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. Diversions and use of this surface water occur 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 rights 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. ~~As a consequence~~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 being~~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 (acft/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~~098~~ 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 discussed here 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 ~~14~~ 11 percent of the total authorized diversion volume. Forty-six other major water rights make up 3,148,642~~2,310,000~~ acft/yr (~~76~~ 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 ~~66~~ 71 percent of the total authorized diversion amount in the basin. The remaining ~~1,064~~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.

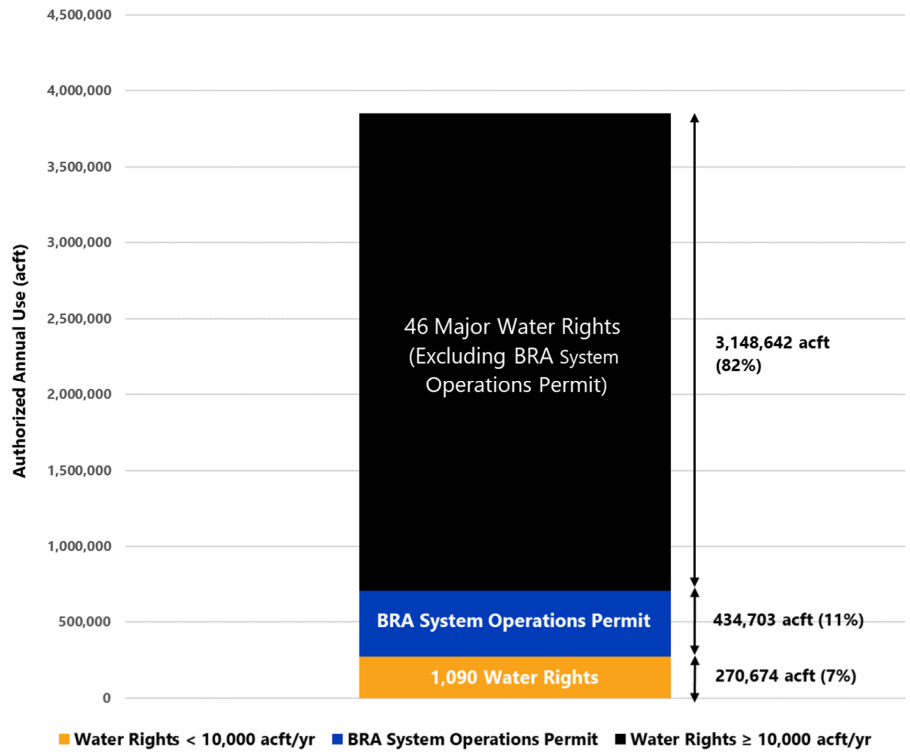

Figure 3.1 Distribution of Water Rights in the Region G portion of the Brazos River Basin

The Brazos G Area includes the majority of the water rights in the Brazos River Basin. A total of ~~963~~ 9874~~7~~ water rights exist in the Brazos G portion of the Brazos River Basin, with a total authorized diversion of 1,927,034~~1,276,000~~457,202 acft/yr. In the Brazos G portion of the Brazos River Basin, ~~28~~ 31 water rights (~~2.9~~3.12 percent) make up 1,644,901~~1,040,000~~225,975 acft/yr (~~81.9~~84.15~~.4~~ percent) of the authorized diversion volume. The remaining ~~935~~ 956~~16~~ 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 39 water rights (3.5 percent) in the Brazos River Basin, but these include some very large rights and make up 1,164,000 acft/yr (38 percent) of the total authorized diversions. Other planning areas make up a small percentage of the remaining water rights and total authorized diversions in the basin, as shown in Figure 3-2 and Figure 3-3.~~

~~The Brazos G Area includes the majority of the water rights in the Brazos River Basin. A total of 963~~ 990 ~~water rights existacft/yr of the diversion volume~~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 and make up 1,838,937 acft/yr (47.7 percent) ~~1,842,855 acft/yr (32 percent)~~ of the total authorized

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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.

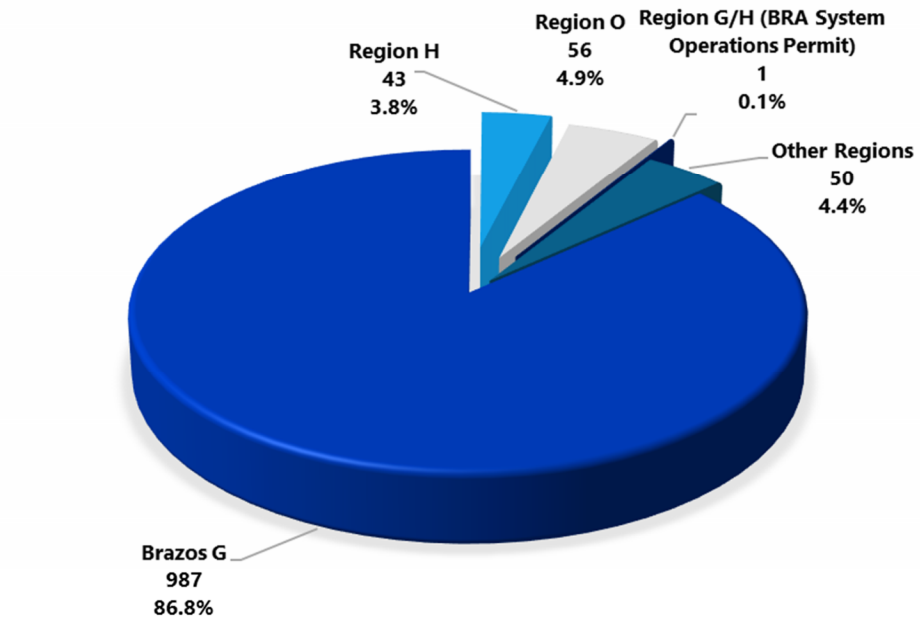


Figure 3.2 Comparison of Water Rights in the Brazos River Basin by Planning Area

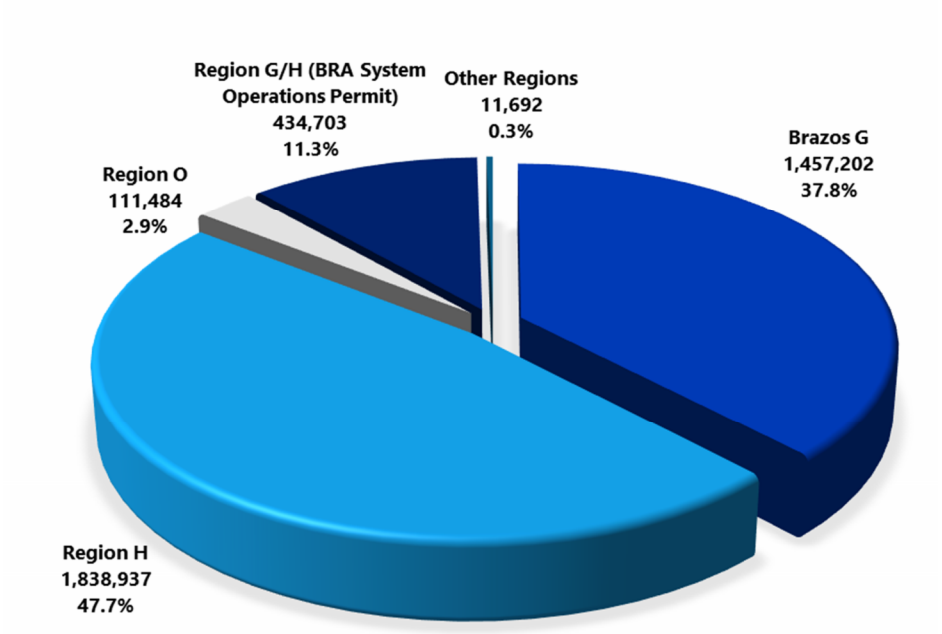
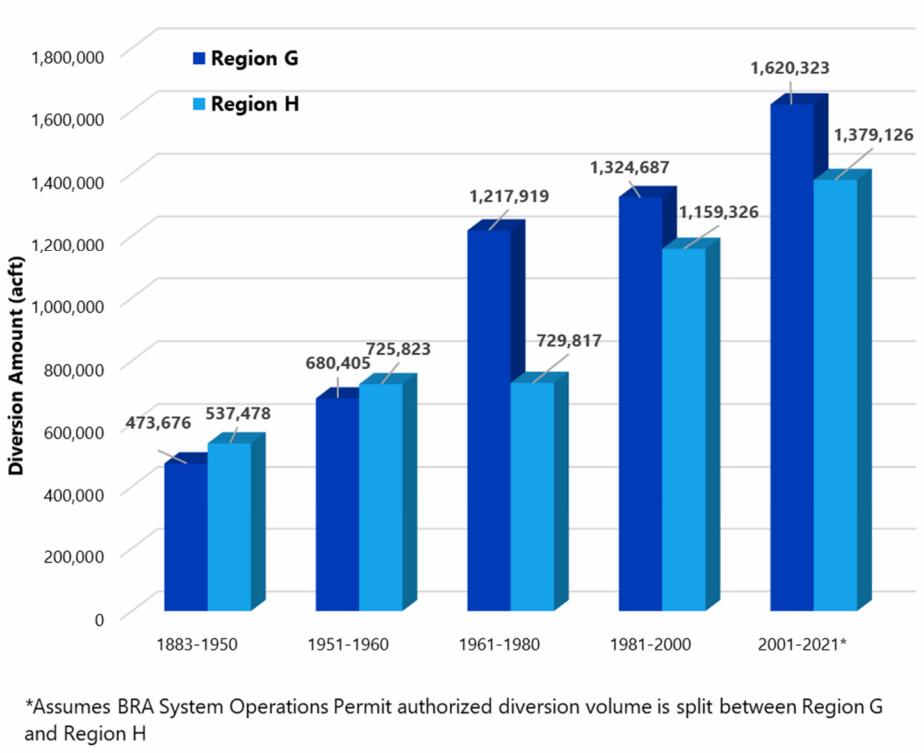


Figure 3.3 Comparison of Authorized Diversion Volume (acre-feet/year) in the Brazos River Basin by Planning Area

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 acft/yr and/or 5,000 acft of authorized storage. Figure 3.5 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.

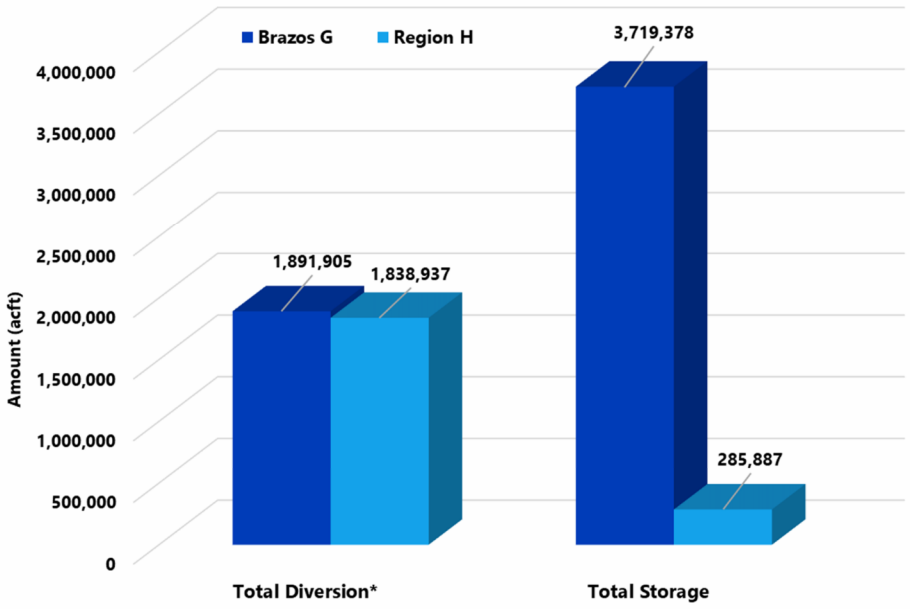


*Assumes BRA System Operations Permit authorized diversion volume is split between Region G and Region H

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 4,287,0654,116,000 acre-feet (acft), with 3,835,3153,609,000 719,378 acft (87.7879 percent) located in Brazos G. In Region H, the quantity of reservoir storage is 285,8876231,000 acft (5.66.7 percent) of the total authorized storage volume in the river basin. Since the development of the 202116 Brazos G Plan, 20,816less than 600 acft 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 acft.

The large quantity of reservoir storage in Brazos G provides for a firm supply of water during drought conditions, when streamflows are low. Figure 3.6 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~~6 Comparison of Storage and Diversion Volumes for Brazos G and Region H

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A total of 48 major reservoirs, defined as authorized storage capacities greater than 5,000 acft, 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 3.5 and Table 3.1b.~~.~~

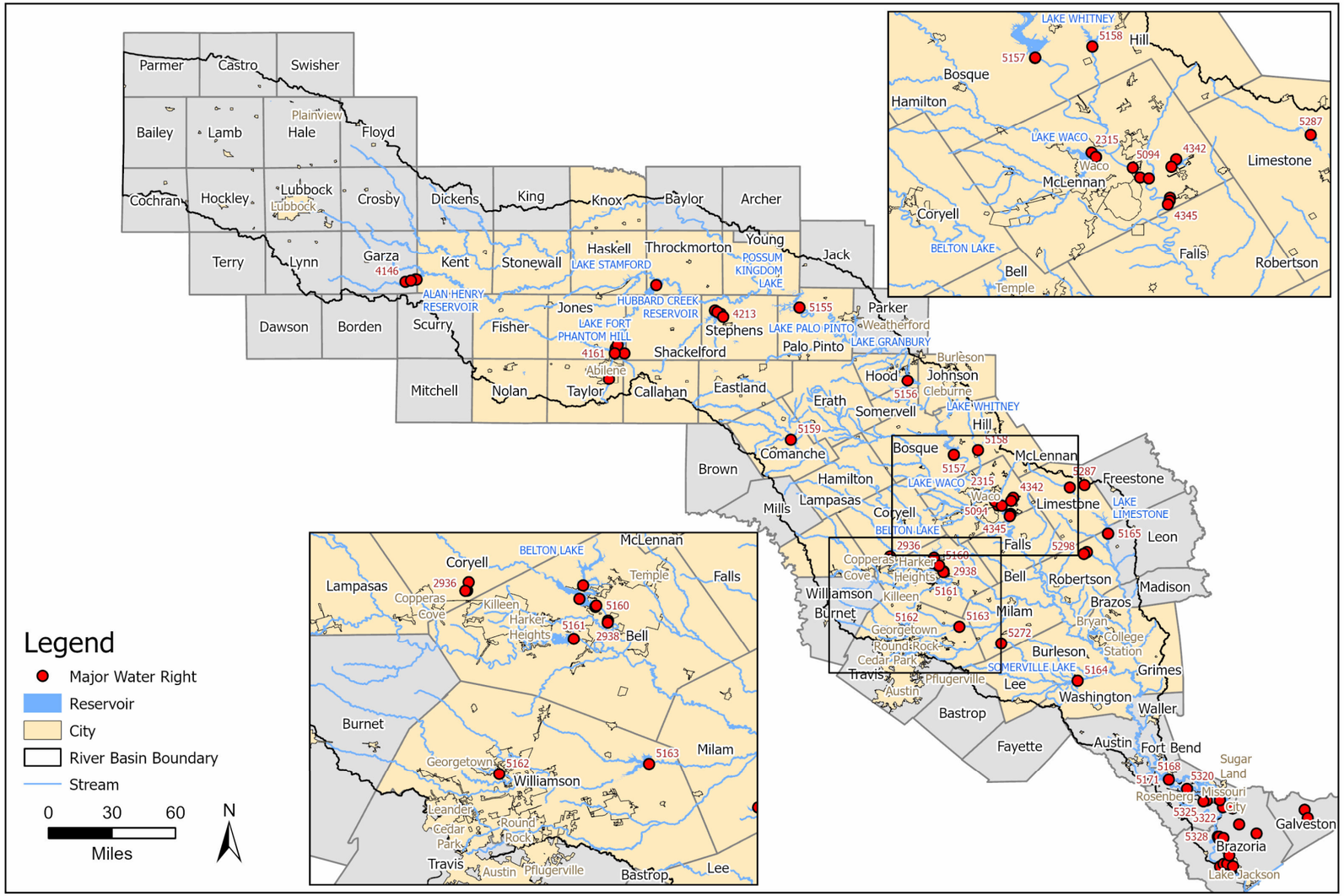

Figure 3.65 Major Water Rights and Reservoirs in the Brazos River Basin

Table 3.1a Major Reservoirs[1] of the Brazos River Basin

Reservoir	Water Right Owner	Authorized Storage (acft)	Authorized Diversion (acft)	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

Reservoir	Water Right Owner	Authorized Storage (acft)	Authorized Diversion (acft)	Priority Date	County	Planning Region
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		
Limestone	Brazos River Authority	225,400	65,074	5/6/1974	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

Reservoir	Water Right Owner	Authorized Storage (acft)	Authorized Diversion (acft)	Priority Date	County	Planning Region
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: acft = acre- feet; 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 acft.
(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 acft/yr with priority dates ranging from 1929 to 1976, which are used in conjunction with the two off-channel reservoirs.

Table 3.2~~1~~b Major Water Rights and Reservoirs in the Brazos River Basin

WRID	Owner	Priority Date	Diversion Amount (acft)	Storage Amount (acft)
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

WRID	Owner	Priority Date	Diversion Amount (acft)	Storage Amount (acft)
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
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

WRID	Owner	Priority Date	Diversion Amount (acft)	Storage Amount (acft)
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	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	
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

WRID	Owner	Priority Date	Diversion Amount (acft)	Storage Amount (acft)
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
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 3.2.

Table 3.32 Interbasin Transfers Associated with the Brazos River Basin[1]

River Basin of Origin	Location of Use			Description	Authority Diversion (acft/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

River Basin of Origin	Location of Use			Description	Authority Diversion (acft/yr)	Priority Date
	River Basin	Planning Region	County			
Brazos	Trinity	C	Multiple	Lake Possum Kingdom to Trinity Basin	5,240	4/6/1938
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
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:
Abbreviations: acft/yr = acre-feet per year.
(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 562,151~~696,719~~ acft/yr from its system of reservoirs in the Brazos River Basin. The BRA contracts raw water to various entities for long-term supply as well as short-term supply for municipal, industrial, and irrigation 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 3.3 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 ~~between~~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~~3 Water Supply Contracts and Other Current Demands Supplied by Water User Groups (WUGs) and Wholesale Water Providers (WWPs) (acre-feet/year)

Commented [TS4]: Table to be finalized pending WUG and WWP input.

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, Steam Electric (ALCOA)	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

Water User Group/Wholesale Water Supplier	Contract Demand Year					
	2030	2040	2050	2060	2070	2080
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	45,707	45,707	45,707	45,707	45,707	45,707
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, Jarrell-Schwertner WSC, Sonterra MUD)	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
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
Moffat WSC						
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	**251,143**	**251,143**	**251,143**	**251,143**	**251,143**	**251,143**
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)	1,000	1,000	1,000	1,000	1,000	1,000
Bosque County, Steam Electric (Bosque Generating, L.P.)	6,500	6,500	6,500	6,500	6,500	6,500
Palo Pinto County, Steam Electric (Brazos Electric Power Coop.)						
Palo Pinto County, Irrigation (Carr-Thomas Ranch)	50	50	50	50	50	50
City of Abilene	11,681	11,681	11,681	11,681	11,681	11,681
City of Brenham	4,200	4,200	4,200	4,200	4,200	4,200

Water User Group/Wholesale Water Supplier	Contract Demand Year					
	2030	2040	2050	2060	2070	2080
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.	1,000	1,000	1,000	1,000	1,000	1,000
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
Palo Pinto County, Irrigation (Hill Country Harbor Village)	250	250	250	250	250	250
Brazos County, Irrigation (Horizon Turf Grass)	350	350	350	350	350	350
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.)	2,000	2,000	2,000	2,000	2,000	2,000
Hood County-Other (LSF Development Corp)	90	90	90	90	90	90
Hood County-Other (Monarch Utilities I, 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
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
Parker County SUD (*Region C)*	1,100	1,100	1,100	1,100	1,100	1,100
Pecan Grove MUD 1 (*Region H)*	3,800	3,800	3,800	3,800	3,800	3,800
Hood County, Irrigation (Pecan Plantation Owners Association)	750	750	750	750	750	750
Possum Kingdom WSC	750	750	750	750	750	750
Palo Pinto County, Irrigation (Ranch Owner's Association)	250	250	250	250	250	250

Water User Group/Wholesale Water Supplier	Contract Demand Year					
	2030	2040	2050	2060	2070	2080
Hood County, Irrigation (Rex R. Worrell)						
SLC Water Supply Company	200	200	200	200	200	200
Sportsmans World MUD	125	125	125	125	125	125
Stephens Regional SUD (Stephens County RWSC)	800	800	800	800	800	800
Somervell County, Steam Electric (TXU Electric)	39,350	39,350	39,350	39,350	39,350	39,350
Parker County, Irrigation (Sugar Tree, Inc.- *Region C*)	430	430	430	430	430	430
Grimes County, Steam Electric (Texas Municipal Power Agency)	3,600	3,600	3,600	3,600	3,600	3,600
Palo Pinto County, Manufacturing (TPWD)	1,200	1,200	1,200	1,200	1,200	1,200
Hood County, Steam Electric (TXU Electric)						
Palo Pinto County, Mining (Vulcan Construction Materials)	1,000	1,000	1,000	1,000	1,000	1,000
Wellborn SUD	4,000	4,000	4,000	4,000	4,000	4,000
West Central Texas MWD	235	235	235	235	235	235
Hill County, Mining (Western Company of Texas)						
Hill County, Irrigation (White Bluff Property Owners)	1,000	1,000	1,000	1,000	1,000	1,000
Young County, Steam Electric Power (TXU Electric)	14,000	14,000	14,000	14,000	14,000	14,000
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	**370,428**	**370,428**	**370,428**	**370,428**	**370,428**	**370,428**
BRA (PURCHASED FROM LOWER COLORADO RIVER AUTHORITY)						
Georgetown	1,200	1,200	1,200	1,200	1,200	1,200
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	**24,700**	**24,700**	**24,700**	**24,700**	**24,700**	**24,700**
BRA (SYSTEM OPERATIONS)[2]						
Double Diamond (Retreat)	619	619	619	619	619	619
West Central Texas MWD	225	225	225	225	225	225
LENMO	774	774	774	774	774	774
TPWD Possum Kingdom State Park	15	15	15	15	15	15
Sportsman's World MUD	290	290	290	290	290	290
City of Abilene	7,737	7,737	7,737	7,737	7,737	7,737
Parker County SUD	774	774	774	774	774	774
Possum Kingdom WSC	1,934	1,934	1,934	1,934	1,934	1,934
Corky Underwood	54	54	54	54	54	54
Neuhaus Trust Partnership	309	309	309	309	309	309
FHLM WSC						
Horizon Turfgrass	348	348	348	348	348	348

Water User Group/Wholesale Water Supplier	Contract Demand Year					
	2030	2040	2050	2060	2070	2080
City of Brenham	774	774	774	774	774	774
Vulcan Materials	387	387	387	387	387	387
Total Brazos G	16,723	16,723	16,723	16,723	16,723	16,723
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
BASF	3,868	3,868	3,868	3,868	3,868	3,868
Marathon-GBR	5,700	5,700	5,700	5,700	5,700	5,700
GCWA	36,362	36,362	36,362	36,362	36,362	36,362
Total Region H	78,276	78,276	78,276	78,276	78,276	78,276
TPWD Water Trust						
GM Reserve						
Total Other						
Total Contract (Region H)						
Total Contract (Region G)						
Total Other						
Total Contracts and Other Demands	**92,516**	**92,516**	**92,516**	**92,516**	**92,516**	**92,516**
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	1,659	2,033	2,620	3,207	3,344	3,481
City of Belton	5,966	5,966	5,966	5,966	5,966	5,966
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	20,920	23,723	26,636	29,626	32,606	32,606
Bell County-Other	750	750	750	750	750	750
Total Contracts and WUG Demands	**44,134**	**47,311**	**50,811**	**54,388**	**57,505**	**57,642**
BLUEBONNET WSC						

Water User Group/Wholesale Water Supplier	Contract Demand Year					
	2030	2040	2050	2060	2070	2080
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 Rodgers	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 (Westphalia WSC)						
Falls County-Other (Town of Mooreville)						
Total Contracts and WUG Demands	**10,445**	**10,445**	**10,445**	**10,445**	**10,445**	**10,445**
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
Knox County-Other (City of Benjamin)						

Water User Group/Wholesale Water Supplier	Contract Demand Year					
	2030	2040	2050	2060	2070	2080
Knox County-Other (City of Goree)						
Knox County-Other (Knox County Rural WSC)						
City of Haskell	637	637	637	637	637	637
City of Knox City	260	260	260	260	260	260
City of Munday	268	268	268	268	268	268
Total Contracts and WUG Demands	**1,666**	**1,666**	**1,638**	**1,608**	**1,579**	**1,547**
PALO PINTO CO MWD No. 1						
City of Mineral Wells[3]	5,301	5,401	5,456	5,527	5,598	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	**9,551**	**9,651**	**9,706**	**9,777**	**9,848**	**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 (Blair WSC)						
Taylor County-Other (S.U.N. WSC)						
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

Water User Group/Wholesale Water Supplier	Contract Demand Year					
	2030	2040	2050	2060	2070	2080
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
Total Contracts and WUG Demands	**41,919**	**43,931**	**45,704**	**47,482**	**49,462**	**51,682**
ACTON MUD						
Acton MUD (municipal WUG demands)	2,320	2,511	2,728	2,963	3,218	3,495
Hood County-Other	782	801	844	888	1,496	2,077
Total Contracts and WUG Demands	**3,102**	**3,312**	**3,572**	**3,851**	**4,714**	**5,572**
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)	276	283	289	294	300	308
Hill County-Other	31	32	33	34	35	35
Total Contracts and WUG Demands	**307**	**315**	**322**	**328**	**335**	**343**
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						

Water User Group/Wholesale Water Supplier	Contract Demand Year					
	2030	2040	2050	2060	2070	2080
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)	3,927	3,913	3,913	3,913	3,913	3,913
Williamson County-Other	518	518	518	518	518	518
Total Contracts and WUG Demands	**4,445**	**4,431**	**4,431**	**4,431**	**4,431**	**4,431**
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**
BURLESON						
City of Burleson (municipal WUG demands)	6,647	7,781	8,946	10,007	11,199	12,536
Johnson County, Manufacturing	2	2	2	2	2	2
Total Contracts and WUG Demands	**6,649**	**7,783**	**8,948**	**10,009**	**11,201**	**12,538**
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)	18,724	18,666	18,666	18,666	18,666	18,666
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	**21,171**	**21,113**	**21,113**	**21,113**	**21,113**	**21,113**
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						

Water User Group/Wholesale Water Supplier	Contract Demand Year					
	2030	2040	2050	2060	2070	2080
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
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

Water User Group/Wholesale Water Supplier	Contract Demand Year					
	2030	2040	2050	2060	2070	2080
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**
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

Water User Group/Wholesale Water Supplier	Contract Demand Year					
	2030	2040	2050	2060	2070	2080
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**
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**

Water User Group/Wholesale Water Supplier	Contract Demand Year					
	2030	2040	2050	2060	2070	2080
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
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						

Water User Group/Wholesale Water Supplier	Contract Demand Year					
	2030	2040	2050	2060	2070	2080
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						

Water User Group/Wholesale Water Supplier	Contract Demand Year					
	2030	2040	2050	2060	2070	2080
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
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

Water User Group/Wholesale Water Supplier	Contract Demand Year					
	2030	2040	2050	2060	2070	2080
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**
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

Water User Group/Wholesale Water Supplier	Contract Demand Year					
	2030	2040	2050	2060	2070	2080
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**
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

Water User Group/Wholesale Water Supplier	Contract Demand Year					
	2030	2040	2050	2060	2070	2080
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
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**

Water User Group/Wholesale Water Supplier	Contract Demand Year					
	2030	2040	2050	2060	2070	2080
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**
WAXAHACHIE (REGION C)[4]						
Files Valley WSC						
Total Contracts and WUG Demands						
COLORADO RIVER MWD (REGION F)[1]						
City of Abilene[5]	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**

Water User Group/Wholesale Water Supplier	Contract Demand Year					
	2030	2040	2050	2060	2070	2080
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) Contracts for BRA Sys Ops supplies will be considered as recommended water management strategies for the 2026 Brazos G Plan, and are not considered to be current supplies.
(3) Includes municipal supply to portion of Mineral Wells located in Region C.
(4) Only listing Entity's contracts with Region G. Does not list Entity's other contract demands and Entity Demand.
(5) 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.

- ~~Utilization of naturalized flow and evaporation data developed by the BRA for its adopted management plan, which extends the hydrologic period of record through 2015.~~
- 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 3.4 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 consistent with the BRA adopted management plan.
- 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, Limestone, Possum Kingdom, Somerville, and Whitney) modeled source availabilities 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 acft 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 uses Year 2032~~0, or the most up to date reservoir survey as available, and ~~estimated Year 2080 elevation-area-capacity information for all reservoirs authorized for greater than 5,000 acft storage capacity.~~

- The Brazos G WAM includes five subordination agreements, listed below, as ~~agreed to~~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; and
  - » 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.
  - » ~~Possum Kingdom Reservoir is subordinated to Lake Alan Henry,~~
  - » ~~Possum Kingdom Reservoir is subordinated to the Fort Phantom Hill Reservoir Scalping water right located on the Clear Fork of the Brazos River,~~
  - » ~~Possum Kingdom Reservoir is subordinated to Hubbard Creek Reservoir,~~
  - » ~~Possum Kingdom Reservoir is subordinated to the City of Stamford's California Creek pump-back operation into Lake Stamford, and~~
  - » ~~Lake Waco is subordinated to the City of Clifton's 1996 priority date water right.~~
- 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.
- ~~Exclusion of the following permitted but not constructed reservoirs:~~
  - » ~~Allens Creek Reservoir~~
  - » ~~Post Reservoir~~
  - » ~~Turkey Peak Reservoir (Lake Palo Pinto expansion)~~

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

Commented [TS5]: To be updated.

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

Entity[1]	County	Current 2030 Discharge[2]	Estimated 2080 Discharge[3]
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
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

Entity[1]	County	Current 2030 Discharge[2]	Estimated 2080 Discharge[3]
City of Temple and City of Belton	Bell	6.084	3.187
City of West Columbia	Brazoria	0.430	0.148
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 (acft/yr):		**84271**	**58961**

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 2015-2017 period.
(3) Future estimates assume 25% of Year ~~2020~~ 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-~~2015~~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 ~~November 2016~~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.

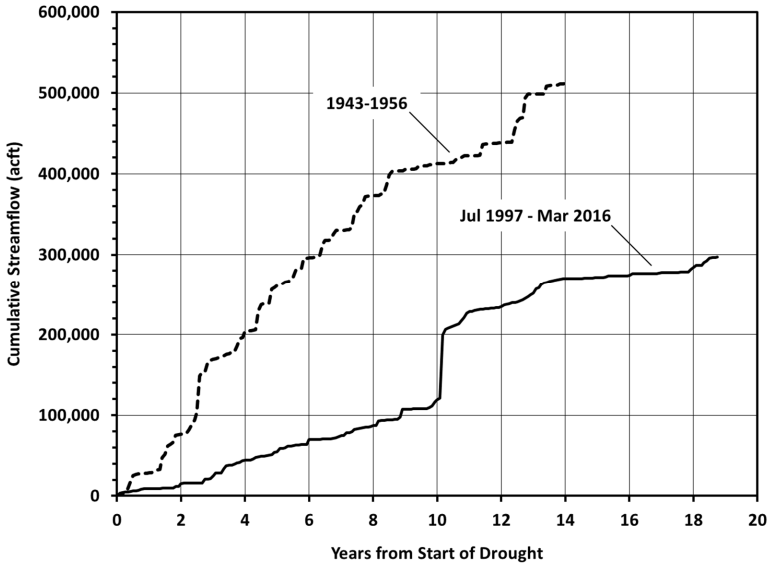

Figure 3.7 Comparison of Cumulative Streamflows for Two Drought Periods for the Clear Fork at Nugent, TX Streamgage (08084000)

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 acft yield estimates were determined using the updated ~~2020~~ 2030 (current) and ~~2070~~ 2080 (future) elevation-area-capacity information based on projected reservoir sedimentation. For reservoirs with less than 5,000 acft of storage, as-permitted capacities were used to estimate yields. Future reservoir sediment conditions were estimated using available reservoir sedimentation data. ~~Sedimentation conditions used for the 2021 Plan are identical to those used for the 2016 Plan, except for those reservoirs for which updated reservoir sedimentation data exist.~~ Summary of current (2030) and future (2080) sediment estimates for reservoirs with recent surveys area~~s~~ summarized in Table 3.5.

Table 3.~~65~~ Summary of Current and Future Sediment Estimates for Reservoirs with Recent Surveys (available as of May 1, 2018)

Reservoir	Year of New Survey	Sedimentation Rate (acft/yr)	2026 Plan Conservation Storage Capacity (acft)	
			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 ~~2021~~ 2026 Plan sedimentation rate was maintained at the same level as that used in the ~~2016~~ 2021 Plan to estimate current and future sediment conditions.
(4) volumetric surveys and sedimentation rates were inconclusive ~~Sedimentation rate provided in TWDB survey report.~~

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 3.6.

Table 3.~~7~~6 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	155,560	151,710		
C5156	Granbury	58,652	53,792		
C5157	Whitney	18,336	18,336		
C5158	Aquilla	13,896	11,862		
C5159	Proctor	14,216	11,456		
C5160	Belton[(1)]	100,257	100,257		
C5161	Stillhouse Hollow	67,768	67,048		
C5162	Georgetown	12,601	12,302		
C5163	Granger	17,387	15,488		
C5164	Somerville	44,130	42,080		
C5165	Limestone	65,074	65,074		
Large Non-BRA Reservoirs					
C3758, C5272	Alcoa	14,000	14,000		
C5268	Dansbury (Bryan Utilities)	85	85		
C5311, C5307	Gibbons Creek	9,740	9,740		

Water Right ID	Reservoir Name	Firm Yield		Safe Yield	
		2030	2080	2030	2080
C4345	Lake Creek	7,798	7,798		
C34403	Davis	0	0		
C3470	Leon	4,160	4,080		
C4039	Mineral Wells (Region C)	1600	1560		
C4031	Palo Pinto[2]	8,860	7,280	6,480	5,026
C4106	Pat Cleburne	5,700	5,650		
C4097	Squaw Creek	8,228	7,830		
C4342	Tradinghouse	5,310	5,310		
C5298	Twin Oaks	3,047	2,047		
P5551, P5899	Waco	36,850	36,330		
C3693	White River	85	85		
Minor Reservoirs					
P4135	Crawford	0	0		
C3465	Eastland	510	500		
C4024	Gordon	0	0		
C4355	Marlin	2,300	2,300		
P5000	Mart	0	0		
P5085	Robinson	3828	3728		
P5744	Wheeler Branch	1,660	1,450		
C4019	Strawn	160	160		
C3450	Throckmorton	50	50		
Upper Basin Reservoirs					
C4142	Abilene[3]	1675	1675	1175	1175
C4211	Cisco	1,337	1,337	1,127	1,127
C4214	Daniel	200	200	108	108
C4151, C4161, C4139, C4165	Fort Phantom Hill[6]	7,836	7,413	5,344	5,086
C3458	Graham-Eddleman	1,800	1,400	858	460
C4213	Hubbard Creek[4]	26,740	25,170	17,115	15,489
C4150	Kirby[5]	530	530	320	320
C4179	Stamford	4,070	3,540	2,107	1,617
C4130	Sweetwater[3]	700	700	520	520
C4128	Sweetwater_Trammel_RC4128[3]	300	300	210	210

Water Right ID	Reservoir Name	Firm Yield		Safe Yield	
		2030	2080	2030	2080
C4152	Lytle Lake	230	230	230	230
C4180	City of Hamlin Lake	40	40	24	24
C4181	Anson North	34	30	22	21
C4194	Woodson	0	0	0	0
C4202	Baird	30	30	20	20
C4208	McCarty	110	110	80	80
C4207	Moran	90	90	60	60
C3462	Bryson	0	0	0	0
C3444	Millers Creek Reservoir	330	90	200	53

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.
~~(1)~~(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.
~~(2) BRA reservoir firm yield estimates are considered a stand-alone yield and do not include system operations.~~
~~(3) Safe yield estimate for Lake Palo Pinto is based on a 6-month safe yield calculation.~~
~~(4) Reservoir not used for supply by owning entity or is not considered a reliable supply.~~
~~(5) Lake Belton yield includes 12,000 acft/yr of water rights held by Department of the Army.~~
(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.
~~(7) Safe yield estimate for Hubbard Creek Reservoir is based on a 2-year safe yield calculation.~~
~~(8) Lake Kirby is used as part of the City of Abilene's reuse system and not for raw water supply. Yield estimates for Lake Kirby do not include effluent inflows.~~

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~~5~~. 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 allows the BRA to appropriate available run-of-river streamflow in the middle and lower Brazos Basin (downstream of Possum Kingdom Reservoir) in amounts greater than the diversion amounts authorized in existing certificates and permits held by the BRA, and use these supplies in coordination 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 3.7 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.~~8~~7 Summary of BRA Reservoir Firm Yields and System Operations Reliable Supply

BRA Reservoir	Stand-Alone Firm Yield (ac-ft/yr)	
	2030	2080
Possum Kingdom	155,560	151,710
Granbury	58,652	53,792
Whitney	18,336	18,336
Aquilla	13,896	11,862
Proctor	14,216	11,456
Belton[1]	100,257	100,257
Stillhouse Hollow	67,768	67,048
Georgetown	12,601	12,302
Granger	17,387	15,488
Somerville	44,130	42,080
Limestone	65,074	65,074
Total Reservoir Firm Yields	**567,877**	**549,405**
System Yield	**722,161**	**659,328**

System Operations Reliable Supply[2]	**154,284**	**109,923**

Notes:
Abbreviations: acft/yr = acre-feet per year.
(1) BRA portion of Lake Belton stand-alone yield excludes 12,000 acft/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.

3.2.6 Unappropriated Flows in the Brazos River Basin

The Brazos G WAM calculates unappropriated flow each month for the 1940 - 2018~~5~~ 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), and
- 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 3.8 summarizes the monthly and annual unappropriated flows at these selected locations for the current conditions run.

Table 3.~~9~~8 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 (acft)				Annual Unappropriated Flows (acft)				
	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

Abbreviations: acft = acre-feet.

Figure 3.8 provides a comparison of median annual unappropriated flows at the selected location to those calculated in the 20216 Brazos G Plan. The comparison shows that the median unappropriated flow at the selected locations has decreased at five of the eight all of the selected locations has decreased since the 2016 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.

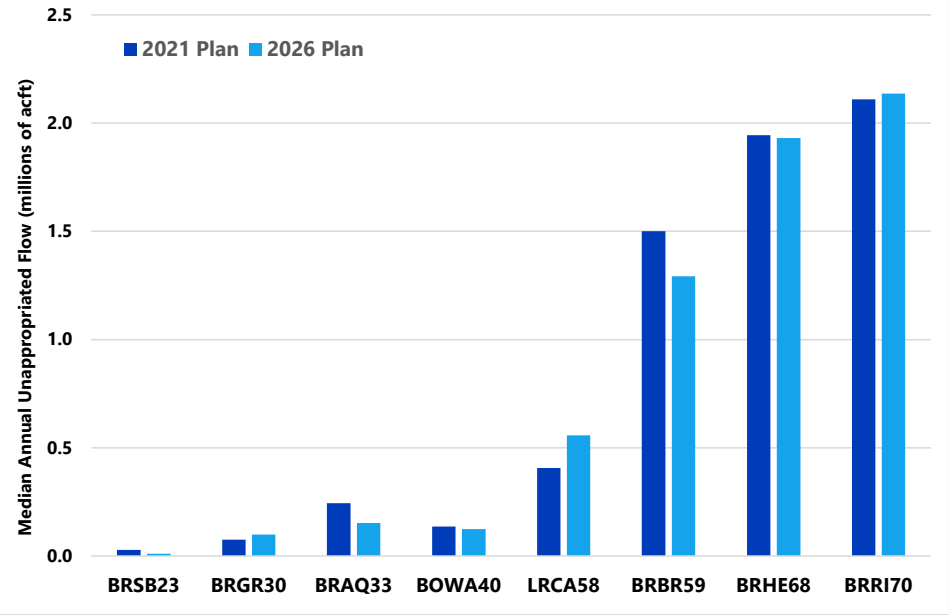

Figure 3.8 Comparison of Simulated Median Annual Unappropriated Flow to 2016 Brazos G Plan2026 Brazos G Plan

Figure 3-9 through Figure 3.16 illustrate the annual time series of unappropriated flows at each location. As Table 3.8 and Figure 3.9 through Figure 3.16 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 30 46 out of 796 years of the model simulation. Conversely, unappropriated flow is present in all but 8 10 years at Richmond in the lower basin, and often in large quantities. Unappropriated flow is not available at Richmond for three four years during the severe drought of the 1950s, which is the lowest flow period during the 1940 to 2015 2018 simulation period at this gage.

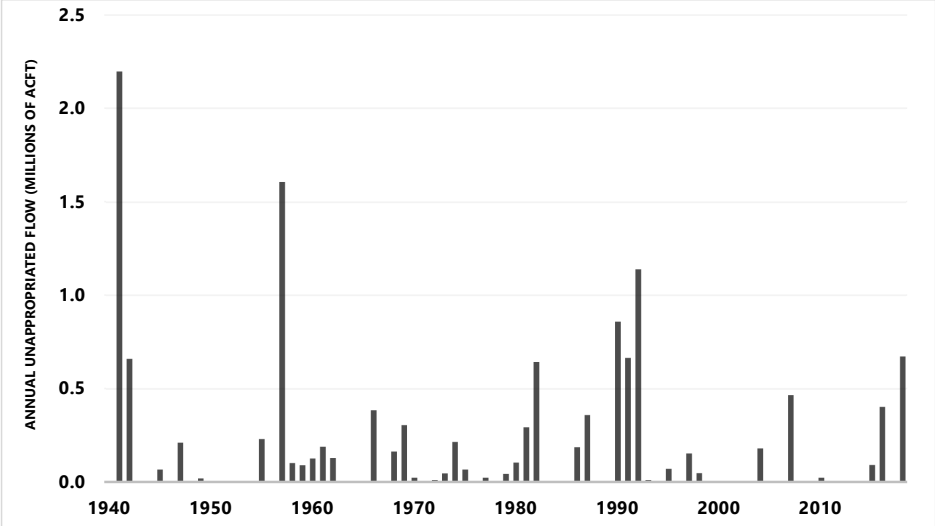

Figure 3.9 Simulated Annual Unappropriated Flow at Brazos River at South Bend (BRSB23)

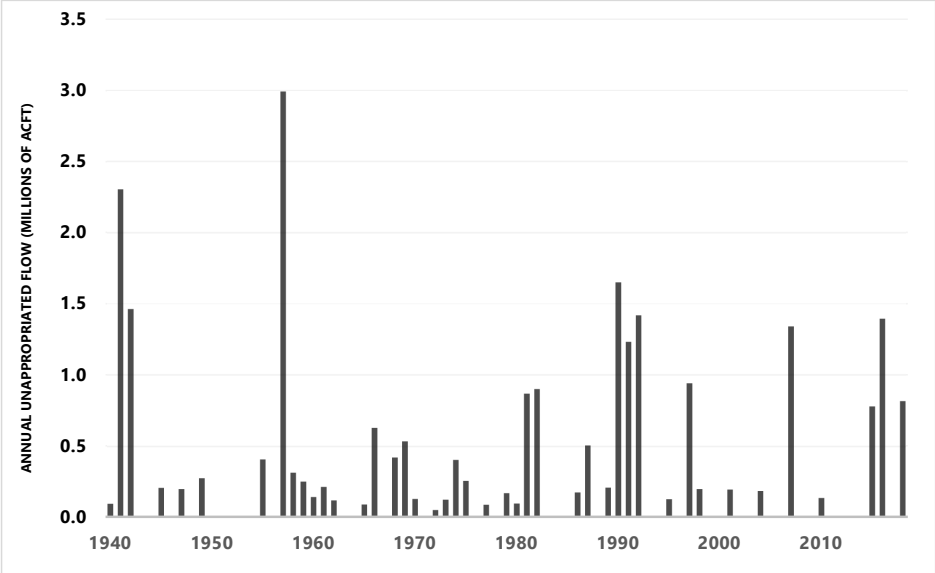

Figure 3.10 Simulated Annual Unappropriated Flow at Brazos River near Glen Rose (BRGR30)

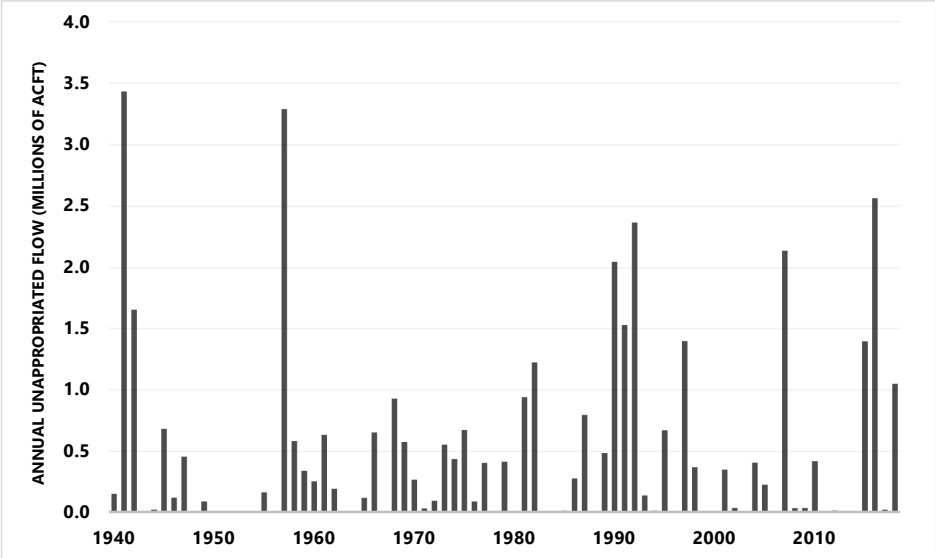

Figure 3.11 Simulated Annual Unappropriated Flow at Brazos River near Aquilla (BRAQ33)

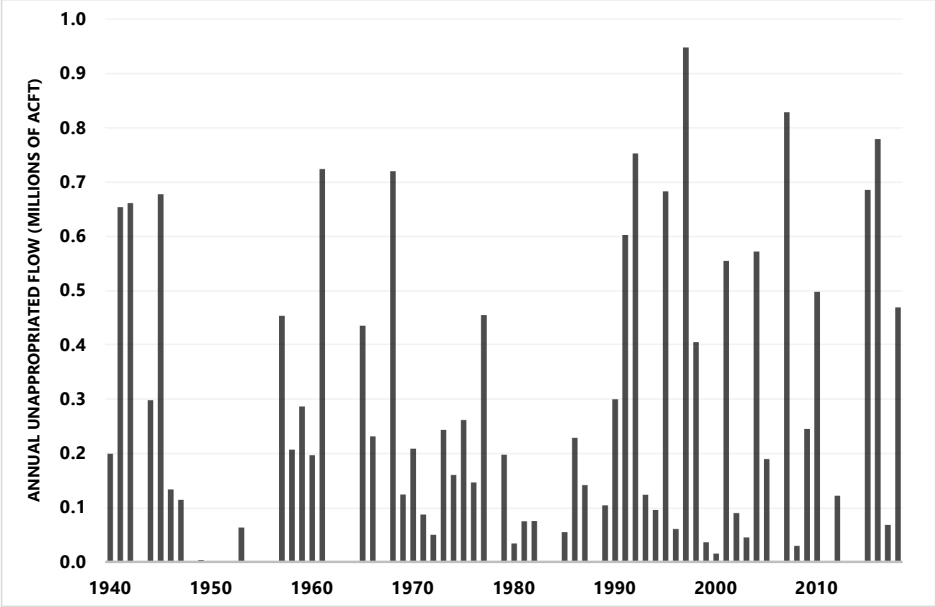

Figure 3.12 Simulated Annual Unappropriated Flow at Brazos River near Waco (BOWA40)

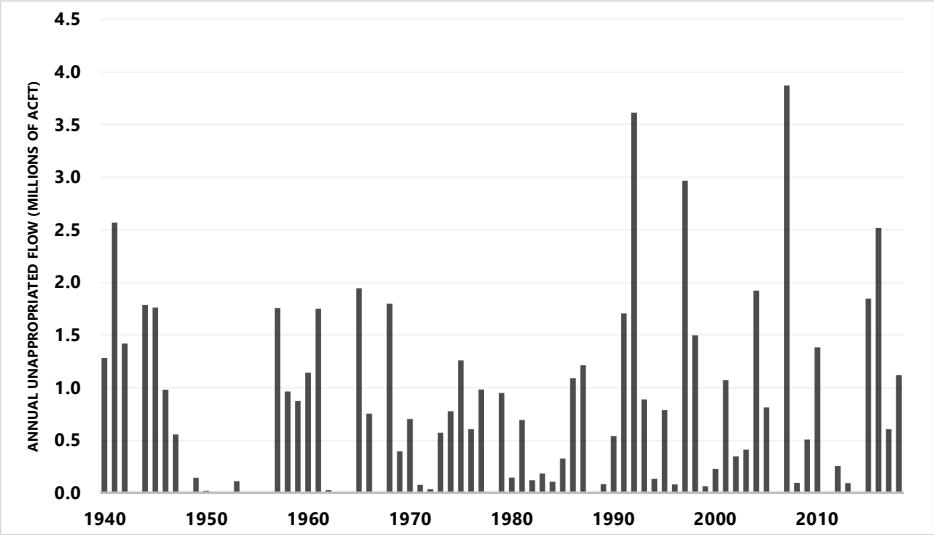

Figure 3.13 Simulated Annual Unappropriated Flow at Little River at Cameron (LRCA58)

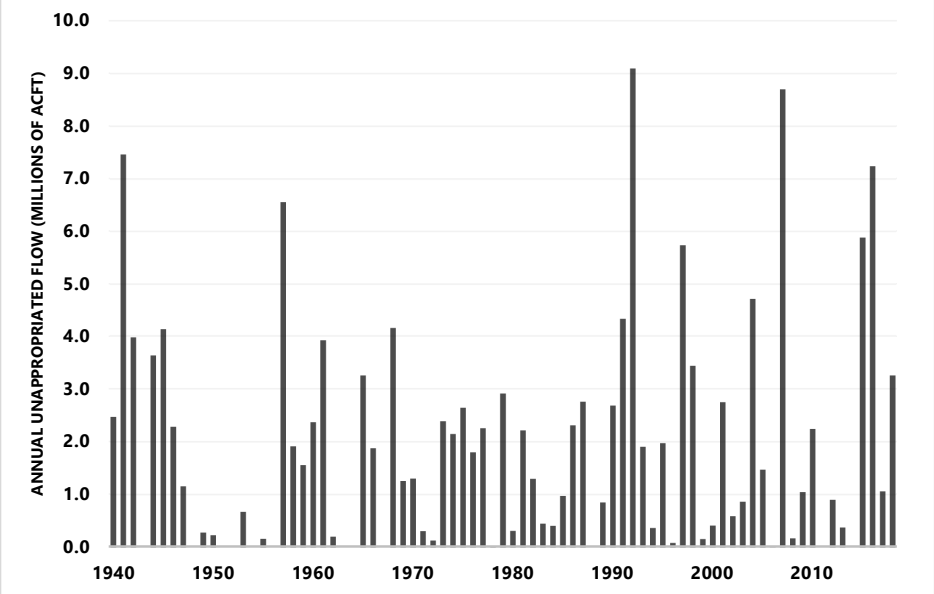

Figure 3.14 Simulated Annual Unappropriated Flow at Brazos River near Bryan (BRBR59)

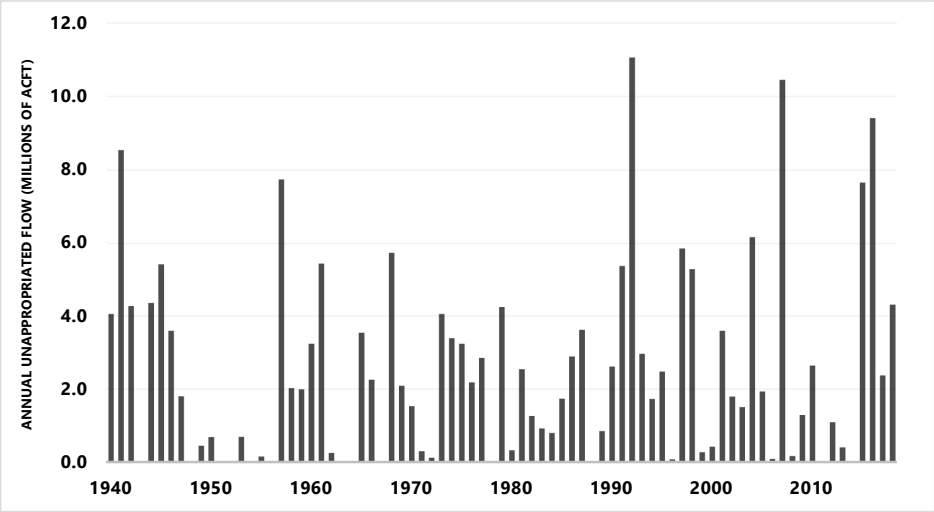

Figure 3.15 Simulated Annual Unappropriated Flow at Brazos River near Hempstead (BRHE68)

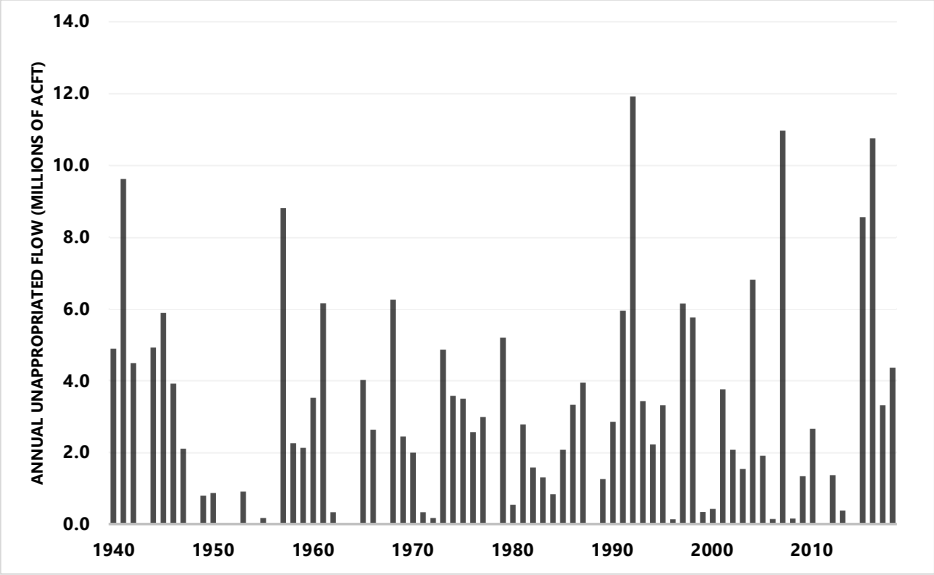

Figure 3.16 Simulated Annual Unappropriated Flow at Brazos River at Richmond (BRRI70)

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 3.9[2].

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

[2] Texas Commission on Environmental Quality, ~~2018~~ 2024 Texas 303(d) List (~~November 8, 2018~~June 26, 2024).

Table 3.~~10~~9 2024~~12~~ Draft Texas 303(d) List (~~November 8, 2019~~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
			5r	Depressed dissolved oxygen in water	2012
1209I	Gibbons Creek	Grimes	5b	Bacteria in water (Recreation Use)	2002
			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
			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
			5r	Depressed dissolved oxygen in water	2006
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

Segment Number	Segment Name	County	Category	Parameter of Concern	Year First Listed
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
			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
			5b	Chloride in water	2006
			5b	Sulfate in water	2002
			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
			5c	Impaired fish community in water	2016
1237	Lake Sweetwater	Nolan	5c	Chloride in water	2022
			5c	Sulfate in water	2022
			5c	Total dissolved solids in water	2022
1238	Salt Fork Brazos River	Kent / Crosby	5c	Bacteria in water (Recreation Use)	2020
			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
			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

Segment Number	Segment Name	County	Category	Parameter of Concern	Year First Listed
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
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
			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. ~~Navasota River below Lake Limestone (Segment 1209) for bacteria, are categorized as 5a, meaning TMDLs are underway, scheduled, or will be scheduled for one or more parameters.~~

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~~19 Basin Highlights Report~~. A ~~brief summary of these projects is described below.~~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.

~~3.3.3.1 Little River, San Gabriel River, and Big Elm Creek Watershed Inventory~~

~~The BRA is working on the Little River watershed to lower elevated levels of E. Coli. The watershed inventory was developed with data and information on water quality impairment and issues in the watershed. In April 2017 the Texas Water Resources Institute competed a report to address the water quality issues using a GIS tool that was developed to integrate numerous existing information resources. Big Elm Creek is developing a Watershed Protection Plan, which will hopefully be adopted Fall of 2020.~~

3.3.3.2 Watershed Protection Plan for Lake Granger and San Gabriel River

The BRA and the Little River-San Gabriel Soil and Water Conservation District are developing a Watershed Protection Plan for Lake Granger and the San Gabriel River to address water quality issues of stream erosion, sedimentation and bacteria concentrations. This plan was developed in 2011 by the BRA. The district has received funding to aid participants implementing best management practices on agricultural lands. This plan is currently being implemented[3].

3.3.3.3 Watershed Protection Plan for Leon River

TCEQ began developing a TMDL for the river segment between Lake Procter and Hamilton in 2002 for bacteria concentrations. The BRA is working with stakeholders and the Texas State Soil and Water Conservation Board to develop a Watershed Protection Plan to assist TCEQ in selecting implementation strategies for the TMDL. The USEPA approved the plan in early 2015 and the Leon River Watershed Protection Plan (WPP) is currently being implemented[4].

3.3.3.4 Watershed Protection Plan for Lampasas River

The Lampasas River was flagged by the TCEQ to implement a watershed protection plan due to elevated levels of bacteria in 2002. The Lampasas River Watershed Partnership and local residents worked to create a WWP. They made recommendations for voluntary pollutant load reductions. The WWP was submitted to the USEPA in 2013 and it is now being implemented[5].

3.3.3.5 Watershed Protection Plan for Nolan Creek and South Nolan Creek

The TCEQ listed Nolan Creek and South Nolan Creek on the 303(d) impaired for elevated bacteria concentrations in 1996. The Nolan Creek Partnership has provided local input for the development of a WWP, which is almost complete. The goal is to provide education programs and practices to improve the water quality. The WWP will hopefully be accepted in spring of 2019 by the USEPA.

3.3.3.6 Watershed Protection Plan for the Navasota River below Lake Limestone

The Navasota River and several tributaries were listed as imparted by the TCEQ in 2002 for elevated E. coli concentrations, low dissolved oxygen, elevated nutrients, and chlorophyll-a. The watershed stakeholders created a Navasota River below Lake Limestone Watershed Protection Plan. This plan included management strategies to retain landscape, removing feral hogs, livestock, on-site sewage facilities, pets and wastewater. All management recommendation were voluntary. The WWP was approved by the USEPA in 2017 and is currently being implemented[6]. The watershed stakeholders are also pursuing a TMDL that is in review with the TCEQ.

[3] BRA, 2011. Lake Granger and San Gabriel River Water Protection Plan. https://www.tsswcb.texas.gov/sites/default/files/files/programs/nonpoint-source-managment/Completed%20Projects/Lake_Granger_and_San_Gabriel_River_WPP.pdf
[4] Parsons Water & Infrastructure Inc. and the Brazos River Authority. Watershed Protection Plan for the Leon River Below Proctor Lake and Above Belton Lake. http://leonriver.tamu.edu/media/1110/final-leon-wpp.pdf.
[5] Lampasas River Watershed Protection Plan. http://www.lampasasriver.org/.
[6] Navasota River Below Lake Limestone Watershed Protection Plan. http://twri.tamu.edu/media/661581/tr-497.pdf.

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[7]. 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 3.17.

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.

The MAG determination is based upon drought-of-record conditions which would occur simultaneously with increased, dry-year demands. ~~For groundwater systems sensitive to annual hydrologic variability, this this is a rational approach. However, supplies from some aquifer systems, such as the Carrizo-Wilcox Aquifer, are not sensitive to annual or short-term fluctuations in hydrology. For these systems, simply applying the MAG has been found to be an overly conservative estimate of availability. With the realization that demands in many years will be substantially less than the dry-year demands, the Brazos G Regional Water Planning Group has adopted a MAG Peak Factor to increase planning supplies, which is based on developing an annual pumping pattern that reflects annual variation in pumping from an aquifer over a period while not exceeding the cumulative volume that would be pumped by the MAG in that same period. Any adjustments to the MAG, such as the MAG Peak Factor, must still honor the established DFCs for a given aquifer. A MAG Peak Factor is incorporated for the Carrizo-Wilcox Aquifer in Brazos County for this planning cycle. This peak factor is a composite factor representing the cumulative availability for the Carrizo-Wilcox Aquifer system from both the Carrizo and Simsboro Formations and represents an annual available groundwater supply which is 15 percent to 20 percent greater across the planning horizon than the MAG. The process for developing the MAG Peak Factors is presented in Appendix K.~~

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~~16~~ 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. The Brazos G technical consultant requested specific groundwater availability estimates based on the above information and

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

coordinated closely with TWDB staff to finalize the non-MAG groundwater availability estimates for aquifers in counties and river basins for which an official MAG has not been adopted.

Commented [TS6]: To be revised as necessary based on assessments of local hydrogeologic data and local resources.

Table 3.10 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 eastern areas. As tabulated in Table 3.11 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.

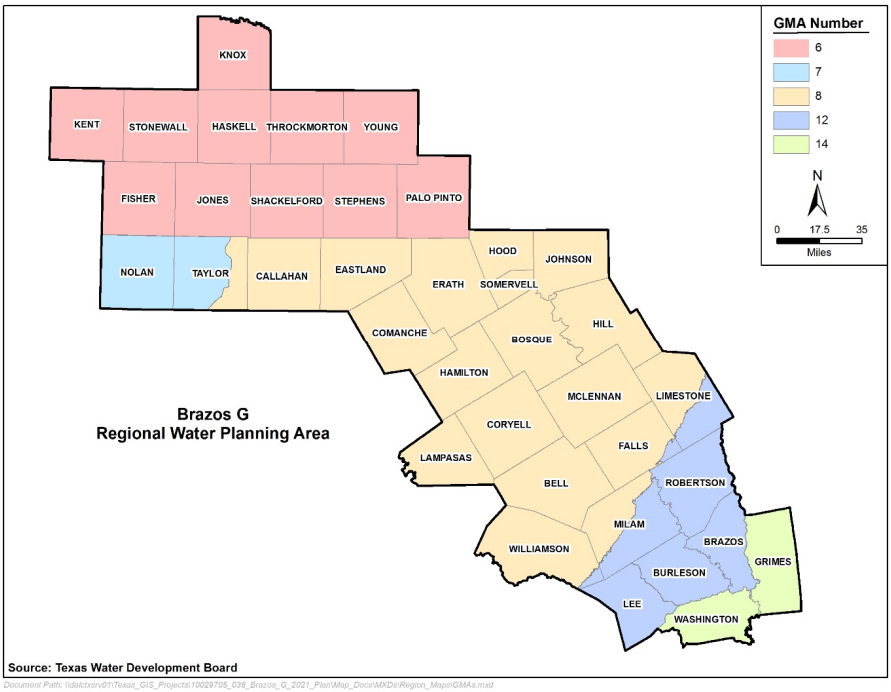

Figure 3.17 Groundwater Management Areas in Brazos G

Table 3.11~~10~~ Groundwater Availability Used in the ~~2021~~ 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
	Trinity	9,275	9,275	9,275	9,275	9,275	9,275
	Subtotal	**15,744**	**15,744**	**15,744**	**15,744**	**15,744**	**15,744**

County	Aquifer	Availability (acre-feet/year)					
		2030	2040	2050	2060	2070	2080
Bosque	Brazos River Alluvium A	830	830	830	830	830	830
	Trinity	8,769	8,769	8,769	8,769	8,769	8,769
	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
	Carrizo-Wilcox	44,153	50,160	56,168	62,176	68,184	68,184
	Gulf Coast(1)	1,189	1,189	1,189	1,189	1,189	1,189
	Queen City	245	357	469	582	694	694
	Sparta	6,014	7,545	9,076	10,607	12,138	12,138
	Yegua-Jackson	6,270	7,092	7,091	7,091	7,091	7,091
	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
	Carrizo-Wilcox	56,468	65,638	69,407	69,579	69,750	69,750
	Queen City	3,090	3,467	3,883	4,344	4,863	4,863
	Sparta	2,840	3,131	3,437	3,760	4,105	4,105
	Yegua-Jackson	5,315	7,004	7,004	7,000	6,058	6,058
	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
	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
	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
	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
	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
	Subtotal	**20,607**	**20,607**	**20,607**	**20,607**	**20,607**	**20,607**

County	Aquifer	Availability (acre-feet/year)					
		2030	2040	2050	2060	2070	2080
Falls	Brazos River Alluvium A	16,684	16,684	16,684	16,684	16,684	16,684
	Carrizo-Wilcox	46	50	56	62	69	69
	Trinity	1,435	1,435	1,435	1,435	1,435	1,435
	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
	Dockum	79	79	79	79	79	79
	Seymour	6,132	6,132	6,472	6,473	6,131	5,900
	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
	Carrizo-Wilcox(1)	4	4	4	4	12	4
	Gulf Coast	51,487	51,487	51,487	51,487	51,487	51,487
	Navasota River Alluvium(1)	2,216	2,216	2,216	2,216	2,216	2,216
	Queen City(1)	0	0	0	0	0	0
	Sparta(1)	0	0	0	0	0	0
	Yegua-Jackson(1)	787	787	787	787	787	787
	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
	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
	Subtotal	**41,638**	**41,752**	**41,638**	**41,752**	**41,638**	**41,752**
Hill	Brazos River Alluvium(1)	632	632	632	632	632	632
	Trinity	5,152	5,152	5,152	5,152	5,152	5,152
	Woodbine	586	586	586	586	586	586

County	Aquifer	Availability (acre-feet/year)					
		2030	2040	2050	2060	2070	2080
	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
	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
	Woodbine	1,981	1,981	1,981	1,981	1,981	1,981
	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
	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
	Seymour(1)	1,180	1,180	1,179	1,179	1,179	1,179
	Subtotal	**7,430**	**7,430**	**7,429**	**7,429**	**7,429**	**7,429**
Knox	Blaine(1)	700	700	700	700	700	700
	Seymour	26,640	26,222	26,530	29,157	26,973	26,807
	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
	Hickory	113	113	113	113	113	113
	Marble Falls	2,839	2,839	2,839	2,839	2,839	2,839
	Trinity	1,661	1,661	1,661	1,661	1,661	1,661
	Subtotal	**7,208**	**7,208**	**7,208**	**7,208**	**7,208**	**7,208**
Lee	Carrizo-Wilcox	29,283	30,948	32,683	34,517	36,187	36,187
	Queen City	700	767	839	917	1,000	1,000
	Sparta	809	975	1,181	1,434	1,751	1,751
	Trinity	0	0	0	0	0	0
	Yegua-Jackson(1)	662	662	662	662	662	662
	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
	Trinity	0	0	0	0	0	0
	Subtotal	**960**	**1,059**	**1,168**	**1,288**	**1,422**	**1,422**

County	Aquifer	Availability (acre-feet/year)					
		2030	2040	2050	2060	2070	2080
McLennan	Brazos River Alluvium(1)	15,023	15,023	15,023	15,023	15,023	15,023
	Trinity	20,649	20,649	20,649	20,649	20,649	20,649
	Woodbine	0	0	0	0	0	0
	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
	Carrizo-Wilcox	31,300	32,246	33,283	34,431	35,710	35,710
	Queen City	1,348	1,643	2,003	2,441	2,976	2,976
	Trinity	0	0	0	0	0	0
	Subtotal	**64,023**	**65,255**	**66,648**	**68,231**	**70,044**	**70,044**
Nolan	Blaine(1)	100	100	100	100	100	100
	Dockum(1)	5,750	5,750	5,750	5,750	5,750	5,750
	Edwards-Trinity (Plateau) (1)	693	693	693	693	693	693
	Subtotal	**6,543**	**6,543**	**6,543**	**6,543**	**6,543**	**6,543**
Palo Pinto	Trinity(1)	1	1	1	1	1	1
	Subtotal	**1**	**1**	**1**	**1**	**1**	**1**
Robertson	Brazos River Alluvium	55,424	55,157	54,839	54,723	54,618	54,618
	Carrizo-Wilcox	49,164	58,979	68,795	78,609	88,424	88,424
	Queen City	144	252	359	467	575	575
	Sparta	338	509	680	851	1,022	1,022
	Subtotal	**105,070**	**114,897**	**124,673**	**134,650**	**144,639**	**144,639**
Shackelford	Cross Timbers(1)	712	712	712	712	712	712
	Other (Local) Aquifer(1)	97	97	97	97	97	97
	Subtotal	**809**	**809**	**809**	**809**	**809**	**809**

County	Aquifer	Availability (acre-feet/year)					
		2030	2040	2050	2060	2070	2080
Somervell	Trinity	1,988	1,988	1,988	1,988	1,988	1,988
	Subtotal	**1,988**	**1,988**	**1,988**	**1,988**	**1,988**	**1,988**
Stephens	Cross Timbers(1)	620	620	620	620	620	620
	Other (Local) Aquifer(1)	85	85	85	85	85	85
	Subtotal	**705**	**705**	**705**	**705**	**705**	**705**
Stonewall	Blaine(1)	8,700	8,700	8,700	8,700	8,700	8,700
	Seymour(1)	254	254	253	254	253	254
	Subtotal	**8,954**	**8,954**	**8,953**	**8,954**	**8,953**	**8,954**
Taylor	Edwards-Trinity (Plateau)(1)	489	489	489	489	489	489
	Trinity	14	14	14	14	14	14
	Subtotal	**503**	**503**	**503**	**503**	**503**	**503**
Throckmorton	Seymour(1)	115	115	115	115	115	115
	Cross Timbers(1)	364	364	364	364	364	364
	Subtotal	**479**	**479**	**479**	**479**	**479**	**479**
Washington	Brazos River Alluvium(1)	5,770	5,770	5,770	5,770	5,770	5,770
	Gulf Coast	40,397	40,397	40,397	40,397	40,397	40,397
	Yegua-Jackson(1)	157	157	157	157	157	157
	Subtotal	**46,324**	**46,324**	**46,324**	**46,324**	**46,324**	**46,324**
Williamson	Carrizo-Wilcox	140	155	171	189	208	208
	Edwards-BFZ	3,462	3,462	3,462	3,462	3,462	3,462
	Hickory	0	0	0	0	0	0
	Trinity	3,698	3,698	3,698	3,698	3,698	3,698

County	Aquifer	Availability (acre-feet/year)					
		2030	2040	2050	2060	2070	2080
	Other (Local) Aquifer(1)	665	665	665	665	665	665
	Subtotal	**7,965**	**7,980**	**7,996**	**8,014**	**8,033**	**8,033**
Young	Seymour(1)	258	258	258	258	258	258
	Cross Timbers(1)	1,718	1,718	1,718	1,718	1,718	1,718
	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 3.12~~11~~ Groundwater Availability from the Brazos G Area Aquifers

Aquifer	2070 Groundwater Availability (acft/yr)	Typical Range in Well Yields (gpm)
Western Area		
Blaine	4,400	less than 25
Cross Timbers	1,495	5 to 300
Dockum	7,388	100 to 400
Edwards-Trinity (Plateau)	1,029	5 to 300
Ogallala and Edwards Trinity- High Plains	3	
Other (Local) Aquifers	80	5 to 300
Seymour	74,848	100 to 1,000
Trinity	26	50 to 500
		Subtotal: 89,269
Central Area		
Brazos River Alluvium	15,333	250 to 500
Carrizo-Wilcox	5,620	100 to 3,000
Edwards-BFZ (Northern Segment)	7,269	200 to 2,000
Ellenburger-San Saba	129	Unknown
Gulf Coast	201	300 to 800
Marble Falls	23	less than 100
Other (Local) Aquifers	524	5 to 300
Trinity	99,163	50 to 500
Woodbine	948	50 to 150

Commented [TS7]: To be updated based on future analysis as needed.

Commented [TS8]: Typical ranges to be updated as necessary.

Aquifer	2070 Groundwater Availability (acft/yr)	Typical Range in Well Yields (gpm)
		Subtotal: 129,210
Eastern Area		
Brazos River Alluvium	129,906	250 to 500
Carrizo-Wilcox	123,808	100 to 3,000
Gulf Coast	10,097	300 to 800
Queen City	1,689	200 to 500
Sparta	8,810	200 to 600
Navasota River Alluvium	58	Unknown
Yegua-Jackson	6,497	50 to 300
Trinity	758	50 to 500
		Subtotal: 281,623
		Total: 500,102

BEZ = Balcones Fault Zone; ND = not determined.

Commented [TS7]: To be updated based on future analysis as needed.

Commented [TS8]: Typical ranges to be updated as necessary.

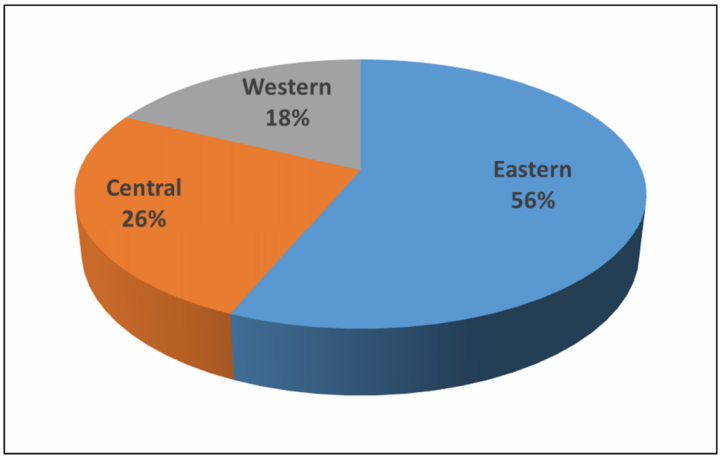

Figure 3.18 Distribution of Groundwater by Area within Brazos G

3.4.2 Western Area

Only part of the western area is underlain by a major or minor aquifer, as shown in Figure 3.19. Together, the five aquifers, Blaine, Dockum, Cross Timbers, Edwards-Trinity (Plateau), and Seymour and the other (Local) aquifers, can supply up to 89,269 acft/yr. Of the five aquifers, the Seymour Aquifer has about 84 percent of the supplies and is scattered in six counties; however, about 90 percent of the supply is in Knox and Haskell counties. The Dockum Aquifer exists only on the western fringe and can contribute about 8 percent of the groundwater supply in the area (Figure 3.21).The Cross Timbers minor aquifer contributes 2 percent of the groundwater supply in the area. Undifferentiated aquifers underlie some of the area,

including all of Shackelford, Stephens, Throckmorton, and Young counties. At best, the undifferentiated aquifers can provide only meager supplies for livestock and domestic uses.

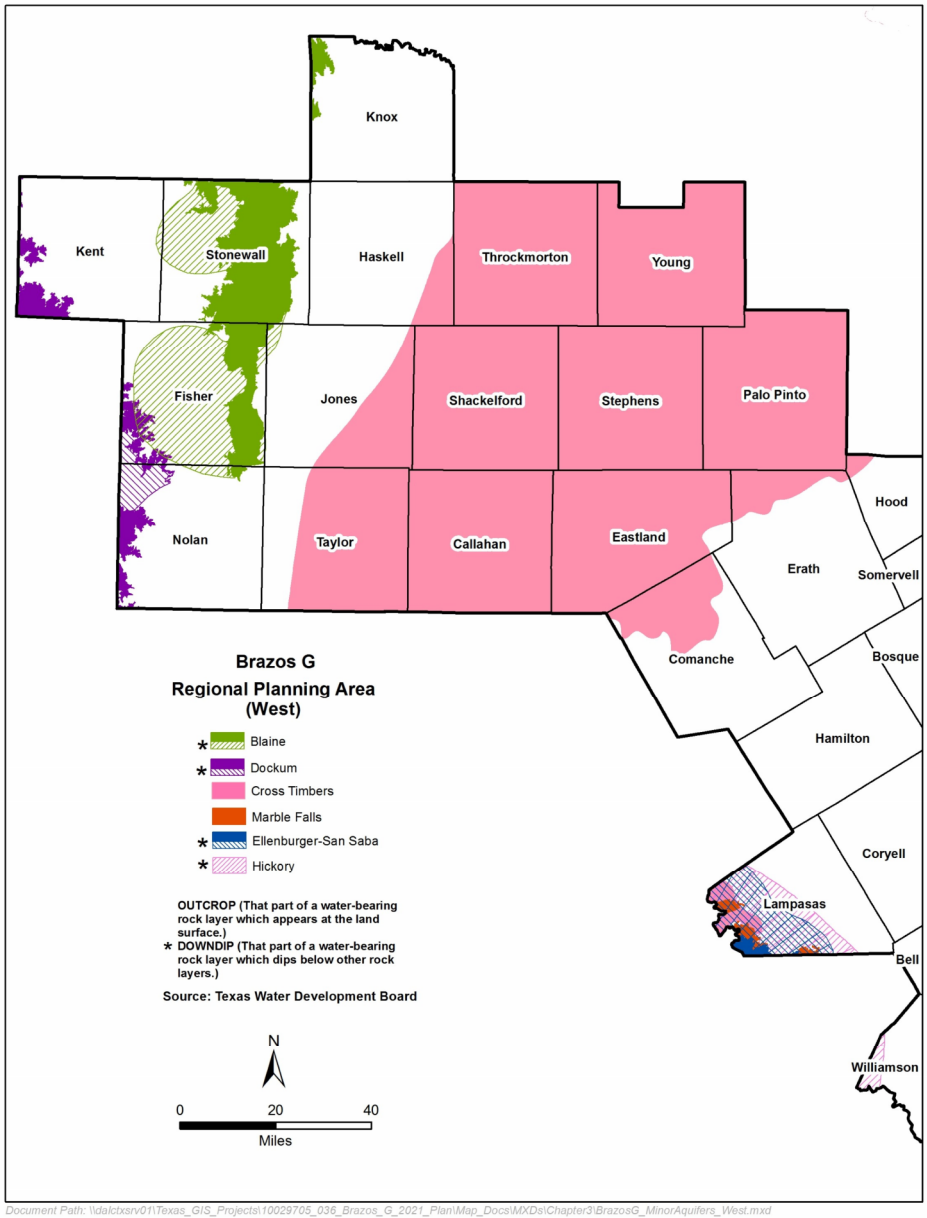

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Figure 3.19 Major Aquifers in the Western Area

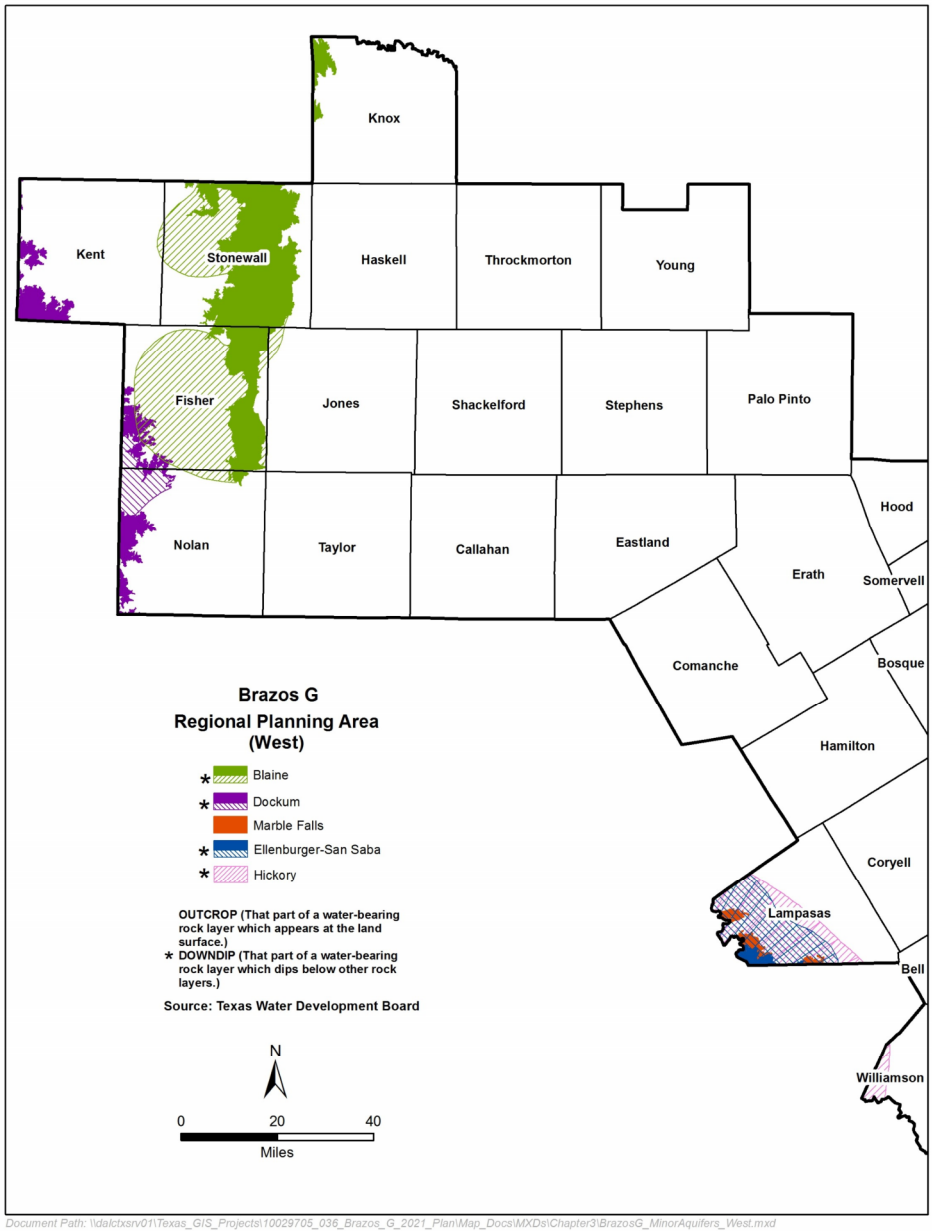

Figure 3.20 Minor Aquifers in the Western Area

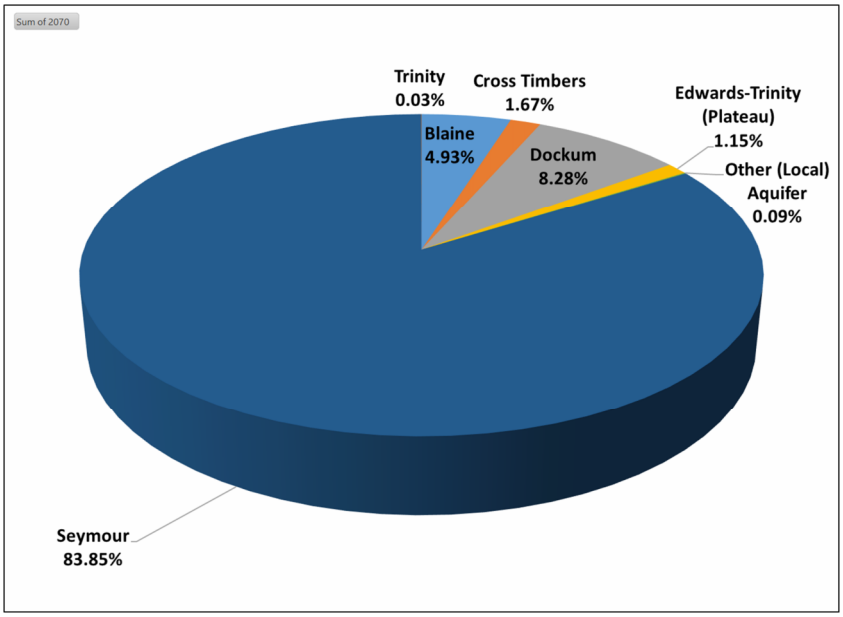

Figure 3.21 Groundwater Availability in the Western Area

3.4.3 Central Area

Major or minor aquifers exist in the southeastern two-thirds of the central area, as shown in Figure 3.22. Together, the nine aquifers (Brazos River Alluvium, Carrizo-Wilcox, Edwards-BFZ (Northern Segment), Ellenburger-San Saba, Gulf Coast, Marble Falls, Trinity, Woodbine, and Other (Local) Aquifers) can provide up to 129,210acft/yr. Of these aquifers, the Trinity Aquifer is most extensive and has about 77 percent of the supplies (Figure 3.24). Although the Trinity Aquifer as a whole can provide 99,163acft/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 (Northern Segment) exists only in parts of Bell and Williamson counties and has about five percent of the area's groundwater supply. In Limestone County, the Carrizo-Wilcox MAG decreased significantly for the current planning cycle, showing an 88 percent decrease for 2080.

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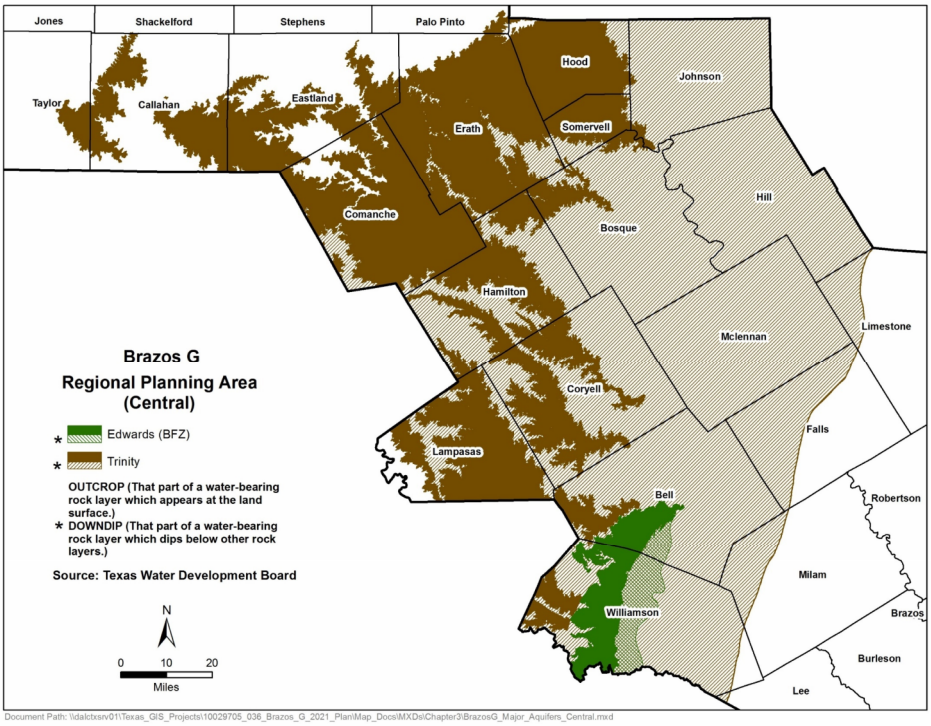

Figure 3.22 Major Aquifers in the Central Area

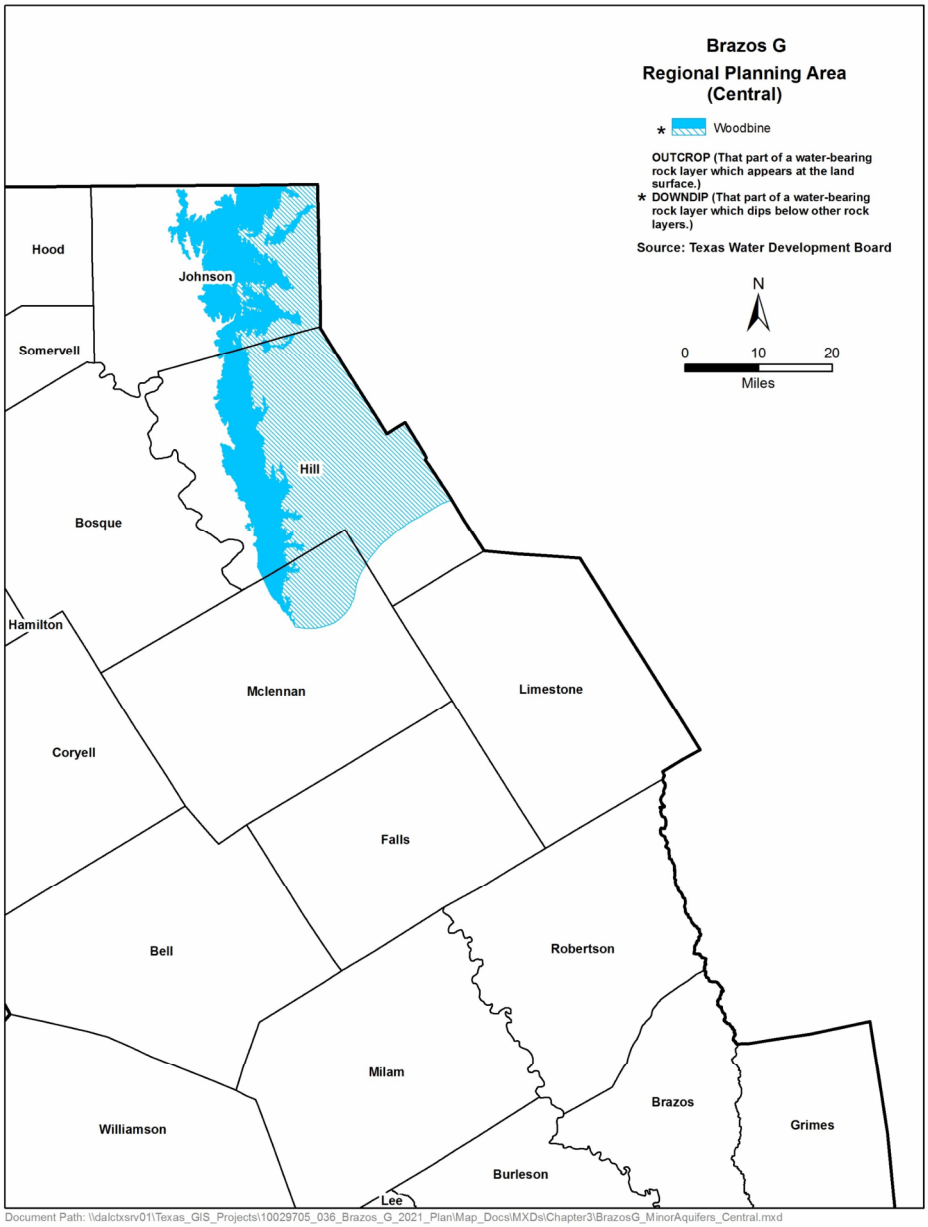

Figure 3.23 Minor Aquifers in the Central Area

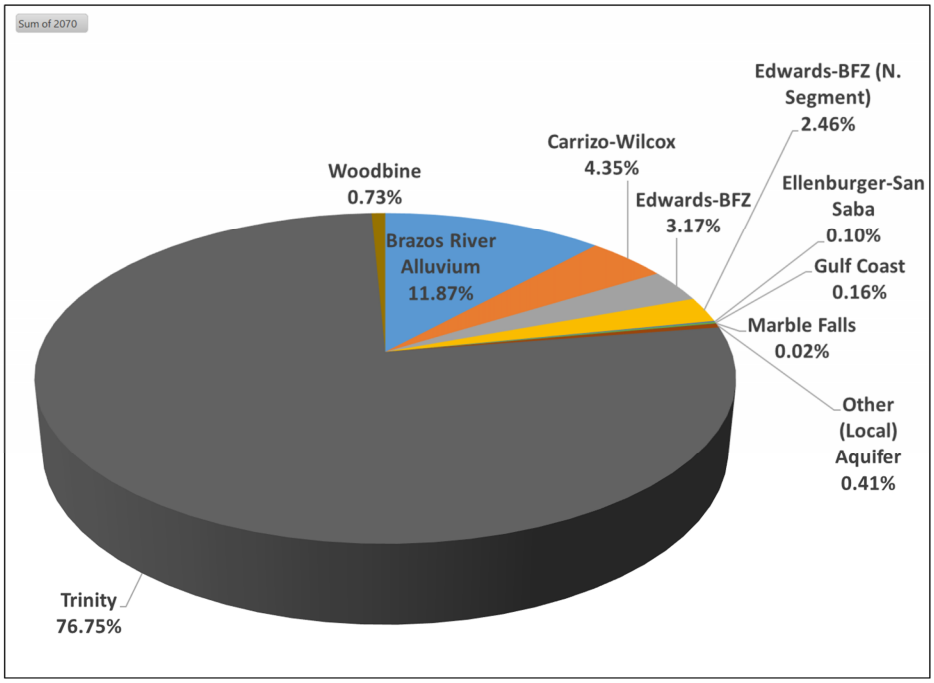

Figure 3.24 Groundwater Availability in the Central Area

3.4.4 Eastern Area

Major or minor aquifers exist throughout the eastern area except in the western fringe, as shown in Figure 3.25. Together, the eight aquifers (Brazos River Alluvium, Carrizo-Wilcox, Gulf Coast, Queen City, Sparta, Trinity, Navasota River Alluvium and Yegua-Jackson) can provide up to 281,623 acft/yr. Of these aquifers, the Carrizo-Wilcox Aquifer and Brazos River Alluvium Aquifers are most extensive and represents about 44 to 46 percent of the supplies, respectively (Figure 3.26 and Figure 3.27).

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~~Lake Clyde~~, OH Ivie Lake, ~~Lake Joe Pool (TRA),~~ the Cross Timbers Aquifer, Richland Chambers and/or Cedar Creek Reservoirs (TRWD), and the Highland Lakes System (LCRA). Table 3.12 summarizes the current supplies from other regions to the Brazos G Area.

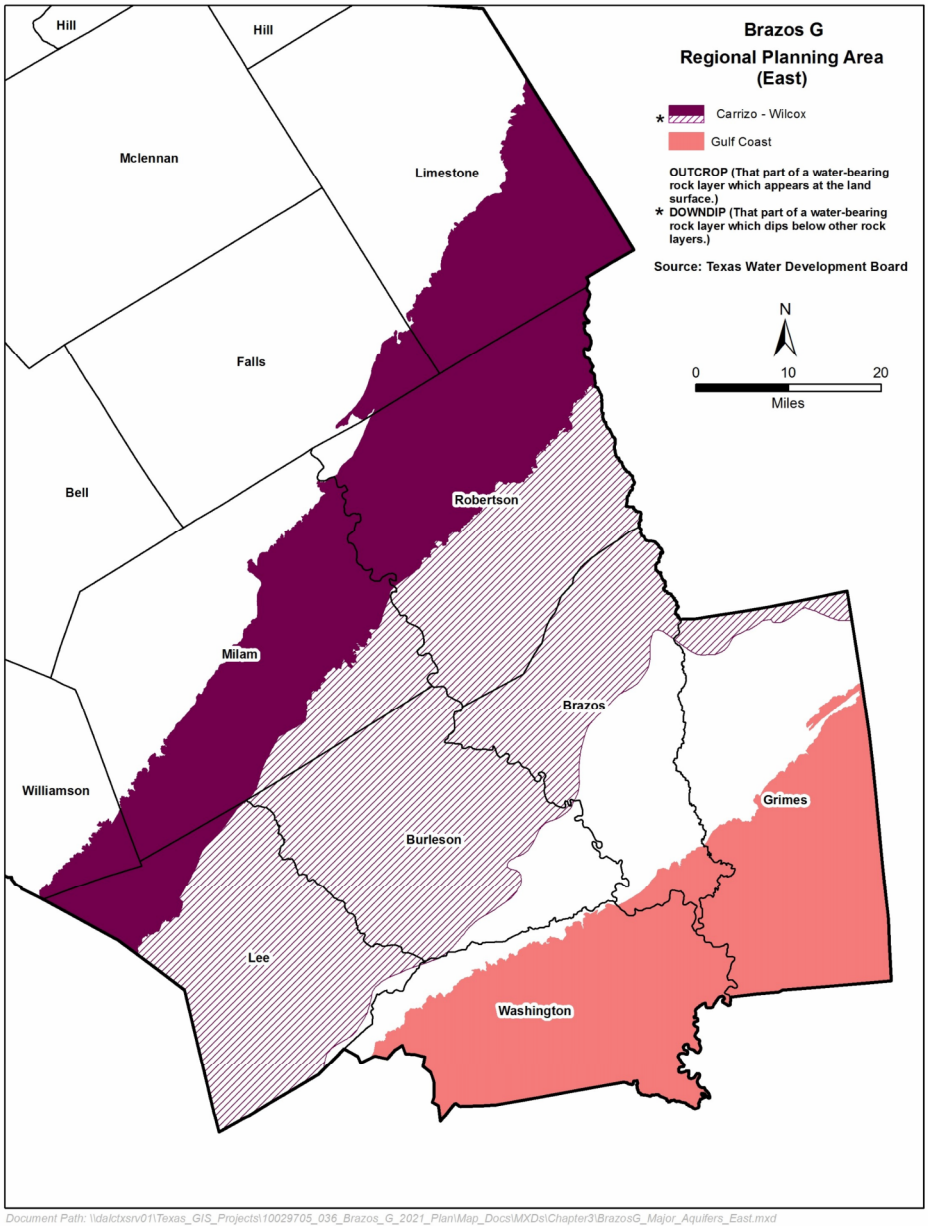

Figure 3.25 Major Aquifers in the Eastern Area

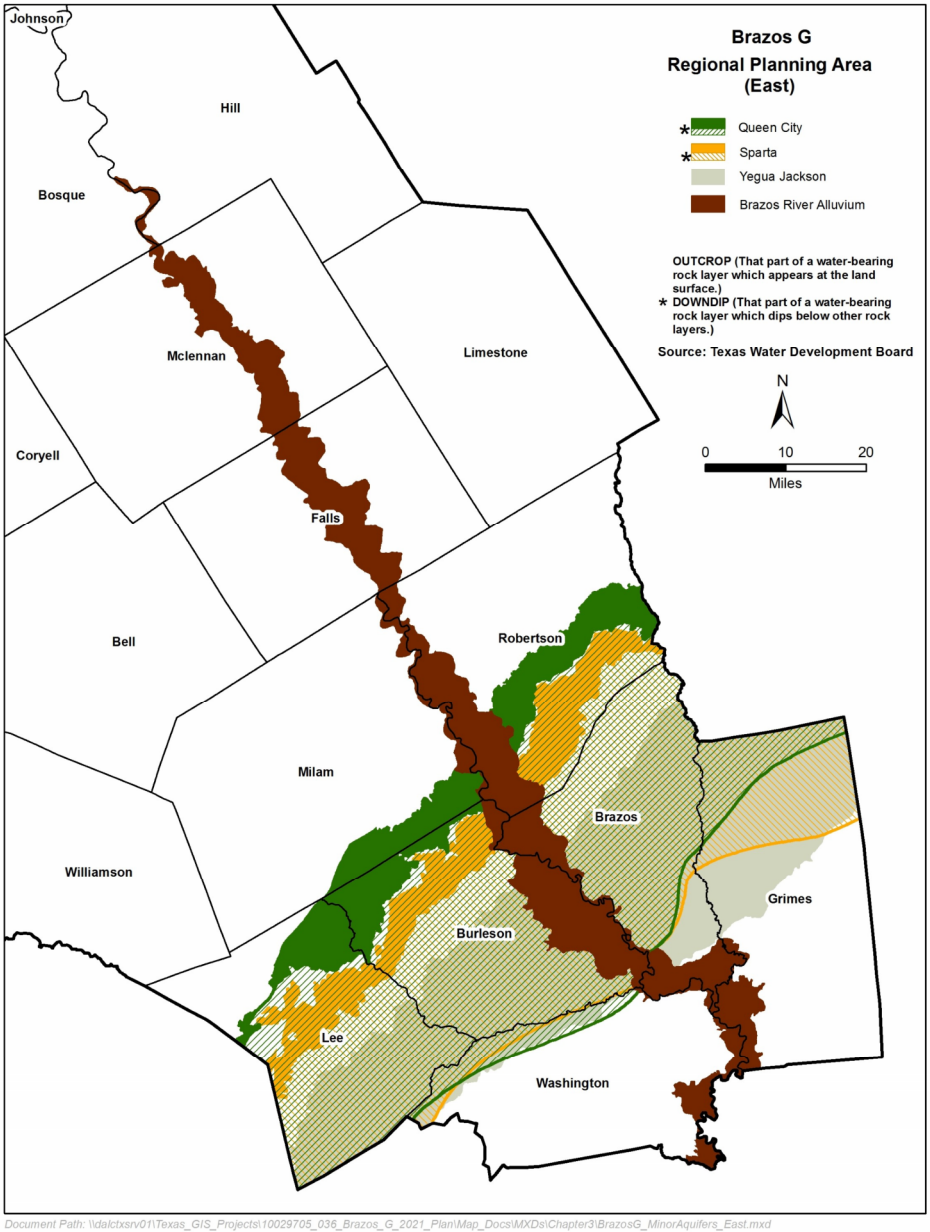

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Figure 3.26 Minor Aquifers in the Eastern Area

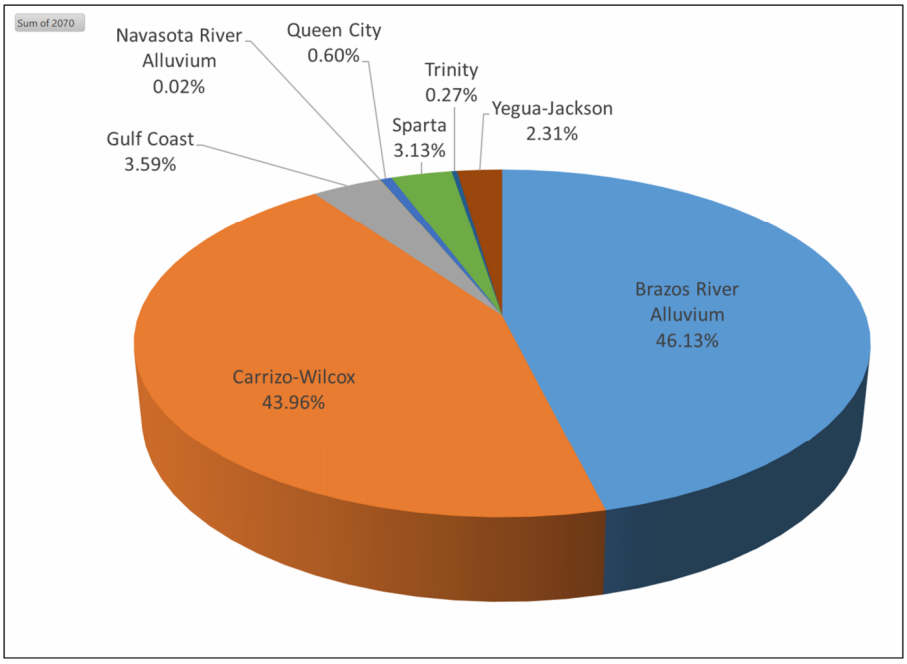

Figure 3.27 Groundwater Availability in the Eastern Area

Table 3.13~~12~~ Water Supplies from Other Regions

Receiving Entity	Supplier	Source(1)	Source Region	Contract Amount or Amount Supplied in 2030 (acft)
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

Receiving Entity	Supplier	Source[1]	Source Region	Contract Amount or Amount Supplied in 2030 (acft)
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
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

Receiving Entity	Supplier	Source[1]	Source Region	Contract Amount or Amount Supplied in 2030 (acft)
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
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
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

Receiving Entity	Supplier	Source(1)	Source Region	Contract Amount or Amount Supplied in 2030 (acft)
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:
acft/yr = acre-feet per year.
(1) Supplies available from out-of-region sources are as input into ~~DB22~~ DB27 by the source planning area.
(2) ~~Current~~The current contract allows 16.54% of the one-year safe yield of O.H. Ivie Reservoir. Supply shown is 2032~~0~~ 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. ~~For example, provisions in the current contract between the City of Abilene and the West Central Texas Municipal Water District for supplies to the City from Hubbard Creek Reservoir preclude the City from receiving its normal pro-rata share of the reservoir's allocated safe yield during times when the reservoir is significantly drawn down. However, the other member cities of~~

~~the district (Anson, Albany, and Breckenridge) do not have similar provisions in their contracts with the district.~~

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 particular source.
- ~~For county-other municipal supplies, it is assumed that the rural household (municipal type) demand would be met from aquifers underlying that river basin portion of the county. The rural supply is generally calculated as 125 percent of the year 2010 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 downward for every entity using that particular 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 ~~2011~~02020 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 particular 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 particular 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 particular 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 taken into account for the ~~2021~~ 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 particular 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. ~~Twenty~~ 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

Similar to 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 in order 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

Commented [TS10]: To be generated via DB27 for IPP.

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.