River at Richmond	BRRI70	H
Brazos River at Gulf of Mexico	BRGM73	H

Strategies requiring a new water right permit were simulated junior to all other appropriations in the Brazos River Basin including the BRA System Operations Permit. It was assumed during evaluation of most of the strategies that some form of priority calls agreement would be required between the BRA and the entity developing a new water supply project to more fully realize the yield potential of a project. These agreements were not included for new strategies in the cumulative impacts analysis, unless the entity sponsoring a strategy already has an agreement with the BRA. In all cases, the priorities of BRA's existing rights were honored, as simulated under system operations.

The existing priority calls agreements with the BRA and other water right holders were considered in this model run. The inclusion or exclusion of the subordination agreements does not affect the resulting streamflows at the selected locations in a substantive manner.

The cumulative effects of the recommended water management strategies on regulated streamflow were evaluated by comparing descriptive streamflow statistics for the base condition with those from the plan condition at the selected evaluation locations.

Figure 6.3 through Figure 6.11 present these comparisons for regulated streamflow at each of the evaluation locations. Regulated flow is the total streamflow remaining in the stream after all existing water rights have been exercised and other water management activities have taken place. It represents the total flow passing a location (control point) after all water rights have appropriated the flows to which they are entitled.

Many locations on the main stem of the Brazos River exhibit reduced median monthly flows with the implementation of the 2026 Plan than with the base condition. The Bosque and Little River segments show increased median monthly flows from the base conditions with the full implementation of the plan.

The median stream flow reductions of the Brazos River near South Bend are the result of the implementation of the Cedar Ridge, Lake Creek, and Throckmorton Reservoirs. The largest decrease would occur in May at 16% with all other months decreasing less than 14%. However, the streamflow frequency plot shows that the overall change to the flow regime is minor.

The Brazos River near Aquilla location shows decreases in median streamflow for 9 of the 12 months. The range of differences at this location is a 35% decrease in February to a 5% increase in June, with three months having increased median flows. These differences are likely attributed to the reallocation of Lake Aquilla and have a minor impact to the overall flow regime as shown in the streamflow frequency figure. The Bosque River near Waco location controls a relatively small watershed compared to the other locations investigated in this analysis. Changes associated with this location are relatively negligible. The Little River near Cameron location reflects changes from projects recommended for implementation in the Little River watershed, specifically the Lake Granger ASR and Augmentation strategies and the Lake Georgetown ASR strategy. While monthly median flows exhibit increases up to 57% in August, little difference is apparent in the overall frequency of flows.

The four most downstream locations, Brazos River near Bryan, Brazos River near Hempstead, Brazos River at Richmond, and the Brazos River at the Gulf of Mexico are all located on the main stem of the Brazos River and the changes in streamflow at these locations show similar trends. These locations are located downstream in the basin and downstream from the majority of the recommended water management strategies. These locations have the potential to be impacted by the implementation of any of the proposed strategies. New reservoir and diversion projects will tend to reduce streamflow at these locations, while alterations in the BRA System Operations tends to increase streamflows as releases from upstream reservoirs pass these locations to satisfy demands at downstream locations. The Bryan location shows decreases in median streamflow for all 12 months by as much as 26% and Hempstead sees 11 months with decrease in median streamflow by as much as 20%. At the Richmond location, 11 months have a decrease in median flow by as much as 13%. As with the middle and upper basin streamflow locations, there is little difference in the overall frequency of flows at the lower basin locations. The Brazos River at the Gulf of Mexico location shows in median streamflow in 11 months by as much as 47%.

Overall, the cumulative effects of the implemented plan will have a slight to modest effect on streamflows in the Brazos Basin with both increases and decreases. Locations below new reservoirs or reservoirs with augmented supplies will generally experience reduced streamflows; although generally not to a significant level, and the detrimental effects of these reductions can be minimized with proper consideration of reservoir pass-through requirements to maintain flows necessary to meet the needs of the environment. In summary, none of the locations will experience significantly different streamflows with implementation of the recommended water management strategies in the 2026 Plan.

6.1.2 Groundwater

Recommended water management strategies involving additional development of groundwater would increase total groundwater usage by entities in the Brazos G Area by slightly more than 140,046 acft/yr by 2080. The greatest increase occurs in the Carrizo-Wilcox Aquifer where strategies involving groundwater development for Brazos G entities would increase pumping by about 93,181 acft/yr 2080 over what is considered to be existing supplies. In the Carrizo-Wilcox, strategies include an additional 74,581 acft/yr of pumping by 2080. Overall, the amount of groundwater identified for water management strategies is rather modest in comparison to the amount from all the other water management strategies. However, the development of groundwater is likely to be concentrated in a few areas, which could experience noticeable declines in groundwater levels. However, none of the strategies increase projected groundwater pumpage beyond the Modeled Available Groundwater (MAG) established by county and aquifer. Thus, projected groundwater conditions are expected to be within the Desired Future Conditions (DFC) and within a range that the local groundwater conservation districts consider manageable.

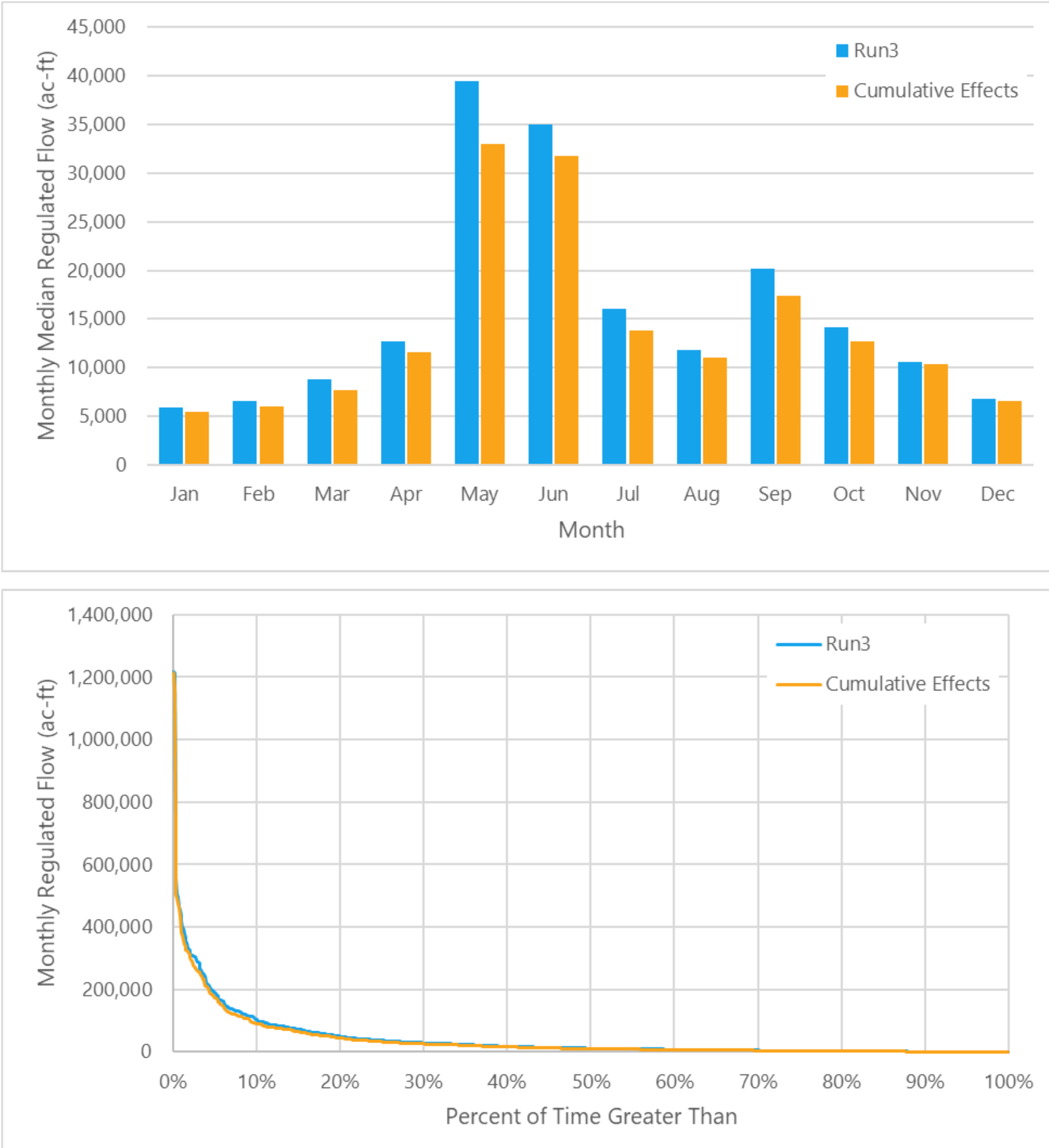


Figure 6.3 Effects of Plan Implementation on Streamflows – Brazos River at South Bend

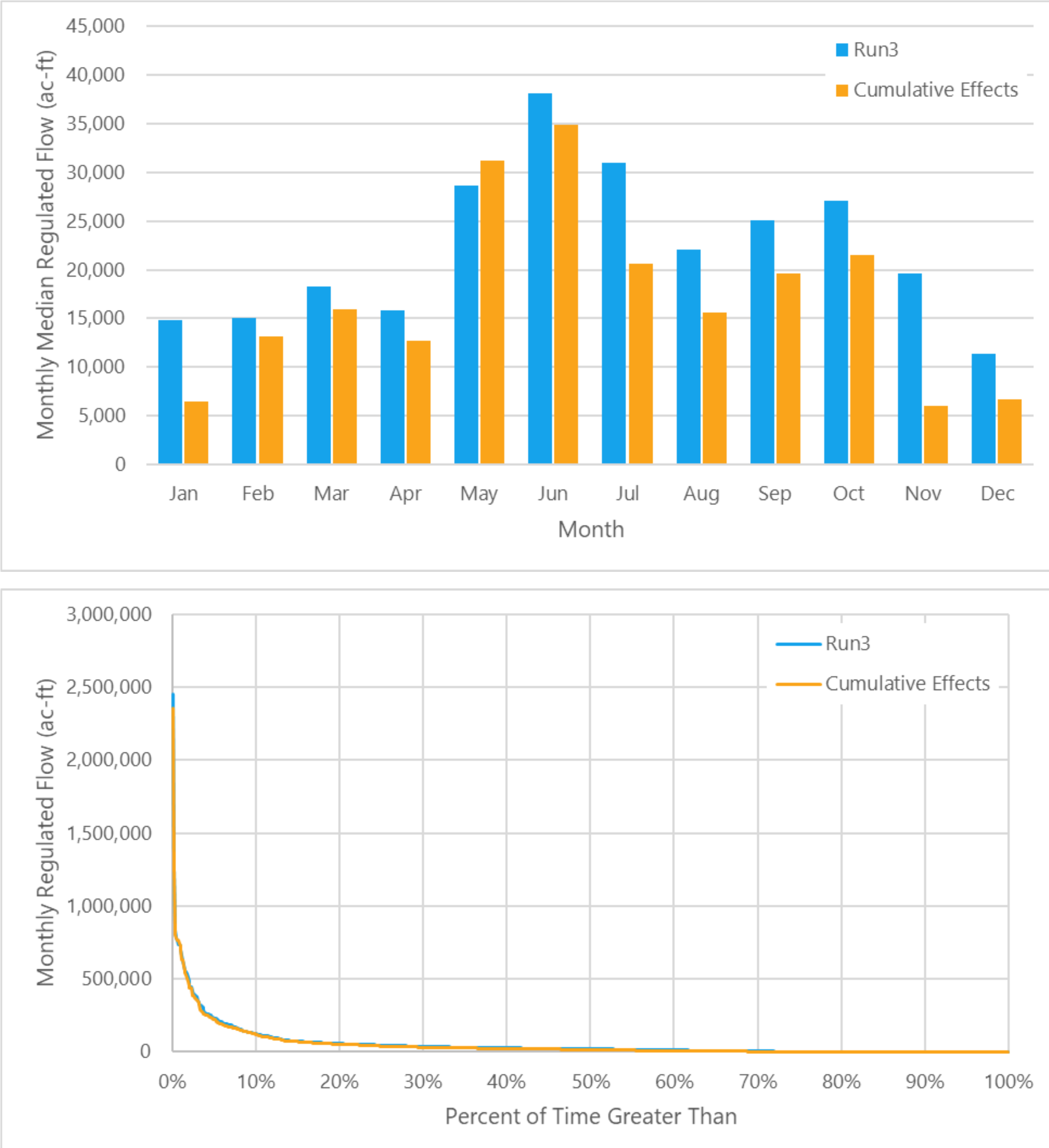
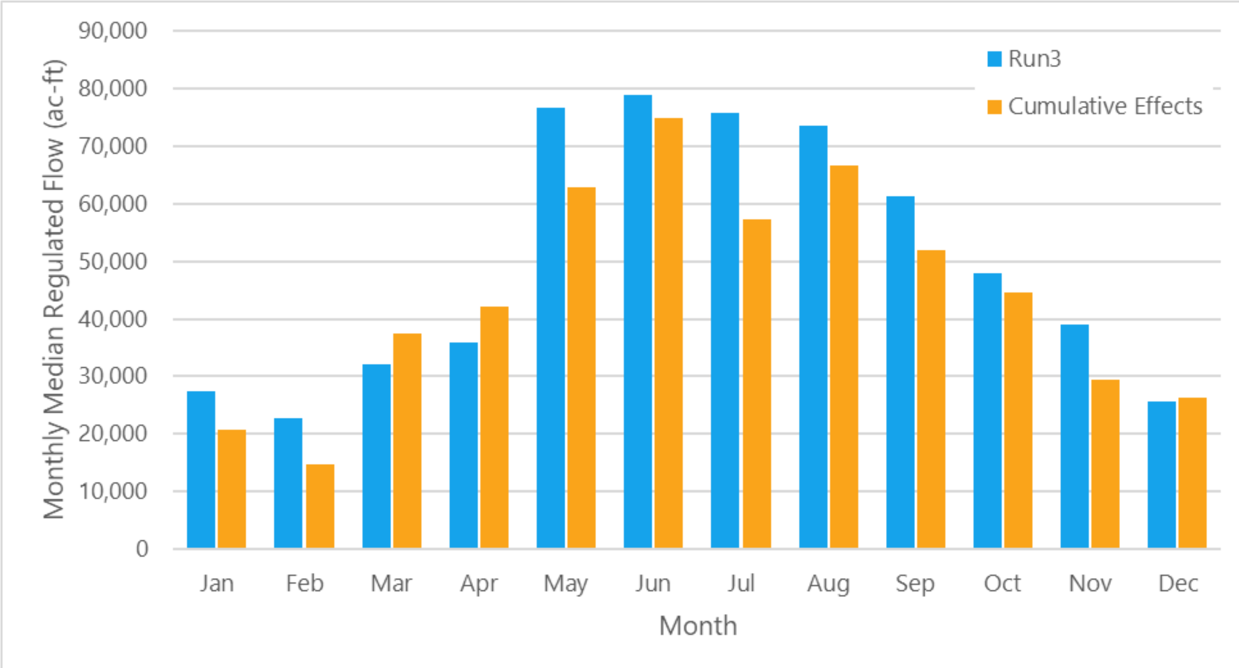


Figure 6.4 Effects of Plan Implementation on Streamflows – Brazos River near Glen Rose



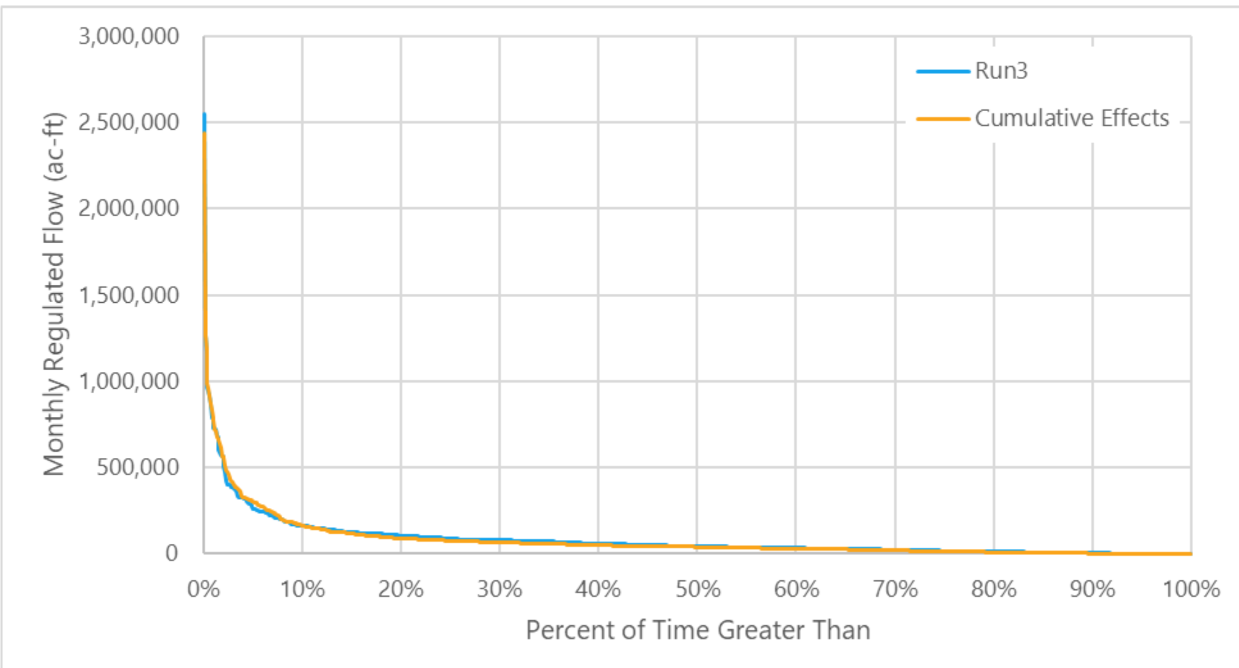
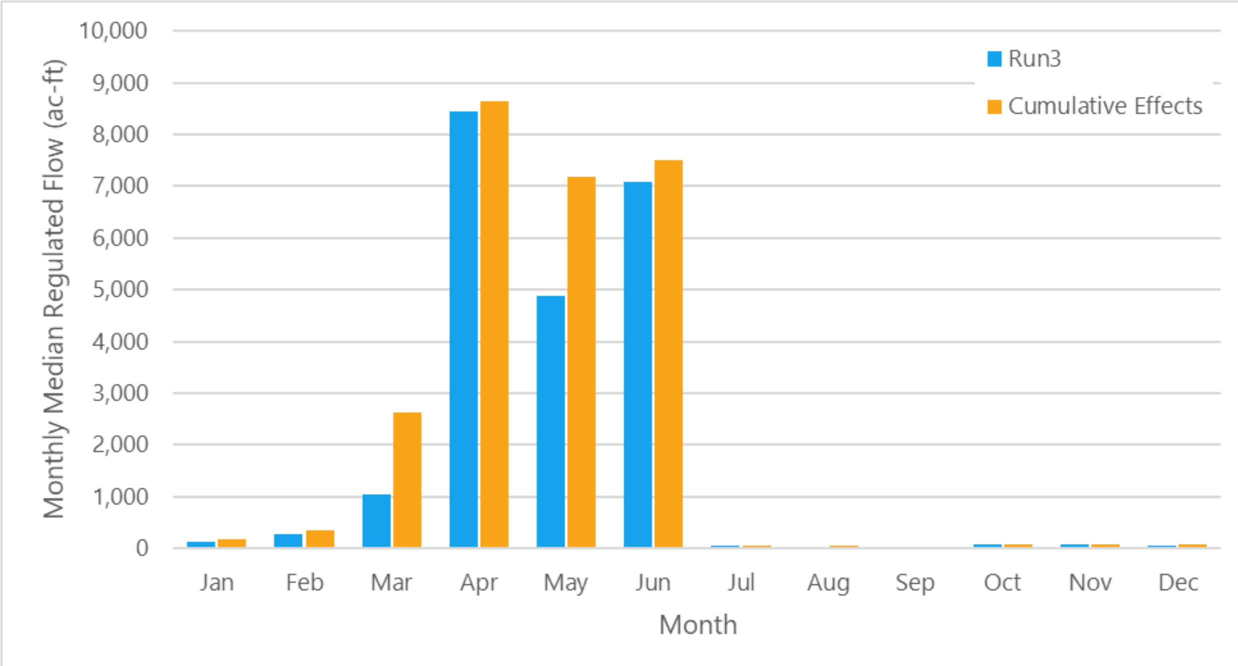


Figure 6.5 Effects of Plan Implementation on Streamflows – Brazos River near Aquilla



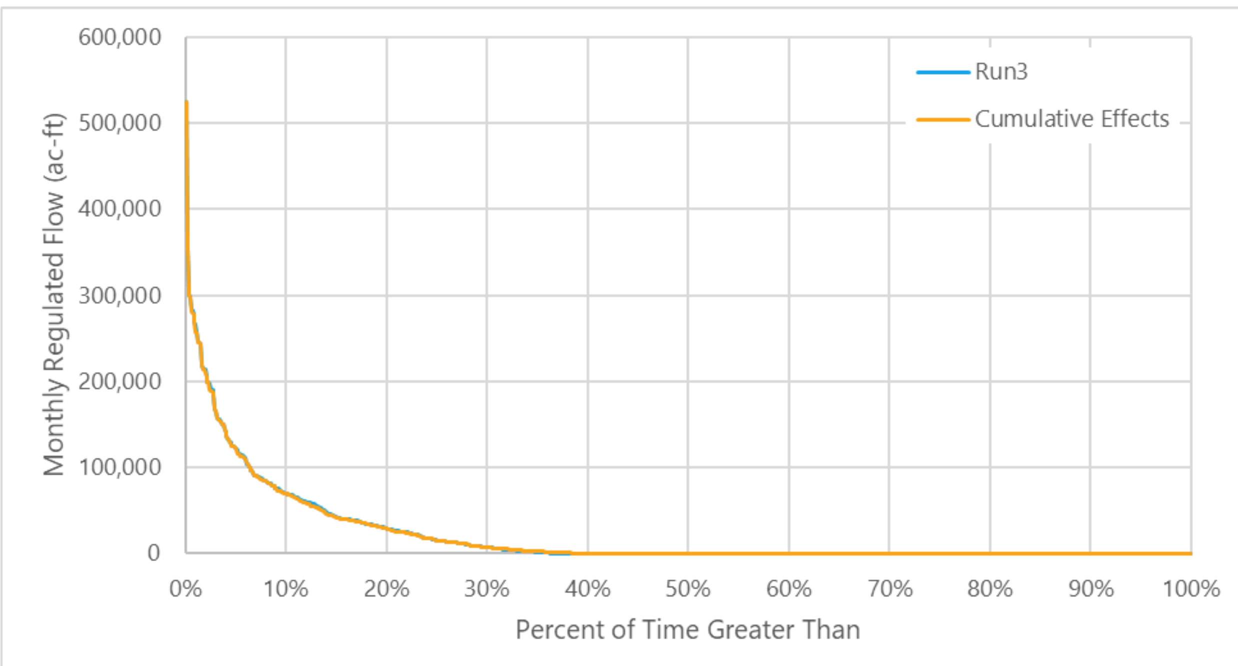
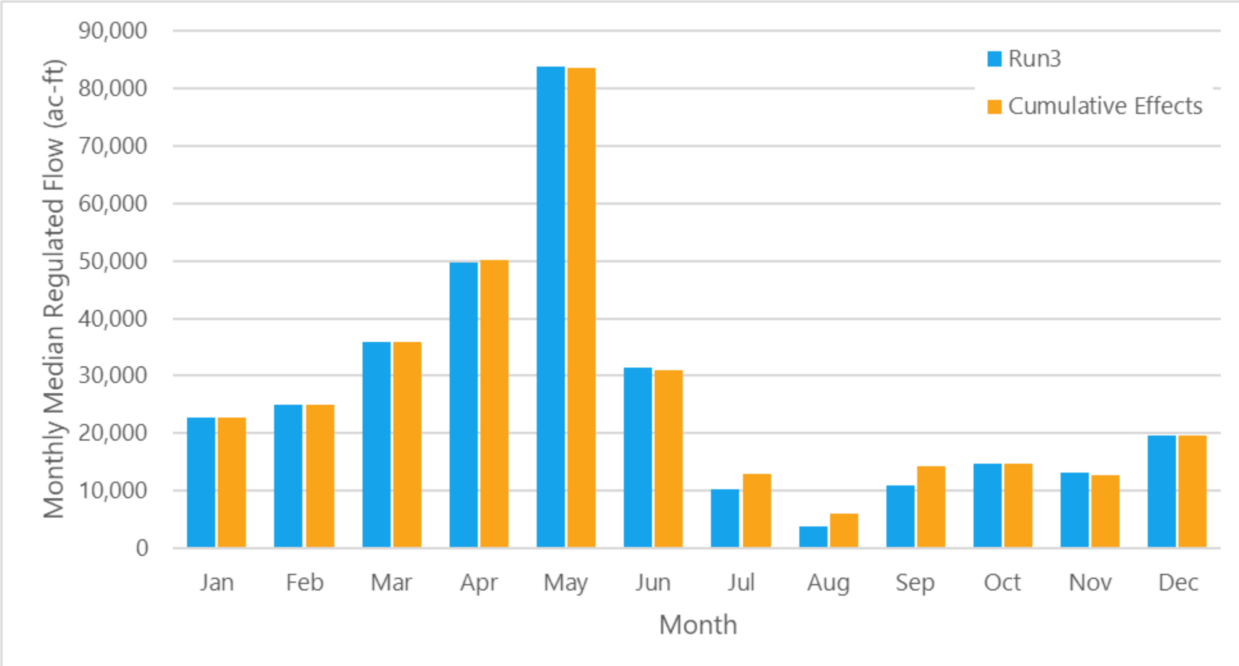


Figure 6.6 Effects of Plan Implementation on Streamflows – Bosque River near Waco



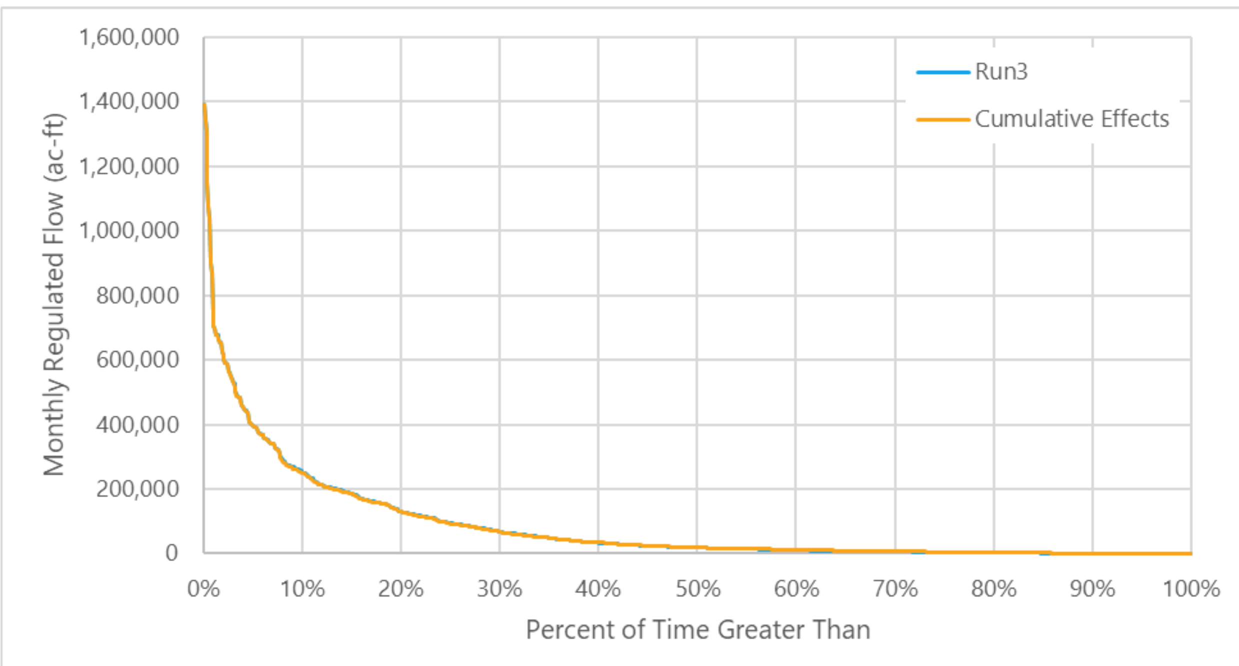


Figure 6.7 Effects of Plan Implementation on Streamflows – Little River near Cameron

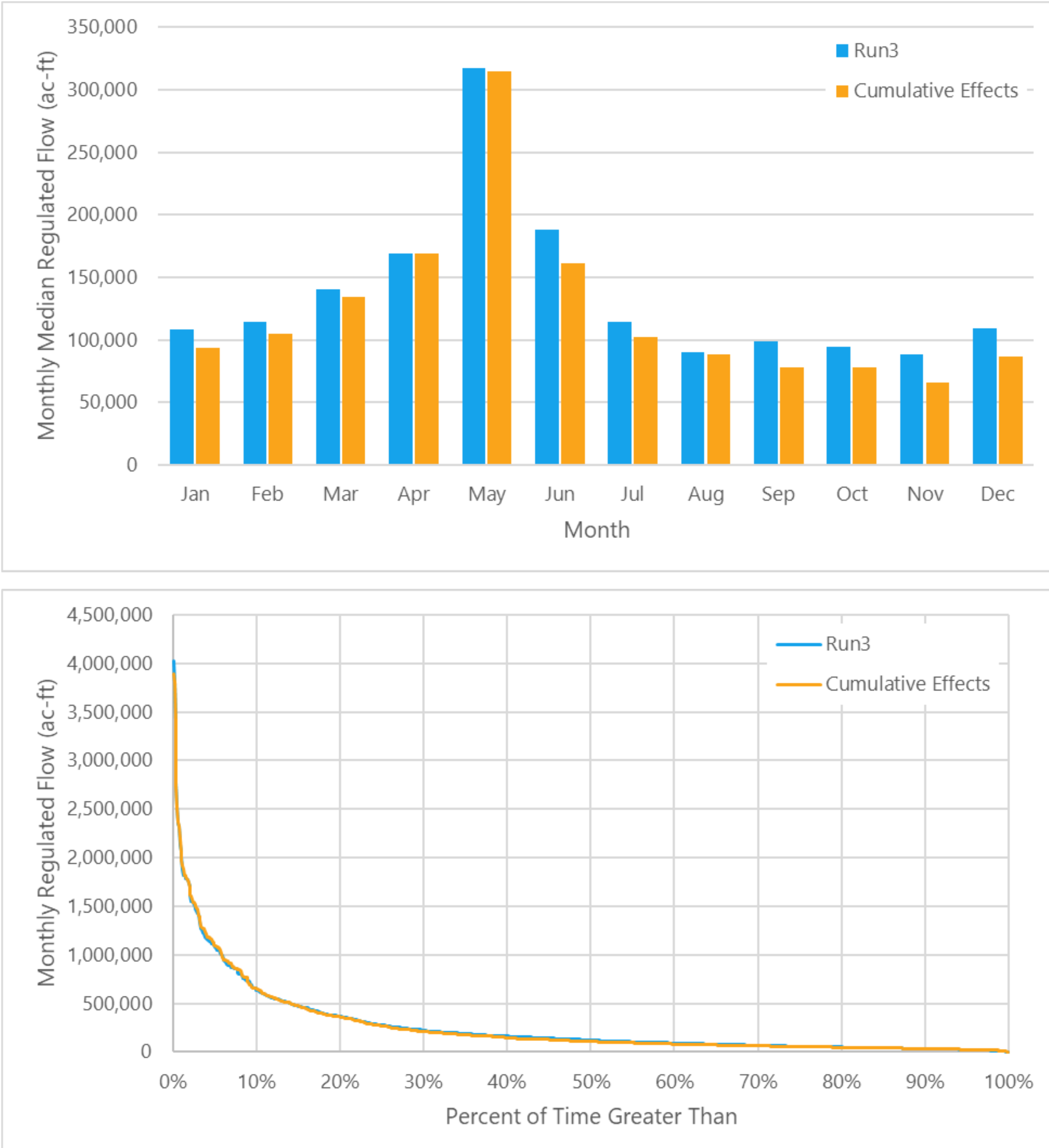
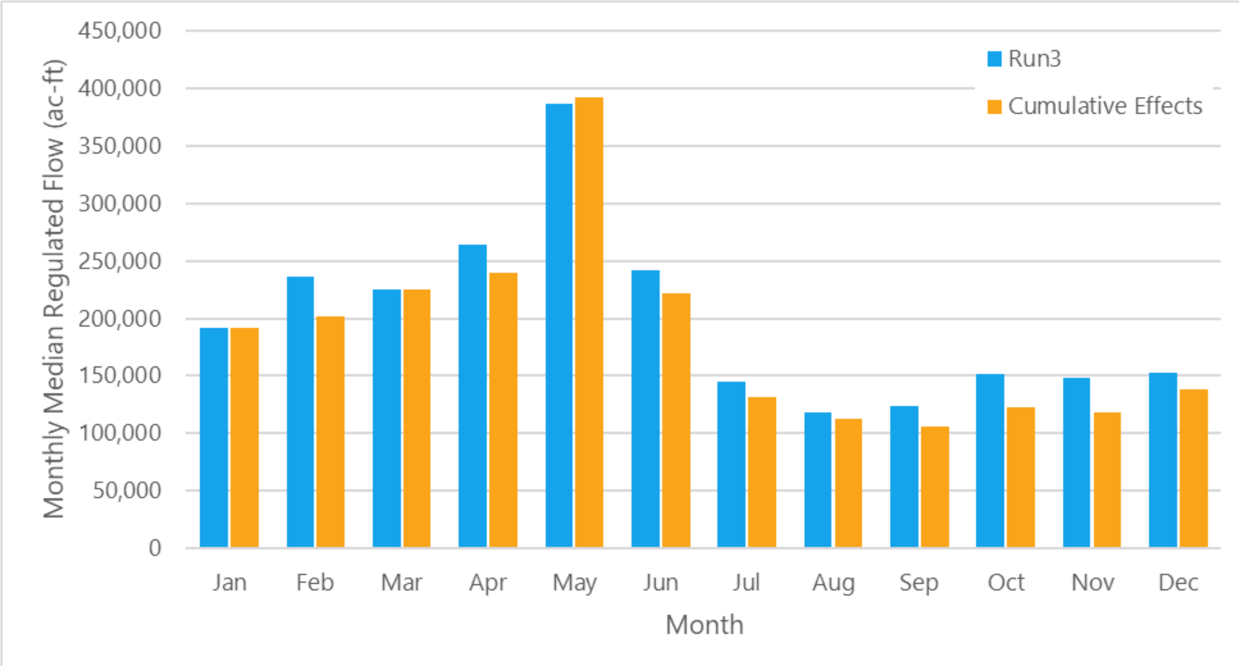


Figure 6.8 Effects of Plan Implementation on Streamflows – Brazos River near Bryan



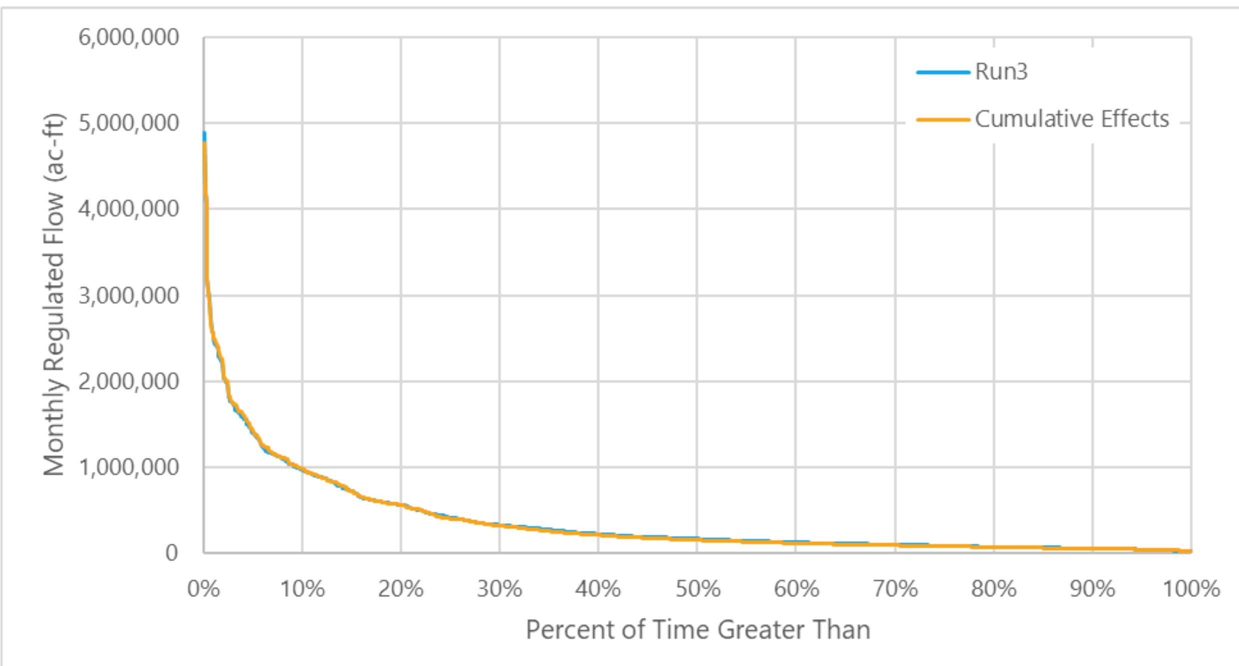
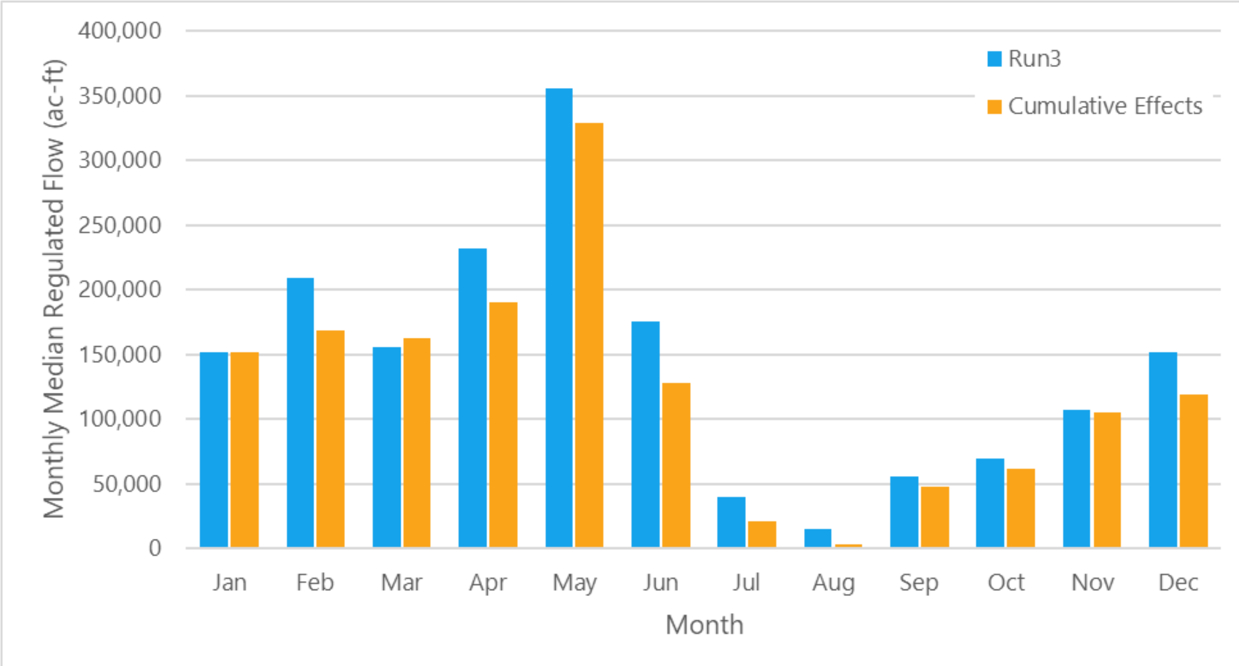


Figure 6.9 Effects of Plan Implementation on Streamflows – Brazos River near Hempstead

Figure 6.10 Effects of Plan Implementation on Streamflows – Brazos River at Richmond



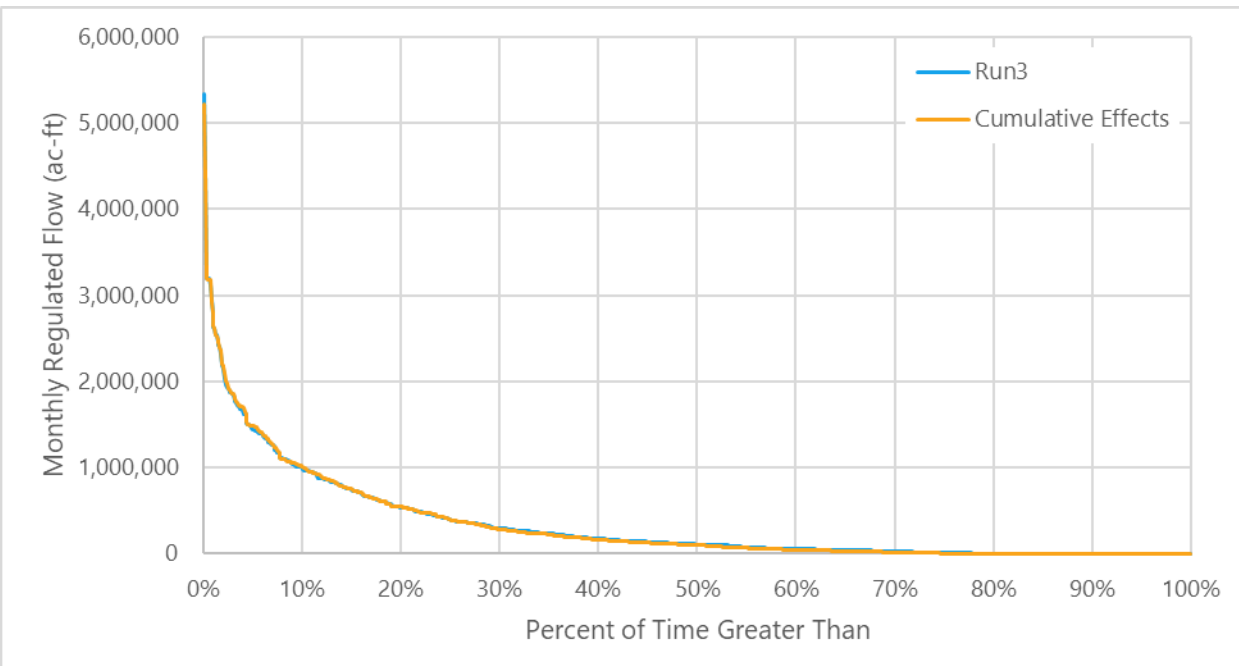


Figure 6.11 Effects of Plan Implementation on Streamflows – Brazos River at Gulf of Mexico

6.2 Summary of the Environmental Effects of the 2026 Brazos G Regional Water Plan

Overall, the strategies recommended in the 2026 Plan will have limited negative effects on the environment. The largest localized impacts will be from new reservoirs. New reservoirs recommended as strategies in the 2026 Plan (Lake Creek Reservoir, Cedar Ridge Reservoir, Throckmorton Reservoir, Lake Palo Pinto Enlargement, Clifton Reservoir Enlargement, Coryell County Off-Channel Reservoir, City of Groesbeck Off-Channel, and Brushy Creek Reservoir) will inundate more than 12,600 acres, reducing wildlife habitat, bottomland hardwood forestland and cultivated farmland as documented in the individual strategy evaluations (Volume II). Permitting for these projects will require mitigation land of at least equal ecological value, reducing the negative environmental consequences of the projects. Streamflows immediately downstream from these projects will decrease but permit requirements will also specify reservoir pass-through flows necessary to maintain ecological health in the downstream receiving stream.

Many elements of the 2026 Plan augment existing resources and delay or eliminate the need for new constructed projects. For example, reallocation of reservoir hydropower or flood storage pools offers a change in use of existing reservoir facilities and make available additional supply that previously would have only been made available through construction of a major water supply project. Utilization of water from the Colorado River Basin's Highland Lakes System in Williamson County reduces the need for new major water supply projects to serve Williamson County needs. The utilization of reuse water by several WUGs and WWPs will extend supplies and could delay the need for new raw water projects. Augmentation of Lake Granger through conjunctive use with an Aquifer Storage and Recovery (ASR) project maximizes the use of the existing reservoir facility.

Overall, the strategies recommended in the 2026 Plan maximize use of existing resources and reduce the need for several large, costly reservoir projects, minimizing impacts to the environment.

6.3 Impacts of Recommended Water Management Strategies on Key Parameters of Water Quality and Moving Water from Rural and Agricultural Areas

The guidelines for 2026 Regional Water Plans include describing major impacts of recommended water management strategies on key parameters of water quality identified by the regional water planning group and consideration of third party social and economic impacts associated with voluntary redistribution of water from rural and agricultural areas.

6.3.1 Impacts of Water Management Strategies on Key Parameters of Water Quality

The Brazos G RWPG has identified the following eleven key parameters of water quality to consider for recommended water management strategies:

- Chlorides.
- Sulfates.
- Total Dissolved Solids (TDS).

- Total Suspended Solids (TSS).
- Dissolved Oxygen.
- pH Range.
- Indicator Bacteria (Escherichia coli or fecal coliform).
- Temperature.
- Nitrates.
- Total Phosphorous.
- Total Nitrogen- ammonia.

The selection of key water quality parameters is based on Texas Surface Water Quality Standards Chapter 307, current water quality concerns identified in the Brazos River Authority's Basin Highlights Report, water user concerns expressed during Brazos G RWPG meetings, and regional water quality studies. Total Phosphorous and Total Nitrogen were selected based on nutrient concerns in the North Bosque Watershed and will be considered throughout the Brazos G region.

The major impacts of recommended water management strategies on key parameters of water quality were identified by the Brazos G RWPG pursuant to Texas Administrative Code Chapter 357-Regional Water Planning Guidelines. The recommended water management strategies for the Brazos G region and effects of the key water quality parameters are presented in Table 6-3.

Water quality concerns affecting existing supplies are described in greater detail in Chapter 3.3, which also includes a summary of special water quality studies and activities in the Brazos River Basin. These identified water quality concerns present challenges that may need to be overcome before a water management strategy can be used as a water supply. For water quality parameters that cannot be fully addressed due to lack of available information or inconclusive water quality studies, the Brazos G RWPG recommends further studies prior to implementing a water management strategy.

6.3.2 Impacts of Voluntary Redistribution of Water from Rural and Agricultural Areas

Several opportunities for voluntary redistribution exist for the Brazos G Area, such as supplying groundwater from the Carrizo-Wilcox Aquifer in Lee County to water users in Milam County. If there is increased groundwater pumping it could result in lowering of artesian levels in the Carrizo-Wilcox Aquifer and, consequently, may increase costs to pump water for water supply for rural and agricultural users.

The remaining water management strategies recommended to meet water needs (Chapter 5) do not include transferring significant quantities of water needed by rural and agricultural users and, therefore, are not considered to impact them.

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Table 6.3 Summary of Water Management Strategies, Potential Water Quality Concerns, and WUGs Potentially Affected

Recommended WMS	Project Origination	Beneficiaries of Project	Potential Water Quality Concerns Affecting Use of Supply
Treated Effluent Reuse	Bell, Brazos, Johnson, McLennan, Williamson	Manufacturing (Bell and McLennan Counties) Mining (Johnson and McLennan Counties) Steam-Electric (Brazos and Johnson Counties); Municipal (Cities of Bryan, College Station, Cleburne, Waco, Bellmead, Lacy-Lakeview, Hewitt, Lorena, Harker Heights, Killeen, Brushy Creek MUD, Cedar Park, Cleburne, Liberty Hill, Georgetown and 439 WSC)	Indicator bacteria
Water Conservation	Varies	All municipal, industrial, and agricultural users with projected needs (shortages)*	Total dissolved solids, sulfates, and chlorides
Interbasin Transfer of Surface Water from Lower Colorado River Basin (Region K)			
BCRUA	Varies	Municipal (Leander, Liberty Hill, Round Rock, Florence, County-Other [Williamson], Corix Utilities and Cedar Park)	None identified
New Reservoirs			
Brushy Creek Reservoir	Falls	Municipal (City of Marlin)	None identified
Cedar Ridge Reservoir	Clear Fork	Municipal (City of Abilene, County-Other [Taylor], Merkel, Potosi WSC, Roscoe, Steamboat WSC, Sweetwater, The Bitter Creek WSC and Tye); Irrigation (Taylor County) Manufacturing (Nolan County); Mining (Nolan and Taylor Counties)	None identified
Clifton Lake	Bosque	Municipal (City of Clifton, Meridian, Valley Mills, Childress Creek WSC and County-Other [Bosque])	None identified
Coryell County OCR	Coryell	Municipal (Gatesville, Flat WSC, County-Other [Coryell] and Multi-County WSC)	None identified
Groesbeck OCR	Limestone	Municipal (City of Groesbeck)	None identified
Lake Creek Reservoir	Throckmorton and Baylor	Municipal (North Central Texas Municipal Water Authority, Haskell, Knox City and Munday)	Total dissolved solids, sulfates, and chlorides from Brazos River diversion
Throckmorton Reservoir	Throckmorton	Municipal (City of Throckmorton and Graham)	None identified
Wheeler Branch OCR	Somervell	Municipal (Somervell County Water District, Glen Rose and County-Other [Somervell]); Steam-Electric (Somervell)	None identified

Recommended WMS	Project Origination	Beneficiaries of Project	Potential Water Quality Concerns Affecting Use of Supply
Augmentation of Existing Surface Water Supplies			
Lake Aquilla Reallocation	Hill	BRA	None identified
Lake Whitney Reallocation	Bosque/Hill	BRA	None identified
Lake Waco Reallocation	Bell	City of Waco	None Identified
Lake Granger ASR	Williamson	BRA	Increasing trends in sulfates, chlorides, elevated nutrients, and sedimentation from total suspended solids
Lake Granger Augmentation	Williamson	BRA	Increasing trends in sulfates, chlorides, elevated nutrients, and sedimentation from total suspended solids
Lake Georgetown ASR	Williamson	BRA	Increasing trends in sulfates, chlorides, elevated nutrients, and sedimentation from total suspended solids
Turkey Peak Dam – Lake Palo Pinto Enlargement	Palo Pinto	Municipal (Palo Pinto County MWD No. 1, Santo SUD, Count-Other [Palo Pinto] and Mineral Wells); Irrigation (Palo Pinto County)	None identified
Bryan ASR	Brazos	Municipal (City of Bryan)	None identified
College Station ASR	Brazos	Municipal (City of College Station)	None identified
Johnson County ASR	Johnson	Municipal (Johnson County SUD)	None identified
McLennan County ASR	McLennan	Municipal (City of Mart, Waco and North Bosque WSC)	None identified
Groundwater Development			
Blaine Aquifer	Stonewall, Knox, Fisher, Nolan	Mining (Stonewall, Knox counties); Irrigation (Knox County); Municipal (The Bitter Creek WSC)	Chlorides and total dissolved solids

Recommended WMS	Project Origination	Beneficiaries of Project	Potential Water Quality Concerns Affecting Use of Supply
Carrizo-Wilcox Aquifer	Brazos, Lee, Robertson, Limestone, Milam, Burleson, Williamson, Bell, Burnet	Mining (Lee county); Manufacturing (Limestone County); Steam Power (Limestone); Municipal (Robertson County-Other, Bryan, Bistone MWSD, Hutto, Georgetown, College Station, Southwest Milam WSC, Rockdale, Robertson County WSM, Milam County-Other, Mexia)	Iron and manganese and temperature (deep wells only)
Edwards Aquifer	Bell, Nolan, Williamson	Irrigation (Bell and Williamson Counties); Manufacturing (Bell and Nolan Counties); Mining (Bell and Nolan counties); Municipal (Roscoe)	None
Trinity Aquifer	Bell, Bosque, Comanche, Coryell, Erath, Hamilton, Hood, Somervell, McLennan, Eastland, Williamson, Falls, Hill, Johnson, Palo Pinto	Mining (Hood, Somervell, Comanche, Eastland, Coryell, Bell, Palo Pinto counties); Manufacturing (Erath, Hamilton counties); Irrigation (Hamilton, Bosque, McLennan, Palo Pinto counties); Municipal (Bartlett, Comanche County-Other, Coryell County-Other, Erath County-Other, Hill County-Other, Hood County-Other, McLennan County-Other, Williamson County-Other, Acton MUD, Axtell WSC, Bell County WCID 2, Bethesda WSC, Brandon Irene WSC, Chalk Bluff WSC, Crawford, Double Diamond Utilities, East Crawford WSC, Gholson WSC, Godley, Gordon, Highland Park WSC, Itasca, Johnson County SUD, Levi WSC, Lipan, Parker WSC, Spring Valley WSC, Stephenville, Strawn, Tolar, Woodrow Osceola WSC, Woodway)	Chlorides and total dissolved solids
Gulf Coast Aquifer	Grimes, Washington, Lampasas	Irrigation (Grimes County); Manufacturing (Washington County); Mining (Grimes and Washington Counties); Municipal (Brenham, Central Washington County WSC, Corix Utilities and Grimes County-Other)	None identified
Seymour Aquifer	Kent, Jones, Fisher	Municipal (Kent County-Other, Jones County-Other, Fisher County-Other)	Chlorides and total dissolved solids
Sparta Aquifer	Burleson, Brazos, Grimes, Robertson	Manufacturing (Burleson County); Mining (Brazos County); Municipal (Wickson Creek SUD)	Iron and manganese
Woodbine Aquifer	Hill, Johnson	Irrigation (Hill County); Municipal (Hill County-Other, Bethesda WSC, Chatt WSC, Grandview, Johnson County SUD)	Chlorides, total dissolved solids, iron and manganese
Yegua-Jackson Aquifer	Brazos, Robertson	Mining (Brazos County); Municipal (Brazos County-Other, Willborn SUD)	Chlorides and total dissolved solids

Recommended WMS	Project Origination	Beneficiaries of Project	Potential Water Quality Concerns Affecting Use of Supply
College Station GW Desal	Brazos	College Station	Chlorides and total dissolved solids
Cross Timbers Aquifer	Throckmorton, Young	Municipal (Young County-Other); Irrigation (Throckmorton and Young Counties); Livestock (Young County); Manufacturing (Young County); Mining (Throckmorton and Young Counties)	None identified
Williamson County GW	Williamson, Bell, Coryell	Williamson County-Other, Elm Creek WSC, Hutto, Round Rock	None identified
Texas A&M Sparta Aquifer	Brazos	Texas A&M University	None identified
Queen City Aquifer	Burleson, Milam	Manufacturing (Burleson); Mining (Milam)	None identified
Marble Falls Aquifer	Lampasas	Irrigation	None identified
Falls County – Brazos River Alluvium	Falls	County-Other	None identified
Lee County - GW	Lee	County-Other	None identified

Note:
(1) For municipal users with shortages, additional conservation was recommended only for WUGs exceeding their target GPCDs, which is 140 GPCD for most WUGs and 120 GPCD for selected WUGs in Williamson County.

6.4 Social and Economic Impacts of Not Meeting Projected Water Needs

Section 357.40(a) of the rules for implementing Senate Bill 1 requires that the social and economic impacts of not meeting regional water supply needs be evaluated by regional water planning groups. The purpose of this element of Senate Bill 1 planning is to provide an estimate of the social and economic importance of meeting projected water needs or, conversely, to provide estimates of potential costs of not meeting the projected needs of each WUG. The social and economic effects of not meeting a projected water need can be viewed as the potential benefit to be gained from implementing a strategy to meet the particular need. The summation of all the impacts provides a view of the ultimate magnitude of the economic impacts of not meeting all the projected needs.

In January 2024, the TWDB communicated to the Brazos G RWPG that the TWDB will develop a socioeconomic impact analysis report for each region to meet the aforementioned regional water planning requirement. TWDB anticipates releasing these reports in August 2025. This section of the report serves as a placeholder until such time as TWDB provides the documentation of these analyses. The analysis conducted by the TWDB will be summarized in a report included in Appendix G of the final 2026 Brazos G RWP. This section will be updated as part of the final RWP adoption.

6.5 Needs Left Unmet in the 2026 Brazos G Regional Water Plan

Table 6.4 and Table 6.5 summarizes the needs left unmet for the Brazos G primary WUGs, by water use category and by WUG. Additional details are discussed in Sections 6.5.1 and 6.5.2 below.

6.5.1 Municipal Needs Unmet in 2030

For a water management strategy or project to meet needs within the context of regional water planning, a project must be potentially feasible while not over-allocating a water source. The 2026 Brazos G Regional Water Plan reflects realistic, economically viable strategies and projects with online dates that take into account lack of action to date. This includes consideration of a strategy's feasibility in the real-world regulatory and water management context, noting the capability for WUGs to feasibly obtain supply beyond what is identified as available for the purposes of regional water planning.

It is appropriate, therefore, that the plans reflect the resulting unmet municipal needs that may arise because of such considerations. Such needs may arise that, in the event of drought, could only be addressed through drought restrictions – until such time that a project can be brought online. In the 2026 Brazos G Regional Water Plan, needs remain unmet for a significant number of municipal water user groups because potentially feasible water management strategies and projects cannot come online by the decade in which the need arises, or a strategy may not realistically be feasible outside of the regional planning context. The unmet municipal needs identified for WUGs in the Brazos G region are shown in Table 6.5.

For a regional water plan to be approved by the TWDB with any unmet municipal needs, Texas Administrative Code 357.50(j)(1-3) states that the regional water planning group includes adequate justification, including the following requirements:

> *"(1) documents that the RWPG considered all potentially feasible WMSs, including Drought Management WMSs and contains an explanation why additional conservation and/or Drought Management WMSs were not recommended to address the need;"*

All potentially feasible WMSs and WMSPs were considered to meet the needs identified herein, including drought management WMSs. The BGRWPG identified no additional potentially feasible strategies that could be implemented for these municipal WUGs beyond those identified herein. The BGRWPG has already recommended advanced water conservation for WUGs with baseline GPCDs higher than their associated targets as water conservation is likely a cheaper alternative for many WUGs than acquiring new supplies.

The BGRWPG does not recommend Drought Management as a recommended water management strategy to meet needs. Drought management measures reduce water demands during times of drought, and do not make more efficient use of existing resources. Applying drought management measures is equivalent to not meeting the projected water demands, per the explanation provided in Chapter 7, and the BGRWPG prefers to show the needs projected for municipal WUGs as not being met during a drought equivalent to the drought of record rather than artificially showing them as met by reducing demands during drought.

Further, the BGRWPG incorporated into its adopted process for identifying recommended water management strategies the assessment of feasibility as described by the TWDB for identifying infeasible strategies from the 2021 Brazos G RWP. This step was incorporated to further avoid recommending infeasible strategies in future plans. As such, if a WUG or WWP has not taken sufficient steps to make a project reasonably feasible of providing water by the online decade identified within the Plan, then a strategy may have been considered but deemed infeasible for recommendation, thus leaving an unmet need (unless another feasible strategy were identified). The BGRWPG prefers to show the needs projected for municipal WUGs as not being met during a drought equivalent to the drought of record rather than artificially showing them as met by recommending an infeasible strategy.

> *"(2) describes how, in the event of a repeat of the Drought of Record, the municipal WUGs associated with the unmet need shall ensure the public health, safety, and welfare in each Planning Decade that has an unmet need; and"*

While the BGRWPG does not recommend Drought Management as a water management strategy nor infeasible strategies to meet projected needs for municipal WUGs, the BGRWPG recognizes that drought management measures will be implemented by utilities as outlined in their individual Drought Contingency Plans. These measures can prolong supply and reduce impacts to communities by limiting water use to only essential water uses in order to protect public health, safety and welfare.

The Brazos G region is vast with many relatively isolated communities with limited water supply alternatives. If Drought Management or infeasible strategies were to be recommended, this could provide a false sense of security that "needs are met", when, in actuality, projected water demands would not be met. In the event of a drought worse than the drought of record, this approach could further imperil a community because the benefits of drought management have already been realized in the plan and there are no additional management strategies that can be employed in response to the drought.

> *"(3) explains whether there may be occasion, prior to development of the next IPP, to amend the RWP to address all or a portion of the unmet need."*

For unmet needs in 2030, there will be limited opportunity or need to amend the 2026 Plan prior to development of the next initially prepared plan to address the unmet municipal needs. The 2026 Brazos G Regional Water Plan identifies unmet municipal needs in all planning decades as well as the percentage of demand left unmet in 2030. Any amendments would have to be accomplished and include strategies that would come online prior to 2030, which is 4 years after the adoption of the 2026 RWP. Therefore, the identification of those strategies by the Brazos G RWPG is unlikely. However, entities in the Brazos G region can either contact the Brazos G RWPG for additional assistance or develop their own strategies to meet their needs. One particular instance where unmet needs may be met may occur with updates to the MAG related to Limestone County.

For unmet needs identified for later decades in the planning period, there will be the opportunity, prior to the development of the next initially prepared plan, to amend the 2026 Plan to address all or a portion of the unmet municipal need.

6.5.2 Non-Municipal Needs Unmet

The Brazos G RWPG has opted to leave certain projected needs unmet for some county-aggregated non-municipal WUGs in the 2026 Brazos G Regional Water Plan for the following reasons. Table 6.5 lists those unmet non-municipal needs.

- Irrigation
  - No economically viable supply can be developed.
- Livestock
  - Small need in 2030 only.
- Manufacturing
  - Small need in 2030 only.
- Mining
  - No reasonable supply can be developed.
  - Mining customers are encouraged to explore reuse options to address their supply shortfalls. However, the BGRWPG does not provide individual WMSs for mining customers due to the absence of a sponsor. It is expected that mining customers will develop their own reuse strategies as the need arises.
- Steam-Electric
  - No reasonable supply can be developed.

Table 6.4 Needs Left Unmet for Brazos G Primary WUGs by Use Category

WUG Type	Needs left Unmet (ac-ft/yr)						Percent of Overall Demands left Unmet in 2030
	2030	2040	2050	2060	2070	2080	
Municipal	27,096	52,337	86,055	108,681	132,173	175,899	5%
Irrigation	44,627	39,788	35,495	32,729	34,748	34,996	14%
Livestock	805	805	839	878	914	949	2%
Manufacturing	1,169	1,241	1,973	2,093	2,211	2,342	7%
Mining	7,734	7,474	7,401	7,537	6,679	6,791	28%
Steam Electric Power	15,163	15,910	12,811	14,762	16,716	18,702	10%
Total Brazos G WUGs	**96,594**	**117,555**	**144,574**	**166,680**	**193,441**	**239,679**	**9%**

Note: Draft values are subject to change and represent WUG as a whole, including splits outside of Brazos G. All Brazos G primary WUGs are included in the sum above.

Table 6.5 Needs for WUGs Left Unmet in the 2026 Brazos G Regional Water Plan

WUG Type	WUG Name	Counties	Needs left Unmet (ac-ft/yr)						Percent of Demands left Unmet in 2030
			2030	2040	2050	2060	2070	2080	
Municipal	Bell County WCID 3	Bell	132	401	894	1,387	1,509	1,629	8%
Municipal	Belton	Bell	0	0	0	270	319	842	0%
Municipal	Benjamin	Knox	21	19	9	11	0	17	37%
Municipal	Bethesda WSC	Tarrant, Johnson	157	143	396	392	24	655	2%
Municipal	Bistone Municipal Water Supply District	Limestone	0	10	73	57	20	75	0%
Municipal	Brandon Irene WSC	Navarro, Hill	52	40	13	0	0	13	9%
Municipal	Brushy Creek MUD	Williamson	13	7	5	5	5	6	0%
Municipal	Bryan	Brazos	0	0	0	0	0	4,596	0%
Municipal	Burleson	Tarrant, Johnson	88	158	133	366	424	1,423	1%
Municipal	Cedar Park	Williamson, Travis	1,035	919	391	391	391	391	5%
Municipal	Cego-Durango WSC	Falls	0	6	34	58	89	133	0%
Municipal	Central Texas College District	Bell, Coryell	145	128	111	93	75	75	52%
Municipal	Copperas Cove	Coryell, Lampasas	0	1,026	2,374	3,253	3,061	1,495	0%
Municipal	Corix Utilities Texas Inc	Mitchell, Lampasas, Washington, Blanco, Burnet, Colorado, Llano, Matagorda, Mills, San Saba	810	830	898	967	1,048	1,151	22%
Municipal	County-Other, Bell	Bell	0	86	120	58	0	0	0%
Municipal	County-Other, Comanche	Comanche	1	0	0	0	0	0	0%
Municipal	County-Other, Erath	Erath	0	0	0	0	0	276	0%
Municipal	County-Other, Falls	Falls	31	0	0	0	0	0	4%
Municipal	County-Other, Grimes	Grimes	199	229	255	265	268	261	14%

WUG Type	WUG Name	Counties	Needs left Unmet (ac-ft/yr)						Percent of Demands left Unmet in 2030
			2030	2040	2050	2060	2070	2080	
Municipal	County-Other, Hill	Hill	127	134	153	175	185	183	27%
Municipal	County-Other, Hood	Hood	539	1,024	1,900	2,759	3,181	3,471	13%
Municipal	County-Other, Jones	Jones	85	30	0	0	0	0	10%
Municipal	County-Other, Knox	Knox	2	2	1	1	1	0	2%
Municipal	County-Other, Lee	Lee	5	2	0	0	0	0	2%
Municipal	County-Other, McLennan	McLennan	0	169	214	232	249	250	0%
Municipal	County-Other, Nolan	Nolan	18	14	7	0	0	0	13%
Municipal	County-Other, Robertson	Robertson	45	19	0	0	0	0	21%
Municipal	County-Other, Washington	Washington	1	1	1	0	0	0	0%
Municipal	County-Other, Williamson	Williamson	4,786	11,220	15,021	14,688	14,128	19,491	58%
Municipal	County-Other, Young	Young	20	31	44	62	73	76	4%
Municipal	Cross Country WSC	Bosque, McLennan	0	0	0	0	0	136	0%
Municipal	Double Diamond Utilities	Hill, Johnson, Palo Pinto	381	310	273	232	168	95	12%
Municipal	Elm Creek WSC	Bell, Coryell, McLennan	95	115	109	84	59	80	14%
Municipal	Eula WSC	Callahan	114	118	122	126	130	133	46%
Municipal	Florence	Williamson	74	84	94	104	113	137	36%
Municipal	Fort Belknap WSC	Stephens, Throckmorton, Young	0	0	0	17	23	68	0%
Municipal	Fort Griffin SUD	Shackelford, Stephens, Throckmorton	9	5	5	4	2	0	4%
Municipal	Georgetown	Bell, Williamson, Burnet	0	16,727	39,571	51,198	62,456	75,354	0%
Municipal	Gholson WSC	Hill, McLennan	0	0	49	0	0	79	0%
Municipal	Godley	Johnson	0	0	0	0	27	55	0%

WUG Type	WUG Name	Counties	Needs left Unmet (ac-ft/yr)						Percent of Demands left Unmet in 2030
			2030	2040	2050	2060	2070	2080	
Municipal	Gordon	Erath, Palo Pinto	26	4	0	0	0	0	16%
Municipal	Graham	Young	1,356	1,097	253	89	0	0	55%
Municipal	Haskell	Haskell	538	473	0	0	0	0	89%
Municipal	Hilco United Services	Ellis, Bosque, Hill	1,013	924	889	925	979	1,032	76%
Municipal	Hog Creek WSC	Bosque, McLennan	91	52	12	0	0	0	23%
Municipal	Hutto	Williamson	752	0	266	1,703	4,437	8,314	28%
Municipal	Itasca	Hill	1	1	1	1	0	1	1%
Municipal	Jarrell-Schwertner	Bell, Williamson	2,938	3,625	4,058	4,502	4,972	5,453	32%
Municipal	Johnson County SUD	Tarrant, Johnson	559	383	748	1,020	905	1,901	6%
Municipal	Jonah Water SUD	Williamson	1,690	3,273	5,212	7,824	10,759	14,062	27%
Municipal	Killeen	Bell	0	0	0	0	624	4,203	0%
Municipal	Knox City	Knox	163	138	0	0	0	0	66%
Municipal	Leander	Williamson, Travis	1,019	100	530	48	1,145	1,499	4%
Municipal	Levi WSC	Falls, McLennan	89	104	112	105	118	138	16%
Municipal	Mexia	Limestone	767	729	685	657	636	603	75%
Municipal	Mineral Wells	Parker, Palo Pinto	0	0	0	0	0	13	0%
Municipal	Multi County WSC	Coryell, Hamilton, Lampasas	4	5	5	5	5	4	1%
Municipal	Munday	Knox	202	183	0	0	0	0	89%
Municipal	Paloma Lake MUD 1	Williamson	128	134	137	138	138	138	24%
Municipal	Paloma Lake MUD 2	Williamson	103	108	110	111	111	111	26%
Municipal	Post Oak SUD	Navarro, Hill, Limestone	183	122	72	44	36	37	54%
Municipal	Prairie Hill WSC	Limestone, McLennan	256	242	243	255	271	289	92%
Municipal	Rio Vista	Hill, Johnson	1	1	1	1	7	47	1%
Municipal	Round Rock	Williamson, Travis	804	1,037	1,268	1,316	1,359	1,452	3%
Municipal	Santo SUD	Parker, Hood, Palo Pinto	7	11	16	20	25	30	2%

WUG Type	WUG Name	Counties	Needs left Unmet (ac-ft/yr)						Percent of Demands left Unmet in 2030
			2030	2040	2050	2060	2070	2080	
Municipal	Somervell County Water District	Somervell	661	504	308	139	102	90	44%
Municipal	Sonterra MUD	Williamson	936	2,267	3,843	5,551	7,474	9,638	41%
Municipal	Staff WSC	Eastland, Stephens	0	0	0	0	5	22	0%
Municipal	Stephenville	Erath	0	0	0	0	102	865	0%
Municipal	Taylor	Williamson	0	901	2,461	3,911	5,543	7,444	0%
Municipal	Texas A&M University	Brazos	3,392	1,103	0	0	0	0	33%
Municipal	Texas State Technical College	McLennan	139	0	0	0	0	0	7%
Municipal	The Grove WSC	Bell, Coryell	0	0	1	2	2	7	0%
Municipal	Thorndale	Milam	63	78	96	113	126	147	24%
Municipal	Throckmorton	Throckmorton	84	71	0	0	0	0	58%
Municipal	Wellborn SUD	Brazos, Robertson	0	0	0	796	1,048	1,419	0%
Municipal	Wickson Creek SUD	Brazos, Grimes, Robertson	0	0	125	20	186	247	0%
Municipal	Williamson County MUD 11	Williamson	106	505	974	1,487	2,064	2,714	11%
Municipal	Williamson County WSID 3	Williamson, Travis	40	155	359	643	966	1,333	4%
Irrigation	Irrigation, Comanche	Comanche	7,129	6,477	5,841	5,832	5,838	5,872	27%
Irrigation	Irrigation, Grimes	Grimes	8	4	1	1	1	1	1%
Irrigation	Irrigation, Hamilton	Hamilton	0	0	0	3	6	7	0%
Irrigation	Irrigation, Haskell	Haskell	6,562	5,283	4,387	4,262	4,299	4,299	13%
Irrigation	Irrigation, Johnson	Johnson	229	217	207	207	207	207	42%
Irrigation	Irrigation, Knox	Knox	8,629	8,165	7,267	4,758	6,787	7,000	23%
Irrigation	Irrigation, McLennan	McLennan	111	9	0	0	0	0	2%

WUG Type	WUG Name	Counties	Needs left Unmet (ac-ft/yr)						Percent of Demands left Unmet in 2030
			2030	2040	2050	2060	2070	2080	
Irrigation	Irrigation, Nolan	Nolan	9,287	9,056	8,441	8,199	8,038	8,038	72%
Irrigation	Irrigation, Robertson	Robertson	11,219	9,741	8,536	8,652	8,757	8,757	15%
Irrigation	Irrigation, Stephens	Stephens	87	84	81	81	81	81	57%
Irrigation	Irrigation, Taylor	Taylor	1,008	410	410	410	410	410	71%
Irrigation	Irrigation, Williamson	Williamson	209	203	195	195	195	195	52%
Irrigation	Irrigation, Young	Young	149	139	129	129	129	129	23%
Livestock	Livestock, Comanche	Comanche	784	784	784	784	784	784	23%
Livestock	Livestock, Palo Pinto	Palo Pinto	0	0	34	73	109	144	0%
Livestock	Livestock, Somervell	Somervell	21	21	21	21	21	21	14%
Manufacturing	Manufacturing, Comanche	Comanche	0	0	0	0	0	1	0%
Manufacturing	Manufacturing, Coryell	Coryell	1	1	1	1	1	1	20%
Manufacturing	Manufacturing, Eastland	Eastland	0	0	0	0	0	15	0%
Manufacturing	Manufacturing, Erath	Erath	15	10	3	0	0	0	17%
Manufacturing	Manufacturing, Lampasas	Lampasas	37	45	49	58	61	53	16%
Manufacturing	Manufacturing, Limestone	Limestone	220	223	226	234	241	251	87%
Manufacturing	Manufacturing, Nolan	Nolan	9	8	8	9	9	10	2%
Manufacturing	Manufacturing, Palo Pinto	Palo Pinto	18	19	20	21	22	23	64%
Manufacturing	Manufacturing, Taylor	Taylor	49	76	775	804	834	865	7%
Manufacturing	Manufacturing, Williamson	Williamson	820	859	891	966	1,043	1,123	42%

WUG Type	WUG Name	Counties	Needs left Unmet (ac-ft/yr)						Percent of Demands left Unmet in 2030
			2030	2040	2050	2060	2070	2080	
Mining	Mining, Burleson	Burleson	3,384	3,273	3,161	3,161	3,161	3,161	61%
Mining	Mining, Eastland	Eastland	222	235	220	235	222	222	69%
Mining	Mining, Haskell	Haskell	4	4	4	4	4	4	100%
Mining	Mining, Limestone	Limestone	2,923	2,892	2,858	2,878	1,953	2,019	83%
Mining	Mining, Somervell	Somervell	833	898	959	1,031	1,089	1,129	61%
Mining	Mining, Taylor	Taylor	368	172	199	228	250	256	72%
Steam Electric Power	Steam-Electric Power, Limestone	Limestone	989	1,173	1,904	2,594	3,244	3,877	4%
Steam Electric Power	Steam-Electric Power, Robertson	Robertson	4,900	5,084	0	0	0	0	11%
Steam Electric Power	Steam-Electric Power, Somervell	Somervell	8,664	9,020	10,248	11,535	12,876	14,197	12%
Steam Electric Power	Steam-Electric Power, Young	Young	610	633	659	633	596	628	73%

Notes:
(1) Draft values are subject to change and represent WUG as a whole, including splits outside of Brazos G. All Brazos G primary WUGs are included in the sum above.

CHAPTER 7 DROUGHT RESPONSE INFORMATION, ACTIVITIES AND RECOMMENDATIONS

Droughts are of great importance to the planning and management of water resources in Texas. Although droughts can occur in all climatic zones, they have the greatest potential to become catastrophic in dry or arid regions such as West and Central Texas. It is not uncommon for mild droughts to occur over short periods of time in Texas; however, there is no certain way to predict how long or severe a drought will be while it is occurring. The only defense available in drought-prone areas such as the Brazos G Area is proper planning and preparation for worst-case scenarios. This requires understanding of drought patterns and the historical droughts in the region.

Due to significant population growth throughout Texas, which is expected to continue in the Brazos G Area based on Texas Water Development Board (TWDB) projections, the demand for water has increased. With growing demand and the threat of climate change contributing to water scarcity, planning is even more important to prevent shortages, deterioration of water quality, and lifestyle/financial impacts on water suppliers and users. This chapter presents information on drought preparedness in the Brazos G Area, including regional droughts of record, drought uncertainties, example drought contingency plans, drought triggers and actions, emergency interconnects, responses to local drought conditions, and methods to estimate available water supplies in the region.

7.1 Droughts of Record in the Brazos G Area

Section 7.1 presents information on the droughts of records in the Brazos G Area.

7.1.1 Background

One of the best tools in drought preparedness is a thorough understanding of the drought of record (DOR), or the worst drought to occur for a particular area during the available period of hydrologic data. However, there are many ways that the "worst drought" can be defined (degree of dryness/severity, duration, relative soil moisture content, agricultural impacts, socioeconomic impacts, etc.). Regional water planning focuses on hydrological drought, which is typically the type of drought associated with the largest shortfalls in surface and/or subsurface water supply. The frequency and severity of hydrological drought is often defined on a watershed or river basin scale, although it could be different from one area to the next, even within a planning region.

The Brazos G Area encompasses all or parts of 37 counties and stretches from Kent County in the northwest to Grimes County in the Southeast; this means that it is a very hydrologically, geographically, and physiographically diverse area. Therefore, Brazos G was divided into three smaller areas to assess the drought of record. The northernmost area, referred to as Upper Brazos G, is made up of Palo Pinto, Stephens, and Eastland counties and all counties to their northwest. The middle area, referred to as Mid Brazos G, contains all the counties south of Stephens and Palo Pinto and north of Milam and Robertson. The southernmost area, referred to as Lower Brazos G, is made up of Milam, Robertson, Lee, Burleson, Brazos, Washington, and Grimes counties. Figure 7.1 depicts these three areas.

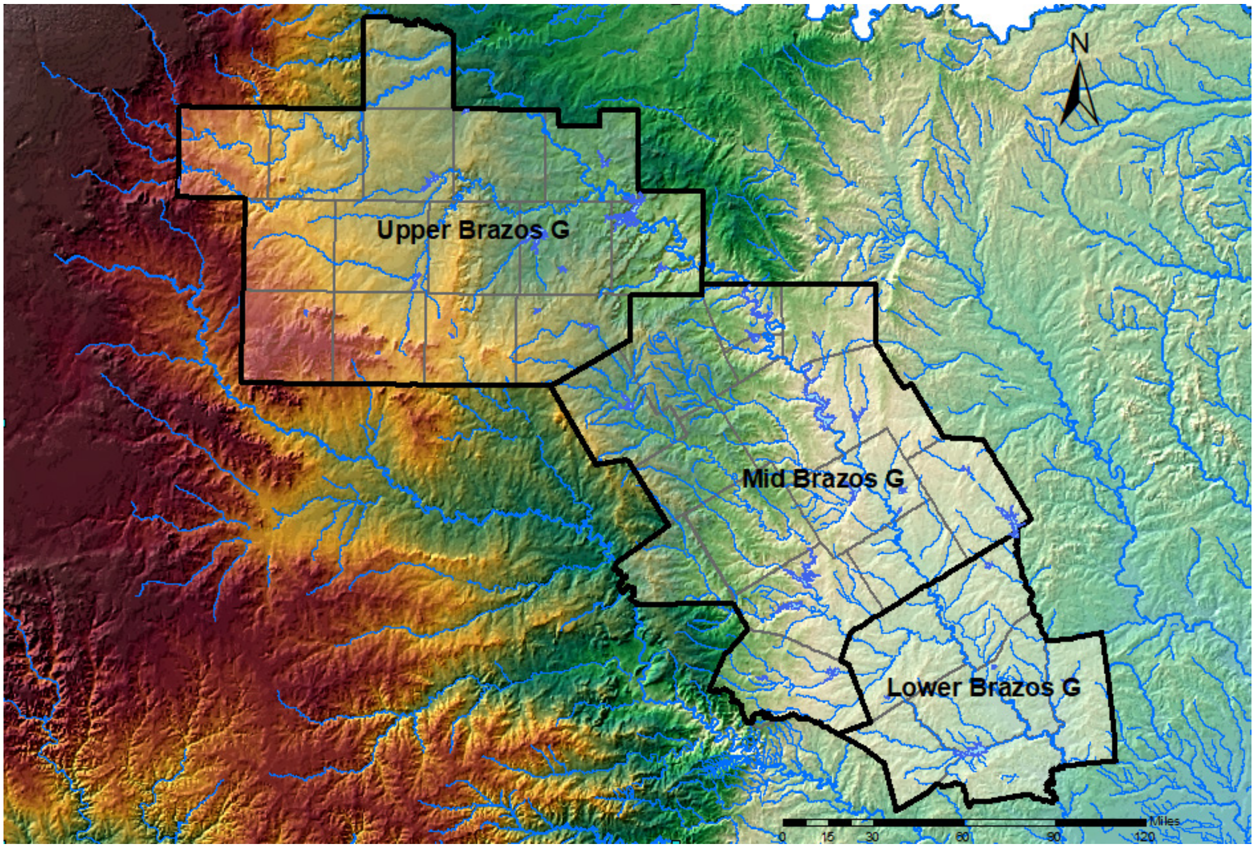


Figure 7.1 Map of Brazos G Sub-Areas

Texas is divided into ten climate divisions by the National Oceanic and Atmospheric Administration (NOAA), which are regions with consistent climatological behaviors. Figure 7.2 shows Brazos G in relationship to these climate divisions with the majority lying within Climate Division 3, but also intersecting Divisions 2, 4, 6, and 7. It is necessary to consider these divisions as numerous drought indices are calculated based on these divisions.

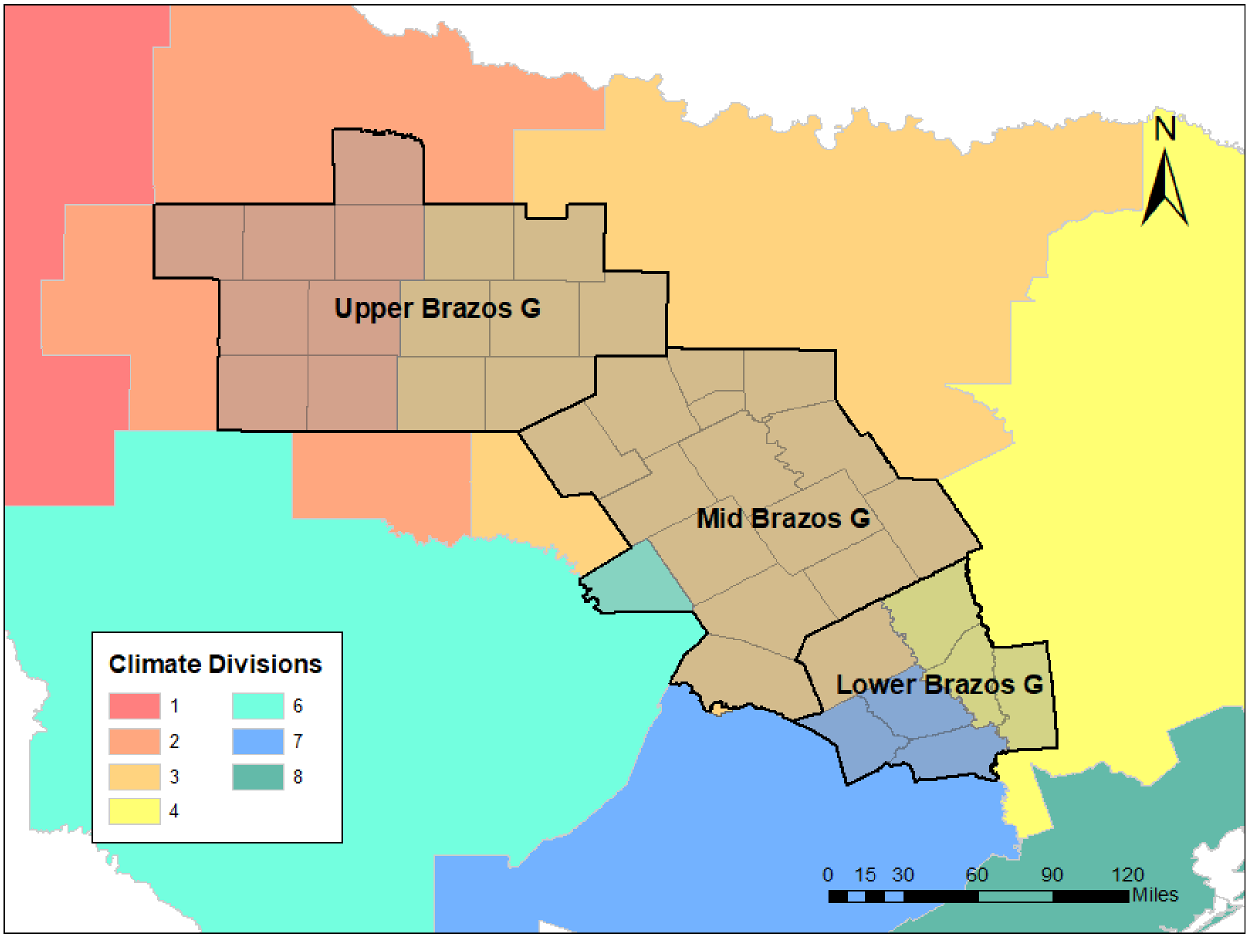


Figure 7.2 Map of Brazos G Climate Divisions

7.1.2 Current Drought of Record

In terms of severity and duration, the devastating drought of the 1950s generally is considered the drought of record for most of Texas, including most of the Brazos G Area. By 1956, 244 of the 254 counties in the state were considered disaster areas. At that time, the 1950s drought included the 2nd, 3rd, and 8th driest years on record (1956, 1954, and 1951, respectively). This drought lasted almost a decade in many places and affected numerous states across the nation. The 1950s drought kick-started Texas's water supply planning effort and has been used by water resource engineers and managers as a benchmark drought for water supply planning. However, Texas has experienced two recent droughts centered around 2006 and 2011 that were significant enough to necessitate considering them as DORs for the Brazos G Area. In 2011, severely decreased precipitation resulted in substantial declines in streamflow throughout Texas. Record high temperatures also occurred June through August leading to an increase in evaporation rates. The evaporation was so great that by August 4, 2011, state climatologist John Nielson-Gammon declared 2011 to be the worst 1-year drought on record in Texas. The 2011 water year statewide annual precipitation was 11.27 inches, more than 2 inches less than the previous record low of 13.91 inches in 1956. The remaining sections in Section 7.1 describe the methods for assessing drought severity and the drought conditions for different subareas within Brazos G areas.

7.1.3 Drought Indicators

Several techniques can be used to assess the effect of a drought, using parameters such as severity, duration and spatial extent. As previously mentioned, there are numerous ways that the "worst drought" can be defined, and it is important to consider multiple methods of assessing a drought. The Palmer Drought Severity Index, analysis of results from water availability modeling, analysis of historical naturalized streamflows, and evaluation of parameters used to develop groundwater availability models can be incorporated into planning efforts and are discussed in more detail below.

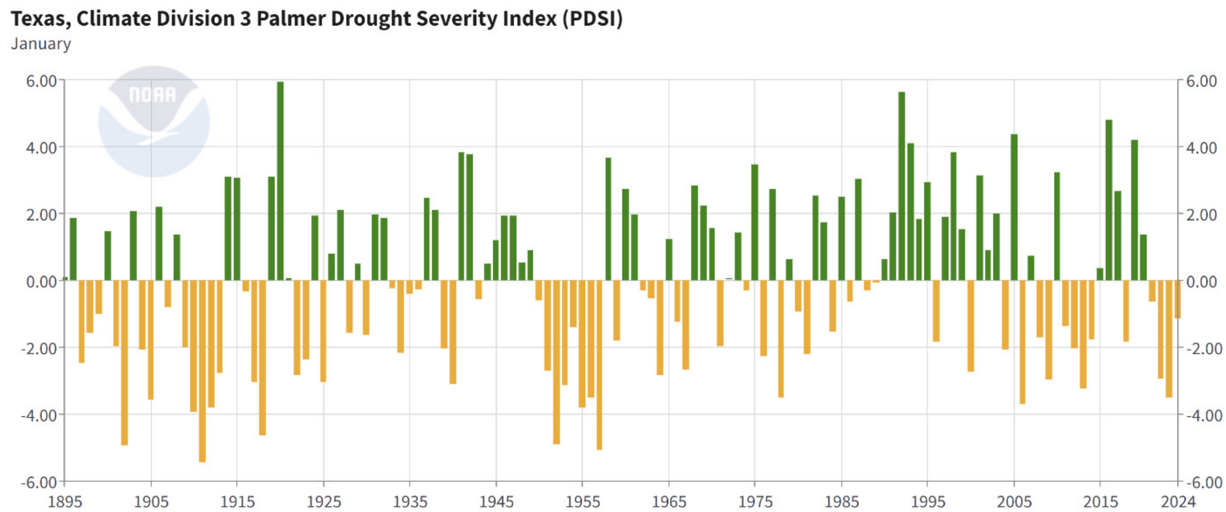
7.1.3.1 Palmer Drought Severity Index (PDSI)

The Palmer Drought Severity Index (PDSI), first published in 1965, was one of the first comprehensive efforts using precipitation and temperature for estimating the moisture of a region. By incorporating monthly temperature and precipitation data along with the moisture capacity of soils, the PDSI accounts for the cumulative water balance from previous months, enabling more accurate tracking of drought over time. NOAA publishes weekly and monthly PDSI maps by climate division for the Contiguous United States, going as far back as 1895. This makes it a widely used and robust tool to monitor long term drought conditions. PDSI values can range from -10 to 10, with negative values indicating dry conditions. Ranges assigned to drought levels are summarized in Table 7.1.

Table 7.1 PDSI Value Ranges

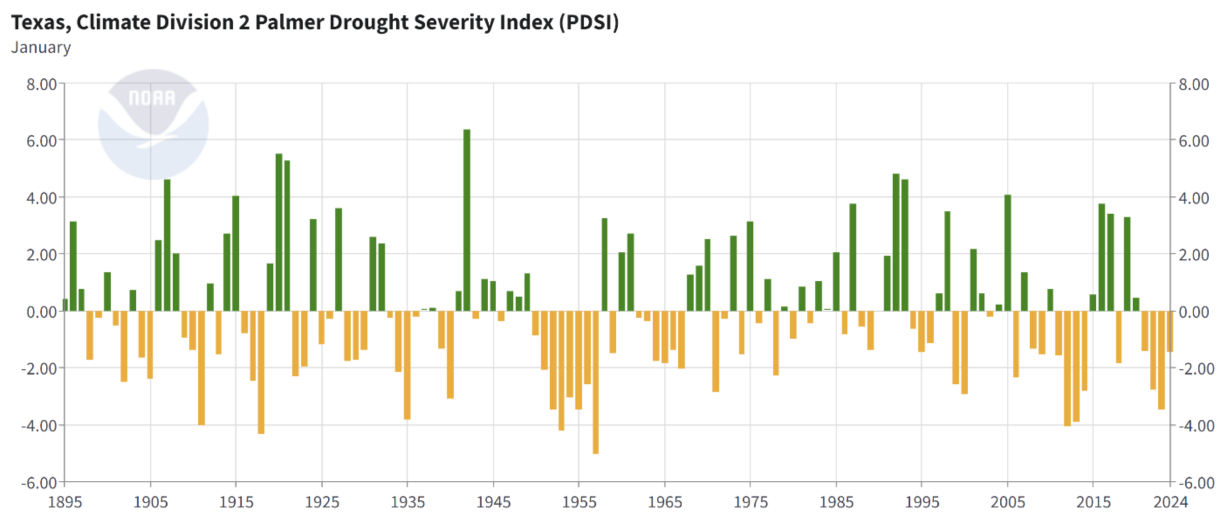
PDSI Value Range	Drought/Moisture Level
Less than -4	Extreme Drought
-4 to -3	Severe Drought
-3 to -2	Moderate Drought
-2 to 2	Mid-Range
2 to 3	Moderately Moist
3 to 4	Very Moist
Greater than 4	Extremely Moist

As stated earlier, most of Brazos G lies in Texas Climate Division 3. Figure 7.3 shows annual PDSI values for Texas Climate Division 3. While the 1908 drought and the more recent drought in the early 21st century were severe, the drought of the 1950s was the most intense over a longer period of time, supporting the continued use of this drought as the drought of record for Brazos G. However, the eight most upstream counties in Brazos G are in Texas Climate Division 2. Figure 7.4 shows that the drought of the 1950s has, to this point, lasted longer than the most recent drought. The available information is not strong enough to change the drought of record, but it is worth noting the intensity of 2011.



Source: NOAA, National Centers for Environmental Information. https://www.ncei.noaa.gov/access/monitoring/climate-at-a-glance/divisional/time-series/4103/pdsi/1/1/1895-2024

Figure 7.3 Historical Palmer Drought Severity Indices: Division 3



Source: NOAA, National Centers for Environmental Information. https://www.ncei.noaa.gov/access/monitoring/climate-at-a-glance/divisional/time-series/4102/pdsi/1/1/1895-2024

Figure 7.4 Historical Palmer Drought Severity Indices: Division 2

The differences between the two climate divisions further emphasizes the importance of dividing Brazos G into sub-areas. One way to address varying Climate Divisions and sub-regions is to incorporate a weighted average of Climate Division PDSI values within the sub-areas. Figure 7.5, Figure 7.6 and Figure 7.7 show the historical weighted PDSI values by sub-area. As can be seen in all of the sub-areas, the 1950s drought is longer and more intense than any other drought period. This indicates that the 1950s drought should be used as the drought of record when considering the PDSI.

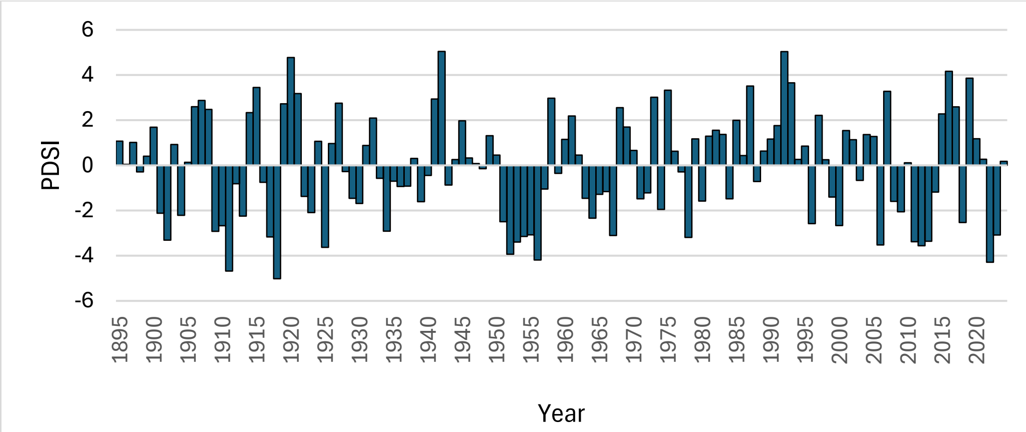


Figure 7.5 Historical Weighted Average Palmer Drought Severity Indices: Upper Brazos G

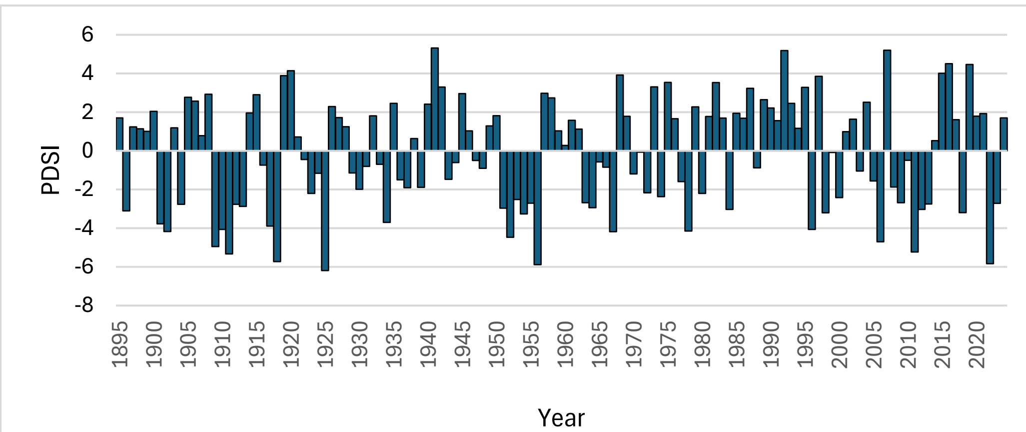


Figure 7.6 Historical Weighted Average Palmer Drought Severity Index: Mid Brazos G

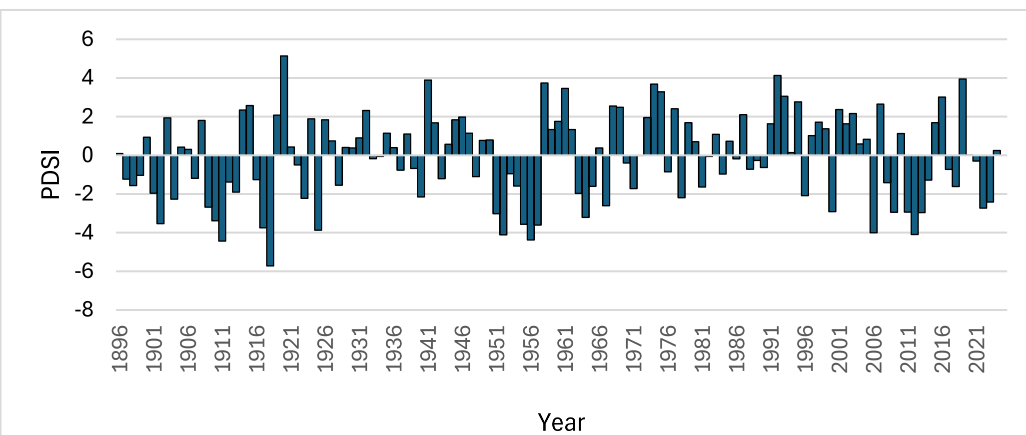


Figure 7.7 Historical Weighted Average Palmer Drought Severity Index: Lower Brazos G

7.1.3.2 Water Availability Modeling

Engineers and planners often use surface water models to demonstrate the effects of historical droughts on water supply. Effects can be more readily observed on surface water than groundwater. Reservoir supplies that were not in place during historic droughts can be assessed using historic hydrology and these modeling tools. The primary tool used in regional planning in Texas to observe the performance of reservoirs under historic drought conditions is the Texas Commission on Environmental Quality (TCEQ) water availability model (WAM). The WAM is the tool used to determine the available flow, firm yield, and safe yield of surface water projects in the regional water plan. Since the publishing of the 2021 Brazos G Regional Water Plan, the TCEQ's official Brazos River Basin WAM (Brazos WAM) has been updated with an extended hydrology through the year 2018. This WAM forms the basis of the modeling performed for the purposes of the 2026 Brazos G Regional Water Plan. The official WAM has been modified to include reservoir sedimentation for reservoirs with storage capacity of 5,000 ac-ft or more and volumetric surveys with reported sedimentation rates. This updated Brazos WAM is referred to as the Brazos G WAM.

The Brazos G WAM was used to analyze the DOR for each reservoir in the Brazos G Area, as shown in Table 7.2. The DOR is considered for a reservoir as the period in which the critical month (month with lowest storage) occurs during a firm yield simulation. In the Middle Brazos G Area, nine out of fourteen reservoirs still have the 1950s drought as their DOR and in the Lower Brazos G Area, four out of five have the 1950s drought as their DOR. This supports the continued use of the 1950s drought as the DOR for reservoirs in the Lower and Middle Brazos G Areas. However, with the extended years of data of the Brazos G WAM, the most recent drought that broke in 2015 is supported as the DOR for the Upper Brazos G Area. In the Upper Brazos G area, eleven out of fourteen reservoirs indicate the 2015 drought as their DOR and zero of the reservoirs indicated the 1950s drought as their DOR. This indicates that the 1950s drought is no longer the best representation of the DOR for the Upper Brazos G Area.

Table 7.2 Drought of Record Based on Reservoir Firm Yield Analysis

Reservoir		County	Critical Year	Critical Month	New More Recent DOR?(1)
Upper Brazos G	Hubbard Creek Reservoir	Shackelford, Stephens	2015	4	Yes
	Lake Abilene	Taylor	2015	4	Yes
	Lake Cisco	Eastland	2015	4	Yes
	Lake Daniel	Stephens	2004	10	Yes
	Lake Davis	Knox	2004	11	Yes
	Lake Fort Phantom Hill	Jones	2015	4	Yes
	Lake Graham	Young	2004	2	Yes
	Lake Kirby	Taylor	2015	2	Yes
	Lake Leon	Eastland	2015	4	Yes
	Lake Palo Pinto	Palo Pinto	2015	2	Yes
	Lake Stamford	Haskell	2014	5	Yes
	Lake Sweetwater	Nolan	2015	3	Yes
	Millers Creek Reservoir	Throckmorton, Baylor	2015	5	Yes
	Possum Kingdom Lake	Stephens, Young, Palo Pinto	2015	4	Yes

Reservoir		County	Critical Year	Critical Month	New More Recent DOR?(1)
Middle Brazos G	Aquilla Lake	Hill	1957	3	No
	Belton Lake	Bell, Coryell	1957	2	No
	Granger Lake	Williamson	1956	11	No
	Lake Creek Lake	McLennan	1956	9	No
	Lake Georgetown	Williamson	2015	2	Yes
	Lake Granbury	Hood	2015	2	Yes
	Lake Mexia	Limestone	1952	1	No
	Lake Pat Cleburne	Johnson	1957	2	No
	Lake Waco	McLennan	1978	12	Yes
	Lake Whitney	Bosque, Hill, Johnson	1963	10	Yes
	Proctor Lake	Comanche	2015	2	Yes
	Squaw Creek Reservoir	Somervell, Hood	1957	3	No
	Stillhouse Hollow Lake	Bell	1957	2	No
	Tradinghouse Creek Reservoir	McLennan	1957	2	No
Lower Brazos G	Lake Limestone	Robertson, Leon, Limestone	1964	12	Yes
	Alcoa Lake	Milam	1956	9	No
	Gibbons Creek Reservoir	Grimes	1957	2	No
	Somerville Lake	Washington, Lee, Burleson	1957	2	No
	Twin Oak Reservoir	Robertson	1957	4	No

Notes:
(1) New more recent drought of record relative to the 1950s drought.

7.1.3.3 Naturalized Streamflow

Naturalized streamflow data can be used as an indicator of drought. Streamflow as an indicator tends to be more sensitive to short-term drought than reservoir modeling due to its lack of storage. To analyze the health of runoff-dependent streams in the basin, naturalized streamflows were obtained from the Brazos WAM at the six locations shown in Figure 7.8. Naturalized flows represent flows that would have been in the stream naturally without the influences of water management activities such as diversions, reservoir operations and wastewater discharges.

Two monitoring sites were chosen in each of the three Brazos G sub-areas. In each area, one site is a tributary and one is on the main stem of the Brazos River. In Upper Brazos G, sites were chosen on the Clear Fork at Nugent and on the Brazos River near South Bend. Sites were chosen on the Leon River near Belton and on the Brazos River at Waco for Mid Brazos G. For Lower Brazos G, sites were chosen on the Little River at Cameron and on the Brazos River near Hempstead. These specific sites were selected due to the completeness of the USGS gage data upon which the flow naturalization is based.

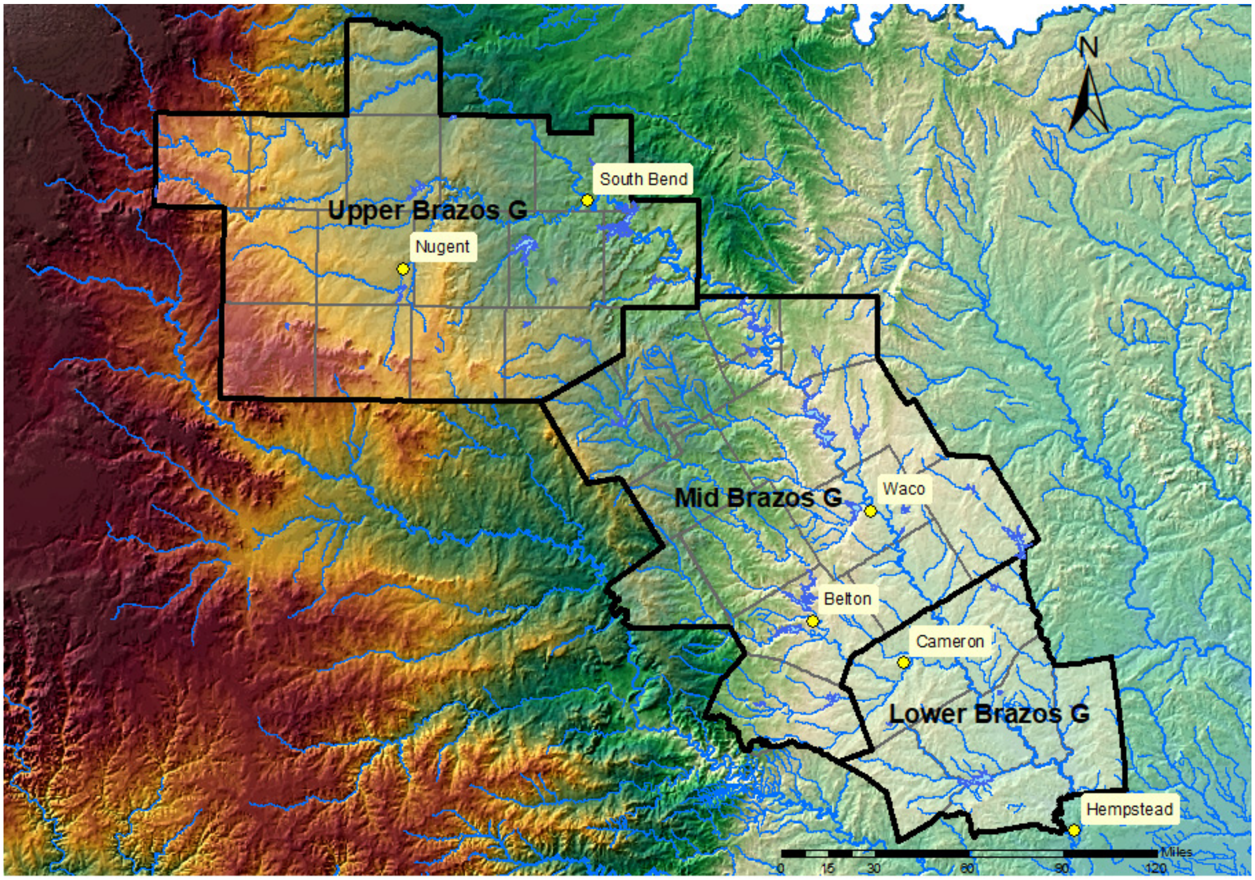
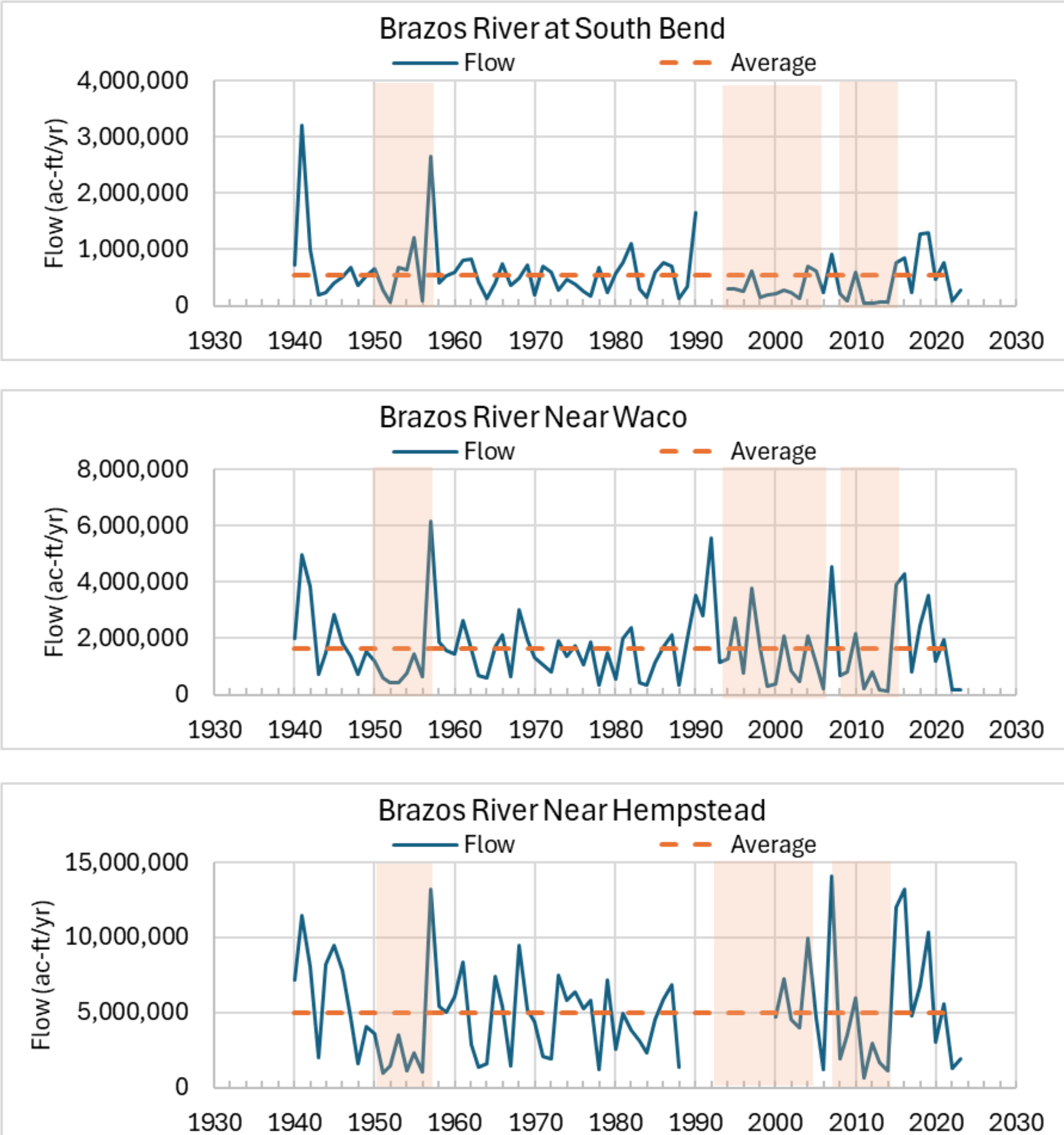


Figure 7.8 Sites Selected for Naturalized Streamflow Analysis

Annual naturalized flows at the three main stem sites are shown graphically in Figure 7.9 and numerically in Table 7.3. These graphs and table compare annual flows to the mean flow for the entire time period (1940-2023). The graphs illustrate the amount of time the streams spent below the long-term mean flow during the three severe drought periods identified. As shown in Figure 7.9, in Upper Brazos G, the 2000s drought had the most total time spent below the long-term average while in the Mid and Lower Brazos G Areas, the 1950s drought had the most total time spent below the long-term average. On the other hand, Table 7.3 suggests that the percentages of days where the daily flows are lower than the mean flow are highest in the 2010s drought for Upper Brazos G area and in the 1950s drought for the Middle and Lower Brazos G areas.



Note: Shaded regions correspond to the 1950s, 2000s, and 2010s droughts.

Source: https://waterdata.usgs.gov/tx/nwis/current/?type=flow_res&group_key=county_cd

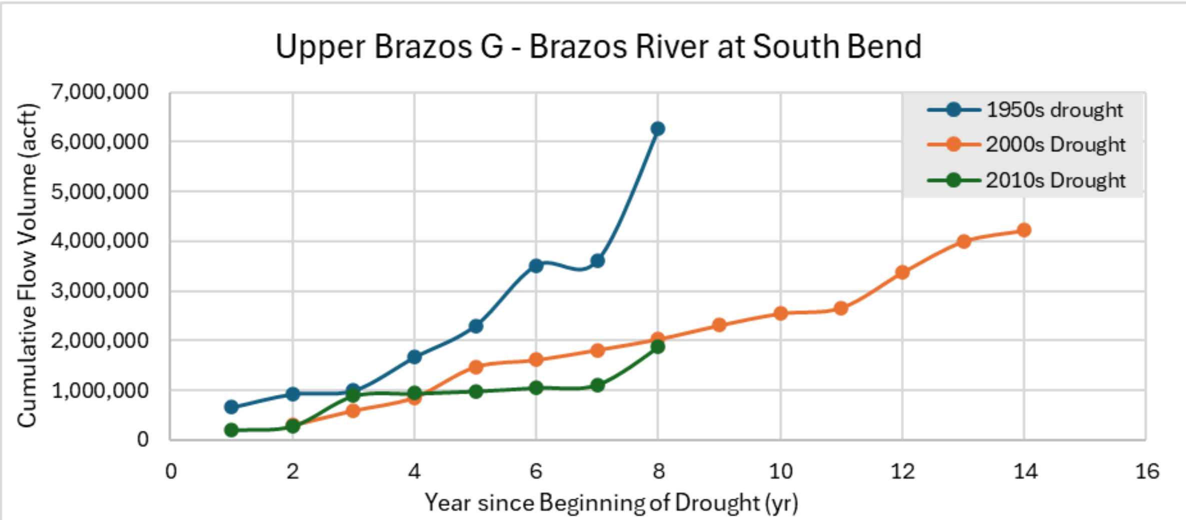
Figure 7.9 Annual Naturalized Flows at Three Sites on the Main Stem of the Brazos River

Table 7.3 Percent of Days the Brazos River is Below Mean Annual Flow for Three Drought Periods

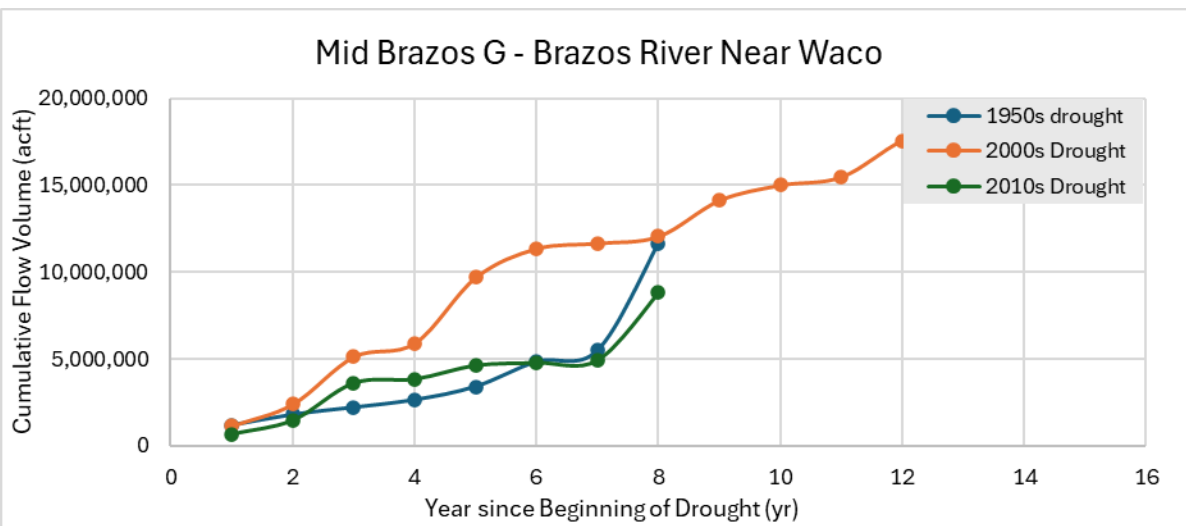
Brazos G Sub-Area	Location	1950s drought	2000s Drought	2010s Drought
Upper	Brazos River at South Bend	93%	92%	96%
Middle	Brazos River near Waco	87%	80%	86%
Lower	Brazos River near Hempstead	86%	71%	82%

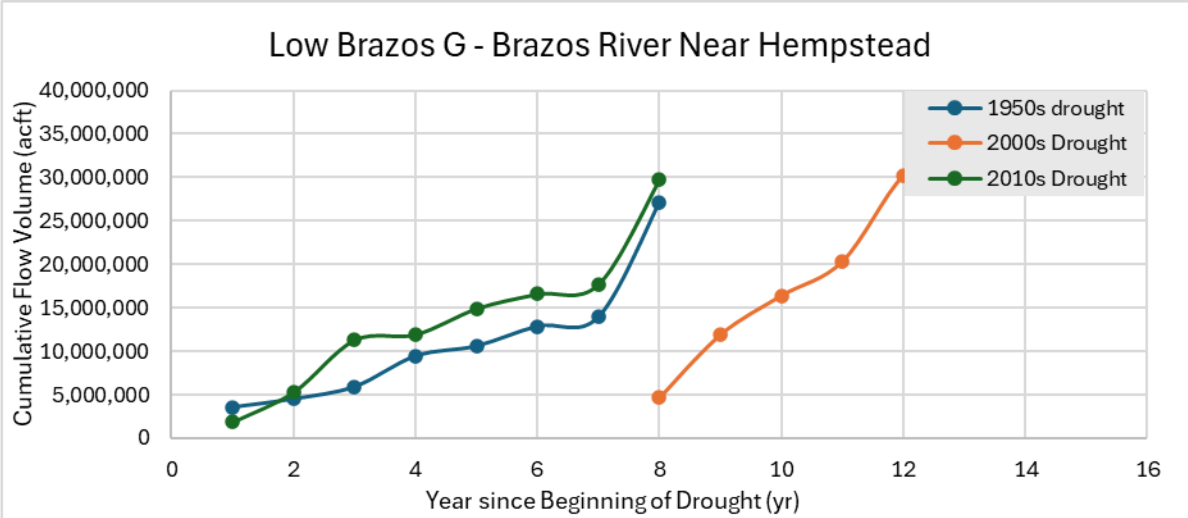
Notes:
(1) The percentages shown above reflect the periods that flow data are available from the USGS stream gages.

The severity of each drought is illustrated in Figure 7.10, which presents cumulative streamflows measured at each of the aforementioned locations. In the figure, cumulative streamflows since drought initiation are compared for three drought periods: 1950 – 1957, 1993 – 2006, and 2008 – 2015. Similar to the findings from Table 7.3, although some flow data are missing, Figure 7.10 suggests that the cumulative flows in the 2010s drought for Upper Brazos G area are generally lower, while the cumulative flows in the 1950s drought for the Middle and Lower Brazos G areas are lower. This finding indicates that the 2010s drought should be considered to be the new drought of record for streamflow (useful for evaluating run-of-river water rights) in the Upper Brazos G area.



Note: Flow data for the first year during the 2000s drought was not available.

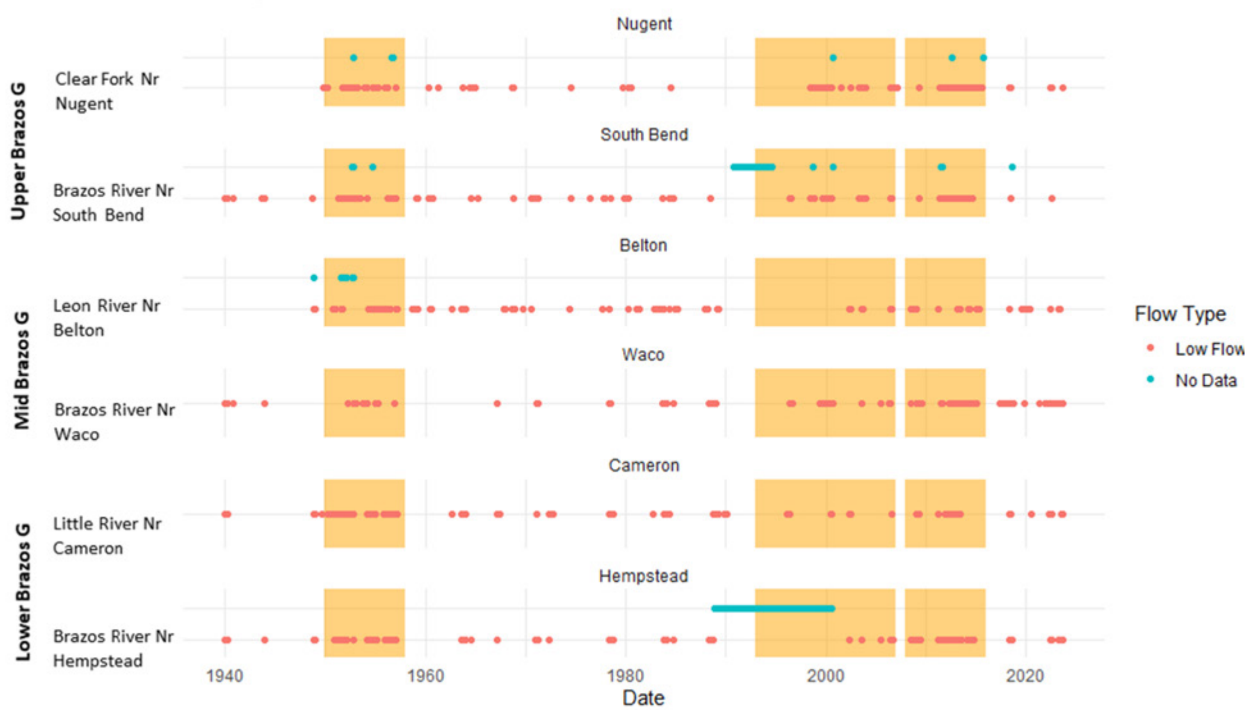




Note: Flow data for the first seven years during the 2000s drought was not available.

Figure 7.10 Cumulative Naturalized Streamflow for Three Drought Periods for Upper, Mid, & Lower Brazos G

A comparison of low-flow periods for each of the six selected stream locations was also performed and is shown in Figure 7.11. For this graph, a low-flow period is defined as any month where the monthly flow rate falls below the 10th percentile of the monthly flow rates recorded from 1940 to 2023. This comparison highlights each of the drought periods, showing which sites spent the most time in low-flow conditions. For all the streams selected in Upper, Mid, and Lower Brazos G, it appears that the most severe periods are the 1950s drought and the 2010s drought, while the conditions in the 2000 drought is less pronounced.



Note: Shaded regions correspond to the 1950s, 2000s, and 2010s droughts.

Figure 7.11 Comparison of Low-Flow Periods for Six Selected Locations

7.1.3.4 Groundwater

Groundwater systems continually adjust to changes in climate, water withdrawal, and land use. Certain aquifers are more drought sensitive than others based on a multitude of factors including land type, recharge rates, and discharge rates. Sensitivity analyses can provide information on how different variables affect aquifer conditions. An aquifer is susceptible to drought if a small change in the inflow or outflow greatly affects the water level of the aquifer. Sensitivities to drought for aquifers in Brazos G range from very low to high. A very low sensitivity implies that small changes in the inflow or outflow do not cause a significant change in aquifer conditions while a high sensitivity implies that small changes in the inflow or outflow cause a significant change aquifer conditions. Table 7.4 presents drought sensitivity assessments obtained from the TWDB groundwater availability modeling (GAM) reports. The Edwards BFZ, Seymour, Trinity, Brazos River Alluvium, and Woodbine aquifers were found to be the most drought susceptible with sensitivities ranging from moderate to high.

Table 7.4 Drought Sensitivity of Brazos G Aquifers

Aquifer Name	Aquifer Type	Drought Sensitivity		Counties	GMAs
		Outcrop	Subcrop		
Carrizo-Wilcox	Major	Low	Very Low	Brazos, Burleson, Falls, Grimes, Lee, Limestone, Milam, Robertson, Williamson	11, 12, 13, 14, 15, 16
Edwards (BFZ)	Major	High	High	Bell, Williamson	8, 9, 10, 13
Edwards-Trinity (Plateau)	Major	Low	Very Low	Nolan, Taylor	2, 3, 4, 7, 8, 9, 10
Gulf Coast	Major	Low	--	Brazos, Grimes, Washington	11, 12, 13, 14, 15, 16
Seymour	Major	Moderate	--	Fisher, Haskell, Jones, Kent, Knox, Stonewall, Throckmorton, Young	1, 6, 7
Trinity	Major	Moderate	Very Low	Bell, Bosque, Callahan, Comanche, Coryell, Eastland, Erath, Falls, Hamilton, Hill, Hood, Johnson, Lampasas, Limestone, McLennan, Milam, Palo Pinto, Somervell, Taylor, Williamson	6, 7, 8, 9, 11, 12, 13
Blaine	Minor	Low	Very Low	Fisher, Haskell, Jones, Kent, Knox, Nolan, Stonewall	1, 6, 7
Brazos River Alluvium	Minor	Moderate	--	Bosque, Brazos, Burleson, Falls, Grimes, Hill, McLennan, Milam, Robertson, Washington	8, 12, 14
Dockum	Minor	Low	Very Low	Fisher, Kent, Nolan	1, 2, 3, 6, 7
Ellenburger-San Saba	Minor	Very Low	Very Low	Lampasas	7, 8, 9
Marble Falls	Minor	Low	--	Lampasas	7, 8, 11
Queen City	Minor	Low	Very Low	Brazos, Burleson, Grimes, Lee, Milam, Robertson, Washington	11, 12, 13, 14, 15
Sparta	Minor	Very Low	Very Low	Brazos, Burleson, Grimes, Lee, Robertson, Washington	11, 12, 13, 14, 16
Woodbine	Minor	Moderate	Very Low	Hill, McLennan	8
Yegua-Jackson	Minor	Low	--	Brazos, Burleson, Grimes, Lee, Washington	11, 12, 13, 14, 15, 16

Notes:
(1) "--" indicates information not available.

The subcrop and outcrop areas of Brazos G aquifers are shown in Figure 7.12. The colors on the map represent the drought sensitivities with blue representing least sensitive and red representing most sensitive. The Edwards BFZ is the only Brazos G aquifer with a high sensitivity to drought in both its subcrop and outcrop. The Seymour Aquifer, Trinity Outcrop, Brazos River Alluvium Outcrop, and Woodbine Outcrop have a moderate sensitivity to drought. The remaining aquifers in Brazos G have a low or very low sensitivity to drought.

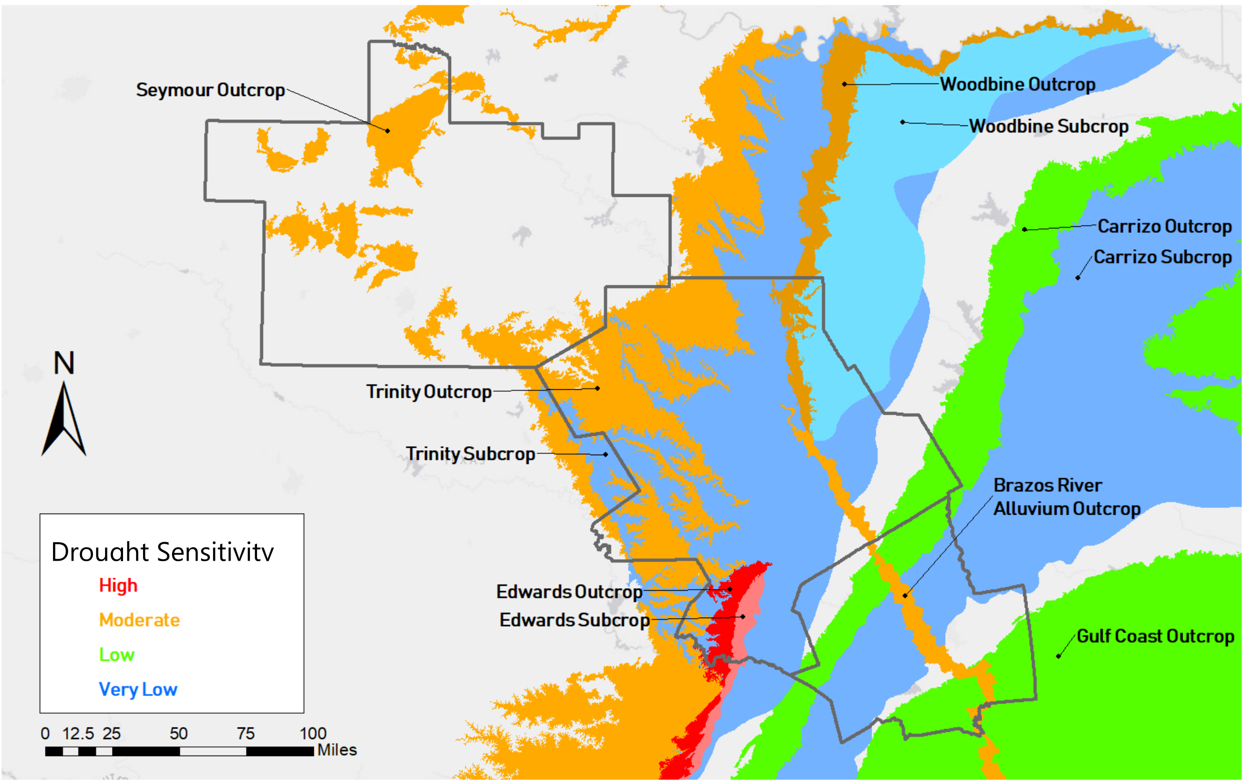


Figure 7.12 Drought Sensitivity of Brazos G Aquifers

7.1.4 Recent Droughts and New DORs

Three separate droughts were considered in this drought of record analysis: the 1950s drought, the drought that lasted from 1993-2006, and the 2008-2015 drought. The 1950s drought was arguably the most devastating drought ever recorded in Texas and has been used by water planners and engineers as the drought of record for many years. It included three of the driest years on record at the time it occurred: 1956 (2nd), 1954 (3rd), and 1951 (8th). As noted previously, the naturalized flows of the official WAM that serves as the basis for the Brazos G WAM have been extended through the year 2018, capturing each of these drought periods.

The Brazos WAM was used to evaluate the firm yields of the major reservoirs in the Brazos G Area. The analysis indicates that a new drought of record has occurred for each reservoir in Upper Brazos G, with 11 out of 14 having the 2008-2015 drought as their DOR and 3 out of 14 with 1993-2006 as the DOR. This indicates that the 1950s drought should no longer be used as the DOR in Upper Brazos G and that the 2008-2015 drought should be used instead. In Mid Brazos G, 9 out of 14 reservoirs still had the 1950s drought as their DOR, 3 out of 14 had the 2008-2015 drought as their DOR, one had its critical year in 1963, and another had its critical year in 1978. In Lower Brazos G, 4 out of the 5 reservoirs had the 1950s drought as their DOR, one had the 2008-2015 drought as the DOR. This indicates that the 1950s drought should still be considered as the DOR in Mid and Lower Region G.

7.2 Uncertainty and Drought(s) Worse Than the Drought of Record

This section highlights Brazos G's approach to addressing uncertainty and preparing for extreme drought conditions and summarizes the measures to enhance resilience against droughts worse than the Drought of Record (DWDOR).

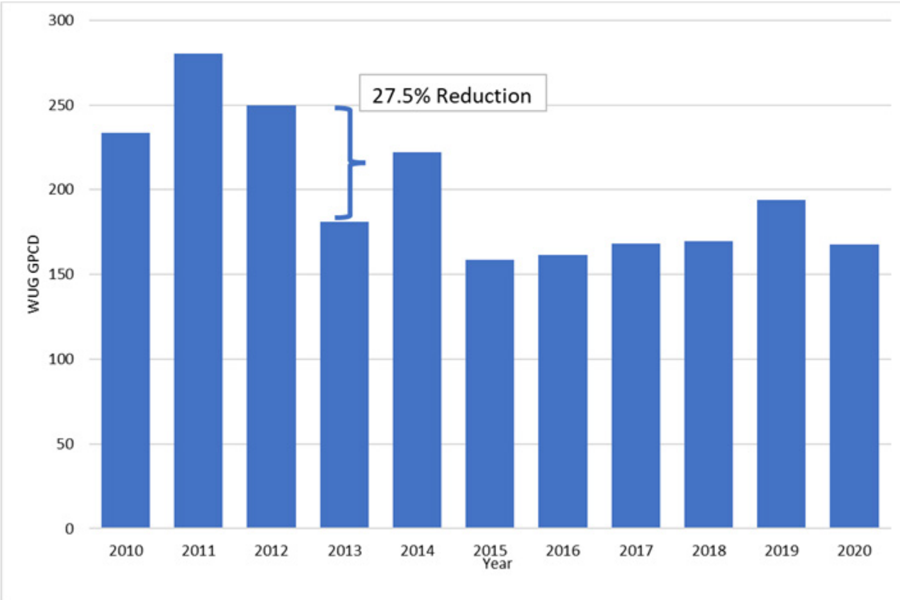
7.2.1 Planning for Uncertainty

The Brazos G Regional Water Planning Group (RWPG) acknowledges the inherent uncertainties associated with planning factors such as population, demand, and supply during the planning process. In addressing these uncertainties and preparing for drought conditions, the RWP utilizes baseline water demand factors reflective of recent drought conditions to inform demand projections in the Brazos G Area. Additionally, supply projections, informed by the TCEQ WAM, reflect safe yields during drought conditions, as documented in Brazos G's 2026 Technical Memorandum. Given that the RWP is updated every five years, the Brazos G RWPG will closely monitor and review demand and supply conditions, ensuring ongoing preparedness.

7.2.2 Existing Measures for Preparation of the DWDOR

As discussed in Section 7.2.1, the demand projection in Chapter 2 reflects baseline demand during recent drought years, while the supply projection in Chapter 3 reflects safe yields under drought conditions. Although demand from the DWDOR is likely to exceed baseline demand, these projections serve as the initial benchmarks for the Brazos G RWPG to prepare for the DWDOR. Additionally, many Water User Groups (WUGs) within Brazos G have adopted a Drought Contingency Plan (DCP), which includes measures such as a weekly irrigation schedule and fines. Based on the GPCD reduction during the 2010s drought shown in Figure 7.13, WUGs in Brazos G achieved a 27.5 percent reduction from 2012 to 2013, some of which could be attributed to conservation efforts and the natural replacement of inefficient fixtures.

These measures, including the implementation of a weekly irrigation schedule and fines, are strategically chosen because they have proven effective in reducing water demand during drought conditions while minimizing the burden on both human and financial resources. However, it should be noted that due to the permanent irrigation schedule and other conservation measures already in place in many WUGs in Brazos G, the recent GPCD has stabilized, indicating that achieving a similar magnitude of reduction in the future will be challenging. Consequently, while the current drought measures employed by many WUGs are expected to reduce water demand, the reduction may be less significant than what was observed during the 2010s. Since the baseline demand used in the 2026 RWP projection reflects the higher dry-year demand since 2010, it provides a buffer to address potential drought shortages.



Sources: TWDB provided spreadsheet dated March 2022 (CORRECTED - WUG_HistoricalData_2026RWPs.xlsx).

Figure 7.13 Drought Sensitivity of Brazos G Aquifers

7.2.3 Potential Additional Measures for DWDOR Resilience

As part of drought preparedness efforts, the Texas Section of the American Water Works Association (TAWWA) compiled the TAWWA Drought Planning Survey Results . This report outlines key findings regarding drought planning for Texas public water utilities. It highlights effective measures for demand management during droughts, such as monetary consequences like fines and fees, which are seen as effective but diminishing in impact over time. Additionally, designated watering schedules are considered the next most effective water-saving measure; however, many utilities surprisingly lack such schedules, even during drought periods. As discussed in Section 7.2.2, these drought measures have proven to be effective measures in reducing demand during droughts. Therefore, the Brazos G RWPG recommends that the WUGs within the Brazos G area consider implementing these measures as part of their drought contingency planning if they are not already utilized.

7.3 Current Drought Preparations and Response

Section 7.3 describes the current drought preparations and responses in the Brazos G area.

7.3.1 Current Drought Preparations and Response

This section describes the water user group level planning and basin responses in the Brazos G area.

7.3.1.1 Water User Group Level Planning

Water user groups (WUGs) in Brazos G can prepare for drought by participating in the regional planning process. The regional planning process attempts to meet projected water demands during a drought of severity equivalent to the drought of record. WUGs that provide accurate information to the planning group and TWDB and consider recommendations accepted by the regional planning group should be able to supply water through drought periods. In addition, all wholesale water providers (WWPs) and most municipalities develop individual drought contingency plans or emergency action plans to be implemented at various stages of a drought.

7.3.1.2 Basin Responses

Throughout Texas, including the Brazos River Basin, water rights are issued under the prior appropriation system. During times of shortage, curtailment of water rights has become necessary in recent droughts. Dow Chemical made priority water rights calls in the Brazos River Basin in 2009, 2011, 2012, and 2013. When a priority call is made, upstream water rights that are junior in priority to the water right making the call are required to forgo diversions and impoundment of water and allow streamflows to pass downstream to honor the priority of downstream senior rights. The priority calls affected most water rights in the basin. Partly in response to the priority calls and in response to the ongoing drought, the Brazos Watermaster Program was established by petition and subsequent order issued by the TCEQ Commissioners on April 21, 2014. The program has jurisdiction over the Lower Brazos River Basin including and below Possum Kingdom Reservoir. The Brazos Watermaster will monitor water use and streamflow and coordinate with water rights holders when flows need to be passed to honor senior water rights.

7.3.2 Assessment of Local Drought Contingency Plans

Predicting the timing, severity and length of a drought is an inexact science; however, it is safe to assume that drought is an inevitable component of the Texas climate. For this reason, it is critical to plan for these occurrences with policies outlining adjustments to the use, allocation and conservation of water in response to drought conditions. Drought and other circumstances that interrupt the reliable supply or water quality of a source often lead to water shortages. During a drought period, there generally is a greater demand on the already decreased supply as individuals attempt to maintain landscape vegetation through irrigation because less rainfall is available. This can further exacerbate a water supply shortage situation.

In accordance with the requirements outlined in the Texas Water Code (TWC) Chapter 11 and the Texas Administrative Code §288(b), wholesale water suppliers, retail public water suppliers (serving 3,300 connections or more), and irrigation districts must submit a revised and adopted drought contingency plan to the TCEQ every five years for approval. Retail public water systems with fewer than 3,300 connections must have their drought contingency plans (DCPs) available during TCEQ inspections, but they are not required to submit their plan to TCEQ. The most recent deadline to submit updated DCPs to TCEQ was May 1, 2024.

TCEQ has developed model DCPs for wholesale and retail water providers to use as a guidance tool when preparing their respective drought contingency plans. Although the model DCPs might not be applicable to every water system, they can serve as a starting point and an example for most entities to follow. Important DCP components that should be addressed in the plan include the following:

- Specific and quantified goals targeted for water use reduction.
- Drought response stages, including triggers to initiate and terminate each stage.
- Descriptions of drought indicators along with supply/demand management measures.
- Notification and enforcement procedures, including variance for granting exceptions.
- Public education and input into the plan.
- Coordination with regional water planning groups.

In order to minimize or mitigate the impact of water shortages due to emergency situations, including severe drought and equipment failure, the structure of DCPs is based on a variety of triggers that initiate a variety of responses depending on the 'stage' or severity of the situation. Stage one of a DCP typically represents a situation of mild water shortage, which results in initiating drought management measures on a voluntary basis. The last stage of a DCP usually represents an extreme water shortage for a community and triggers the most stringent mandatory drought management measures.

Local DCP information adopted by 11 wholesale and 86 retail water providers, as well as 13 groundwater conservation districts in the region was reviewed and summarized for each stage, including drought triggers used for initiating specific drought responses. The total number of DCPs reviewed was 86, which also included the 42 entities' DCPs reviewed during the previous planning cycle. The Brazos River Authority provided the Brazos G team with copies of DCPs received from approximately 96 wholesale and retail water providers, which includes DCPs that were adopted during previous cycle; however, follow-up calls were made to many of those entities along with the remaining 33 wholesale and retail water providers to obtain copies of their recently updated DCPs. Approximately 82 percent of the wholesale and retail water providers adopted revised DCPs during 2018-2019.

A summary of drought triggers evaluated during the review of each DCP, included the following:

- Natural/Manmade Contamination.
- Demand/Capacity Based.
- Mechanical Failure.
- Groundwater Level.
- Groundwater Production Rate.
- Reservoir Level.
- Supply Based.
- Time Period.
- Wholesale Provider (initiated by).
- Other (i.e., Contractual Obligation, Natural Disaster, Notification by Executive Leadership).

In addition, the following drought responses were reviewed based on the drought stage and associated triggers of the DCP:

- Assessment and Identification of Situation.
- Water Rate Change or Surcharge.
- Irrigation Schedule.
- Mandatory Reduction.
- Notification of Public Agencies or Specific Users.

- Prohibited Use.
- Public Notification.
- Discontinue Water Diversions.
- Suspend Service.
- Water Allocation.
- Other (i.e., Additional Fees, Temporary Variance).

7.3.2.1 Water User Groups

Based on TWDB guidance outlined in this regional water planning cycle, drought triggers used for initiating drought responses are summarized for 86 retail water providers and presented in Table 7.5.

7.3.2.2 Wholesale Water Providers

Drought contingency plans for all WWPs in the Brazos G Area were also evaluated. Since the WWPs typically serve a number of cities and entities in the region, they play a different role than the retail providers in how they monitor the onset of drought, as well as respond to their wholesale customers to address drought conditions. In addition, telephone discussions were conducted with a majority of the WWPs to better understand their plans on how they would address the impact of severe drought or contamination of their water supplies. A summary of their DCP triggers and responses is presented in Table 7.6.

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Table 7.5 Summary of DCPs for WUGs in the Brazos G Area

Entity Name	DCP Date	Stage Number	Triggers										Responses											Water Supplies	
			Contamination	Demand/Capacity Based	Failure	Groundwater Level	Production Rate	Reservoir Level	Supply Based	Time	Wholesale Provider	Other(1)	Assessment and Identification	Water Rate Change or Surcharge	Irrigation Schedule	Mandatory Reduction	Notification of Public Agencies or Specific Users	Prohibited Use	Public Notification	Discontinue Water Diversions	Suspend Service	Water Allocation	Other(2)	SW	GW
439 WSC	2023	1		√					√		√				√				√					√	
		2		√					√		√				√		√	√	√						
		3		√							√				√		√	√	√				√		
		4 – Emerg.	√	√	√						√				√	√	√	√	√				√		
Acton MUD	2019	1		√								√			√				√				√	√	√
		2		√								√			√		√	√	√				√		
		3		√								√			√		√	√	√				√		
		4							√			√			√		√	√	√				√		
		5 - Emerg.	√		√		√		√			√				√	√	√	√				√		
		6 - Wtr Alloc.		√								√		√			√		√			√	√		
Bethesda WSC	2019	Dry										√			√				√				√	√	√
		1		√							√	√			√		√	√	√				√		
		2		√					√		√	√			√		√	√	√				√		
		3	√	√	√				√		√	√				√	√	√	√				√		
Block House MUD	2024	1										√			√			√	√				√	√	
		2		√					√		√	√			√		√	√	√				√		
		3	√	√					√		√	√			√		√	√	√				√		
		4 - Emerg.							√		√	√			√		√	√	√		√	√	√		
Bold Springs WSC	2018	1								√		√			√				√				√		√
		2					√					√			√			√	√				√		
		3					√					√				√		√	√				√		
		4					√					√				√	√	√	√			√	√		
		5 - Emerg.	√		√							√				√	√	√	√			√	√		
Brushy Creek MUD	2024	1	√	√	√	√						√			√			√	√					√	
		2	√	√	√	√						√			√		√	√	√				√		
		3	√	√	√	√						√			√	√	√	√	√				√		
City of Abilene	2019	Voluntary								√					√				√				√	√	
		1		√				√	√			√			√		√	√	√				√		
		2		√	√			√	√			√			√		√	√	√				√		
		3 - Emerg.		√	√			√	√			√		√		√	√	√	√			√	√		
		4 - Wtr Crisis	√		√							√		√		√	√	√	√			√	√		

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Entity Name	DCP Date	Stage Number	Triggers										Responses											Water Supplies	
			Contamination	Demand/Capacity Based	Failure	Groundwater Level	Production Rate	Reservoir Level	Supply Based	Time	Wholesale Provider	Other(1)	Assessment and Identification	Water Rate Change or Surcharge	Irrigation Schedule	Mandatory Reduction	Notification of Public Agencies or Specific Users	Prohibited Use	Public Notification	Discontinue Water Diversions	Suspend Service	Water Allocation	Other(2)	SW	GW
City of Albany	2024	1		√				√	√		√				√		√		√				√	√	
		2		√				√	√		√				√		√	√	√				√		
		3		√				√	√		√			√			√	√	√			√	√		
		4 - Emerg.	√	√	√			√	√		√		√			√	√	√	√				√		
City of Anson	2019	1		√				√									√		√					√	
		2		√				√								√	√		√						
		3		√				√						√		√	√	√	√			√	√		
		4 - Emerg.	√		√								√				√						√		
City of Bellmead	2023	1						√	√			√			√		√	√	√						√
		2						√	√			√			√		√	√	√				√		
		3						√	√			√			√		√	√	√				√		
		4 – Emerg.	√		√										√	√	√	√	√				√		
City of Belton	2019	1		√				√	√		√	√			√				√				√	√	
		2		√				√	√		√	√			√		√	√	√				√		
		3		√				√	√		√	√			√		√	√	√				√		
		4						√	√		√	√			√		√	√	√				√		
		5 - Emerg.	√		√						√	√		√		√	√	√	√			√	√		
City of Breckenridge	2019	1			√			√	√			√					√		√				√	√	
		2			√			√	√			√			√		√	√	√				√		
		3			√			√	√			√				√	√	√	√			√	√		
		4 - Emerg.	√		√			√				√	√			√	√	√	√			√	√		
City of Bryan	2019	1								√		√			√				√				√		√
		2		√								√			√		√	√	√				√		
		3	√	√	√		√		√			√				√	√	√	√			√	√		
City of Burleson	2024	1	√	√	√		√				√	√			√	√	√		√				√	√	
		2													√	√	√	√	√				√		
		3													√	√	√	√	√				√		
City of Cedar Park	2019	1										√			√				√				√	√	
		2		√				√	√		√	√			√		√	√	√				√		
		3	√	√				√	√		√	√			√		√	√	√				√		
		4 - Emerg.									√	√				√	√	√	√		√	√	√		
City of Cisco	2024	1						√	√			√					√		√				√	√	
		2						√	√			√			√	√	√	√	√			√	√		
		3 - Emerg.		√				√	√			√		√		√	√	√	√			√	√		

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Entity Name	DCP Date	Stage Number	Triggers										Responses											Water Supplies	
			Contamination	Demand/Capacity Based	Failure	Groundwater Level	Production Rate	Reservoir Level	Supply Based	Time	Wholesale Provider	Other(1)	Assessment and Identification	Water Rate Change or Surcharge	Irrigation Schedule	Mandatory Reduction	Notification of Public Agencies or Specific Users	Prohibited Use	Public Notification	Discontinue Water Diversions	Suspend Service	Water Allocation	Other(2)	SW	GW
City of Cleburne	2024	1	√	√	√			√	√			√	√			√	√	√	√				√	√	√
		2	√	√	√			√	√			√			√	√	√	√	√				√		
		3	√	√	√			√	√			√			√	√	√	√	√		√		√		
		4 - Emerg.	√	√	√			√	√			√			√	√	√	√	√		√		√		
City of College Station	2019	1		√	√					√	√	√			√		√	√	√				√		√
		2		√					√			√			√		√	√	√			√	√		
		3 - Emerg.	√		√							√				√	√	√	√		√	√	√		
City of Comanche	2011	1		√				√				√			√	√	√		√				√	√	
		2		√				√				√			√	√	√		√				√		
		3		√				√				√			√	√	√	√	√				√		
		Emerg.	√	√	√			√				√		√	√		√		√			√	√		
City of Copperas Cove	2015	1		√							√				√		√	√	√				√	√	
		2		√							√				√		√	√	√				√		
		3		√							√				√		√	√	√				√		
		4 - Emerg.	√		√							√				√	√	√	√		√	√	√		
City of Eastland	2020	1			√			√							√			√	√					√	
		2													√		√	√							
		3															√	√							
		4															√	√							
City of Gatesville	2018	1		√					√		√				√				√				√	√	
		2		√							√				√		√	√	√				√		
		3 - Emerg.	√		√						√	√				√	√	√	√				√		
		4 - Pro Rata									√	√		√			√		√			√	√		
City of Georgetown	2023	1		√		√		√	√	√		√	√		√		√	√	√				√	√	√
		2		√		√		√	√	√		√	√		√		√	√	√				√		
		3 - Emerg.		√					√	√		√	√			√	√	√	√				√		
		4	√	√	√				√	√		√	√			√	√	√	√			√	√		
City of Glen Rose	2024	1		√					√						√			√	√				√	√	
		2							√						√				√				√		
		3							√						√				√				√		
		4 – Emerg.			√				√						√	√			√				√		
City of Gordon	2014	1		√				√									√		√					√	
		2		√				√								√	√		√						
		3 - Emerg.		√				√								√	√		√			√			

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Entity Name	DCP Date	Stage Number	Triggers										Responses											Water Supplies	
			Contamination	Demand/Capacity Based	Failure	Groundwater Level	Production Rate	Reservoir Level	Supply Based	Time	Wholesale Provider	Other[1]	Assessment and Identification	Water Rate Change or Surcharge	Irrigation Schedule	Mandatory Reduction	Notification of Public Agencies or Specific Users	Prohibited Use	Public Notification	Discontinue Water Diversions	Suspend Service	Water Allocation	Other[2]	SW	GW
City of Graham	2019	1		√				√				√			√				√				√	√	
		2		√				√	√			√			√		√	√	√				√		
		3		√				√	√			√			√		√	√	√				√		
		4		√				√	√			√			√		√	√	√			√	√		
		5 - Emerg.	√		√			√	√			√				√	√	√	√			√	√		
City of Granbury	2024	1		√											√		√		√				√	√	√
		2		√											√		√	√	√				√		
		3		√											√		√	√	√				√		
		4							√						√	√	√	√	√				√		
		5 - Emerg.	√		√		√		√			√		√		√	√	√	√			√			
City of Hamilton	2019	1						√							√								√	√	
		2			√			√							√								√		
		3						√							√			√					√		
		4 - Emerg.	√		√			√						√	√	√						√	√		
City of Harker Heights	2024	1		√							√				√				√				√	√	
		2		√					√		√				√		√	√	√				√		
		3		√					√		√						√	√	√				√		
		4 - Emerg.	√	√	√				√			√				√	√	√	√		√	√	√		
City of Hearne	2001	1					√									√	√		√				√		√
		2					√								√	√	√		√				√		
		3					√								√	√	√		√				√		
		4					√								√	√	√		√				√		
		5 - Emerg.	√		√												√		√						
City of Hubbard	2018	1				√			√						√				√				√	√	√
		2				√			√						√		√	√	√				√		
		3				√			√						√		√	√	√				√		
		4				√			√						√		√	√	√				√		
		5 - Emerg.	√		√									√			√	√	√			√			
City of Hutto	2022	1		√					√			√			√		√		√				√	√	
		2		√					√			√			√		√	√	√				√		
		3		√					√			√			√		√	√	√				√		
		4 – Emerg.	√	√	√				√			√				√	√	√	√				√		
		5 – Water allo.										√					√		√			√	√		

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Entity Name	DCP Date	Stage Number	Triggers										Responses											Water Supplies	
			Contamination	Demand/Capacity Based	Failure	Groundwater Level	Production Rate	Reservoir Level	Supply Based	Time	Wholesale Provider	Other[1]	Assessment and Identification	Water Rate Change or Surcharge	Irrigation Schedule	Mandatory Reduction	Notification of Public Agencies or Specific Users	Prohibited Use	Public Notification	Discontinue Water Diversions	Suspend Service	Water Allocation	Other[2]	SW	GW
City of Killeen	2019	1		√				√	√		√	√			√				√				√	√	
		2		√				√	√		√	√			√		√	√	√				√		
		3		√				√	√		√	√			√		√	√	√				√		
		4		√				√	√		√	√			√		√	√	√				√		
		5 - Emerg.	√		√						√	√					√	√	√				√		
City of Lampasas	2024	1		√							√	√			√		√		√				√	√	
		2		√							√	√			√		√	√	√				√		
		3		√							√	√			√		√	√	√				√		
		4		√							√	√			√	√	√	√	√				√		
		5 - Emerg.	√		√						√	√				√	√	√	√			√	√		
City of Leander	2024	1		√					√	√		√	√		√				√				√	√	
		2		√				√	√		√		√		√	√	√	√	√	√			√		
		3		√				√	√		√	√			√	√	√	√	√	√			√		
		4 - Emerg.	√	√	√			√	√		√	√				√	√	√	√				√		
City of Lexington	2022	1		√				√				√			√				√				√		√
		2		√				√	√			√			√			√	√				√		
		3		√				√				√		√	√	√		√	√				√		
		4		√				√						√	√	√	√	√	√				√		
		5 – Emerg.	√		√									√		√	√	√					√		
City of Liberty Hill	2012	1		√					√			√			√				√				√	√	√
		2		√					√			√			√		√	√	√				√		
		3	√	√	√				√		√	√				√	√	√	√				√		
City of Lorena	2024	1		√					√			√			√		√		√				√	√	
		2		√	√			√	√			√			√		√	√	√						
		3		√	√											√	√	√	√						
		4 – Emerg.	√		√											√	√		√						
City of Mexia	2024	1		√				√	√		√				√		√		√					√	√
		2		√				√	√		√				√		√	√	√				√		
		3		√	√			√	√		√			√		√	√	√	√			√	√		
		4 - Emerg.	√		√								√			√	√		√				√		

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Entity Name	DCP Date	Stage Number	Triggers										Responses											Water Supplies	
			Contamination	Demand/Capacity Based	Failure	Groundwater Level	Production Rate	Reservoir Level	Supply Based	Time	Wholesale Provider	Other[1]	Assessment and Identification	Water Rate Change or Surcharge	Irrigation Schedule	Mandatory Reduction	Notification of Public Agencies or Specific Users	Prohibited Use	Public Notification	Discontinue Water Diversions	Suspend Service	Water Allocation	Other[2]	SW	GW
City of Midlothian	2019	1	√	√	√			√	√		√	√			√		√	√	√				√	√	
		2	√	√	√			√	√		√	√			√		√	√	√				√		
		3	√	√	√			√	√		√	√				√	√	√	√			√	√		
		Emerg.	√	√	√							√		√		√	√	√	√			√	√		
City of Mineral Wells	2024	1		√	√			√				√			√				√				√	√	
		2		√	√			√				√			√		√	√	√				√		
		3		√	√			√				√				√	√	√	√						
		4		√	√			√				√		√		√	√	√	√						
		5 – Emerg.	√		√							√	√	√		√	√	√	√						
City of Robinson	2019	1								√		√					√		√				√	√	√
		2						√	√	√		√			√		√		√				√		
		3		√				√	√	√		√			√		√	√	√				√		
		4		√				√	√	√		√			√		√	√	√				√		
		5		√	√			√	√	√		√			√		√	√	√				√		
		6						√	√			√			√		√	√	√				√		
		7 - Emerg.	√		√				√			√		√		√	√	√	√			√	√		
City of Rockdale	2019	1		√								√			√		√		√				√		√
		2		√								√			√		√	√	√				√		
		3		√								√			√		√	√	√				√		
		4		√								√			√		√	√	√				√		
		5 - Emerg.	√	√	√							√				√	√	√	√				√		
City of Round Rock	2024	1		√				√	√	√	√	√			√		√		√				√	√	√
		2		√				√	√		√	√			√		√	√	√						
		3		√				√	√		√	√				√	√	√	√						
City of Rule	2013	1									√				√								√	√	√
		2									√				√			√					√		
		3									√				√			√					√		
		4 - Emerg.	√		√									√				√				√	√		
City of Stamford	2012	1						√	√														√	√	
		2		√				√	√					√	√			√					√		
		3		√				√	√					√	√			√					√		
		4		√	√			√	√			√		√				√				√	√		

Entity Name	DCP Date	Stage Number	Triggers										Responses											Water Supplies	
			Contamination	Demand/Capacity Based	Failure	Groundwater Level	Production Rate	Reservoir Level	Supply Based	Time	Wholesale Provider	Other(1)	Assessment and Identification	Water Rate Change or Surcharge	Irrigation Schedule	Mandatory Reduction	Notification of Public Agencies or Specific Users	Prohibited Use	Public Notification	Discontinue Water Diversions	Suspend Service	Water Allocation	Other(2)	SW	GW
City of Sweetwater	2019	1		√			√	√											√				√	√	√
		2		√			√	√							√		√	√	√				√		
		3		√			√	√							√		√	√	√				√		
		4		√			√	√						√	√		√	√	√			√	√		
		Emerg.		√	√				√			√	√	√		√	√	√	√				√		
City of Taylor	2019	1		√											√				√				√	√	
		2		√											√		√	√	√				√		
		3		√											√		√	√	√				√		
		4		√											√		√	√	√				√		
		5 - Emerg.	√	√	√				√			√					√	√	√				√		
		6 - Wtr Alloc.		√										√			√	√	√			√	√		
City of Temple	2019	1								√					√				√				√	√	
		2		√							√	√			√		√	√	√				√		
		3		√							√	√			√		√	√	√			√	√		
		4 - Emerg.	√		√						√	√				√	√	√	√			√	√		
City of Thorndale	2024	1		√											√				√						√
		2		√				√							√			√	√				√		
		3	√	√	√			√				√			√		√	√	√						
		4	√	√	√			√				√			√		√	√	√						
		5 - Emerg.	√	√	√			√								√	√	√	√						
		6 - Wtr Allo.	√	√	√			√														√			
City of Thrall	2003	1								√					√	√			√				√		√
		2		√		√									√			√	√				√		
		3		√		√									√			√	√				√		
		4		√		√									√			√	√				√		
		Emerg.	√		√							√					√	√	√				√		
City of Troy	2023	1								√		√			√				√				√	√	
		2		√					√			√			√			√	√				√		
		3		√					√			√			√			√	√				√		
		4 – Emerg.	√		√				√`			√		√		√	√	√	√				√		

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Entity Name	DCP Date	Stage Number	Triggers										Responses											Water Supplies	
			Contamination	Demand/Capacity Based	Failure	Groundwater Level	Production Rate	Reservoir Level	Supply Based	Time	Wholesale Provider	Other[1]	Assessment and Identification	Water Rate Change or Surcharge	Irrigation Schedule	Mandatory Reduction	Notification of Public Agencies or Specific Users	Prohibited Use	Public Notification	Discontinue Water Diversions	Suspend Service	Water Allocation	Other[2]	SW	GW
City of Waco	2024	1						√				√			√		√		√				√	√	
		2						√	√			√		√	√		√	√	√				√		
		3						√	√			√		√	√		√	√	√				√		
		4 - Emerg.						√	√			√		√		√	√	√	√				√		
Corix Utilities	2023	1		√		√		√	√										√				√	√	√
		2		√		√		√	√									√	√				√		
		3		√		√		√	√						√	√		√	√				√		
		4	√		√										√	√		√	√				√		
		5 – Emerg.													√	√	√	√	√				√		
East Bell WSC	2022	1		√					√			√			√				√					√	
		2		√					√									√	√						
		3 – Emerg.	√	√	√				√			√				√		√	√						
Files Valley WSC	2024	1																						√	
		2																							
		3 – Emerg.																							
Fort Belknap WSC	2019	1		√					√			√			√		√	√	√				√	√	
		2		√					√							√	√	√	√				√		
		3	√	√	√				√		√	√				√	√	√	√			√	√		
Gholson WSC	2019	1		√								√							√				√		√
		2		√								√		√	√		√	√	√				√		
		3		√								√		√	√		√	√	√				√		
		4		√								√		√	√		√	√	√				√		
		5 - Emerg.	√		√							√				√	√	√	√		√	√	√		
Hill County WSC	2018	1					√								√		√		√				√		√
		2					√								√		√	√	√				√		
		3					√								√		√	√	√				√		
		4					√								√		√	√	√				√		
		5 - Emerg.	√		√							√				√	√	√	√				√		
		6 - Wtr Alloc.					√					√		√		√	√		√			√	√		
Johnson County SUD	2022	1	√	√	√			√	√									√	√					√	
		2	√	√	√			√	√						√			√	√				√		
		3 – Emerg.	√	√	√			√	√						√			√	√				√		

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Entity Name	DCP Date	Stage Number	Triggers										Responses											Water Supplies	
			Contamination	Demand/Capacity Based	Failure	Groundwater Level	Production Rate	Reservoir Level	Supply Based	Time	Wholesale Provider	Other[1]	Assessment and Identification	Water Rate Change or Surcharge	Irrigation Schedule	Mandatory Reduction	Notification of Public Agencies or Specific Users	Prohibited Use	Public Notification	Discontinue Water Diversions	Suspend Service	Water Allocation	Other[2]	SW	GW
Kempner WSC	2024	1		√				√	√						√	√	√		√					√	
		2		√				√	√						√	√	√		√				√		
		3		√				√	√					√	√	√	√		√				√		
		4		√				√	√					√	√	√	√		√			√	√		
		5 – Emerg.	√		√			√						√		√	√		√			√	√		
Lake Palo Pinto Area WSC	2023	0										√							√					√	
		1							√			√			√				√						
		2							√			√			√	√		√	√		√		√		
		3							√			√			√	√		√	√		√		√		
		4 – Emerg.			√				√			√	v			√	√		√						
Manville WSC	2016	1		√			√								√		√		√				√	√	√
		2		√			√		√						√		√	√	√				√		
		3		√	√		√		√			√				√	√	√	√				√		
		4 - Emerg.	√		√							√	√				√		√			√	√		
North San Gabriel MUD No 1	2022	1		√				√	√						√			√	√				√	√	
		2		√				√	√						√			√	√				√		
		3		√				√	√						√	√		√	√						
		4-Emerg.	√	√	√								√	√		√	√	√	√	√					
North San Gabriel MUD No 2	2022	1		√				√	√						√			√	√				√	√	
		2		√				√	√						√			√	√				√		
		3		√				√	√						√	√		√	√				√		
		4- Emerg.	√	√	√			√	√				√	√		√	√	√	√				√		
Paloma Lake MUD No. 2	2019	1								√	√	√			√		√	√	√			√	√	√	
		2	√	√	√				√		√	√			√		√	√	√			√	√		
		3 - Emerg.	√	√	√				√		√	√				√	√	√	√			√	√		
Possum Kingdom WSC	2019	1		√				√	√	√	√	√			√				√				√	√	
		2		√				√	√		√	√		√	√		√	√	√			√	√		
		3 - Emerg.		√	√			√	√		√	√		√		√	√	√	√			√	√		
RMS WSC	2019	1		√								√			√		√		√				√		√
		2		√								√			√		√	√	√				√		
		3		√								√			√		√	√	√			√	√		
		4 - Emerg.	√		√							√				√	√	√	√			√			

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Entity Name	DCP Date	Stage Number	Triggers										Responses											Water Supplies	
			Contamination	Demand/Capacity Based	Failure	Groundwater Level	Production Rate	Reservoir Level	Supply Based	Time	Wholesale Provider	Other[1]	Assessment and Identification	Water Rate Change or Surcharge	Irrigation Schedule	Mandatory Reduction	Notification of Public Agencies or Specific Users	Prohibited Use	Public Notification	Discontinue Water Diversions	Suspend Service	Water Allocation	Other[2]	SW	GW
Salado WSC	2023	1						√	√						√		√		√					√	√
		2						√	√						√		√	√	√						
		3						√	√								√	√	√						
		4 – Emerg.						√	√							√	√	√	√				√		
Somervell County Water District	2019	1	√	√	√			√	√			√					√		√				√	√	
		2	√	√	√			√	√			√			√	√	√	√	√			√	√		
		3	√	√	√			√	√			√				√	√	√	√			√	√		
		4 - Emerg.			√							√				√	√	√	√			√	√		
Sonterra MUD	2023	Voluntary								√					√				√				√	√	√
		1		√											√			√	√				√		
		2		√				√	√			√			√			√	√				√		
		3		√				√	√			√			√	√		√	√				√		
		4 - Emerg.	√		√							√				√	√	√	√			√	√		
Southwest Milam WSC	2019	1		√					√			√			√				√				√		√
		2		√					√									√	√				√		
		3	√	√	√				√		√	√				√	√	√	√			√	√		
Sportsman's World MUD	2024	1		√						√					√	√			√				√	√	
		2		√						√					√	√		√	√				√		
		3		√						√				√	√	√	√	√	√				√		
		4 - Emerg.										√		√		√	√	√	√						
Stephens Regional SUD	2024	1		√				√	√			√					√	√	√				√	√	
		2		√				√	√			√			√		√	√	√				√		
		3		√	√			√	√			√				√	√	√	√			√	√		
		4 - Emerg.			√			√	√			√	√	√		√	√	√	√		√	√	√		
Tri-County SUD	2019	1		√															√				√		√
		2		√										√	√		√	√	√			√	√		
		3		√										√	√		√	√	√			√	√		
		4		√										√	√		√	√	√			√	√		
		5 - Emerg.	√		√							√				√	√	√	√		√	√			
Vista Oaks MUD	2019	Voluntary								√					√		√		√				√	√	
		1			√						√	√			√		√	√	√				√		
		2			√						√	√			√		√	√	√				√		
		3	√		√						√	√				√	√	√	√		√	√	√		

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Entity Name	DCP Date	Stage Number	Triggers										Responses											Water Supplies	
			Contamination	Demand/Capacity Based	Failure	Groundwater Level	Production Rate	Reservoir Level	Supply Based	Time	Wholesale Provider	Other(1)	Assessment and Identification	Water Rate Change or Surcharge	Irrigation Schedule	Mandatory Reduction	Notification of Public Agencies or Specific Users	Prohibited Use	Public Notification	Discontinue Water Diversions	Suspend Service	Water Allocation	Other(2)	SW	GW
Wellborn SUD	2022	1								√					√				√				√	√	√
		2		√				√	√						√			√	√				√		
		3		√				√	√						√			√	√				√		
		4		√				√	√							√	√	√	√				√		
		5 – Emerg.	√	√	√								√	√		√			√				√		
West Bell County WSC	2023	1						√	√								√		√					√	
		2		√	√			√	√							√	√		√				√		
		3						√	√							√	√		√				√		
		4 – Emerg.	√													√	√		√				√		
Wickson Creek SUD	2023	1		√					√						√		√	√	√				√		√
		2		√					√						√		√	√	√				√		
		3		√					√						√		√	√	√						
		4		√					√							√	√	√	√						
		5 – Emerg.	√	√	√				√							√	√		√						
Williamson County MUD No. 10	2024	Voluntary								√					√				√				√	√	
		1	√	√	√			√	√		√	√			√		√	√	√				√		
		2	√	√	√			√	√		√	√			√		√	√	√				√		
		3 - Emerg.	√	√	√			√	√		√	√				√	√	√	√				√		
Williamson County MUD No. 11	2024	Voluntary								√					√				√				√	√	
		1	√	√	√			√	√		√	√			√		√	√	√				√		
		2	√	√	√			√	√		√	√			√		√	√	√				√		
		3 - Emerg.	√	√	√			√	√		√	√				√	√	√	√				√		
Williamson County MUD No. 22	2019	1		√			√			√	√				√				√				√		√
		2		√			√		√		√				√		√	√	√				√		
		3		√	√		√		√		√				√		√	√	√				√		
		4 - Emerg.	√		√						√					√	√	√	√				√		
Woodway	2024	1		√					√			√							√				√	√	√
		2		√					√						√		√	√	√				√		
		3		√					√						√		√	√	√				√		
		4		√					√						√	√	√	√	√				√		
		5 – Emerg.	√		√										√	√	√	√	√				√		

Notes:
(1) Additional triggers: any unforeseen conditions that may occur, including extended period of low rainfall/drought conditions; executive leadership declares critical shortage.
(2) Water use restrictions on: watering with handheld hose, use of greywater, hotel/motel/restaurant water use, pools, fountains, golf courses, athletic fields, parks, car washes.

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Table 7.6 Summary of DCPs for WWPs in the Brazos G Area

Entity Name	DCP Date	Primary Water Supply Source	Stage Number	Triggers											Responses									Water Supplies	
				Contamination	Demand/WTP Capacity	Duration Period	Equipment out of Service or Failure	Groundwater Level	Production Rate	Reservoir Level	Supply Based	Raw Water Provider	Weather Conditions	Other[1]	Review System Ops/Make Repairs	Initiate Measures from Raw Water Provider	Irrigation Schedule	Mandatory Reduction	Notify Wholesale Customers &/or Emerg. Resp. Officials	Notify Board Members & Public	Discontinue Water Diversions	Water Allocation	Water Rate Change or Surcharge	SW	GW
Aquilla WSD	2019	Lake Aquilla	1		√	√				√	√	√	√		√	√	√		√	√				√	
			2		√	√				√	√	√	√		√	√	√	√	√	√					
			3	√	√	√	√			√	√	√	√	√	√	√		√	√	√		√			
			4 - Emerg.	√			√			√	√	√	√	√	√	√		√	√	√		√			
Bell County WCID No. 1	2024	Lake Belton & Lake Stillhouse	1		√	√			√	√	√	√	√		√	√			√	√		√	√	√	
			2		√	√	√		√	√	√	√	√		√	√		√	√	√		√	√		
			3	√	√	√	√		√	√	√	√	√	√	√	√		√	√	√		√	√		
Bistone MWSD[2]	2024	Lake Mexia; Carrizo-Wilcox Aquifer	1		√	√		√		√	√						√		√	√				√	√
			2		√	√		√		√	√						√	√	√	√					
			3 - Emerg.		√	√	√	√		√	√							√	√	√		√	√		
Bluebonnet WSC	2019	Lake Belton	1							√		√	√		√	√			√	√				√	
			2							√		√	√		√	√		√	√	√					
			3							√		√	√		√	√		√	√	√					
			4 - Emerg.							√		√	√		√	√		√	√	√		√	√		
Brazos River Authority	2019	Multiple reservoirs	1	√	√	√	√		√	√			√	√	√				√	√				√	
			2	√	√	√	√		√	√			√	√	√			√	√	√					
			3	√	√	√	√		√	√			√	√	√			√	√	√	√	√			
			4 – Pro-rata Curtailment	√	√	√	√		√	√			√	√	√			√	√	√	√	√			
Central Texas WSC	2018	Lake Stillhouse	1		√					√		√			√				√	√				√	√
			2		√					√		√			√	√		√	√	√		√			
			3		√					√		√			√	√		√	√	√		√	√		
			4 - Emerg.	√			√			√		√			√	√		√	√	√	√				
Eastland County WSC	2019	Lake Leon	1		√	√				√							√		√	√				√	
			2		√	√				√								√	√	√		√	√		
			3		√	√				√								√	√	√		√	√		
			4 - Emerg.			√	√			√	√			√	√			√	√	√		√	√		
North Central Texas Municipal Water Authority	2019	Millers Creek Reservoir	1							√	√				√				√	√				√	√
			2							√	√				√			√	√	√					
			3							√	√				√			√	√	√		√	√		
			4 - Emerg.	√			√								√			√	√	√	√	√	√		

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Entity Name	DCP Date	Primary Water Supply Source	Stage Number	Triggers											Responses									Water Supplies	
				Contamination	Demand/WTP Capacity	Duration Period	Equipment out of Service or Failure	Groundwater Level	Production Rate	Reservoir Level	Supply Based	Raw Water Provider	Weather Conditions	Other(1)	Review System Ops/Make Repairs	Initiate Measures from Raw Water Provider	Irrigation Schedule	Mandatory Reduction	Notify Wholesale Customers &/or Emerg. Resp. Officials	Notify Board Members & Public	Discontinue Water Diversions	Water Allocation	Water Rate Change or Surcharge	SW	GW
Palo Pinto County MWD No. 1	2014	Lake Palo Pinto	1							√					√				√	√				√	
			2							√					√				√	√					
			3				√			√					√				√	√		√	√		
			4 - Emerg.	√			√				√			√	√			√	√	√		√	√		
Upper Leon River MWD	2024	Lake Proctor	1							√	√	√	√		√	√			√	√				√	
			2							√	√	√	√		√	√		√	√	√					
			3 - Emerg.	√			√			√	√	√	√		√	√		√	√	√		√	√		
West Central TX MWD	2024	Hubbard Creek Reservoir	1							√	√		√			√			√	√				√	
			2							√	√		√		√	√		√	√	√					
			3							√	√		√		√	√		√	√	√		√			
			4							√	√		√		√	√		√	√	√		√			
			5 - Emerg.				√							√	√	√		√	√	√					

Notes:
(1) Additional triggers: any unforeseen conditions that may occur, such as acts of God or man.
(2) Bistone MWSD is both a WUG and WWP, but the DCP is more similar to those provided by WWPs and is included here instead of the WUG table.

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7.3.2.3 Groundwater Conservation Districts

According to the Texas Water Code, Section 36.1071(a), groundwater conservation districts (GCDs) are required to adopt management plans that address natural resource issues, drought conditions, conservation, recharge enhancement, rainwater harvesting, and precipitation enhancement/brush control, as well as include desired future conditions (DFCs). Since GCDs are water regulators and not water suppliers, their role is to provide scientific information to those entities with permits to help them make informed decisions during emergency conditions. As a result, drought response measures are typically addressed within a GCD's Management Plan instead of a separate drought contingency plan. Of the thirteen GCDs located in the Brazos G Area, the following Districts have developed a separate DCP in conjunction with their Management Plan: Brazos Valley GCD, Clearwater Underground Water Conservation District, and Middle Trinity GCD. A summary of their DCP triggers and responses are summarized below in Table 7.7.

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Table 7.7 Summary of Groundwater Conservation District DCPs in the Brazos G Area

Groundwater Conservation District	Major Aquifer(s)	Stage Number	Drought Triggers	District's Responses
Brazos Valley GCD	Carrizo-Wilcox, Queen City, Sparta, Yegua-Jackson & Brazos River Alluvium	1-Mild	NOAA 30-day rain node deficit from avg rainfall; PDSI shows mild drought.	Conduct water conservation public education; keep up-to-date drought information (PDSI) and other helpful drought indicators on website.
		2-Moderate	NOAA 30-day rain node deficit from avg rainfall; PDSI shows moderate level of drought for 6 mo.	Conduct water conservation public education; keep up-to-date drought information (PDSI) and other helpful drought indicators on website; review and confirm permit holders are enforcing their DCPs.
		3-Severe	NOAA 30-day rain node deficit from avg rainfall; or PDSI shows severe level of drought; natural or man-made contamination of water supply source(s); or declaration by State or Federal Gov't of disaster due to drought condition in a county served by District; or unforeseen events cause health/safety risks to the public.	Conduct water conservation public education; keep up-to-date drought information (PDSI) and other helpful drought indicators on website; review and confirm permit holders are enforcing their DCPs; monitor well levels frequently basis after consulting District's hydrologist.
		4-Extreme	NOAA 30-day rain node deficit from avg rainfall; or PDSI shows extreme level of drought for 12 mo.; water level monitoring indicates significant decrease in water levels to affect GW production of permit holders; natural or man-made contamination of water supply source(s); or declaration by State or Federal Gov't of disaster due to drought condition in a county served by District; or unforeseen events cause health/safety risks to the public.	Conduct water conservation public education; keep up-to-date drought information (PDSI) and other helpful drought indicators on website; review and confirm permit holders are enforcing their DCPs; monitor well levels frequently basis after consulting District's hydrologist; designate DMZ under Rule 7.2 as appropriate and/or restrict GW production by permittees.
Clearwater Underground Water CD	Edwards BFZ	1-Aware	*PDI 70 to 79%; Spring Discharge 900 to 701 ac-ft/month* (PDI monitored daily on running-year basis & based on NEX-RAD rainfall data; PDI trigger cond. must be exceeded 28 consecutive days; Spring Discharge monitored with daily max discharge values averaged over 5 consecutive days on running 5-day basis)	Continue or increase voluntary reduction; check for plumbing leaks; no filling of ponds, lakes, tanks, reservoirs, swimming pools or other surface impoundments w/total capacity of more than 50,000 gallons except for PWSs (goal to achieve 10% reduction in water usage)
		2-Concern	*PDI 60 to 69%; Spring Discharge 700 to 401 ac-ft/month* (PDI monitored daily on running-year basis & based on NEX-RAD rainfall data; PDI trigger cond. must be exceeded 28 consecutive days; Spring Discharge monitored with daily max discharge values averaged over 5 consecutive days on running 5-day basis)	Continue or increase voluntary reduction; check for plumbing leaks; no filling of ponds, lakes, tanks, reservoirs, swimming pools or other surface impoundments w/total capacity of more than 50,000 gallons except for PWSs (goal to achieve 20% reduction in water usage); limit outdoor watering to once every 5-7 days bet. 7pm and 7am (ag/horticulture operations exempted but encouraged to reduce watering by 20%); wash vehicles at car wash only as needed; water livestock in leak-proof troughs if possible.
		3-Serious	*PDI 50 to 59%; Spring Discharge 400 to 201 ac-ft/month* (PDI monitored daily on running-year basis & based on NEX-RAD rainfall data; PDI trigger cond. must be exceeded 28 consecutive days; Spring Discharge monitored with daily max discharge values averaged over 5 consecutive days on running 5-day basis)	Continue or increase voluntary reduction; check for plumbing leaks; no filling of ponds, lakes, tanks, reservoirs, swimming pools or other surface impoundments w/total capacity of more than 50,000 gallons except for PWSs (goal to achieve 30% reduction in water usage); limit outdoor watering to once every 5-7 days bet. 7pm and 7am (ag/horticulture operations exempted but encouraged to reduce watering by 30%); wash vehicles at car wash only as needed; water livestock in leak-proof troughs if possible; fountains/swimming pools/décor. ponds covered where possible; water for dust control when req'd by law.
		4-Critical	*PDI < 50%; Spring Discharge 200 ac-ft/month or less* (PDI monitored daily on running-year basis & based on NEX-RAD rainfall data; PDI trigger cond. must be exceeded 28 consecutive days; Spring Discharge monitored with daily max discharge values averaged over 5 consecutive days on running 5-day basis)	Continue or increase voluntary reduction; check for plumbing leaks; no filling of ponds, lakes, tanks, reservoirs, swimming pools or other surface impoundments (goal to achieve 40% reduction in water usage); no outdoor watering (ag/horticulture operations exempted but encouraged to reduce watering by 40%); no vehicle washing; water livestock in leak-proof troughs if possible; water for dust control when req'd by law.

Groundwater Conservation District	Major Aquifer(s)	Stage Number	Drought Triggers	District's Responses
Clearwater Underground Water CD	Trinity	1-Aware	*PDI 70 to 79%;* (PDI monitored daily on running-year basis & based on NEX-RAD rainfall data; PDI trigger cond. must be exceeded 28 consecutive days)	Continue or increase voluntary reduction; check for plumbing leaks; no filling of ponds, lakes, tanks, reservoirs, swimming pools or other surface impoundments w/total capacity of more than 50,000 gallons except for PWSs (goal to achieve 10% reduction in water usage)
		2-Concern	*PDI 60 to 69%;* (PDI monitored daily on running-year basis & based on NEX-RAD rainfall data; PDI trigger cond. must be exceeded 28 consecutive days)	Continue or increase voluntary reduction; check for plumbing leaks; no filling of ponds, lakes, tanks, reservoirs, swimming pools or other surface impoundments w/total capacity of more than 50,000 gallons except for PWSs (goal to achieve 20% reduction in water usage); limit outdoor watering to once every 5-7 days bet. 7pm and 7am (ag/horticulture operations exempted but encouraged to reduce watering by 20%); wash vehicles at car wash only as needed; water livestock in leak-proof troughs if possible.
		3-Serious	*PDI 50 to 59%;* (PDI monitored daily on running-year basis & based on NEX-RAD rainfall data; PDI trigger cond. must be exceeded 28 consecutive days)	Continue or increase voluntary reduction; check for plumbing leaks; no filling of ponds, lakes, tanks, reservoirs, swimming pools or other surface impoundments w/total capacity of more than 50,000 gallons except for PWSs (goal to achieve 30% reduction in water usage); limit outdoor watering to once every 5-7 days bet. 7pm and 7am (ag/horticulture operations exempted but encouraged to reduce watering by 30%); wash vehicles at car wash only as needed; water livestock in leak-proof troughs if possible; fountains/swimming pools/décor. ponds covered where possible; water for dust control when req'd by law.
		4-Critical	*PDI < 50%;* (PDI monitored daily on running-year basis & based on NEX-RAD rainfall data; PDI trigger cond. must be exceeded 28 consecutive days)	Continue or increase voluntary reduction; check for plumbing leaks; no filling of ponds, lakes, tanks, reservoirs, swimming pools or other surface impoundments (goal to achieve 40% reduction in water usage); no outdoor watering (ag/horticulture operations exempted but encouraged to reduce watering by 40%); no vehicle washing; water livestock in leak-proof troughs if possible; water for dust control when req'd by law.
Middle Trinity GCD	Trinity	0	*PDSI > 80%; soil moisture index*	N/A
		1	*PDSI 70 to 80%; soil moisture index*	Reduction of pumping by 10% on voluntary basis; information posted on District's website
		2	*PDSI 60 to 70%; soil moisture index*	Reduction of pumping by 20% on voluntary basis; information posted on District's website
		3	*PDSI 50 to 60%; soil moisture index*	Reduction of pumping by 30% on voluntary basis; information posted on District's website
		4	*PDSI < 50%; soil moisture index*	Reduction of pumping by 40% on voluntary basis; information posted on District's website

Also, GCDs are generally more concerned about long-term pumping (usage over decades) than short-term drought conditions. All of the GCDs use either the PDSI or Precipitation Deficit Index (PDI) to monitor the severity of drought conditions. Based on PDSI or PDI readings, the GCDs then notify all of their permitted public water suppliers to implement their respective DCPs. Also, each of the GCDs focus on their respective DFCs based on specific aquifer characteristics within their management area (i.e., Carrizo-Wilcox versus the Trinity Aquifer).

7.4 RWPA Drought Response Triggers & Actions

As shown in Tables 7.5, 7.6, and 7.7 many WUGs, WWPs, and GCDs within the Brazos G region have developed DCPs for their respective service areas. These DCPs include detailed drought triggers and corresponding management measures tailored to the specific water resources they manage. The Brazos G RWPG recommends leveraging these existing drought triggers and actions outlined in the DCPs to ensure a coordinated and effective response across the region. By aligning the regional water planning efforts with the established triggers and actions, the RWMP aims to enhance the resilience of water supplies during drought conditions. This approach also promotes consistency and cooperation among the various entities managing and relying on water resources within the Brazos G area.

7.5 Existing and Potential Emergency Interconnects

In the event of a severe and prolonged drought or interruption or contamination of an existing water supply, it is important for municipal water user groups (WUGs) to have a back-up plan and alternative source of supply available. In fact, TCEQ requires all public water systems (PWSs) to have a plan in place based on the guidelines outlined in 30 TAC, Chapter 288, Subchapter B. Interconnects between two municipal WUGs are an acceptable alternative for emergency water supply in lieu of trucking in treated drinking water to a community.

The TCEQ Texas Drinking Water Watch database (TCEQ database) was the primary source used to identify existing emergency interconnect information for the Brazos G Area. The availability of each PWS water source is categorized as Permanent, Seasonal, Interim or Emergency in the TCEQ database; however, details on existing interconnect supply capacity or location are not provided. As a result, numerous emergency users and providers were contacted by phone to obtain infrastructure details about each interconnect, such as meter size, pipeline diameter and capacity; information regarding future emergency interconnects was also collected. In many cases, an understanding or agreement is already in place between the interconnect provider and user about the transfer volume of water supply in the event of an emergency. According to Texas Water Code §16.053(r), confidential information regarding the location coordinates of each of the emergency interconnects was not gathered or included in the regional plan.

A summary of the number of existing and future emergency interconnects in the Brazos G Area, including who is connected to whom, principal county served, infrastructure details and the emergency provider's source of supply is presented in Table 7.8. During this planning cycle, 125 interconnects were identified compared to 115 interconnects in the 2021 Brazos G Plan. A few of the WUGs, including the Cities of Bryan, College Station and Round Rock, have more than one interconnect with particular WUGs.

Forty-four of the potential emergency providers have a single source of water supply. If this source became contaminated or no longer available for the emergency user, then other alternatives or arrangements would be necessary. Twenty-one of the WUG providers have two supply sources, and four of the listed WUG providers have three or more sources of supply.

Table 7.8 Summary of Emergency Interconnects in the Brazos G Area

Emergency User [A]	Emergency Provider [B]	Provider's Sources [C]		
		Source #1	Source #2	Source # 3
ACTON MUD	CITY OF GRANBURY	LAKE GRANBURY (SW)	HOOD COUNTY (GW)	
CITY OF ALVARADO	JOHNSON COUNTY SUD	MANSFIELD (SW)	BRA-LAKE GRANBURY (SW)	JOHNSON COUNTY (GW)
AQUA WSC	CITY OF LOCKHEART			
AXTELL WSC	EOL WSC	MCLENNAN COUNTY (GW)		
CITY OF BAIRD	CALLAHAN COUNTY WSC	CLYDE (SW)	BAIRD(SW)	
CITY OF BAIRD	CITY OF CLYDE	LAKE CLYDE (SW)	ABILENE (SW)	
BEACHVIEW ACRES WATER ASSOCIATION	LAKESHORE WATER SYSTEM	HILL COUNTY (GW)		
BELL MILAM FALLS WSC	EAST BELL WSC	CENTRAL TEXAS WSC (SW)	BELL COUNTY (GW)	
CITY OF BELTON	CENTRAL TEXAS WSC	STILLHOUSE HOLLOW (SW)	BELL COUNTY (GW)	
BENTWATER ON LAKE GRANBURY	CITY OF GRANBURY	LAKE GRANBURY (SW)	HOOD COUNTY (GW)	
BETHANY SUD	BETHESDA WSC	FORT WORTH (SW)	JOHNSON COUNTY (GW)	
BLOCK HOUSE MUD	CITY OF LEANDER	LCRA-LAKE TRAVIS (SW)		
BLUE WATER OAKS ESTATES	JOHNSON COUNTY SUD	BRA-LAKE GRANBURY (SW)	MANSFIELD (SW)	JOHNSON COUNTY (GW)
BOLD SPRINGS WSC	CITY OF WEST	WACO (SW)	MCLENNAN COUNTY (GW)	
BRAZOS RIVER ACRES	RIVER COUNTRY ACRES	HOOD COUNTY (GW)		
CITY OF BREMOND	TRI COUNTY SUD	FALLS COUNTY (GW)	ROBERTSON COUNTY (GW)	
BRUSHY CREEK MUD	CITY OF ROUND ROCK	BRA-LAKE GEORGETOWN (SW)	WILLIAMSON COUNTY (GW)	
CITY OF BRYAN	CITY OF COLLEGE STATION	BRAZOS COUNTY (GW)		
CITY OF BRYAN	WICKSON CREEK SUD	BRAZOS COUNTY (GW)		
CANYON CREEK ADDITION	ACTON MUD	BRA-LAKE GRANBURY (SW)	HOOD COUNTY (GW)	
CEDRON CREEK RANCH WATER SUPPLY	STEELE CREEK HARBOR	BOSQUE COUNTY (GW)		
CHALK BLUFF WSC	ROSS WSC	MCLENNAN COUNTY (GW)	WACO (SW)	
CITY OF COLLEGE STATION	CITY OF BRYAN	BRAZOS COUNTY (GW)		
CITY OF COLLEGE STATION	TEXAS A&M UNIVERSITY MAIN CAMPUS	BRAZOS COUNTY (GW)		
CITY OF COLLEGE STATION	WELLBORN SUD	NAVASOTA RIVER (SW)	BRAZOS (GW)	
COMANCHE COVE	CITY OF GRANBURY	LAKE GRANBURY (SW)	HOOD COUNTY (GW)	
COTTONWOOD WSC	CITY OF WEST	WACO (SW)	MCLENNAN COUNTY (GW)	
CROSS COUNTRY WSC	HIGHLAND PARK WSC	BOSQUE COUNTY (GW)		
CROSS COUNTRY WSC	PATRICK WSC	MCLENNAN COUNTY (GW)		
CROWN RANCH SUBDIVISION	DOBBIN PLANTERSVILLE WSC 1	MONTGOMERY COUNTY (GW)		
DOBBIN PLANTERSVILLE WSC 2	DOBBIN PLANTERSVILLE WSC 1	MONTGOMERY COUNTY (GW)		
EAST BELL WSC	BELL MILAM FALLS WSC	CENTRAL TEXAS WSC (SW)	BELL MILAM FALLS WSC (GW)	
EAST BELL WSC	CITY OF TEMPLE	LEON RIVER (SW)		
EOL WSC	AXTELL WSC	MCLENNAN COUNTY (GW)		
EOL WSC	PRAIRIE HILL WSC	LIMESTONE COUNTY (GW)		

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Emergency User [A]	Emergency Provider [B]	Provider's Sources [C]		
		Source #1	Source #2	Source # 3
EULA WSC	CITY OF CLYDE	LAKE CLYDE (SW)	ABILENE (SW)	
FALCON CREST ADDITION	NORTHCREST ADDITION	JOHNSON COUNTY (GW)		
CITY OF FLORENCE	CITY OF GEORGETOWN	BRA-LAKE GEORGETOWN (SW)	WILLIAMSON COUNTY (GW)	
CITY OF GEORGETOWN	CITY OF LEANDER	LCRA-LAKE TRAVIS (SW)		
CITY OF GEORGETOWN	CITY OF ROUND ROCK	BRA-LAKE GEORGETOWN (SW)	WILLIAMSON COUNTY (GW)	
CITY OF GEORGETOWN (FUTURE)	CITY OF ROUND ROCK	LCRA-LAKE TRAVIS (SW)	WILLIAMSON COUNTY (GW)	
CITY OF GEORGETOWN (FUTURE)	CITY OF ROUND ROCK	LCRA-LAKE TRAVIS (SW)	WILLIAMSON COUNTY (GW)	
GLEN OAKS MOBILE HOME PARK	WICKSON CREEK SUD	BRAZOS COUNTY (GW)		
CITY OF GODLEY	JOHNSON COUNTY SUD	BRA-LAKE GRANBURY (SW)	MANSFIELD (SW)	JOHNSON COUNTY (GW)
CITY OF GRANBURY	BRAZOS REGIONAL PUA	BRA-LAKE GRANBURY (SW)		
GRANBURY ACRES	CITY OF GRANBURY	LAKE GRANBURY (SW)	HOOD COUNTY (GW)	
GUN & ROD ESTATES	CITY OF BRENHAM	LAKE SOMERVILLE (SW)		
HAMILTON INN	CITY OF HAMILTON	UPPER LEON MWD (SW)		
HILLTOP WSC	BOLD SPRINGS WSC	MCLENNAN COUNTY (GW)		
CITY OF HUBBARD	POST OAK SUD	DAWSON (SW)	CORSICANA (SW)	
JARRELL SCHWERTNER WSC	SONTERRA MUD	WILLIAMSON COUNTY (GW)	BRA-LONE STAR RWA (SW)	
JONAH WATER SUD	CITY OF GEORGETOWN	BRA-LAKE GEORGETOWN (SW)	WILLIAMSON COUNTY (GW)	
CITY OF KILLEEN	CENTRAL TEXAS WSC	STILLHOUSE HOLLOW (SW)	BELL COUNTY (GW)	
LAGUNA VISTA SUBDIVISION	LAGUNA TRES SUBDIVISION	HOOD COUNTY (GW)		
LAKESHORE WATER SYSTEM 2	LAKESHORE WATER SYSTEM	HILL COUNTY (GW)		
LATHAM SPRINGS BAPTIST ENCAMPMENT	GHOLSON WSC	HILL & MCLENNAN COUNTY (GW)		
CITY OF LEANDER	CITY OF CEDAR PARK	LCRA-LAKE TRAVIS (SW)		
LEE COUNTY FWSD #1	LEE COUNTY WSC	LEE COUNTY (GW)		
LEON JUNCTION WSC	FLAT WSC	GATESVILLE (SW)		
LINCOLN WSC	LEE COUNTY WSC	LEE COUNTY (GW)		
CITY OF LORENA	CITY OF HEWITT	MCLENNAN COUNTY (GW)	WACO (SW)	LORENA (SW/GW)
LTG WSC	PURE WSC	MCLENNAN COUNTY (GW)		
MALLARD POINTE	CITY OF GRANBURY	LAKE GRANBURY (SW)	HOOD COUNTY (GW)	
MANVILLE WSC	CROSS COUNTY WSC (GW) AND 1 - ROYSTON LN			
MESA GRANDE WSC	CITY OF GRANBURY	LAKE GRANBURY (SW)	HOOD COUNTY (GW)	
METROPLEX HOMESTEADS WATER SUPPLY	JOHNSON COUNTY SUD	JOHNSON COUNTY (GW)	BRA-LAKE GRANBURY (SW)	MANSFIELD (SW)
CITY OF MEXIA	BISTONE MWSD	LIMESTONE COUNTY (GW)	LAKE MEXIA (SW)	
MINERVA WSC	SOUTHWEST MILAM WSC	MILAM COUNTY (GW)		
CITY OF MINGUS	CITY OF GORDEN			
CITY OF MOUNT CALM	BIROME WSC	HILL COUNTY (GW)		
MURRAY HILL WATER SYSTEM	HILL COUNTY WSC	AQUILLA WSD (SW)		

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Emergency User [A]	Emergency Provider [B]	Provider's Sources [C]		
		Source #1	Source #2	Source # 3
NOLAN COUNTY FWSD #1	CITY OF SWEETWATER	OAK CREEK LAKE, LAKES SWEETWATER & TRAMMELL (SW)	NOLAN COUNTY (GW)	
NORTH MILAM WSC	CITY OF CAMERON	LITTLE RIVER (SW)		
OAK HILL WATER SYSTEM	HILL COUNTY WSC	AQUILLA WSD (SW)		
OAKVIEW FARMS SUBDIVISION	BETHESDA WSC	FORT WORTH (SW)	JOHNSON COUNTY (GW)	
CITY OF OGLESBY	CORYELL CITY WSD	GATESVILLE (SW)		
PRAIRIE HILL WSC	EOL WSC	MCLENNAN COUNTY (GW)		
PURE WSC	LTG WSC	MCLENNAN COUNTY (GW)		
RIDGE CREST ADDITION & MISTY HOLLOW	BETHESDA WSC	FORT WORTH (SW)	JOHNSON COUNTY (GW)	
CITY OF RIESEL	TRI COUNTY SUD	FALLS COUNTY (GW)	ROBERTSON COUNTY (GW)	
CITY OF RIO VISTA	JOHNSON COUNTY SUD	BRA-LAKE GRANBURY (SW)	MANSFIELD (SW)	JOHNSON COUNTY (GW)
RIVER COUNTRY ACRES	BRAZOS RIVER ACRES	HOOD COUNTY (GW)		
CITY OF ROCKDALE	SOUTHWEST MILAM WSC	MILAM COUNTY (GW)		
CITY OF ROGERS	BELL MILAM FALLS WSC	CENTRAL TEXAS WSC (SW)	BELL COUNTY (GW)	
CITY OF ROUND ROCK	CITY OF AUSTIN	LCRA-LAKE TRAVIS (SW)	LCRA-LAKE AUSTIN (SW)	
CITY OF ROUND ROCK	CITY OF GEORGETOWN	BRA-LAKE GEORGETOWN (SW)		
CITY OF ROUND ROCK (FUTURE)	CITY OF GEORGETOWN	LCRA-LAKE TRAVIS (SW)		
CITY OF ROUND ROCK (FUTURE)	CITY OF GEORGETOWN	LCRA-LAKE TRAVIS (SW)		
CITY OF ROUND ROCK	BRUSHY CREEK MUD	BRA-LAKE GEORGETOWN (SW)		
SHADY HILLS ESTATES WATER SYSTEM	BETHESDA WSC	FORT WORTH (SW)	JOHNSON COUNTY (GW)	
SHADY MEADOWS ESTATES	OAKVIEW FARMS AND BETHESDA WSC			
SONTERRA MUD	JARRELL SCHWERTNER WSC	WILLIAMSON COUNTY (GW)	CENTRAL TEXAS WSC (SW)	SALADO WSC (GW)
SOUTH BOSQUE WSC	CITY OF WACO	LAKE WACO (SW)	MCLENNAN COUNTY (GW)	
SOUTH SAN GABRIEL RANCHES	HIGH GABRIEL WSC	WILLIAMSON COUNTY (GW)		
SOUTHWEST MILAM WSC	CITY OF ROCKDALE	MILAM COUNTY (GW)		
STEPHENS REGIONAL SUD	CITY OF BRECKENRIDGE	WEST CENTRAL TEXAS MWD (SW)	LAKE DANIELS (SW)	LAKE HUBBARD (SW)
SUNDANCE ADDITION	JOHNSON COUNTY SUD	MANSFIELD (SW)	BRA-LAKE GRANBURY (SW)	MANSFIELD (SW)
SYLVESTER MCCAULLEY WSC	CITY OF HAMLIN	ABILENE (SW)		
TEXAS A&M UNIVERSITY MAIN CAMPUS	CITY OF COLLEGE STATION	BRAZOS COUNTY (GW)		
CITY OF THROCKMORTON	FORT BELKNAP WSC	CITY OF GRAHAM (SW)		
TWIN CREEK SUBDIVISION	BETHESDA WSC	FORT WORTH (SW)	JOHNSON COUNTY (GW)	
CITY OF WACO	BLUEBONNET WSC	LAKE BELTON (SW)		
WELLBORN SUD	CITY OF BRYAN	BRAZOS COUNTY (GW)		
WELLBORN SUD	CITY OF COLLEGE STATION	BRAZOS COUNTY (GW)		
WELLBORN SUD	TEXAS A&M UNIVERSITY MAIN CAMPUS	BRAZOS COUNTY (GW)		
WEST BELL COUNTY WSC	CITY OF KILLEEN	BELL COUNTY WCID 1 (SW)		
WEST BRAZOS WSC	CITY OF WACO	LAKE WACO (SW)	MCLENNAN COUNTY (GW)	

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Emergency User [A]	Emergency Provider [B]	Provider's Sources [C]		
		Source #1	Source #2	Source # 3
WESTERN HILLS	CITY OF GRANBURY	LAKE GRANBURY (SW)	HOOD COUNTY (GW)	
WESTSIDE RURAL WSC	BETHESDA WSC	FORT WORTH (SW)	JOHNSON COUNTY (GW)	
CITY OF WHITNEY	HILL COUNTY WSC	AQUILLA WSD (SW)		
WICKSON CREEK SUD	CITY OF BRYAN	BRAZOS COUNTY (GW)		
WICKSON CREEK SUD	WELLBORN SUD	NAVASOTA RIVER (SW)	BRAZOS (GW)	
WILLIAMSON COUNTY WSID 3	CITY OF ROUND ROCK	BRA-LAKE GEORGETOWN (SW)	WILLIAMSON COUNTY (GW)	
WORTH RANCH	PALO PINTO WSC	MINERAL WELLS (SW)		
WUGs with Emergency Interconnects since the 2021 RWP				
BARTLETT	PIETZICH / EMMA			
BELLMEAD	SW FROM CITY OF WACO			
BETHESDA WSC	1A - 5512 RENDON			
BIROME WSC	GW FROM CITY OF MOUNT CALM			
BISTONE MUNICIPAL WATER SUPPLY DISTRICT	1 - SWTP (LAKE MEXIA NEAR DAM)			
CLEBURNE	200 W WARDVILLE ST			
DUBLIN	HIGHLAND AVE			
FORT GATES WSC	MAIN PLANT			
ITASCA	3T (WELL 4) - 200 S ELM ST			
JARRELL-SCHWERTNER	GW FROM SONTERRA MUD			
JOHNSON COUNTY SUD	20 - PALUXY / PLANT 20			
MARLIN	INTAKE 2 - BRAZOS RIVER			
MCGREGOR	3 - PLANT 2 / JOHNSON DR (FORMER WELL 4)			
PENDLETON WSC	2 - PLEASANTVIEW RD			
ROSS WSC	EMERGENCY I/C WITH CHALK BLUFF WSC			
SALADO WSC	EMERGENCY I/C STAGE COACH INN			
SWEETWATER	INTAKE 2 - LAKE TRAMMEL			
TEXAS A&M UNIVERSITY	EMERGENCY GW FROM CITY OF COLLEGE STATION			
TOLAR	4 - N OF 3			

Notes:
Emergency interconnect users/providers listed in TCEQ Drinking Water Watch Database; infrastructure details to be confirmed by email and/or via phone discussions. Text in red represents updated information from the 2026 planning cycle.

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7.6 Drought Management WMS

The regional water plan is developed to meet projected water demands during a drought of severity equivalent to the drought of record. Brazos G sees the purpose of the planning as ensuring that sufficient supplies are available to meet future water demands. For this reason, drought management recommendations have not been made by Brazos G as a water management strategy for specific WUG needs. Reducing water demands during a drought as a defined water management strategy does not ensure that sufficient supplies will be available to meet the projected water demands; but simply eliminates the demands. While Brazos G encourages entities in the region to promote demand management during a drought, it should not be identified as a “new source” of supply. Recommending demand reductions as a water management strategy is antithetical to the concept of planning to meet projected water demands. It does not make more efficient use of existing supplies as does conservation, but instead effectively turns the tap off when the water is needed most. It is planning to not meet future water demands.

While Drought Management WMS are not recommended as water management strategies by the BGRWPG, DCPs are encouraged for all entities and the region supports the implementation of the drought responses outlined in these DCPs when corresponding triggers occur. While the relief provided from these DCP responses can prolong supply and reduce impacts to communities, they are not considered to be predictable or controllable for all entities under all potential droughts. Where recommended by other RWPGs, the BGRWPG supports such recommendations.

7.7 Emergency Responses to Local Drought Conditions or Loss of Water Supply

As a result of the severe drought experienced during 2015 and 2016, the state water planning process encourages entities to plan for this potential emergency condition based on the drought of record. It is especially important for small entities that rely on a sole source of supply to have a back-up plan in case they experience a local drought, infrastructure/equipment failure or water supply contamination. Although many entities and WWPs have adopted DCPs, it is less common for the smaller municipalities or those included in County-Other to have these types of emergency plans in place.

All municipal WUGs in the region were evaluated regarding their potential emergency response to local drought conditions or loss of existing water supplies. Based on TWDB’s template for this task, the emergency response alternatives included both temporary and/or permanent solutions. For the purpose of the evaluation, it was assumed that the entities being evaluated had approximately 180 days or less of water supply remaining. Municipal WUGs using groundwater supplies also considered implementing desalination of brackish groundwater, depending on the aquifers located in the area, as an alternative source of supply. MAG availability was not included in the analysis/alternative of drilling additional wells since the emergency supply would be used on a temporary basis. Municipal WUGs using surface water supplies were analyzed for curtailment of junior water rights and for releases from upstream reservoirs; additional yield availability was not analyzed for reservoir releases.

A high-level review and analysis were performed for (1) small WUGs having 2020 Census populations of less than 7,500 and relying on a sole source of water supply; and (2) all County-Other WUGs in the Brazos G Area regardless of population or number of sources. Several of the small WUGs are split by county, but it is the total WUG population that includes them on the list for having a total population of less than 7,500. If a WUG relied on surface water from an intake structure or a specific reservoir, then it was considered to have a sole source of supply, regardless of the number of contracts in place. A WUG that had a contract for purchasing treated water from Brazos River Authority (BRA) was not considered to have a sole source of supply due to BRA's system operations. WUGs using both groundwater and surface water supplies were not included in the evaluation, with the exception of County-Other entities.

Many of the WWPs in the Brazos G Area are also looking for ways to diversify their water supply portfolio in case a severe drought or loss of water supply occurs; examples of water supply initiatives that have been identified or implemented are highlighted below.

Table 7.9 Alternative Water Supply Initiatives for WUG/WWPs in the Brazos G Area

WUG/WWP	Alternative Water Supply Initiative(s)
Bluebonnet WSC	Contracted with the Cities of Waco, Woodway and McGregor to construct a 16-inch diameter line/interconnect (serves both directions) as an alternative water supply source in case of an emergency.
Bistone MWD	Secured dual water supply sources, including Carrizo-Wilcox groundwater wells and water rights in Lake Mexia.
Bell County WCID No. 1	The new water treatment plant at Lake Stillhouse has been constructed in addition to its existing treatment plant, adding redundancy into their water supply.
Palo Pinto County MWD No. 1	Secured an alternative source from Hilltop Reservoir in case they experience high turbidity or contamination of their current water supplies (primarily blend and treat water from the Brazos River and Lake Palo Pinto); Hilltop Reservoir is located adjacent to the Palo Pinto County MWD No. 1 water treatment plant and provides an additional 90-day water supply in case of an emergency.
City of Bryan	Constructed Gibbons Creek Reservoir as an alternative surface water supply, and considering Aquifer Storage and Recovery (ASR) project to diversify their groundwater portfolio.
West Central Texas MWD	As of 2016, aecured an additional source of supply, Possum Kingdom Reservoir, in case the District experiences severe drought or emergency conditions impacting their primary water supply from Lake Hubbard.
City of Stamford	Identified additional groundwater supplies from property owners located north of the city, as well as additional surface water supplies from Cedar Ridge Reservoir.
Central Texas WSC	Will be able to supplement and firm up their water supply as a result of the Lake Granger Augmentation Project.
North Central Texas MWA	Drilled nine wells in the Seymour Aquifer during 2015 to provide back-up groundwater supplies for the Authority.

A nearby entity that could provide supply in the case of an isolated incident was identified for each WUG, and existing interconnects were noted based on information listed in the TCEQ database. For the small WUGs split by county, a nearby entity was identified for that particular county if possible. In addition, trucking in water was considered as a supply option under severe circumstances. A total of 197 WUG entries (including small WUGs split by county) were researched and analyzed using the TCEQ database, including 37 County-Other WUGs. Over twice as many WUG entries were evaluated during this planning cycle compared to the 2016 Brazos G Regional Water Plan; the results of this effort are summarized in Table 7.10.

Table 7.10 Potential Emergency Water Supplies for Small and County-Other WUGs Facing Loss of Supply

Entity				Potential Emergency Water Supply Sources							Implementation Requirements			
Water User Group	County	2030 Population	2030 Demand (AF/yr)	Release From Upstream Reservoir	Curtailment of Upstream/Downstream Water Rights	Local Groundwater Well	Brackish Groundwater Desalination	Truck in Water	Supply from Nearby Entity	Existing Emergency Interconnect	Potential Entity Providing Supply	Other Local Entities Required to Participate/Coordinate	Emergency Agreements/Arrangements Already in Place?	Type of Infrastructure Required
BELL COUNTY-OTHER	BELL	4,610	760		X	X	X	X	X		KILLEEN			Well, Pipeline, Transportation
BARTLETT	BELL	1,639	328			X		X	X		HOLLAND			Well, Pipeline, Transportation
BELL COUNTY WCID 3	BELL	9,460	1,659					X	X		NOLANVILLE			Pipeline, Transportation
CENTRAL TEXAS COLLEGE DISTRICT	BELL	891	280					X	X		COPPERAS COVE			Pipeline, Transportation
DOG RIDGE WSC	BELL	5,016	942			X		X	X		HARKER HEIGHTS			Well, Pipeline, Transportation
ELM CREEK WSC	BELL	4,460	693			X		X	X		MOODY			Well, Pipeline, Transportation
HOLLAND	BELL	1,209	136			X		X	X		BARTLETT			Well, Pipeline, Transportation
JARRELL SCHWERTNER WSC	BELL	2,730	368		X	X		X	X	SONTERRA MUD	BRA-LONE STAR RWA			Well, Pipeline, Transportation
MORGANS POINT RESORT	BELL	5,300	774		X	X		X	X		TEMPLE			Well, Pipeline, Transportation
ROGERS	BELL	918	164			X		X	X	BELL MILAM FALLS WSC	BELTON			Well, Pipeline, Transportation
THE GROVE WSC	BELL	1,317	199			X		X	X		MOODY			Well, Pipeline, Transportation
WEST BELL COUNTY WSC	BELL	4,335	783			X		X	X		KILLEEN			Well, Pipeline, Transportation
BOSQUE COUNTY-OTHER	BOSQUE	6,648	894			X		X	X		CLIFTON			Well, Pipeline, Transportation
CHILDRESS CREEK WSC	BOSQUE	1,336	338			X		X	X		CLIFTON			Well, Pipeline, Transportation
HIGHLAND PARK WSC	BOSQUE	517	150			X		X	X		CLIFTON			Well, Pipeline, Transportation
MUSTANG VALLEY WSC	BOSQUE	1,862	439			X		X	X		MERIDIAN			Well, Pipeline, Transportation

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Entity				Potential Emergency Water Supply Sources							Implementation Requirements			
Water User Group	County	2030 Population	2030 Demand (AF/yr)	Release From Upstream Reservoir	Curtailment of Upstream/Downstream Water Rights	Local Groundwater Well	Brackish Groundwater Desalination	Truck in Water	Supply from Nearby Entity	Existing Emergency Interconnect	Potential Entity Providing Supply	Other Local Entities Required to Participate/Coordinate	Emergency Agreements/Arrangements Already in Place?	Type of Infrastructure Required
SMITH BEND WSC	BOSQUE	128	18			X		X	X		CLIFTON			Well, Pipeline, Transportation
VALLEY MILLS	BOSQUE	1,267	247			X		X	X		CLIFTON			Well, Pipeline, Transportation
BRAZOS COUNTY-OTHER	BRAZOS	2,497	350			X	X	X	X		COLLEGE STATION			Well, Pipeline, Transportation
BURLESON COUNTY-OTHER	BURLESON	7,076	788			X	X	X	X		CALDWELL			Well, Pipeline, Transportation
CALDWELL	BURLESON	4,293	919			X		X	X		ROCKDALE			Well, Pipeline, Transportation
DEANVILLE WSC	BURLESON	1,926	367			X		X	X		CALDWELL			Well, Pipeline, Transportation
MILANO WSC	BURLESON	2,811	511			X		X	X		ROCKDALE			Well, Pipeline, Transportation
SNOOK	BURLESON	1,170	410			X	X	X	X		CALDWELL			Well, Pipeline, Transportation
SOMERVILLE	BURLESON	1,316	268			X	X	X	X		CALDWELL			Well, Pipeline, Transportation
CALLAHAN COUNTY-OTHER	CALLAHAN	2,126	159	X	X	X		X	X		CLYDE			Well, Pipeline, Transportation
CALLAHAN COUNTY WSC	CALLAHAN	2,304	190			X		X	X		CLYDE			Well, Pipeline, Transportation
CROSS PLAINS	CALLAHAN	920	211			X		X	X		CLYDE			Well, Pipeline, Transportation
POTOSI WSC	CALLAHAN	7,732	1,164			X		X	X		CLYDE			Well, Pipeline, Transportation
COMANCHE COUNTY-OTHER	COMANCHE	7,117	719	X	X	X		X	X		COMANCHE			Well, Pipeline, Transportation
COMANCHE	COMANCHE	4,307	522		X	X		X	X		DE LEON			Well, Pipeline, Transportation
DE LEON	COMANCHE	2,226	235		X	X		X	X		COMANCHE COUNTY WSC			Well, Pipeline, Transportation
CORYELL COUNTY-OTHER	CORYELL	3,543	401	X	X	X	X	X	X		COPPERAS COVE			Well, Pipeline, Transportation
CENTRAL TEXAS COLLEGE DISTRICT	CORYELL	891	280					X	X		COPPERAS COVE			Pipeline, Transportation

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Entity				Potential Emergency Water Supply Sources							Implementation Requirements			
Water User Group	County	2030 Population	2030 Demand (AF/yr)	Release From Upstream Reservoir	Curtailment of Upstream/Downstream Water Rights	Local Groundwater Well	Brackish Groundwater Desalination	Truck in Water	Supply from Nearby Entity	Existing Emergency Interconnect	Potential Entity Providing Supply	Other Local Entities Required to Participate/Coordinate	Emergency Agreements/Arrangements Already in Place?	Type of Infrastructure Required
ELM CREEK WSC	CORYELL	4,460	693			X		X	X		OGLESBY			Well, Pipeline, Transportation
FLAT WSC	CORYELL	682	194			X		X	X		GATESVILLE			Well, Pipeline, Transportation
FORT GATES WSC	CORYELL	2,345	479			X		X	X		GATESVILLE			Well, Pipeline, Transportation
MULTI COUNTY WSC	CORYELL	3,306	328			X		X	X		GATESVILLE			Well, Pipeline, Transportation
MUSTANG VALLEY WSC	CORYELL	1,862	439			X		X	X		GATESVILLE			Well, Pipeline, Transportation
OGLESBY	CORYELL	515	40			X				CORYELL CITY WSD	GATESVILLE			Well, Pipeline, Transportation
THE GROVE WSC	CORYELL	1,317	199			X		X	X		OGLESBY			Well, Pipeline, Transportation
EASTLAND COUNTY-OTHER	EASTLAND	2,976	255	X	X	X		X	X		EASTLAND			Well, Pipeline, Transportation
CISCO	EASTLAND	3,947	730	X		X		X	X		EASTLAND			Well, Pipeline, Transportation
EASTLAND	EASTLAND	3,515	610	X		X		X	X		CISCO			Well, Pipeline, Transportation
FORT GRIFFIN SUD	EASTLAND	1,141	213	X		X		X	X		CISCO			Well, Pipeline, Transportation
GORMAN	EASTLAND	952	111			X		X	X		CARBON			Well, Pipeline, Transportation
RISING STAR	EASTLAND	698	130			X		X	X		GORMAN			Well, Pipeline, Transportation
STAFF WSC	EASTLAND	1,251	195			X		X	X		GORMAN			Well, Pipeline, Transportation
STEPHENS REGIONAL SUD	EASTLAND	2,831	550	X		X		X	X	BRECKENRIDGE	EASTLAND			Well, Pipeline, Transportation
ERATH COUNTY-OTHER	ERATH	18,207	2,475		X	X		X	X		STEPHENVILLE			Well, Pipeline, Transportation
DUBLIN	ERATH	2,877	323		X	X		X	X		STEPHENVILLE			Well, Pipeline, Transportation
GORDON	ERATH	659	166		X	X		X	X		STEPHENVILLE			Well, Pipeline, Transportation

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Entity				Potential Emergency Water Supply Sources							Implementation Requirements			
Water User Group	County	2030 Population	2030 Demand (AF/yr)	Release From Upstream Reservoir	Curtailment of Upstream/Downstream Water Rights	Local Groundwater Well	Brackish Groundwater Desalination	Truck in Water	Supply from Nearby Entity	Existing Emergency Interconnect	Potential Entity Providing Supply	Other Local Entities Required to Participate/Coordinate	Emergency Agreements/Arrangements Already in Place?	Type of Infrastructure Required
FALLS COUNTY-OTHER	FALLS	6,889	842		X	X	X	X	X		MARLIN			Well, Pipeline, Transportation
CEGO-DURANGO WSC	FALLS	1,174	203			X		X	X		MARLIN			Well, Pipeline, Transportation
FISHER COUNTY-OTHER	FISHER	907	100			X	X	X	X		ROTAN			Well, Pipeline, Transportation
GRIMES COUNTY-OTHER	GRIMES	10,456	1,434			X	X	X	X		NAVASOTA			Well, Pipeline, Transportation
NAVASOTA	GRIMES	7,917	1,581			X		X	X		COLLEGE STATION			Well, Pipeline, Transportation
TDCJ LUTHER UNITS	GRIMES	1,170	319			X	X	X	X		NAVASOTA			Well, Pipeline, Transportation
TDCJ W PACK UNIT	GRIMES	1,675	451			X	X	X	X		NAVASOTA			Well, Pipeline, Transportation
HAMILTON COUNTY-OTHER	HAMILTON	3,461	415			X		X	X		HAMILTON			Well, Pipeline, Transportation
HAMILTON	HAMILTON	2,700	527			X		X	X		MULTI COUNTY WSC			Well, Pipeline, Transportation
HICO	HAMILTON	1,224	177			X		X	X		HAMILTON			Well, Pipeline, Transportation
MULTI COUNTY WSC	HAMILTON	624	62			X		X	X		HAMILTON			Well, Pipeline, Transportation
HASKELL COUNTY-OTHER	HASKELL	2,221	286		X	X	X	X	X		HASKELL			Well, Pipeline, Transportation
HASKELL	HASKELL	3,179	602			X	X	X	X		STAMFORD			Well, Pipeline, Transportation
STAMFORD	HASKELL	2,846	728			X	X	X	X		HASKELL			Well, Pipeline, Transportation
HILL COUNTY-OTHER	HILL	4,438	470	X	X	X	X	X	X		HILLSBORO			Well, Pipeline, Transportation
CHATT WSC	HILL	1,251	220			X		X	X		HILLSBORO			Well, Pipeline, Transportation
Entity				Potential Emergency Water Supply Sources							Implementation Requirements			
FILES VALLEY WSC	HILL	3,600	706			X		X	X		HILLSBORO			Well, Pipeline, Transportation
GHOLSON WSC	HILL	4,560	627			X	X	X	X		AQUILLA	X		Well, Pipeline, Transportation

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Entity				Potential Emergency Water Supply Sources							Implementation Requirements			
Water User Group	County	2030 Population	2030 Demand (AF/yr)	Release From Upstream Reservoir	Curtailment of Upstream/Downstream Water Rights	Local Groundwater Well	Brackish Groundwater Desalination	Truck in Water	Supply from Nearby Entity	Existing Emergency Interconnect	Potential Entity Providing Supply	Other Local Entities Required to Participate/Coordinate	Emergency Agreements/Arrangements Already in Place?	Type of Infrastructure Required
ITASCA	HILL	1,698	200			X		X	X		HILLSBORO			Well, Pipeline, Transportation
POST OAK SUD	HILL	1,007	226			X		X	X		HUBBARD			Well, Pipeline, Transportation
WHITNEY	HILL	2,424	454			X		X	X	HILL COUNTY WSC	AQUILLA			Well, Pipeline, Transportation
WOODROW OSCEOLA WSC	HILL	2,842	546			X		X	X		HILLSBORO			Well, Pipeline, Transportation
HOOD COUNTY-OTHER	HOOD	41,090	4,127	X	X	X		X	X		GRANBURY			Well, Pipeline, Transportation
LIPAN	HOOD	937	146			X		X	X		GRANBURY			Well, Pipeline, Transportation
SANTO SUD	HOOD	2,005	270			X		X	X		GRANBURY			Well, Pipeline, Transportation
TOLAR	HOOD	1,153	186			X		X	X		GRANBURY			Well, Pipeline, Transportation
JOHNSON COUNTY-OTHER	JOHNSON	12,805	1,310	X	X	X		X	X		BURLESON			Well, Pipeline, Transportation
GODLEY	JOHNSON	1,365	170			X		X	X	JOHNSON COUNTY SUD	CLEBURNE			Well, Pipeline, Transportation
GRANDVIEW	JOHNSON	1,754	291			X		X	X		ALVARADO			Well, Pipeline, Transportation
RIO VISTA	JOHNSON	1,069	185			X		X	X	JOHNSON COUNTY SUD	CLEBURNE			Well, Pipeline, Transportation
JONES COUNTY-OTHER	JONES	7,090	857	X	X	X	X	X	X		ABILENE			Well, Pipeline, Transportation
ANSON	JONES	2,291	345			X	X	X	X		STAMFORD			Well, Pipeline, Transportation
HAMLIN	JONES	1,544	315			X	X	X	X		STAMFORD			Well, Pipeline, Transportation
STAMFORD	JONES	2,846	728			X	X	X	X		ANSON			Well, Pipeline, Transportation
KENT COUNTY-OTHER	KENT	245	29			X	X	X	X		JAYTON			Well, Pipeline, Transportation
JAYTON	KENT	492	97			X	X	X	X		ASPERMONT			Well, Pipeline, Transportation

Entity				Potential Emergency Water Supply Sources							Implementation Requirements			
Water User Group	County	2030 Population	2030 Demand (AF/yr)	Release From Upstream Reservoir	Curtailment of Upstream/Downstream Water Rights	Local Groundwater Well	Brackish Groundwater Desalination	Truck in Water	Supply from Nearby Entity	Existing Emergency Interconnect	Potential Entity Providing Supply	Other Local Entities Required to Participate/Coordinate	Emergency Agreements/Arrangements Already in Place?	Type of Infrastructure Required
KNOX COUNTY-OTHER	KNOX	900	89		X	X	X	X	X		MUNDAY			Well, Pipeline, Transportation
KNOX CITY	KNOX	1,004	246			X		X	X		MUNDAY			Well, Pipeline, Transportation
MUNDAY	KNOX	1,162	228			X		X	X		GOREE			Well, Pipeline, Transportation
LAMPASAS COUNTY-OTHER	LAMPASAS	740	95			X	X	X	X		LAMPASAS			Well, Pipeline, Transportation
LAMPASAS	LAMPASAS	8,600	1,562			X		X	X		LOMETA	X		Well, Pipeline, Transportation
LEE COUNTY-OTHER	LEE	2,717	271			X	X	X	X		GIDDINGS			Well, Pipeline, Transportation
GIDDINGS	LEE	5,497	1,129			X	X	X	X		THRALL			Well, Pipeline, Transportation
LEXINGTON	LEE	1,951	376			X		X	X		GIDDINGS			Well, Pipeline, Transportation
LIMESTONE COUNTY-OTHER	LIMESTONE	2,782	251	X	X	X	X	X	X		MEXIA			Well, Pipeline, Transportation
GROESBECK	LIMESTONE	3,225	585	X	X			X	X		MEXIA			Pipeline, Transportation
MART	LIMESTONE	1,798	460			X	X	X	X		MEXIA	X		Well, Pipeline, Transportation
MEXIA	LIMESTONE	6,936	1,026			X		X	X	BISTONE MWD	SLC WSC			Well, Pipeline, Transportation
POST OAK SUD	LIMESTONE	1,007	226			X		X	X		TEHUACANA	X		Well, Pipeline, Transportation
PRAIRIE HILL WSC	LIMESTONE	1,384	277			X	X	X	X	EOL WSC	MEXIA	X		Well, Pipeline, Transportation
SLC WSC	LIMESTONE	1,000	101			X		X	X		MEXIA			Pipeline, Transportation
MCLENNAN COUNTY-OTHER	MCLENNAN	5,941	734	X	X	X		X	X		WACO			Well, Pipeline, Transportation
AXTELL WSC	MCLENNAN	1,775	303			X	X	X	X	EOL WSC	WACO	X		Well, Pipeline, Transportation
CHALK BLUFF WSC	MCLENNAN	3,608	576			X	X	X	X	ROSS WSC	WACO	X		Well, Pipeline, Transportation

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Entity				Potential Emergency Water Supply Sources							Implementation Requirements			
Water User Group	County	2030 Population	2030 Demand (AF/yr)	Release From Upstream Reservoir	Curtailment of Upstream/Downstream Water Rights	Local Groundwater Well	Brackish Groundwater Desalination	Truck in Water	Supply from Nearby Entity	Existing Emergency Interconnect	Potential Entity Providing Supply	Other Local Entities Required to Participate/Coordinate	Emergency Agreements/Arrangements Already in Place?	Type of Infrastructure Required
CRAWFORD	MCLENNAN	870	202		X	X		X	X		MCGREGOR			Well, Pipeline, Transportation
EAST CRAWFORD WSC	MCLENNAN	985	331			X		X	X		WOODWAY			Well, Pipeline, Transportation
ELM CREEK WSC	MCLENNAN	4,460	693			X		X	X		BRUCEVILLE-EDDY			
EOL WSC	MCLENNAN	1,873	228			X	X	X	X	AXTELL WSC & PRAIRIE HILL WSC	WACO	X		Well, Pipeline, Transportation
GHOLSON WSC	MCLENNAN	3,435	472			X	X	X	X		WACO	X	X	Well, Pipeline, Transportation
H & H WSC	MCLENNAN	1,475	199			X	X	X	X		TRI COUNTY SUD	X		Well, Pipeline, Transportation
HIGHLAND PARK WSC	MCLENNAN	517	150			X		X	X		WACO, GHOLSON WSC			Well, Pipeline, Transportation
LACY LAKEVIEW	MCLENNAN	7,585	1,022			X		X	X		WACO			Well, Pipeline, Transportation
LEVI WSC	MCLENNAN	2,193	574			X		X	X		LORENA			
MART	MCLENNAN	1,798	460			X	X	X	X		WACO	X		Well, Pipeline, Transportation
MCGREGOR	MCLENNAN	9,961	2,602			X		X	X		MOODY			Well, Pipeline, Transportation
MCLENNAN COUNTY WCID 2	MCLENNAN	1,185	222			X	X	X	X		WACO	X		Well, Pipeline, Transportation
NORTH BOSQUE WSC	MCLENNAN	2,075	638			X		X	X		WACO			Well, Pipeline, Transportation
PRAIRIE HILL WSC	MCLENNAN	1,384	277			X	X	X	X	EOL WSC	WACO	X		Well, Pipeline, Transportation
RIESEL	MCLENNAN	1,231	156			X	X	X	X	TRI COUNTY SUD	RMS WSC	X	X	Well, Pipeline, Transportation
TEXAS STATE TECHNICAL COLLEGE	MCLENNAN	1,000	2,016			X		X	X		LACY LAKEVIEW			
VALLEY MILLS	MCLENNAN	1,267	247			X		X	X		WACO			Well, Pipeline, Transportation
WINDSOR WATER	MCLENNAN	647	104			X		X	X		WOODWAY			Well, Pipeline, Transportation
MILAM COUNTY-OTHER	MILAM	7,187	853		X		X	X	X		CAMERON			Pipeline, Transportation

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Entity				Potential Emergency Water Supply Sources							Implementation Requirements			
Water User Group	County	2030 Population	2030 Demand (AF/yr)	Release From Upstream Reservoir	Curtailment of Upstream/Downstream Water Rights	Local Groundwater Well	Brackish Groundwater Desalination	Truck in Water	Supply from Nearby Entity	Existing Emergency Interconnect	Potential Entity Providing Supply	Other Local Entities Required to Participate/Coordinate	Emergency Agreements/Arrangements Already in Place?	Type of Infrastructure Required
CAMERON	MILAM	5,320	1,265			X		X	X		MILANO WSC			Well, Pipeline, Transportation
MILANO WSC	MILAM	2,811	511			X		X	X		CAMERON			Well, Pipeline, Transportation
ROCKDALE	MILAM	7,428	1,609			X		X	X	SOUTHWEST MILAM WSC	CAMERON			Well, Pipeline, Transportation
THORNDALE	MILAM	1,775	265			X		X	X		ROCKDALE			Well, Pipeline, Transportation
NOLAN COUNTY-OTHER	NOLAN	1,218	135		X	X		X	X		SWEETWATER			Well, Pipeline, Transportation
ROSCOE	NOLAN	1,092	222			X		X	X		SWEETWATER			Well, Pipeline, Transportation
PALO PINTO COUNTY-OTHER	PALO PINTO	3,089	272	X	X			X	X		MINERAL WELLS			Pipeline, Transportation
GORDON	PALO PINTO	659	166	X		X		X	X		STRAWN			
LAKE PALO PINTO AREA WSC	PALO PINTO	1,061	128	X				X	X		SANTO SUD			
NORTH RURAL WSC	PALO PINTO	1,654	177	X	X			X	X		PALO PINTO WSC			
PALO PINTO WSC	PALO PINTO	748	102	X	X			X	X		NORTH RURAL WSC			
POSSUM KINGDOM WSC	PALO PINTO	1,413	599	X	X			X	X		GRAFORD			
SANTO SUD	PALO PINTO	2,005	270	X		X		X	X		GORDON			
SPORTSMANS WORLD MUD	PALO PINTO	76	75	X	X			X	X		PALO PINTO WSC			
STEPHENS REGIONAL SUD	PALO PINTO	2,831	550	X		X		X	X	BRECKENRIDGE	POSSUM KINGDOM WSC			
STRAWN	PALO PINTO	547	124	X	X			X	X		MINERAL WELLS			Pipeline, Transportation
STURDIVANT PROGRESS WSC	PALO PINTO	2,285	237	X	X			X	X		PALO PINTO WSC			
ROBERTSON COUNTY-OTHER	ROBERTSON	1,926	210			X	X	X	X		HEARNE			Well, Pipeline, Transportation
BREMOND	ROBERTSON	781	156			X	X	X	X	TRI COUNTY SUD	HEARNE			Well, Pipeline, Transportation
CALVERT	ROBERTSON	1,042	269			X	X	X	X		HEARNE			Well, Pipeline, Transportation
FRANKLIN	ROBERTSON	1,959	281			X	X	X	X		HEARNE			Well, Pipeline, Transportation
HEARNE	ROBERTSON	5,253	867			X	X	X	X		FRANKLIN			Well, Pipeline, Transportation

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Entity				Potential Emergency Water Supply Sources							Implementation Requirements			
Water User Group	County	2030 Population	2030 Demand (AF/yr)	Release From Upstream Reservoir	Curtailment of Upstream/Downstream Water Rights	Local Groundwater Well	Brackish Groundwater Desalination	Truck in Water	Supply from Nearby Entity	Existing Emergency Interconnect	Potential Entity Providing Supply	Other Local Entities Required to Participate/Coordinate	Emergency Agreements/Arrangements Already in Place?	Type of Infrastructure Required
ROBERTSON COUNTY WSC	ROBERTSON	3,370	522			X	X	X	X		HEARNE			Well, Pipeline, Transportation
TWIN CREEK WSC	ROBERTSON	922	225			X	X	X	X		FRANKLIN			Well, Pipeline, Transportation
SHACKELFORD COUNTY-OTHER	SHACKELFORD	228	22	X	X			X	X		ALBANY			Pipeline, Transportation
CALLAHAN COUNTY WSC	SHACKELFORD	2,304	190	X		X		X	X		MORAN			
FORT GRIFFIN SUD	SHACKELFORD	1,141	213	X		X		X	X		MORAN			
STEPHENS REGIONAL SUD	SHACKELFORD	2,831	550	X		X		X	X	BRECKENRIDGE	ALBANY			
SOMERVELL COUNTY-OTHER	SOMERVELL	1,407	166	X	X			X	X		GLEN ROSE			Pipeline, Transportation
GLEN ROSE	SOMERVELL	2,776	603			X		X	X		TOLAR			Well, Pipeline, Transportation
STEPHENS COUNTY-OTHER	STEPHENS	315	32			X		X	X		BRECKENRIDGE			Well, Pipeline, Transportation
FORT BELKNAP WSC	STEPHENS	3,853	515			X		X	X		BRECKENRIDGE			
FORT GRIFFIN SUD	STEPHENS	1,141	213	X		X		X	X		BRECKENRIDGE			
POSSUM KINGDOM WSC	STEPHENS	1,413	599	X	X			X	X		BRECKENRIDGE			
STAFF WSC	STEPHENS	1,251	195			X		X	X		BRECKENRIDGE			
STEPHENS REGIONAL SUD	STEPHENS	2,831	550	X		X		X	X	BRECKENRIDGE	ALBANY			
STONEWALL COUNTY-OTHER	STONEWALL	462	53			X	X	X	X		ASPERMONT			Well, Pipeline, Transportation
TAYLOR COUNTY-OTHER	TAYLOR	1,516	165		X			X	X		ABILENE			Pipeline, Transportation
POTOSI WSC	TAYLOR	7,732	1,164			X		X	X		ABILENE			
STEAMBOAT MOUNTAIN WSC	TAYLOR	7,215	960			X		X	X		ABILENE			
TYE	TAYLOR	1,016	157			X		X	X		ABILENE			
VIEW CAPS WSC	TAYLOR	1,963	319			X		X	X		ABILENE			
THROCKMORTON COUNTY-OTHER	THROCKMORTON	154	14		X			X	X		THROCKMORTON			Pipeline, Transportation
FORT BELKNAP WSC	THROCKMORTON	3,853	515			X		X	X		THROCKMORTON			
FORT GRIFFIN SUD	THROCKMORTON	1,141	213	X		X		X	X		THROCKMORTON			
STEPHENS REGIONAL SUD	THROCKMORTON	2,831	550	X		X		X	X	BRECKENRIDGE	THROCKMORTON			
THROCKMORTON	THROCKMORTON	617	146		X			X	X	FORT BELKNAP WSC	GRAHAM			Pipeline, Transportation

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Entity				Potential Emergency Water Supply Sources							Implementation Requirements			
Water User Group	County	2030 Population	2030 Demand (AF/yr)	Release From Upstream Reservoir	Curtailment of Upstream/Downstream Water Rights	Local Groundwater Well	Brackish Groundwater Desalination	Truck in Water	Supply from Nearby Entity	Existing Emergency Interconnect	Potential Entity Providing Supply	Other Local Entities Required to Participate/Coordinate	Emergency Agreements/Arrangements Already in Place?	Type of Infrastructure Required
WASHINGTON COUNTY-OTHER	WASHINGTON	10,918	1,362			X	X	X	X		BRENHAM			Well, Pipeline, Transportation
CENTRAL WASHINGTON COUNTY WSC	WASHINGTON	3,623	480			X	X	X	X		BRENHAM			
CHAPPELL HILL WSC	WASHINGTON	493	107			X	X	X	X		BRENHAM			
WILLIAMSON COUNTY-OTHER	WILLIAMSON	53,875	8,194	X	X	X	X	X	X		ROUND ROCK			Well, Pipeline, Transportation
BARTLETT	WILLIAMSON	1,639	328			X	X	X	X		ROUND ROCK			Well, Pipeline, Transportation
BLOCK HOUSE MUD	WILLIAMSON	5,749	808			X		X	X	LEANDER	ROUND ROCK			
FERN BLUFF MUD	WILLIAMSON	5,426	1,152			X		X	X		BRUSHY CREEK MUD			
FLORENCE	WILLIAMSON	1,416	208			X		X	X	GEORGETOWN	ROUND ROCK		X	Well, Pipeline, Transportation
GRANGER	WILLIAMSON	1,234	194			X	X	X	X		ROUND ROCK		X	Well, Pipeline, Transportation
JARRELL-SCHWERTNER WSC	WILLIAMSON	65,322	8,816		X	X		X	X	SONTERRA MUD	GEORGETOWN			
PALOMA LAKE MUD 1	WILLIAMSON	3,447	537			X		X	X		GEORGETOWN		X	Well, Pipeline, Transportation
PALOMA LAKE MUD 2	WILLIAMSON	2,506	390			X		X	X		GEORGETOWN		X	Well, Pipeline, Transportation
THORNDALE	WILLIAMSON	1,775	265			X	X	X	X		ROUND ROCK		X	Well, Pipeline, Transportation
WALSH RANCH MUD	WILLIAMSON	824	128			X		X	X		BRUSHY CREEK MUD			
WILLIAMSON COUNTY MUD 10	WILLIAMSON	3,780	589			X		X	X		GEORGETOWN		X	Well, Pipeline, Transportation
WILLIAMSON COUNTY MUD 11	WILLIAMSON	5,921	922			X		X	X		GEORGETOWN		X	Well, Pipeline, Transportation
WILLIAMSON TRAVIS COUNTIES MUD 1	WILLIAMSON	3,832	584			X		X	X		GEORGETOWN		X	Well, Pipeline, Transportation
YOUNG COUNTY-OTHER	YOUNG	3,410	401		X	X		X	X		GRAHAM			Well, Pipeline, Transportation
FORT BELKNAP WSC	YOUNG	3,853	515			X		X	X		OLNEY	X		Well, Pipeline, Transportation
New WUGs added														
THE BITTER CREEK WSC	Brazos	1,631	247											
CROSS COUNTRY WSC	Brazos	3,310	643											

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Entity				Potential Emergency Water Supply Sources							Implementation Requirements			
Water User Group	County	2030 Population	2030 Demand (AF/yr)	Release From Upstream Reservoir	Curtailment of Upstream/Downstream Water Rights	Local Groundwater Well	Brackish Groundwater Desalination	Truck in Water	Supply from Nearby Entity	Existing Emergency Interconnect	Potential Entity Providing Supply	Other Local Entities Required to Participate/Coordinate	Emergency Agreements/Arrangements Already in Place?	Type of Infrastructure Required
MERKEL	Brazos	2,617	329											
WEST BRAZOS WSC	Brazos	2,290	396											
DOUBLE DIAMOND UTILITIES	Brazos	2,837	3,240											
WOODROW OSCEOLA WSC	Brazos	2,842	546											
HAMBY WSC	Brazos	1,413	176											
LAWN	Colorado	242	47											
BELL COUNTY WCID 1	Brazos	264	98											
CADE LAKES WSC	Brazos	436	110											
BENJAMIN	Brazos	186	57											
HOG CREEK WSC	Brazos	370	396											
NOACK WSC	Brazos	738	152											
S U N WSC	Brazos	2,348	244											
WESTBOUND WSC	Brazos	2,405	183											

Notes:
(1) The 2020 population of the WUGs are informed by the TWDB provided spreadsheet titled “CORRECTED - WUG_HistoricalData_2026RWPs.xlsx” in March 2023. The supply sources are informed by the 2030 supply information from DB 27, accessed on 8/29/2024. Based on the population and water source screening, 15 WUGs were added to the 2021 Table above. Based on DB 27, 6 WUGs which were on the 2021 RWP table above secured additional sources and therefore were removed from the table and 9 WUGs were no longer a WUG in the 2026 RWP.

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7.8 Other Drought-Related Considerations and Recommendations

The Brazos G RWPG acknowledges that DCPs are a useful drought management tool for entities with both surface and groundwater sources and recommends that all entitles consider adopting a DCP in preparation for drought conditions. The RWPG also recommends that in accordance with TCEQ guidelines, entities update their DCPs every five years as triggers can change as wholesale and retail water providers reassess their contracts and supplies.

7.8.1 Drought Response Recommendations for Surface Water

Surface water accounts for approximately 69 percent of projected 2080 municipal supplies in Brazos G. Surface water is sold by more than 73 WUG/WWPs and comes from over 37 lakes and numerous river intakes. With such a variety of supply sources it is difficult to create a set of triggers and responses that fit the needs of each WUG in the regional planning area. Brazos G recognizes that supplies are understood best by the operators and suggests that WUGs without DCPs look to the DCPs of their water providers as examples, if available.

For entities without DCPs which supply themselves with local surface water, the Brazos G RWPG suggests reviewing the drought responses and recommendations used by similar entities in the region. An example of triggers and responses from the DCP for the City of Waco is presented below (Table 7.11). Waco was selected as a representative example because they provide water to several entities throughout the Brazos G Area and rely on a single source of surface water, i.e., Lake Waco. The DCP includes four water stages ranging from “Water Alert” to “Water Crisis”. The triggers depend on parameters such as treatment plant use, storage levels, reservoir elevations, and system failures. The responses include categories ranging from home irrigation limits to commercial and industrial use reductions.

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Table 7.11 Waco Surface Water Drought Contingency Response

Drought Stage	Trigger	Actions	Goals
Stage 1 – MILD Water Shortage	▪ Lake Waco reservoir level decreases to 457 msl (about 80% of capacity); or ▪ Weather forecasts and streamflow conditions warrant restrictions, based on opinion of the city manager; or ▪ Other unforeseen events, such as a water treatment plant, pipe or pump failure or source of supply contamination that necessitates the public participation in a reduction of water usage.	▪ Mandatory restrictions: » The city will reduce use of water for municipal purposes by Submittal of a water plan that includes following the mandated day and times allowed for watering and meeting the water reduction goal. » Monitor "excessive watering" and issue notifications to customers. » Criminal penalties apply during Stage 1 Restrictions. » All landscape and other outdoor water usage at each service address shall be limited to two days a week based on the last digit in the physical street address; however, landscape and outdoor water usage is prohibited from 10:00 AM to 7:00 PM. » Variances will be reduced to 45 days for newly installed plants. All other variance requirements in the Conservation Plan remain in effect. » Golf course landscape watering and Athletic Field watering must adhere to the water plan that was submitted or adhere to the twice a week water schedule.	▪ Reduction of previous 3-year average daily use by 1%
Stage 2 – MODERATE Water Shortage	▪ Lake Waco reservoir level decreases to 452 msl (about 60% capacity) ▪ Inability to recover approximately 90 percent of water stored in all storage facilities within a 24-hour period ▪ Weather forecasts and streamflow conditions warrant restrictions, based on opinion of the city manager ▪ Other unforeseen events, such as a water treatment plant, pipe or pump failure, or source of supply contamination that necessitates the public's participation in a reduction of water usage.	▪ Mandatory restrictions: » The city will reduce use of water for municipal purposes by: 1. Submittal of a water plan that includes following the mandated day and times allowed for watering and meeting the water reduction goal 2. Reduced hours for such things as spray parks. » The city will monitor "excessive watering" and issue notification to customers. "Excessive watering" occurs where run-off extends for a distance greater than (10) feet from the customer's property or where there is washing or hosing down of buildings, sidewalks, driveways, patios, porches, parking surfaces or other paved surfaces. » Criminal penalties apply during Stage 2 restrictions. » All landscape and other outdoor water usage at each service address shall be limited to two days a week based on the last digit in the physical street address; however, landscape and outdoor water usage is prohibited from 10:00 AM to 7:00PM. » Watering of newly installed landscaping variances is reduced to 30 days from the date of planting. After the first month, the landscape water day's schedule and hourly restrictions must be followed. All other variance requirements in the Conservation Plan remain in effect. » Golf course landscape watering and Athletic Field watering must adhere to the water plan that was submitted or adhere to the twice a week watering schedule. » Any other measure that the City Manager determines is necessary and in the best interest of the public to maintain an adequate water supply. » Conservation Rates take effect.	▪ Reduction of previous 3-year average daily use by 2% November – March and 8% April - October

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Drought Stage	Trigger	Actions	Goals
Stage 3 – SEVERE Water Shortage	▪ Lake Waco reservoir level decreases to 449 msl (about 50% capacity); or ▪ There is an inability to recover approximately ninety (90) percent of water stored in all storage facilities within a twenty-four (24) hour period. ▪ Weather forecasts and streamflow conditions, in the opinion of the city manager, warrant restrictions on the use of water; or ▪ Total amount of water available, as determined by the utilities director, to the city from its developed water sources is less than a 24-month supply; or ▪ Other unforeseen events, such as a water treatment plant, pipe or pump failure, or source of supply contamination that necessitate the public's participation in a reduction of water usage	▪ Mandatory restrictions: » The city will reduce use of water for municipal purposes by: 1. Submittal of a water plan that includes following the mandated day and times allowed for watering and meeting the water reduction goal 2. Reduced hours for such things as spray parks. » The city will monitor "excessive watering" and issue notification to customers. "Excessive watering" occurs where run-off extends for a distance greater than (10) feet from the customer's property or where there is washing or hosing down of buildings, sidewalks, driveways, patios, porches, parking surfaces or other paved surfaces. » Criminal penalties apply during Stage 3 restrictions. » All landscape and other outdoor water usage at each physical street address shall continue according to the landscape water days schedule (1 day a week); however, landscape and outdoor water usage is prohibited from 10:00 AM to 7:00PM. » Watering by handheld hose-end nozzle or sprayer that requires continuous human action (such as squeezing of a lever) is permitted on the water day and times reflected above. Buried drip irrigation is still permitted as long as it is buried at least 6 inches deep. » No variables for newly installed plantings will be given. » Existing swimming pools, hot tubes, spas, ornamental ponds and fountains may be replenished with a handheld hose to maintain operation only » Permitting of new swimming pools, hot tubs, spas, ornamental ponds or fountain construction is prohibited, except that those under construction at the time Stage 3 restrictions are initiated may complete construction and may be filled one time only. Filling occurs when an amount of water equal to at least seventy-five (75) percent of the water capacity is placed in structure or facility. » Excessive water fun-off from any landscaped area onto streets, alleys, or parking lots is prohibited. Run-off is excessive when it extends for a distance greater than ten (10) feet from the customer's property. » Washing or hosing down buildings, sidewalks, driveways, patios, porches, parking areas, or other paved surfaces is prohibited. » Commercial car washes will not be allowed to operate during Drought Stage 3. » Use of water from fire hydrants is prohibited except for firefighting and health and safety related activities. » Any other measure that the City Manager determines is necessary and in the best interest of the public to maintain an adequate water supply. ▪ Conservation Rates take effect.	▪ Reduction of previous 3-year average daily use by 2% November – March and 15% from April- October
Stage 4 – EMERGENCY Water Shortage	▪ Lake Waco reservoir level decreases to 445 msl (about 40% capacity), or ▪ City manager determines that catastrophically decreasing reservoir levels and/or delivery capabilities with an inability to recover to provide necessary services for public health, safety, and welfare exist; or ▪ Weather forecasts and streamflow conditions, in the opinion of the manager, warrant restrictions on the use of water; or ▪ Total amount of water available, as determined by the water utilities director, to the city from its developed water sources is less than a 12-month supply; or ▪ Other unforeseen events, such as a water treatment plant, pipe or pump failure or source of supply contamination that necessitate the public's participation in a reduction of water usage.	▪ Mandatory restrictions: » Any and all outdoor/landscape water usage is prohibited until the emergency is alleviated. This applies to all metered water users using the city's public water supply and includes all residential (single or multi-family), commercial (car wash, nurseries, business), recreational (public/private golf courses, parks, athletic fields), religious, health care, school, and municipal entities, This applies to watering with a handheld hose and drip irrigation. » Water used for municipal purposes will be limited to only those activities necessary to maintain the public health, safety and welfare, as determined by the City. » Use of water from fire hydrants is prohibited except for firefighting and other health and safety related activities » Any other measure that the City Manager determines is necessary and in the best interest of the public to maintain an adequate water supply. » Conservation Rates take effect.	▪ Reduction of previous 3-year average daily use by 5% November – March and 20% April – October. ▪ Note the city manager or his/her designee can set a goal for greater water use reduction as circumstances warrant.

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7.8.2 Drought Response Recommendations for Groundwater

Groundwater accounts for approximately 28 percent of projected 2080 municipal supplies. Entities in Brazos G use both brackish and non-brackish wells from over 22 aquifers or formations. With such a variety of supply sources it is difficult to create a set of triggers and responses that fit the needs of each WUG in the regional planning area. Brazos G recognizes that supplies are understood best by the operators and suggests that WUGs without DCPs look to the DCP's of their water providers and groundwater conservation districts as examples, if available.

For entities without DCPs supplying themselves with local groundwater, Brazos G suggests reviewing the drought responses and recommendations used by similar nearby entities. An example of triggers and responses from the DCP for the City of Thrall is presented below (Table 7.12). Thrall was selected as a representative example because they are a small WUG using local groundwater like many of the groundwater reliant WUGS who have not yet developed a DCP. The DCP includes five water stages ranging from "Mild" to "Emergency". The triggers depend on parameters such as season, ground storage levels, contamination, and system failures. The responses include categories ranging from residential irrigation limits to commercial and industrial use reductions. Note that Thrall is in the process of updating this DCP.

Table 7.12 Thrall Groundwater Drought Contingency Response

Drought Stage	Trigger	Actions
Stage I – MILD	Yearly: May 1st – September 30th.	▪ City reduces water main flushing ▪ Voluntary limit on irrigation to 2 days a week at designated times ▪ City of Thrall should adhere to Stage 2 restrictions below ▪ Customers are requested to minimize or discontinue non-essential water use
Stage II – MODERATE	Ground Storage does not gain over 20ft.	▪ Mandatory limit on irrigation to 2 days a week at designated times or by hand-held hose or 5-gallon bucket ▪ Vehicle washing allowed only with hand-held bucket or hose ▪ Filling of pools or Jacuzzis limited to watering days/times ▪ Non-circulating ponds or fountains are prohibited unless supporting aquatic life. ▪ Use of water from fire hydrants shall be limited to firefighting activities or other activities necessary to maintain public health, safety and welfare. ▪ All restaurants are prohibited from serving water unless requested ▪ Non-essential uses are prohibited
Stage III – SEVERE	Ground Storage does not gain over 15 ft.	▪ All actions listed in Stage II ▪ Irrigation limited to hand-held hose or less than 5 gallons of faucet water is used during designated watering days and times. ▪ The use of water for construction from designated hydrants under special permit is discontinued.

Drought Stage	Trigger	Actions
Stage IV – CRITICAL	Ground Storage does not gain over 10 ft	▪ All actions listed in Stages II and III ▪ Only washing of mobile equipment in the critical interest of public health or safety is allowed. Commercial car washes can be used during designated hours. ▪ Filling of swimming pools or fountains is prohibited ▪ No applications for new, additional or expanded water service infrastructure shall be approved
Stage V – EMERGENCY	▪ Infrastructure breaks ▪ Contamination ▪ System outage	▪ All actions described in previous stages ▪ Irrigation of landscaped areas is absolutely prohibited ▪ Use of water to wash any vehicle is absolutely prohibited

7.9 Development of Region-Specific Model Drought Contingency Plans

TCEQ has prepared model drought contingency plans for wholesale and retail water suppliers and irrigation districts to provide guidance and suggestions to entities with regard to the preparation of drought contingency plans. Not all items in the model will apply to every system's situation, but the overall model can be used as a starting point for most entities. The Brazos G RWPG suggests that the TCEQ Model DCPs should be used in conjunction with drought contingency measures such as those listed above for Waco and Thrall for entities wishing to develop a new DCP. The DCPs for Waco and Thrall can be found in Appendix J.

The TCEQ model drought contingency plans can be found on TCEQ's website at the following link:

https://www.tceq.texas.gov/permitting/water_rights/wr_technical-resources/contingency.html

7.10 Drought Preparedness Council Report

The Drought Preparedness Council provided a letter to the BGRWPG on February 8, 2024, providing three recommendations below.

1. "The regional water plans and state water plan shall serve as water supply plans under drought of record conditions. The DPC encourages regional water planning groups to consider planning for drought conditions worse than the drought of record, including scenarios that reflect greater rainfall deficits and/or higher surface temperatures."
    a. Brazos G Response: The Brazos G RWPG has utilized the Chapter 7 template provided by TWDB staff and has addressed the requirements related to DWDOR, as discussed in Section 7.2. This has included identifying where such studies have been conducted for consideration of needs for redundancies to address uncertainty in regional water planning.

2. "The Drought Preparedness Council encourages regional water planning groups to incorporate projected future reservoir evaporation rates in their assessments of future surface water availability."
   a. Brazos G Response: The Brazos G RWPG has utilized the state's official WAM Run 3 models as the basis from which to evaluate surface water source availabilities, and will identify where such information becomes available for consideration to address uncertainty in the regional planning process.
3. "The Drought Preparedness Council encourages regional water planning groups to identify in their plans utilities within their boundaries that reported having less than 180 days of available water supply to the Texas Commission on Environmental Quality during the current or preceding planning cycle. For systems that appeared on the 180-day list, RWPGs should perform the evaluation required by Texas Administrative Code Section 357.42(g), if it has not already been completed for that system."
   a. Brazos G Response: The Brazos G RWPG has utilized the Chapter 7 template provided by TWDB and has addressed the requirements consistent TAC §357.42(g), as shown in Section 7.7.

7.11 Other Drought Recommendations

7.11.1 Counterproductive Variations in Drought Response Strategies

Review of drought contingency plans in the Brazos G Area identified instances where:

1. pNeighboring utilities relying on the same source utilize different drought triggers and
2. Neighboring utilities relying on different sources utilize the same trigger due to the convenience of the media sources available from the larger market (usually smaller suburban communities following the lead of the larger urban community).

Both of these situations can be counterproductive during times of drought and require education of utility customers regarding their source(s) of supply.

7.11.2 Recommendations to the Drought Preparedness Council

The Brazos G RWPG offers no recommendations to the Drought Preparedness Council nor any recommendations regarding the State Drought Preparedness Plan.

7.11.3 Monitoring and Assessment

The Brazos G RWPG recommends that all entities monitor the drought situation around the state and locally in order to prepare for and facilitate decisions. Several state and local agencies are monitoring and reporting on conditions with up-to-date information. More information can be found at these local, state and federal resources:

- Brazos River Authority Drought Information:
  https://www.brazos.org/About-Us/Water-Supply/Drought
- Palmer Drought Severity Index:
  http://www.ncdc.noaa.gov/temp-and-precip/drought/historical-palmers/
- TWDB Drought Information:
  http://waterdatafortexas.org/drought/

- TCEQ Drought Information:
  https://www.tceq.texas.gov/response/drought
- Drought Annex: State of Texas Emergency Management Plan (2014, updated 2016):
  https://waterdatafortexas.org/drought/twdb-reports/state_of_texas_drought_annex_2016.pdf
- National Drought Mitigation Center:
  https://drought.unl.edu/
- National Integrated Drought Information System:
  https://www.drought.gov/drought/states/texas

CHAPTER 8 RECOMMENDATIONS FOR UNIQUE STREAM SEGMENTS, UNIQUE RESERVOIR SITES, AND OTHER LEGISLATIVE POLICY RECOMMENDATIONS

8.1 Recommendations Concerning River and Stream Segments Having Unique Ecological Value

The Texas Parks and Wildlife Department (TPWD) provides a wealth of information on stream segments throughout the state and by region[1]. The Brazos G RWPG supports the proactive dissemination of such information to all water providers and users within the area in support of the continued improvement of the management of the region's water resources.

Regional water planning groups (RWPGs) are given the option of designating stream segments having "unique ecological value" within their planning areas. Five criteria are used to identify such segments:

1. Biological Function:
   a. Quantity (acreage or a real extent of habitat).
   b. Quality (biodiversity, age, uniqueness).
2. Hydrologic Function:
   a. Water Quality.
   b. Flood Attenuation and Flow Stabilization.
   c. Groundwater Recharge and Discharge.
3. Occurrence of Riparian Conservation Areas.
4. Occurrence of High Water Quality, Exceptional Aquatic Life or High Aesthetic Value.
5. Occurrence of Threatened or Endangered Species and/or Unique Communities.

The Brazos G RWPG (Brazos G) has chosen not to designate any stream segments as having unique ecological value.

8.2 Recommendations Concerning Sites Uniquely Suited for Reservoir Construction

Brazos G has previously identified the following sites as uniquely suited for reservoir construction. Each site was associated with a request by a potential local project sponsor to include the project as a recommended or alternative water management strategy in the 2016 Plan:

- Cedar Ridge Reservoir (City of Abilene).

[1] https://tpwd.texas.gov/landwater/water/conservation/water_resources/water_quantity/sigsegs/

- Turkey Peak Reservoir (Palo Pinto County Municipal Water District No. 1).
- Millers Creek Off-Channel Reservoir (North Central Texas Municipal Water Authority) (now known as Lake Creek Reservoir).
- Brushy Creek Reservoir (City of Marlin).
- Coryell County Off-Channel Reservoir (Coryell County).

Texas Water Code, 16.051(g-1) states "The designation of a unique reservoir site under this subsection terminates on September 1, 2015, unless there is an affirmative vote by a proposed project sponsor to make expenditures necessary in order to construct or file applications for permits required in connection with the construction of the reservoir under federal or state law."

Brazos G recommends re-designation of the Millers Creek Off-Channel Reservoir (known as Lake Creek Reservoir) and the Coryell County Off-Channel Reservoir, for which the unique designation appears to have terminated.

Brazos G recommends no change in designation for the previously designated sites for Cedar Ridge Reservoir, Turkey Peak Reservoir and Brushy Creek Reservoir, as those designations have not terminated because sufficient action has been taken prior to September 1, 2015, regarding their development to meet the requirements of Texas Water Code 16.051(g-1).

Brazos G does not recommend designation of any additional sites as uniquely suited for reservoir construction.

8.3 Brazos G – A Valuable Texas Resource

Brazos G is one the most diverse regional water planning areas in Texas, covering 37 counties along the Brazos River Basin. The geographic area extends from Kent, Stonewall, and Knox counties in the northwest to Washington and Lee Counties in the southeast.

Since its inception, Brazos G has been an important platform in regional water planning. Our central mission is to develop a regional water plan. Brazos G does not enact any water planning policy or strategy. Rather, it captures input and develops a regional water plan that meets the statutory requirements. The planning process is the true added value.

Brazos G brings together perspectives from agriculture, industries, municipalities, counties, small business, water utilities, the public, electric utilities, groundwater management representatives, environmental interests, and river authorities in an approach that helps enhance the overall water planning process.

Brazos G uses various resources such as our consultant, Carollo Engineers, Inc., and its subconsultants, to collect reliable region-wide data to include in our regional water plan. We engage with other stakeholders in addressing water planning issues. We reach out to constituents in the 37 counties as we develop the regional water plan. Input from these various sources makes the regional water planning process a bottom-up approach. Brazos G also arranges public meetings, including meetings in its Upper Basin, Middle Basin, and Lower Basin to collect even more public input. This process encourages transparency and inclusivity.

Brazos G serves an important role as an entry point for public engagement in the water planning process. This role also makes it a good resource for the Texas Legislature as it grapples with the realities of an ongoing drought, a rapidly growing population, and strong economic development.

8.4 Legislative and Policy Recommendations

Brazos G established a Water Policy Workgroup to discuss various issues concerning State water policy and to formulate proposed positions for the planning group to consider for recommendation to the Texas Water Development Board (TWDB) and the Texas Legislature. As the population and economic demands grow, water supplies become more stressed. These developments coupled with recent drought conditions make it increasingly important for water planning groups to consider diverse water management strategies.

Regional water planning rules require use of the Texas Commission on Environmental Quality (TCEQ) water availability models (WAMs) in determining surface water supply availability. The period of record for most existing TCEQ WAMs ends with the year 1997. In portions of the Brazos River Basin, drought conditions since 1997 are worse than conditions experienced prior to 1997. Therefore, firm water availability from existing surface water supply sources and from new surface water supply strategies may be overstated. As a result, water shortages may exist that are not apparent in the regional and State water plans. Brazos G recognizes modeled available groundwater (MAG) as the amount of water that the TWDB Executive Administrator determines may be produced on an average annual basis to maintain or achieve the desired future conditions (DFCs) adopted by the Groundwater Conservation Districts (GCDs) within a Groundwater Management Area (GMA). "Desired future condition" means a quantitative description of the desired condition of the groundwater resources in a management area at one or more specified future times.

GMAs are tasked with the joint planning of groundwater resources as prescribed in Texas Water Code Chapter 36.108. DFCs proposed provide a balance between the highest practicable level of groundwater production and the conservation, preservation, protection, recharging, and prevention of waste of groundwater and control of subsidence in the management area. DFCs are policy decisions, not physical facts. Regional water plans are required to use the MAGs in place at the time of adoption of TWDB's state water plan in the next regional water planning cycle or, at the option of the regional water planning group, established subsequent to the adoption of the most recent plan. TWDB revised its planning rules to include a MAG Peak Factor that ensures regional water plans have the ability to fully reflect how, under current statute, GCDs anticipate managing groundwater production under drought conditions. However, additional work and efforts to implement regional water plan projects into the groundwater availability model pumping dataset would further assist and benefit uniform, comprehensive joint planning by both GMAs and Regional Water Planning Groups, further defining the potential impacts and outlook for the future.

Brazos G considers it prudent to explore alternatives to the historic drought of record for water planning purposes. As more diverse water management planning strategies are developed alternative water planning measurements may include firm yield, safe yield and/or operational yield as appropriate. In addition, the water planning process requires coordination with agencies such as the TCEQ and the TWDB. These agencies need sufficient funding and staffing in order to assist water planning groups in fulfilling their water planning mission. Brazos G applauds the Texas Legislature's decision to fund regional flood planning efforts, infrastructure, development of existing and new water resources, and hydrology updates and urges the Texas Legislature to provide additional funding for regular maintenance updates and continued project advancements.

Brazos G will promote water development policies that support efforts to protect both groundwater and surface water sources by encouraging sound practices that will not adversely affect water supply or quality. We support other agencies and organizations in their efforts to encourage responsible land management and water stewardship. Maintaining our watershed health, economic sustainability, and community viability are all critical elements in our water planning efforts. Protecting source water and sensible stewardship of the areas adjacent to and around river basins, sensitive sub-basins, aquifers, and recharge zones is essential for maintaining these resources for present and future needs.

During development of the 2026 Plan, the Water Policy Workgroup revisited several legislative and water policy recommendations incorporated into the 2021 Plan and developed additional recommendations. All recommendations identified by the workgroup were presented for consideration by the full Brazos G RWPG. After deliberation, Brazos G offers the following specific recommendations concerning State water policy to the TWDB and the Texas Legislature.

8.4.1 Issue #1: Streamlining the Processes for Project Implementation

"Brazos G recommends that the Texas Legislature direct all State and local agencies involved in planning, reviewing, and/or permitting water projects to develop defined outcomes and measures of the process for evaluating, approving, permitting, coordinating, and funding in order to allow timely project implementation. Processing timelines are critical factors in the development of new resources. The timely development of new sources, consistent with adopted plan strategies, is a major element of meeting the State's water demands. The amount of time required to gain approval for surface water projects—and, more recently, groundwater projects—is just one example of the need for more structured and cost-effective processes."

8.4.2 Issue #2: Plan Implementation

"Brazos G recognizes the need for expeditious implementation of the State Water Plan facilitated by the use of the State Water Implementation Fund for Texas (SWIFT)."

8.4.3 Issue #3: Coordination between Regional Water Planning Groups and Groundwater Conservation Districts

"Brazos G is committed to working cooperatively with Groundwater Conservation Districts (GCDs) as the State's "preferred method of groundwater management" and Groundwater Management Areas (GMAs) when developing the Regional Plan. The GCDs are requested to review population and water demand projections for their respective Districts and comment accordingly.

GMAs are tasked with the joint planning of groundwater resources as prescribed in Texas Water Code Chapter 36.108 by adopting desired future conditions (DFCs). "Desired future condition" means a quantitative description of the desired condition of the groundwater resources in a management area at one or more specified future times. DFCs proposed provide a balance between the highest practicable level of groundwater production and the conservation, preservation, protection, recharging, and prevention of waste of groundwater and control of subsidence in the management area. DFCs are policy decisions, not physical facts.

Coordination and cooperation among GCDs, GMAs, the RWPG, and other stakeholders are paramount to successful and accurate planning.

Regional water plans are required to consider the MAGs in place at the time of adoption of TWDB's state water plan in the next regional water planning cycle or, at the option of the regional water planning group, established subsequent to the adoption of the most recent plan. GCDs may issue permits in excess of the MAG. Any such exceedance should not be deemed to violate any regional water plan guideline.

TWDB revised its planning rules to include a MAG Peak Factor to assist regional water plans in having the ability to reflect how GCDs anticipate managing groundwater production under drought conditions, but this effort is lacking.

Planning of and management to DFCs as a view of the health of aquifers without unreasonably depleting aquifers is consistent with Brazos G's historical policy not to support water management strategies that would substantially deplete aquifers.

Brazos G encourages and recommends the TWDB amend its rules concerning use of MAG as the limiting factor in accounting of water availability for groundwater projects to be included in the Regional Plan. Unlike management of surface water, MAG is only one of several factors, along with property rights, required to be considered by GCDs in permitting. In order for the planning group to accurately plan and predict needs, a more flexible approach in the use of MAG is necessary.

8.4.4 Issue #4: System Operation of Water Facilities

"Brazos G recognizes the inherent benefit of system operations of existing water supply sources and recommends that State water planning as well as permitting continue to promote such water management strategies. System operation involves coordinated operation of two or more water supply sources (including surface water reservoirs, run-of-river diversions and aquifers) such that the system yield is greater than the sum of the individual sources.

System operation provides several significant benefits to the State, including more effective utilization of existing infrastructure; efficient use of water supplies to meet water demand; delay or avoidance of expensive new water supply infrastructure; and reduced negative environmental impacts potentially resulting from major new projects."

Brazos G fully supports the Asset Management Program for Small Systems (AMPSS) to assist small water and wastewater systems by creating comprehensive asset management plans for managing the systems in a financially and technically sustainable manner.

Brazos G also fully supports the Water Utilities Technical Assistance Program (WUTAP) with a primary goal to provide eligible water and wastewater utilities with financial, managerial and technical capabilities necessary to apply for financial assistance from the TWDB. This support should remain a priority for several reasons, but the primary reason is that many systems have shown the need for this assistance due to limited resources, lack of knowledge and high turnover of staff. The technical assistance based on the needs of the participant systems should include:

- Asset Management Evaluation.
- Preparation of a Rate Study.
- Review of Existing Organizational Operations Procedures.
- Review of Existing Financial Statement/Budgeting Procedures.
- Development of Water Conservation Plans.
- Completion of Project Information Forms/Financial Assistance Applications.

Brazos G recommends continued support for water loss technical assistance and data validation services. This provision will help to yield more accurate data collection and dissemination; promote affordable water service for utility customers; guide water utilities on how to best address and fund water loss mitigation; and, ensure that state financial resources are expended effectively.

8.4.5 Issue #5: Interbasin Transfers of Surface Water

"Brazos G recognizes that Interbasin Transfers (IBTs) have been a critical component of water management in the Brazos G Area and are a necessary component of overall State water management strategies. The automatic assignment of junior rights to an interbasin water transfer is a deterrent and suppresses the development of interbasin water supply projects. We recommend the re-evaluation of the junior water rights provision that is automatically assigned to interbasin transfers. We also recommend that statutory rules, policies and administrative code be reviewed, and the permitting and review process be streamlined to eliminate any unnecessary obstacles to IBTs."

8.4.6 Issue #6: Groundwater Governance

"While Brazos G recognizes that the Rule of Capture remains valid law in Texas, we also recognize that advances in science, changes in water marketing, Texas Supreme Court and case law rulings, and increasing pressures on groundwater add complexity to this issue. Planning and management of groundwater is tasked to balance the conservation and development of groundwater to meet the needs of the state.

Certain aquifers within the Brazos G RWPG are prolific and robust, while, in other parts of the region, groundwater supply is being tapped to its limits. In some instances, landowners will be required to lower pumps or drill deeper wells due to depletion of either artesian pressure or, in limited cases, water table decline caused by over-pumping. Local management through checks and balances can effectively and fairly regulate usage and protect individual property rights, so long as the variation in groundwater conservation districts does not prevent the consideration of regional solutions to regional problems. In many cases, GCDs may be appropriate mechanisms to provide local management of groundwater, to fairly preserve historic use, ensure long-term availability of water supply, and protect private property rights – both the rights of those pumping groundwater, and their neighbors. In areas without a GCD and their modification of the Rule of Capture, it is vital to engage individual local entities utilizing the resource in the current and future planning of the resource through the regional water planning group and GMA.

As such, Brazos G supports the continued management of fresh, brackish, and saline groundwater by GCDs and the joint planning effort of the GMAs. TWDB and GCDs should continue to improve and advance the best available science for use in the development and conservation of all groundwater resources."

8.4.7 Issue #7: Conjunctive Use of Groundwater and Surface Water

"Brazos G recognizes conjunctive use as an important management strategy to maximize use of available resources to meet water demands of the State Water Plan. Conjunctive use is the systematic utilization of groundwater and surface water to optimize the combined yield from both sources. Conjunctive use seeks to maximize the advantages and minimize the disadvantages of each source when both are utilized together. As conjunctive use projects are identified, they should be recommended water management strategies for the regional water plan because Brazos G encourages development of conjunctive use projects. Construction of surface water reservoirs, which provide new sources of water, along with judicial use of groundwater resources, which can be of finite quantity, will provide an integrated solution for the water needs of the future. Brazos G encourages consideration of applicable water quality and environmental issues related to conjunctive use. Brazos G recommends further developing frameworks to evaluate conjunctive use projects."

8.4.8 Issue #8: Aquifer Storage and Recovery (ASR)

"Aquifer Storage and Recovery (ASR) projects have the potential to store large amounts of water, eliminate evaporative losses of stored water, reduce impacts to groundwater and surface water resources in times of peak demand, and minimize the impact on surface owners when compared to large reservoir projects. However, it is important to note the significant time component of ASR projects regarding injection and withdrawal. ASR historically is associated with water injection in the winter months, or times of high supply and low demand, and recovered in the following summer months, times of low supply and high demand. The longer the injected water is left in place, the greater potential for the injected water to migrate and disintegrate with the native water source.

While ASR projects could be beneficial, there are a number of questions regarding ownership of the injected water, percentage of injected water that is recoverable over time, impact to existing groundwater users, and the quality to which injected water must be treated. An improved legal/public policy framework is needed to address these issues and enhance adoption. Further, we recommend that these water management strategies include sufficient hydrologic study to protect receiving aquifers.

8.4.8.1 Aquifer Recharge Projects (ARPs)

An Aquifer Recharge Project (also known as Managed Aquifer Recharge) means a project involving the intentional recharge of an aquifer by means of an injection well or other means of infiltration, including actions designed to reduce declines in the water level of the aquifer, supplement the quality of groundwater available, improve water quality in an aquifer, improve spring flows and other interactions between groundwater and surface water and/or mitigate subsidence. ARPs have the potential to provide another avenue for water resource stewardship to benefit local and regional water supplies for many of the same reasons discussed in the ASR paragraphs above. Storage quantity and water quality reporting for these projects will be vital for use in regional water planning activities to fully account for supplies available during times of drought.

Brazos G recommends that appropriate state agencies and state legislative bodies review TWC 27.201 (1) and consider renaming Aquifer Recharge Project to Managed Aquifer Recharge. This will create consistency with other states as well as eliminate cumbersome wording and misunderstanding of this strategy within the regional planning framework.

Furthermore, Brazos G encourages the use and development of ARP (aka MAR) to enhance and protect water resources available in our region.

8.4.9 Issue #9: Municipal Per Capita Water Use

"Brazos G recommends the regional water planning process be changed to separate non-residential and residential water use and look at both independently. The current practice of using a WUG's overall gallons per capita per day (GPCD) does not take into account the variation of land use or density of WUG service areas. Adopting better definitions and metrics for water planning beyond the limitations of GPCD would improve the water supply planning process as well as allow for more useful comparisons between WUGs. Also, there needs to be consistency in all water use calculations, and better guidance as to whether regional planning groups are to use raw water delivered or treated water provided in calculating water use for resource planning."

8.4.10 Issue #10: Reservoir Water Management

"Brazos G recognizes that the primary purpose of conservation storage capacity in Texas reservoirs authorized for water supply is, in fact, water supply. Although recreational and aesthetic benefits of these reservoirs may provide economic impacts locally, these are secondary incidental benefits. Therefore, we recommend that appropriate state agencies and state legislative bodies uphold the critically important primary purpose of Texas water supply reservoirs to ensure long-standing agreements and contracts are honored and deliveries are not jeopardized by secondary interests. Further, consideration of providing educational programs regarding reservoir purpose and management and other appropriate assistance for businesses and others impacted is recommended.

Additionally, Brazos G recommends that appropriate state agencies and state legislative bodies protect water supply reservoirs from future policies or rules that could cause a conversion from prioritizing water supply purposes to flood control purposes (i.e. mandates of pre-releases, seasonal drawdown protocols, re-allocation of conservation storage, etc.)."

8.4.11 Issue #11: Watershed Planning/Source Water Protection

"Brazos G will promote water development policies that support efforts to protect both groundwater and surface water sources by encouraging sound practices that will not adversely affect water supply or quality. We support agencies and organizations in their efforts to encourage responsible land management Maintaining our watershed health, economic sustainability and community viability are all critical elements in our water planning efforts. Sensible stewardship of the areas adjacent to and around river basins, sensitive sub-basins, aquifers and re-charge zones is essential for maintaining these resources. Through source water protection, Texas can promote equitable costs for present and future water sources. Furthermore, Brazos G encourages all governmental agencies, when making regulatory/ permitting decisions or influencing decisions regarding land and resource use, to give preference to alternatives to protect or enhance the quality of water so that such water resources may be utilized for beneficial use."

8.4.12 Issue #12: Water Pricing and Conservation

"Acknowledging that water providers must protect a limited resource, pricing signals for both retail and wholesale water should incentivize conservation, as should GCD rules (e.g., by not penalizing permit holders for 'underutilization'). Brazos G encourages water providers to seriously consider implementing appropriate rate structures that would be consistent with best management practices for the water industry. State agencies responsible for regulating these rate structures should provide water providers with the ability to not only cover the cost of service but allow water rate structures to act as a tool in recovering the known future costs of developing or acquiring the next available resource. Similarly, groundwater conservation districts should consider imposing transport fees only on water actually transported, not merely permitted for transport, out of a district."

8.4.13 Issue #13: Reuse of Wastewater Effluent

"Brazos G promotes the full development of municipal wastewater effluent as a resilient water resource that can be responsibly used to help meet the water needs of the State of Texas, consistent with the protection of downstream, senior water rights. We further support state agencies and organizations in their efforts to develop technologies and permit the storage and reuse of wastewater effluent as a resilient water source and the protection of downstream surface water rights dependent upon such historically discharged wastewater effluent."

8.4.14 Issue #14: Education

"Brazos G believes strongly that water education is important and supports water conservation and public awareness programs at the state and local level. Research indicates that there is a strong relationship between knowledge of water sources and a willingness to conserve. Conservation can be a cost-effective means of securing future water supply."

8.4.15 Issue #15: Effects of the Federal Safe Drinking Water Act (SDWA) on Water Supply Systems

Brazos G encourages continued support to small and disadvantaged water systems with assistance for planning, acquisition, design, and construction of water infrastructure to meet Federal SDWA standards. Many small and disadvantaged water systems lack the staff, knowledge, skills, and resources needed to comply with current and future SDWA regulations. These gaps can result in violations, enforcement actions, and administrative orders against those systems. To add further complication, many of the water systems in these communities do not have enough customers with the ability to provide a sustainable rate base to reliably fund the system's continued needs and new treatment requirements that did not exist when the system was originally established. Additionally, many do not have full-time operators with the training needed to operate their treatment systems effectively. Many systems also rely on volunteer board members from the community that have a limited understanding of the responsibilities and requirements or have the dedicated time needed to sustainably run the water system and meet health-based standards and regulatory requirements. Brazos G supports education, proactive assistance, and, where necessary, regionalization to aid these water supply systems.

8.4.16 Issue #16: Planning Process Improvements

"In order to realize the value of the planning process, Brazos G recommends the Texas Legislature provide funding and direct the TWDB to adopt policies in the following areas:

- Strategic Initiatives. TWDB should provide funds for studies deemed important by the regional water planning groups as strategic initiatives that should be pursued. These would be similar to the Phase 1 studies performed during the third cycle of the regional water planning process prior to development of the 2011 regional water plans.
- Planning Support for Small Systems. Small systems are often at higher risk of losing water supply during drought, and the TWDB should provide support and funding for closer coordination with small systems.
- Brazos G recommends continued support for water loss technical assistance and data validation services. This provision will help to yield more accurate data collection and dissemination; promote affordable water service for utility customers; guide water utilities on how to best address and fund water loss mitigation; and, ensure that state financial resources are expended effectively.
- Mid-cycle Legislative Requirements. The Texas Legislature should not change the requirements of the regional water plans after the current planning cycle has commenced without also providing additional funding for increased requirements."

CHAPTER 9 IMPLEMENTATION AND COMPARISON TO THE PREVIOUS REGIONAL WATER PLAN

9.1 Introduction

Chapter 9 addresses the statutory requirements outlined in SB 660 (82nd Legislative Session) and the planning rules under 31 TAC §357.45(a), which mandate the evaluation of the implementation status of Water Management Strategies (WMSs) and projects recommended in the 2021 Brazos G Water Plan. This assessment is based on data provided by Regional Water Planning Groups (RWPGs) through DB27, and supplementary information collected via TWDB-provided forms. Key metrics, including project initiation dates, implementation progress, and expenditure to date, are analyzed to identify challenges and impediments to development. Additionally, this chapter offers a comparative analysis of the 2021 and 2026 Plans, emphasizing improvements in the planning process and examining efforts to enhance regional collaboration among Water User Groups (WUGs) to achieve shared benefits and economies of scale.

9.2 Implementation of Previous Regional Water Plan

To evaluate the level of implementation and identify impediments to the development of WMSs recommended in the 2021 Plan—critical factors affecting progress in meeting projected water-supply needs—the Brazos G Planning Group conducted a comprehensive survey and engagement effort. This included emailed surveys, phone calls, virtual and in-person meetings with WUGs throughout the region, and sub-regional meetings to exchange information. In addition to the survey, several supplementary methods were employed to identify projects that may have been implemented. These methods included:

- Assessing the scope of work for potentially infeasible WMSs;
- Identifying changes since the adoption of the previous plan;
- Reviewing funding records from the Texas Water Development Board (TWDB); and
- Analyzing conservation implementation reports submitted to the TWDB.

The findings from these efforts are detailed in Appendix M, providing a structured overview of implementation progress and associated challenges.

9.3 RWPA's Progress In Achieving Economies of Scale

In accordance with statutory requirements established by HB 807 (86th Legislative Session) and the associated planning rules (31 TAC §357.45(b)), regional water plans are required to assess efforts to promote cooperation among WUGs to achieve economies of scale and encourage WMSs that benefit the region as a whole. This regionalization assessment must include:

- The number of recommended WMSs in the previous and current RWPs that serve more than one WUG,
- The number of recommended WMSs in the previous RWP that serve multiple WUGs and have been implemented since that plan, and

- A description of efforts by the RWPG to promote WMSs and WMSPs that serve multiple WUGs and provide regional benefits.

According to data from the Texas Water Development Board (TWDB), 105 WMSs served multiple WUGs in the 2021 RWP, while the 2026 RWP includes 148 WMSs. To this date there are 33 (ongoing and/or completed) strategies that have been implemented based on the information obtained by the Brazos G RWPG. The Brazos G RWPG actively recognizes and encourages coordination among WUGs to develop shared water management strategies where appropriate. Such opportunities, like those being explored in Bell County, are highly valued by the planning group, as it supports key objectives, including:

- Ensuring water solutions are practical, culturally relevant, and socially appropriate.
- Tailoring strategies to address the unique resources and challenges of each community.
- Fostering community participation to instill a sense of ownership and accountability for water resources.
- Promoting knowledge transfer to empower local communities as stewards of their water resources.

The Brazos G RWPG remains committed to exploring opportunities for collaborative water management strategies in this and future regional water plans, ensuring the continued advancement of regional cooperation and shared benefits.

9.4 Comparison To Previous Plan

This section offers a comparative analysis of projected water demands, supplies, needs, and Water Management Strategies (WMSs) between the 2021 and 2026 Plans. Each regional water planning cycle updates population and water demand projections to incorporate the most recent census data or enhanced estimates from the Texas State Demographer. This round of planning has included information from the 2020 U.S. Census.

Changes in per capita water use reflect shifting municipal water use patterns, driven by water conservation initiatives, drought response measures, and development trends. County-aggregated water demands for sectors such as irrigation and steam-electric power are similarly revised, based on updated estimates from the Texas Water Development Board (TWDB).

Groundwater supply projections can fluctuate due to adjustments in Modeled Available Groundwater (MAG) determinations, which are adopted through the Groundwater Management Area process. Surface water supply projections also evolve as the Brazos Basin Water Availability Model (WAM) has been updated by the Texas Commission on Environmental Quality (TCEQ), new return flow projections have been developed, reservoir sedimentation forecasts are revised, and the TWDB alters water availability determination requirements. These updates collectively impact the availability of water supplies for both current uses and future WMSs, leading to the observed differences between the 2021 and 2026 Plans.

9.4.1 Changes to WUGs

The 2021 and 2026 Brazos G Regional Water Plans exhibit notable differences. These variations stem from changes in Water User Groups (WUGs), alongside shifts in population growth, water demand, and source availability. As a result, the assessment of water needs across the Brazos G region differs significantly between the two plans.

Table 9.1 outlines the new WUGs added to the 2026 plan in comparison to the 2021 plan. Notably, no additional WWPs have been included in the 2026 plan. And two previously existing WUGs—Bethany Hearne WSC and Mitchell County Utility—have been removed from the 2026 plan, as these entities have been merged into other WUGs.

Table 9.1 New WUGs in the 2026 Plan

Entity	County
Bell County WCID 1	Bell
Cade Lakes WSC	Burleson
City of Benjamin	Knox
Hog Creek WSC	Bosque, McLennan
Noack WSC	Williamson
S U N WSC	Fisher, Jones, Taylor
Westbound WSC	Callahan, Eastland

9.4.2 Water Demand Projections

Overall, water demand projections for the planning area are greater in the 2026 Plan than in the 2021 Plan, as illustrated in Figure 9.1, with the exception of the 2030 decade. Municipal water demand projections are higher in the 2026 Plan for each decade, increasing to 1,002,767 acft/yr by 2080. Non-municipal demands in the 2026 Plan, however, are significantly less than projections in the 2021 Plan for each decade, reaching 568,686 acft/yr by the 2080 decade. Because of this, the total 2026 demands are lower in the 2030 decade, but then surpass the total demand projections from the 2021 Plan by 2040 due to the large population growth and accordant increases in municipal demand projections, reaching a total of 1,002,767 acft/yr by 2080.

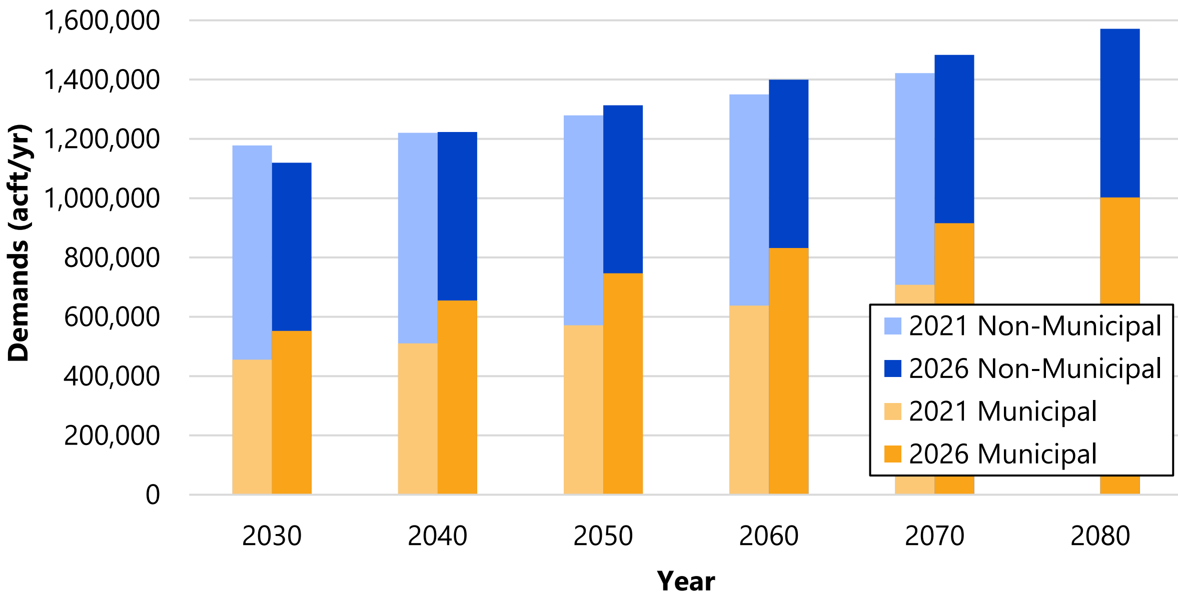

Figure 9.1 Water Demand Projections in the 2021 and 2026 Brazos G Plans

9.4.3 Water Supply Assumptions

For the 2021 Plan, the Modeled Available Groundwater (MAG) for each aquifer system in the Brazos G Area was used. For aquifers without MAG amounts, the Brazos G RWPG adopted availability estimates from the 2016 Plan. The same method was generally applied to the 2026 Plan. The Brazos G region is underlain by seventeen aquifers, including six major and eleven minor aquifers in Texas, with their locations shown in Chapter 1 of this report.

In broad terms, the MAG represents the annual volume of groundwater that can be developed without exceeding the criteria outlined in the aquifer Desired Future Conditions (DFCs), as determined by modeling. When assessing proposed pumping for regulatory approval, the MAG serves as a guideline, often alongside other criteria. However, for planning purposes, the MAGs are treated as firm limits, with annual groundwater production not allowed to exceed these values. When available, the amount of groundwater for development is based on the Texas Water Development Board's determination of MAG, which reflects the desired future conditions (DFC) set by the Groundwater Conservation Districts within a Groundwater Management Area (GMA). The locations of the Groundwater Management Areas (GMAs) are depicted in Figure 9.3.

For aquifers without an adopted MAG, the TWDB provided "non-MAG" estimates for groundwater availability. Many of these non-MAG estimates are based on groundwater modeling conducted during the development of the MAGs for other aquifers. Some of the non-MAG availabilities were carried over from the last planning cycle.

The Brazos G technical consultant reviewed the groundwater availability estimates and recommended some adjustments based on a variety of sources, including information from historical TWDB groundwater reports, the TWDB groundwater database, estimates of historic pumping, and information from Brazos G members and stakeholders. A more detailed analysis of these estimates for specific aquifers is provided in Chapter 3. In many cases, the recommendations were to restore the non-MAG availabilities from the 2021 RWP cycle. Figure 9.2 below compares the total groundwater availability in the Brazos G region between the 2021 and 2026 Plans.

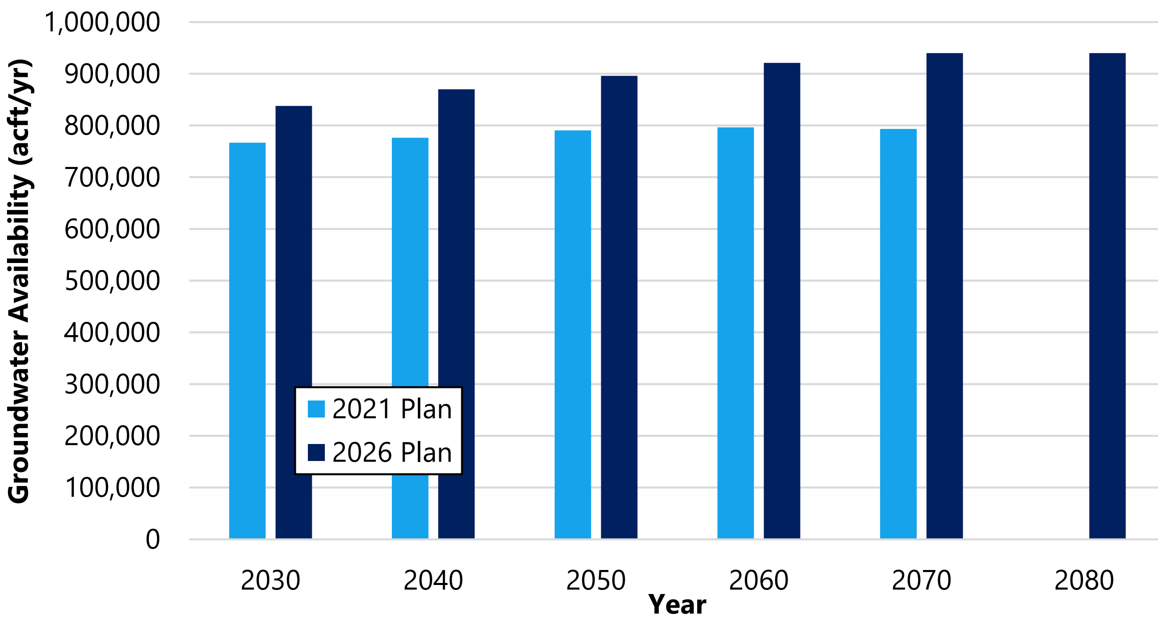

Figure 9.2 Groundwater Availability in Brazos G Region

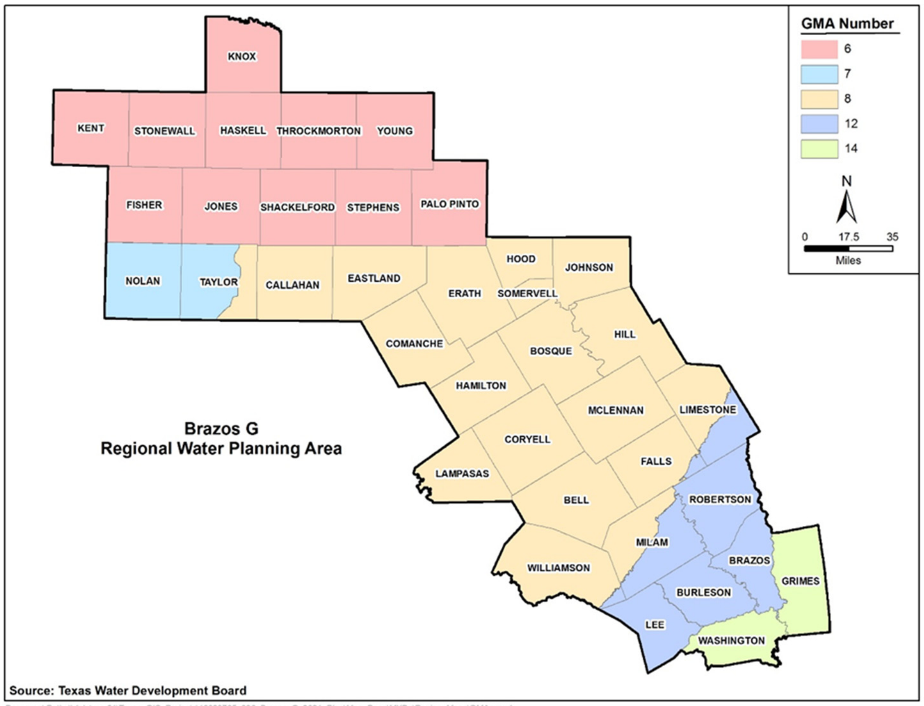

Figure 9.3 Groundwater Management Areas in the Brazos G Region

For surface water availability, both the 2021 and 2026 plans utilized the TCEQ Brazos Water Availability Model (WAM) as the base model, which was then adapted with additional assumptions specific to the regional context, and referred to as the Brazos G WAM. This model incorporates assumptions defined by the TCEQ when evaluating water right reliabilities, though these assumptions may not always align with the needs of regional water planning. For instance, the TCEQ WAM uses permitted storage capacities for all reservoirs, whereas water supply planning requires consideration of current and future sedimentation conditions. A comprehensive list of the assumptions used in the WAM can be found in Chapter 3 of this report.

Both plans also made similar adjustments to the model in determining water availability for existing water rights. This determination is based on a complex set of factors, including location, hydrologic conditions, diversion volume, reservoir storage, and priority date. The 2026 Brazos G WAM includes 77 primary control points that provide naturalized flow data, along with 67 evaporation data sets used to estimate evaporation for the 650 reservoirs represented in the model. The model used for the 2026 Plan is based on an updated TCEQ WAM featuring an extended underlying naturalized hydrologic period of record from 1940 to 2018. Water availability computations are carried out at over 3,800 control points across the river basin, analyzing more than 1,700 water right records. The Brazos G WAM incorporates water right data from the TCEQ for all water rights in the Brazos Basin as of October 2023.

Assumptions for determining groundwater and surface water availability in both plans are compared below in Table 9.3.

Table 9.2 Assumptions for Determining Water Available to Current Supplies and Water Management Strategies

2021 Brazos G Plan	2026 Brazos G Plan
Groundwater availability based on Modeled Available Groundwater where determined, and 2016 estimates and/or modeling to support development of Modeled Available Groundwater for other aquifers. MAG Peak Factor applied to the Carrizo-Wilcox Aquifer in Brazos County.	Groundwater availability based on Modeled Available Groundwater where determined, and 2021 estimates and/or modeling to support development of Modeled Available Groundwater for other aquifers. MAG Peak Factor applied to the Carrizo-Wilcox Aquifer in Brazos County.
Existing surface water supply based on estimated 2020 and 2070 wastewater effluent discharges adjusted for reuse assumptions.	Existing surface water supply based on estimated 2030 and 2080 wastewater effluent discharges adjusted for reuse assumptions.
Existing surface water supply to irrigation rights based on minimum annual supply from minimum monthly diversions.	Existing surface water supply to irrigation rights based on minimum annual diversion from the WAM.
Surface water management strategies exclude wastewater effluent discharges (TCEQ Run 3 assumptions), except where effluent is part of the supply for the strategy.	Surface water management strategies include wastewater effluent discharges (TCEQ Run 3 assumptions).
Surface water management strategies subject to TCEQ Environmental Flow Standards.	Surface water management strategies subject to TCEQ Environmental Flow Standards.
BRA System Operations Permit included in the TCEQ Brazos WAM.	BRA System Operations Permit included in the TCEQ Brazos WAM.

9.4.4 Existing Water Supplies

Water supplies available to WUGs and WWPs in the Brazos G Area have changed slightly since the last planning cycle. Municipal supplies have increased substantially, while supplies to non-municipal WUGs have slightly decreased. WUG supplies are based on the current infrastructure ability of each to obtain water supplies. These abilities primarily include existing infrastructure, water-rights limitations, and groundwater conservation district permit limitations. Groundwater supplies, surface water supplies, and total supplies are compared in Figure 9.4, Figure 9.5, and Figure 9.6, respectively, for municipal and non-municipal WUGs.

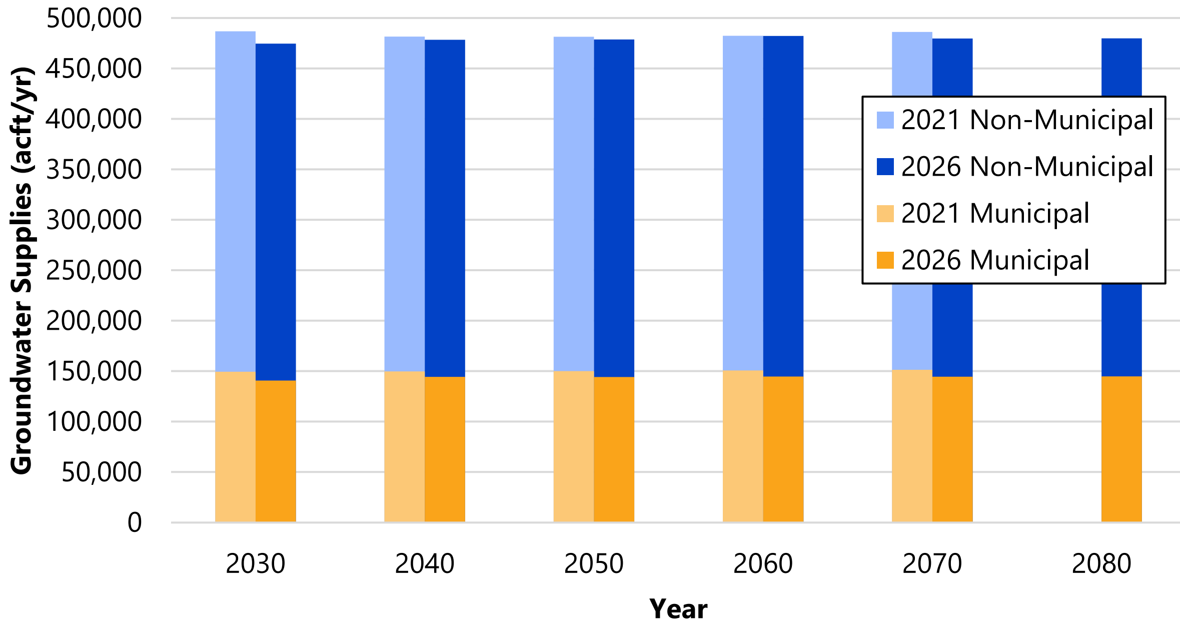

Figure 9.4 Groundwater Supplies Available to WUGs in the 2021 and 2026 Brazos G Plans

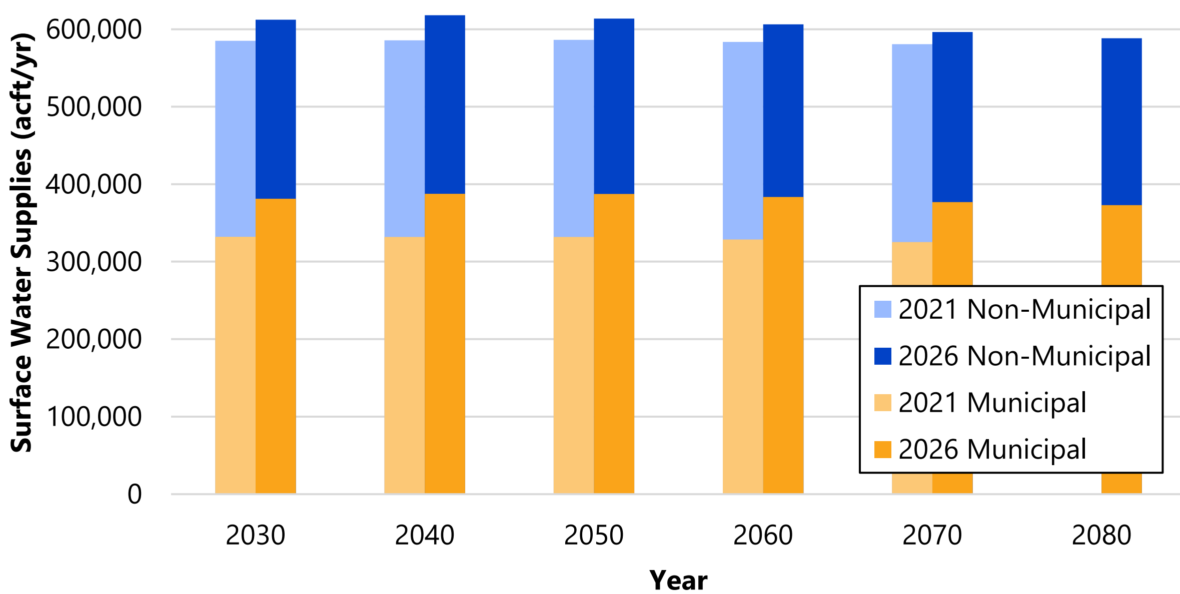

Figure 9.5 Surface Water Supplies Available to WUGs in the 2021 and 2026 Brazos G Plans

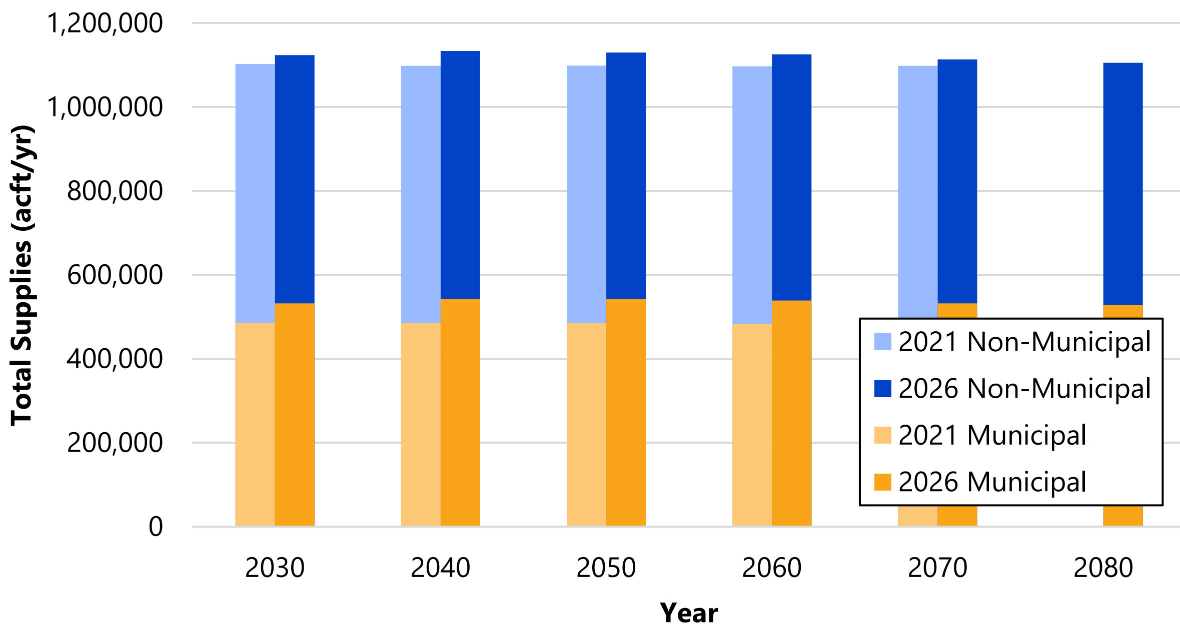

Figure 9.6 Total Water Supplies Available to WUGs in the 2021 and 2026 Brazos G Plans

9.4.5 Needs

When projected water demands surpass the available supply for a WUG, the resulting gap is classified as a "Water Need". This section provides an overview of the water needs (shortages) for WUGs in the Brazos G Area. A detailed table in the Executive Summary Appendix outlines the water needs for each WUG by county, labeled as "Region G Water User Group (WUG) Needs/Surplus."

As shown in Figure 9.7, municipal water shortages tend to rise over the planning period, while municipal surpluses generally decrease, a trend observed in both the 2021 and 2026 Plans. However, the decline in surpluses is relatively minor. A notable difference is the significant increase in municipal shortages in the 2026 Plan compared to the 2021 Plan. The 2026 Plan shows municipal shortages at the outset of the planning period, and these shortages grow at a faster rate than those in the 2021 Plan.

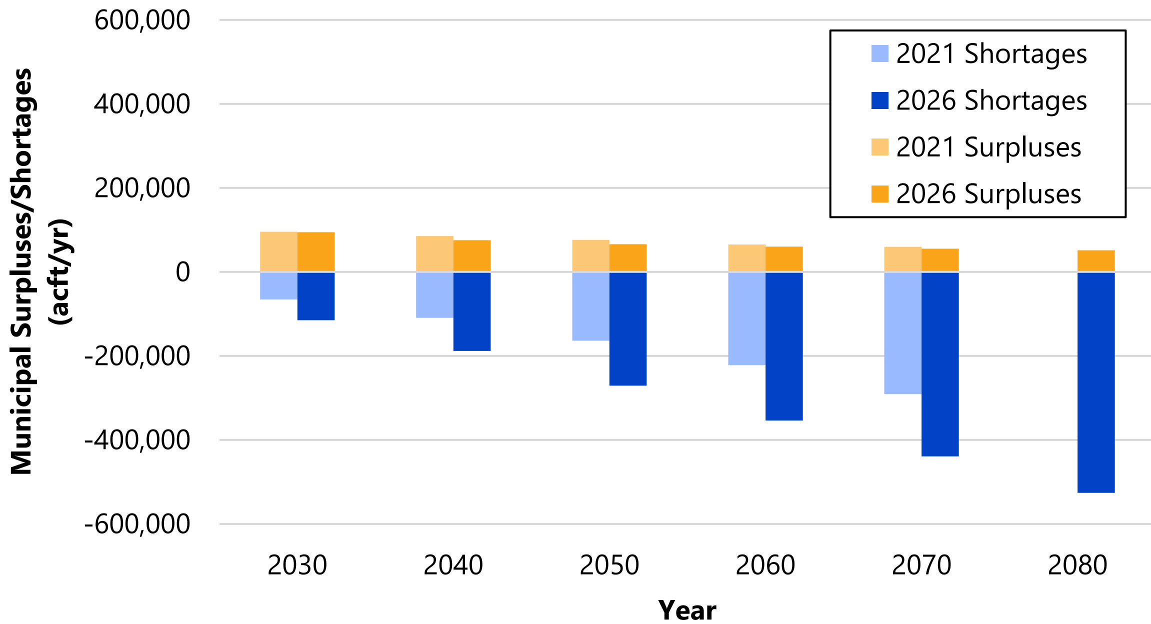

Figure 9.7 Municipal Surpluses and Needs (Shortages) in the 2021 and 2026 Brazos G Plans

A comparison of total needs and surpluses between the two plans, as seen in Figure 9.8, reveals that while the total surpluses in the 2021 Plan are consistently lower than those in the 2026 Plan, the water needs in the 2021 Plan are higher in 2030. By 2040, the difference between the two plans narrows, and from 2050 onwards, the water needs in the 2026 Plan exceed those in the 2021 Plan.

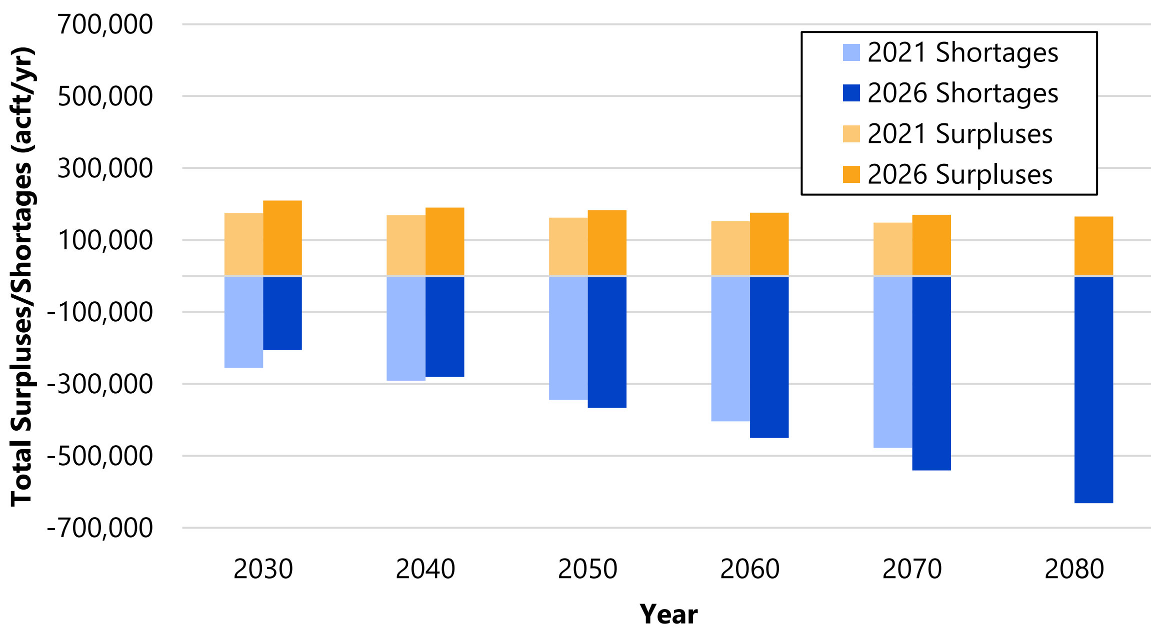

Figure 9.8 Total Surpluses and Needs (Shortages) in the 2021 and 2026 Brazos G Plans

9.4.6 Water Management Strategies and Projects

As anticipated, a significant number of the water management strategies and projects proposed in the 2021 plan are once again recommended in the 2021 Plan. While the projected needs in the 2026 Plan are generally higher across each decade compared to the 2021 Plan, the corresponding surpluses are also higher in the 2026 Plan. However, the 2021 Plan shows lower surpluses, resulting in a comparable supply shortage for WUGs of similar magnitude in both plans. This section highlights the key differences in the WMSs and projects between the 2021 and 2026 Plans.

Significant effort was given to identifying infeasible strategies in the 2021 Brazos G Plan, and incorporating the considerations relating to infeasibility into the process for evaluating potentially feasible water management strategies for the purposes of the 2026 Brazos G Plan. This effort resulted in adjustments to project onsets, revisions to strategies, and an increased attention to the identification of unmet needs (both municipal and non-municipal).

In the 2021 Plan, conservation measures are recommended for all municipal water user groups with per capita water usage exceeding 140 GPCD, regardless of their projected needs or surpluses. Furthermore, more ambitious conservation targets are set for certain municipal entities in Williamson County, with the goal of reducing per capita water use to 120 GPCD by 2070. The 2026 Plan adopts the same methodology and assumptions for municipal water conservation as those applied in the 2021 Plan. However, there is a notable shift in the proportion of recommended water management strategy volumes attributed to conservation strategies between the two plans. In the 2021 Plan, conservation strategies accounted for approximately 29 percent (2.2 million acre-feet per year) of the total recommended water management strategy volumes for 2070. In contrast, the 2026 Plan increases this share to roughly 45 percent of the total recommended volumes.

In the 2021 Plan, municipal conservation strategies recommended for 2070 totaled approximately 977,000 acft, with 320,000 acft allocated to water loss reduction efforts. These conservation strategies addressed approximately 26 percent of the identified municipal water needs in 2020 and 25 percent of the projected needs for 2070.

For the 2026 Plan, approximately 150,068 acre-feet in municipal conservation strategies are recommended for 2070, with 8,571 acre-feet dedicated to water loss reduction. These conservation strategies address about 12 percent of the identified municipal water needs in 2030 and 24 percent of the needs projected for 2080. These changes reflect an evolving focus on conservation as a key strategy to meet future water demands in the region. Reuse is also a key water management strategy in both the 2021 and 2026 Plans.

Supplies from Other Regions

The 2021 Plan anticipates the supply of approximately 78,020 acre-feet per year of water from outside the Brazos G Area during the 2070 decade, while the 2026 Plan projects nearly 48,625 acre-feet per year of out-of-region supplies by 2080.

Several entities in the Brazos G region rely upon source water from outside the region, including the Edwards Trinity Plateau Aquifer, Lake Benbrook, Brownwood Reservoir, Navarro Mills Reservoir, the Colorado River MWD System, Lake Livingston (Trinity River Authority), Lake Corsicana, Halbert Lake, OH Ivie Lake, the Cross Timbers Aquifer, Richland Chambers and Cedar Creek Reservoirs (TRWD), and the Highland Lakes System (LCRA).

New Reservoirs

The amended 2021 Plan recommended the construction of the Groesbeck Off-Channel Reservoir, Coryell County Off-Channel Reservoir, Cedar Ridge Reservoir, Turkey Peak Reservoir, Brushy Creek Reservoir, Throckmorton Reservoir, and Lake Creek Reservoir. The 2026 Plan includes each of the aforementioned reservoirs.

BRA System Operations

The BRA System Operations Permit (Sys Ops Permit) was identified as a recommended water management strategy in the 2021 Plan. Since the adoption of the 2016 Plan, the TCEQ has issued the System Operations Permit to the BRA. This permit, under Permit No. 12-5851, authorizes the BRA to appropriate additional water made available through the operation of the BRA's existing water rights and reservoirs. This supply is now represented as an existing supply for the purposes of the 2026 Plan.

The Sys Ops Permit allows the BRA to divert available run-of-river streamflow from the middle and lower Brazos Basin (downstream of Possum Kingdom Reservoir) in quantities greater than those permitted under existing water rights certificates. This additional water can be used in coordination with water stored in BRA reservoirs to meet future customer needs. For the 2026 Plan, the BRA's System Operations Permit accounts for 11 percent of the total authorized diversion volume.

The BRA holds multiple contracts to supply water to cities, districts, irrigators, and industrial users throughout the Brazos River Basin. Many of these contracts are served by the BRA's reservoirs or through lakeside diversions. However, since the additional supply from the System Operations Permit depends on unregulated flows below existing BRA reservoirs, it is available only for diversion along the main stem of the Brazos River.

Out of the 557,721 acre-feet per year of firm yield from standalone reservoir supplies, the reliable supply from system operations for 2030 is estimated at 131,384 acre-feet per year. This supply is assumed to be available for meeting demands along the main stem of the Brazos River, as there is no infrastructure in place to transport this additional supply to demands located in the Little River or Aquilla sub-systems.

Additional Groundwater Development

The 2026 Plan recommends 60,000 acft/yr and 2021 Plan 65,000 acft/yr of additional groundwater development. Some miscellaneous groundwater projects carried out in the 2021 Plan are no longer recommended due to insufficient MAG being available.

Aquifer Storage and Recovery (ASR)

The 2021 Plan includes five recommended ASR projects for College Station, Bryan, Waco (McLennan County ASR), the BRA (Lake Granger ASR), and Georgetown (Lake Georgetown ASR). All of these projects are also recommended in the 2026 Plan, with the addition of another ASR project for the City of Bryan and modification to the Acton MUD ASR strategy.

Unmet Needs

The Brazos G RWPG conducts a thorough evaluation of proposed water management strategies to ensure they are both technically feasible and economically viable. Strategies deemed infeasible due to practical, technical, or financial constraints are not recommended to address existing water supply needs. As a result, these needs are classified as unmet within the regional water plan. In the 2021 Plan, needs left unmet total a maximum of 148,167 acre-feet per year in 2030 for irrigation, mining and steam-electric uses.

The 2026 Brazos G Plan identifies a significantly greater amount of unmet needs compared to the 2021 Plan, including 84,536 acre-feet per year of municipal unmet needs, compared to 65,413 acre-feet per year in 2030 in the previous plan.

Alternative Water Management Strategies and Projects

Both the 2021 and 2026 Plans include alternative water management strategies for specific WUGs and WWPs. These alternatives are intended to serve as substitutes if the recommended strategies become infeasible. Examples of such alternatives include the development of Carrizo groundwater for the City of Bryan in Robertson County and the West Texas Water Partnership.

9.5 Progress of Regionalization

The regional water planning process is a pivotal mechanism for promoting collaboration and regionalization. It establishes a cohesive framework for planning, incorporating shared population and water demand projections, as well as a standardized approach to assessing supply availability. The public meetings convened regularly by Brazos G facilitate the exchange of information across a vast and diverse planning area, effectively bridging the "silos" that often isolate different entities in their water planning efforts. Brazos G represents five Groundwater Management Areas, which collectively span the entire planning region. Each member brings a distinct perspective, contributing their expertise and insights into the sustainable management of groundwater resources. Brazos G regards groundwater management as a regional issue that necessitates active and engaged participation from local stakeholders.

The 2026 Brazos G Plan outlines several "regional" projects, such as the Bosque County Regional Project, Rolling Plains GCD’s Managed Aquifer Recharge Project, and a range of strategies to address the growing water demands in Williamson, Bell, and Coryell Counties. Efforts such as the Lake Whitney Water Supply Project, Somervell County Water Supply Project, and the West Texas Water Partnership are recommended, while other evolving efforts such as regionalization activities in Bell County have been preliminarily identified by the Brazos G RWPG. Many of the recommended water management strategies and projects in both plans are designed to serve multiple entities-directly or indirectly-, providing comprehensive, regional solutions to the pressing issue of water scarcity in the Brazos River Basin. Brazos G also works in close collaboration with neighboring regional water planning areas, sharing resources and strategies with Regions O, B, C, F, L, K, and H.

Brazos G serves as an essential forum for ongoing participation and dialogue on water supply challenges across the 37-county region. It has fostered a mindset that views water supply issues through a regional lens, encouraging the development of integrated solutions to address the needs of all stakeholders.

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CHAPTER 10 PUBLIC PARTICIPATION AND ADOPTION OF PLAN

10.1 Public Participation

The Brazos G Regional Water Planning Group (BGRWPG) provided considerable opportunity for the public to participate in the planning process. Notices and meeting agendas were posted prior to each meeting in accordance with State law, and these and other meeting materials were posted on the BGRWPG website (www.brazosgwater.org) as they became available prior to each meeting. The public was invited to speak during public comment periods during each planning group and committee meeting. In addition, stakeholders were often invited to participate in planning group and committee meetings (as formal items of the meeting agenda) to present information to the planning group that was pertinent to issues the planning group was considering.

The BGRWPG formally adopted its process for identifying, evaluating and selecting water management strategies on February 13, 2024, and included opportunities for public input during the development of the scope of work to develop the 2026 Plan.

The BGRWPG held three sub-regional meetings in January 2025 to solicit comments on the draft WUG and WWP plans prior to development of the Initially Prepared Plan. These meetings were held in College Station on January 14, 2025 (Lower Subregion), in Waco on January 15, 2025 (Middle Subregion), and in Abilene on January 16, 2025 (Upper Subregion).

The BGRWPG will hold a public hearing to receive comments from the public on the Initially Prepared Plan.

The BGRWPG complied with all Texas Open Meetings Act and Public Information Act requirements during the development of the 2026 Brazos G Regional Water Plan.

10.1.1 Rural Outreach Efforts

The majority of the Brazos G Regional Water Planning Area encompasses a multitude of rural communities across Texas. Engagement with these communities has always been a critical component of regional water planning for the BGRWPG and has been a point of emphasis this planning cycle. Rural outreach has helped to improve data accuracy, promote sustainable practices, build stronger relationships which has increased participation, provide opportunities for learning, developing a better understanding of the unique needs and priorities of the communities, and help to spread knowledge, connecting people with resources.

This Plan is largely supported by information provided by WUGs based on survey results and numerous outreach efforts from the RWPG members and technical consultant. For example, an initial survey was distributed to all WUGs to update and refine information needed to report on population and water demand projection revisions (Chapter 2), existing supplies and physical and legal capacity (Chapter 3). The survey also served as a starting point for the identification of infeasible water management strategies (WMSs) (Chapter 5), from which more direct engagement resulted in an improved picture of the present implementation status of numerous WMS and WMS Projects (Chapter 9), as well as drought information, activities and responses (Chapter 7). Each of these are examples of where rural outreach and engagement were performed for the development of this Plan.

As part of the survey process, surveys were distributed to all the identified WUGs within the Region. Information was further shared with WWPs, MWPs, and GCDs in order to reach a broader audience for engagement. In addition, telephone follow-up calls and virtual meetings were conducted to facilitate responses from WUGs had been appropriately characterized. The results of these surveys are presented in multiple tables throughout the Plan.

The BGRWPG conducted outreach specifically to rural entities in the planning area to collect and evaluate information to support the development of the 2026 Brazos G Regional Water Plan. This included a record of which rural entities were contacted by the BGRWPG's technical consultant, and which entities were not responsive to RWPG contact efforts. Particular focus was given to those rural public water systems that had self-reported water restrictions to TCEQ due to water supply issues during this planning cycle, reported to TCEQ that they had less than 180 days of water supply remaining during this planning cycle, have not previously engaged in the regional planning process, and have already been identified as facing significant near-term shortages under drought conditions in previous regional water planning. Information on these elements was provided by the TWDB to facilitate the engagement with these rural entities, and was used by the BGRWPG's technical consultant for targeted outreach activities.

10.2 Brazos G Regional Water Planning Group Website (www.brazosgwater.org)

The BGRWPG has directed the Brazos River Authority (BRA) to maintain a website where meeting notices, agendas, and presentation materials may be viewed by the public. In addition to meeting materials, the 2001, 2006, 2011 2016, and 2021 Brazos G Regional Water Plans are posted for public viewing and download, as well as documents from the planning process for the 2026 Plan. The website offers other features including member contact information, planning area maps, planning data, and audio transcripts of meetings.

10.3 Coordination with Water User Groups and Wholesale Water Providers

The BGRWPG coordinated with multiple water user groups, wholesale water providers, groundwater conservation districts, groundwater management areas, county judges, and councils of governments in the Brazos G Area regarding population and water demand projections developed by the Texas Water Development Board (TWDB), groundwater and surface water availability estimates, proposed water management strategies, and recommendations for sites uniquely suited for reservoir construction.

A survey was disseminated in May 2023 to water user group, wholesale water providers, groundwater conservation districts, and county judges to obtain input regarding draft population, water demand projections, current sources of supply, implementation of recommended water management strategies and water management strategy projects, and infeasible strategies.

Draft plans for each water user group and wholesale water provider were presented to water user groups and wholesale water providers at the three subregional meetings held in January 2025. In addition, digital copies of the 2026 Brazos G Initially Prepared Plan will be provided to county libraries and county clerks in all Brazos G counties and posted on the Brazos G website for public review and comment.

10.4 Coordination with Other Planning Regions

Coordination with other planning regions was accomplished primarily through the technical consultants, who coordinated data and shared information that was later reported to the planning groups. Coordination was accomplished with the technical consultants from Regions B, C, F, H, K, L and O. Other coordination was accomplished through the participation of planning group members as liaisons with other planning groups.

10.5 Brazos G Regional Water Planning Group Meetings

The BGRWPG held a significant number of public meetings during the 2026 planning cycle, between September 29, 2021, and October 20, 2025, including regular meetings of the full planning group; three sub-regional meetings; periodic meetings of the Executive, Scope of Work, and Finance Committees; and periodic meetings of the Groundwater and Water Policy Workgroups.

10.6 Public Hearing and BGRWPG Responses to Public and Agency Comments on the Initially Prepared Plan

This section will address comments received on the 2026 Brazos G Initially Prepared Plan, and will be developed after its submittal to the TWDB.

10.7 TWDB Comments on the Initially Prepared Plan and BGRWPG Responses

This section will address comments received from the TWDB on the 2026 Brazos G Initially Prepared Plan and will be developed after its submittal to the TWDB and the receipt of comments prior to the adoption of the final 2026 Brazos G Regional Water Plan.

The Brazos G Regional Water Planning Group formally adopted this 2021 Brazos G Initially Prepared Plan on February 13, 2025, and directed the BRA and Carollo Engineers to submit this IPP to the TWDB on or before March 4, 2025.

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In association with:

Advanced Groundwater Solutions, LLC

Prepared for

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