REGION B TECHNICAL MEMORANDUM

Prepared for:

Texas Water Development Board

On behalf of the Region B Water Planning Group

September 10, 2018

TABLE OF CONTENTS

List of Figures

List of Tables

Appendices

EXECUTIVE SUMMARY

This Technical Memorandum discusses population and water demand projections, water availability, existing water supplies, and identified potentially feasible water management strategies in Region B for the fifth cycle of regional water plan development. Included in this report are the required TWDB DB22 reports (eight) along with the additional information required for the Technical Memorandum submittal as set forth in Section 13.1.1 of TWDB's *Second Amended Exhibit C (General Guidelines for Fifth Cycle of the Regional Water Plan Development)* dated April 2018. A public meeting was held on *August 22, 2018* to discuss the contents of this memorandum. Notice of the meeting was posted on *August 2, 2018*. Public comments were solicited at the public meeting and for two weeks after the meeting, closing on *September 5, 2018*.

1.0 TWDB DB22 REPORTS

All DB22 reports are in Appendix A of this document. The eight required DB22 reports for this Technical Memorandum are summarized below. These include DB22 reports numbered 1 through 6, 9, and 10 (10a and 10b). DB22 reports 7 and 8 (concerning needs after implementation of conservation and direct reuse strategies) are not required for the Technical Memorandum but are required for the Initially Prepared Plan and Final Plan.

1.1 POPULATION PROJECTION AND WATER DEMAND

In early 2017, TWDB released their draft population and demand projections for all regions. Each Regional Planning Group was given the ability to make limited adjustments to the projections. The Region B Water Planning Group (RWPG) made adjustments to the projections which were reviewed by TWDB staff prior to approval by the RWPG. TWDB approved the projections in April 2018.

Appendix A contains three database reports related to population and demand. The reports are:

- **TWDB DB22 Report #1 – Water User Group (WUG) Population**
- **TWDB DB22 Report #2 - Water User Group (WUG) Water Demand**
- **TWDB DB22 Report #3 - Water User Group (WUG) Category Summary**

TWDB DB22 Report #1 presents the projected populations for each municipal water user group. This includes water utilities or water systems that provide an average of more than 100 acre-feet per year to retail municipal customers, and rural/unincorporated areas of municipal water use, known as County Other. **TWDB DB22 Report #2** provides the projected water demands for each water user group. This includes both municipal and non-municipal demands. The data in Reports #1 and #2 are reported by entity, county, and river basin. **TWDB DB22 Report #3** summarizes the population, demands, supplies, and water needs by each water use type (municipal, county-other, manufacturing, mining, livestock, irrigation, and steam electric power).

In addition to these summary tables, **Table 1-1** shows the population projections by county. The total population in Region B is expected to increase from 206,307 to 228,973 over the planning horizon. Wichita County has the highest population of the eleven counties. **Table 1-2** shows the total demands for Region B by county (including municipal and non-municipal demand). The total dry-year water demand decreases slightly from 156,489 to 154,535 acre-feet between 2020 and 2070. This decrease is attributed to reductions in municipal per capita water use and reduced mining demands in the later decades. Wichita and Wilbarger counties have the largest demands, which reflect high irrigation use in these counties.

Table 1-1: Adopted Population Projections for Region B by County

County	2020	2030	2040	2050	2060	2070
ARCHER	9,409	9,845	9,960	9,960	9,960	9,960
BAYLOR	3,726	3,726	3,726	3,726	3,726	3,726
CLAY	11,154	11,503	11,503	11,503	11,503	11,503
COTTLE	1,552	1,552	1,552	1,552	1,552	1,552
FOARD	1,389	1,401	1,401	1,401	1,401	1,401
HARDEMAN	4,274	4,383	4,420	4,507	4,552	4,587
KING	300	316	316	316	316	316
MONTAGUE	20,507	21,260	21,600	21,979	22,223	22,401
WICHITA	135,627	140,573	144,448	147,171	149,771	151,982
WILBARGER	14,465	15,252	15,728	16,208	16,542	16,796
YOUNG (Region B)	3,904	4,119	4,274	4,437	4,596	4,749
TOTAL	**206,307**	**213,930**	**218,928**	**222,760**	**226,142**	**228,973**

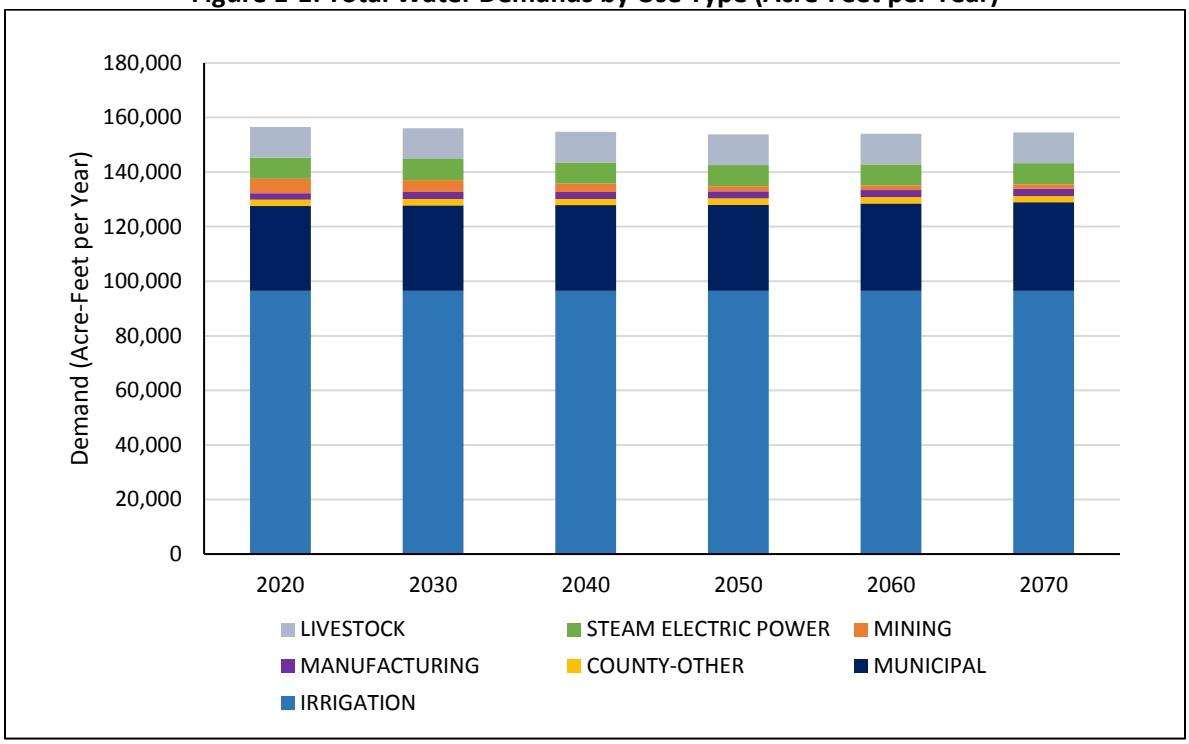
Table 1-2: Adopted Total Dry-Year Water Demand Projections for Region B by County

County	2020	2030	2040	2050	2060	2070
ARCHER	5,465	5,595	5,441	5,358	5,288	5,288
BAYLOR	6,856	6,838	6,823	6,822	6,821	6,821
CLAY	6,140	6,312	6,069	5,938	5,821	5,821
COTTLE	4,862	4,854	4,849	4,844	4,841	4,841
FOARD	3,860	3,854	3,851	3,851	3,850	3,849
HARDEMAN	14,289	14,330	14,327	14,343	14,352	14,361
KING	874	827	785	746	714	714
MONTAGUE	9,165	8,129	7,138	6,245	6,363	6,390
WICHITA	62,826	63,029	63,098	63,226	63,552	63,877
WILBARGER	41,387	41,538	41,563	41,634	41,687	41,733
YOUNG (Region B)	765	777	783	799	819	840
TOTAL	**156,489**	**156,083**	**154,727**	**153,806**	**154,108**	**154,535**

Figure 1-1 shows the total demands for the Region by use category. Irrigation demand accounts for roughly 62% of total projected demand over the planning horizon while municipal (including county-

other) demand comprises roughly 21%. The remaining use types each encompass only 7% or less of total demand in each decade.

Figure 1-1: Total Water Demands by Use Type (Acre-Feet per Year)



1.2 SOURCE WATER AVAILABILITY

TWDB Report #4 – Source Availability in **Appendix A** presents the available water by source. Under the Texas Water Development Board (TWDB) regional water planning guidelines, each region is to identify available water supplies in the region by source and user. The supplies available by source are based on the supply available during drought of record conditions. For surface water reservoirs, this is generally the equivalent of firm yield supply or permitted amount (whichever is lower). The Region B Water Planning Group elected to use reliable supplies (i.e. supplies with a reserve, also called safe yield) as the basis for planning. For run-of-the-river supplies, the firm yield is the minimum supply available in a year over the historical record. Available groundwater supplies are defined by county and aquifer. Generally, groundwater supply is the supply available with acceptable long-term impacts to water levels. Modeled Available Groundwater (MAG) values were developed by the TWDB to define the long-term available groundwater supply. MAGs were developed for the Trinity, Seymour, and Blaine aquifers within existing Groundwater Conservation Districts (GCDs). MAGs were not developed for the Cross Timbers Aquifer, Other Aquifer, and all aquifers within counties with no GCD. Groundwater supplies from these sources

were developed by the RWPG. Existing reuse supplies include Wichita Falls' indirect reuse to Lake Arrowhead and known sales of direct reuse.

Region B has a total of over 197,000 acre-feet per year of available water in 2020, which decreases to about 177,000 acre-feet per year by 2070. These projections include both developed and undeveloped supplies. More than half of Region B's water supply is from groundwater sources. **Table 1-3** shows the overall water supply source availability in Region B over the planning horizon. More detail on the development of these source availabilities is included in **Section 2.0** of this document. It should be noted that these supplies have not been limited by the current infrastructure that treats and delivers the water. The amount of supply available to individual water user groups (WUGs) is referred to as "Existing Water Supplies" and is discussed further in **Section 1.3** of this report.

Table 1-3: Overall Water Supply Source Availability in Region B (Acre-Feet per Year)

Summary	2020	2030	2040	2050	2060	2070
RESERVOIRS	48,624	44,443	40,842	37,242	33,641	27,720
RUN-OF-RIVER & SMALL LAKES	9,147	9,147	9,147	9,147	9,147	9,147
LOCAL SUPPLY	9,384	9,384	9,384	9,384	9,384	9,384
GROUNDWATER	120,704	103,332	109,345	110,330	112,521	121,754
REUSE	9,316	9,319	9,317	8,968	8,968	8,968
REGION B TOTAL	**197,175**	**175,625**	**178,035**	**175,071**	**173,661**	**176,973**

1.2.1 Surface Water

Surface water in Region B is comprised of reservoirs and local supplies. This includes six in-region lakes (Lakes Kickapoo, Arrowhead, Kemp/Diversion, Amon Carter, Nocona, and Olney/Cooper) and two lakes located wholly or partially in other regions (Greenbelt and Millers Creek Reservoirs). The following water supply reservoirs account for over 90 percent of the reservoir water supply available in Region B: Little Wichita and Wichita River supplies (Lake Kickapoo, Lake Arrowhead, Kemp/Diversion system). Local supplies include direct diversions from rivers and creeks (run-of-river supplies associated with water rights) and local stock ponds. A summary of surface water reliable supplies available to Region B are shown in **Table 1-4**.

Table 1-4: Summary of Surface Water Reliable Supplies[1] (Acre-Feet per Year)

Source	2020	2030	2040	2050	2060	2070
KICKAPOO	5,600	5,220	4,960	4,700	4,440	3,700
ARROWHEAD	11,300	10,500	10,160	9,820	9,480	7,300
KEMP/DIVERSION	29,000	26,100	23,200	20,300	17,400	14,500
AMON CARTER	1,270	1,182	1,094	1,006	918	830
NOCONA	1,260	1,260	1,260	1,260	1,260	1,260
OLNEY/COOPER	194	181	168	156	143	130
RUN-OF-RIVER & SMALL LAKES	9,147	9,147	9,147	9,147	9,147	9,147
LOCAL SUPPLIES	9,384	9,384	9,384	9,384	9,384	9,384
TOTAL	**67,155**	**62,974**	**59,373**	**55,773**	**52,172**	**46,251**

[1] Reliable supply is the amount used for planning purposes. It includes a reserve supply.

1.2.2 Groundwater

Groundwater in Region B is sourced from the Seymour, Trinity, Blaine, and Cross Timbers aquifers, as well as from undifferentiated local supplies, referred to as "Other Aquifer" for planning purposes. The Seymour and Trinity are considered major aquifers while the Blaine and Cross Timbers are minor aquifers. The Cross Timbers Aquifer was designated as a minor aquifer in 2017 (formerly called the Paleozoic Aquifer), and some supplies attributed to Other Aquifer in the previous plan are now listed as Cross Timbers instead. Supplies from alluvial sediments not associated with the Cross Timbers formation will continue to be classified as Other Aquifer. **Table 1-5** summarizes the available groundwater supplies in Region B over the planning horizon.

Table 1-5: Summary of Groundwater Supplies in Region B (Acre-Feet per Year)

Aquifer	2020	2030	2040	2050	2060	2070
BLAINE AQUIFER	30,236	27,050	27,123	27,050	27,123	27,050
CROSS TIMBERS AQUIFER	8,225	8,225	8,225	8,225	8,225	8,225
OTHER AQUIFER	5,750	5,750	5,750	5,750	5,750	5,750
SEYMOUR AQUIFER	72,607	58,432	64,361	65,430	67,537	76,854
TRINITY AQUIFER	3,886	3,875	3,886	3,875	3,886	3,875
TOTAL	**120,704**	**103,332**	**109,345**	**110,330**	**112,521**	**121,754**

1.2.3 Reuse

Reuse supply accounts for 5% of total source availability in Region B. **Table 1-6** is the summary of availability from current reuse projects by county.

Table 1-6: Currently Permitted Reuse Supplies Available to Region B

County	Type	Permitted Reuse (Acre-Feet/Year)					
		2020	2030	2040	2050	2060	2070
MONTAGUE	DIRECT	348	351	349	0	0	0
WICHITA	INDIRECT	8,968	8,968	8,968	8,968	8,968	8,968
TOTAL		**9,316**	**9,319**	**9,317**	**8,968**	**8,968**	**8,968**

1.3 EXISTING WATER SUPPLIES

Existing Water Supplies (sometimes referred to as "currently available supplies" or "connected supplies") are supplies that are limited by water rights, contracts, and facilities that are currently in place. The Existing Water Supplies are less than the overall supplies available to the region (Source Water Availability from Section 1.2) because the facilities needed to use some of the source water have not yet been developed. Common constraints limiting supplies include the availability and capacity of transmission systems, treatment plants, and wells. **Table 1-7** shows the Existing Water Supplies in Region B by different source types. **Table 1-8** shows the Existing Water Supplies for water user groups by county. **TWDB Report #5 – Water User Group (WUG) Existing Water Supply** is included in **Appendix A**.

Table 1-7: Existing Water Supplies Available to Region B by Source (Acre-Feet per Year)

Summary	Existing Water Supplies (Acre-Feet/Year)					
	2020	2030	2040	2050	2060	2070
RESERVOIRS	46,789	42,779	39,362	35,964	32,549	26,815
RUN-OF-RIVER	3,161	3,161	3,161	3,161	3,161	3,161
LOCAL SUPPLY	9,329	9,329	9,329	9,329	9,329	9,329
GROUNDWATER	70,450	70,568	69,346	68,806	68,771	68,778
REUSE	9,316	9,319	9,317	8,968	8,968	8,968
TOTAL	**139,045**	**135,156**	**130,515**	**126,228**	**122,778**	**117,051**
SURFACE WATER IMPORTS[2]	875	900	925	801	749	686
GROUNDWATER IMPORTS[3]	530	492	458	358	306	257
TOTAL AVAILABLE	**140,450**	**136,548**	**131,898**	**127,387**	**123,833**	**117,994**

[2] Surface water imports are from Millers Creek Lake (Region G), Greenbelt Lake (Region A), and local surface water supply in the Brazos basin in Young County (Region G).

[3] Groundwater imports are from the Ogallala Aquifer in Donley County (Region A) and Cross-Timbers Aquifer in Young County (Region G).

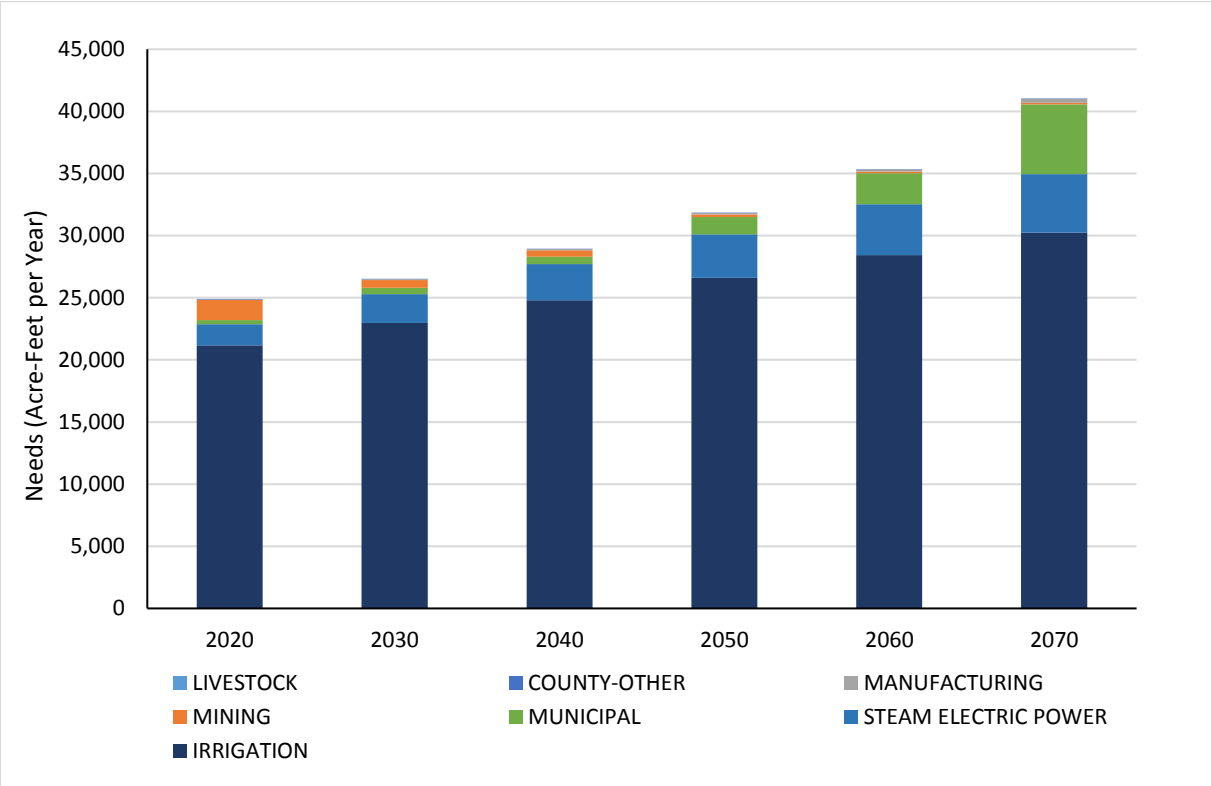
Table 1-8: Existing Water Supplies Available to Region B by County

County	Existing Water Supplies (Acre-Feet/Year)					
	2020	2030	2040	2050	2060	2070
ARCHER	5,164	5,031	4,915	4,784	4,641	4,359
BAYLOR	7,062	7,061	7,060	7,058	7,057	7,056
CLAY	6,747	6,854	6,636	6,504	6,367	6,271
COTTLE	5,411	5,411	5,408	5,304	5,301	5,301
FOARD	4,213	4,207	4,204	4,126	4,088	4,050
HARDEMAN	14,558	14,552	14,547	14,403	14,337	14,264
KING	908	857	815	776	744	744
MONTAGUE	8,978	8,889	7,803	7,091	7,111	7,030
WICHITA	46,257	43,180	40,628	38,091	35,575	30,989
WILBARGER	40,200	39,596	38,992	38,390	37,785	37,176
YOUNG (Region B)	952	910	890	860	827	754
TOTAL	**140,450**	**136,548**	**131,898**	**127,387**	**123,833**	**117,994**

1.4 IDENTIFIED WATER NEEDS/SURPLUSES

For each Water User Group, the existing water supply was compared to the projected demand, resulting in either a need or a surplus for the WUG. **TWDB DB22 Report #6 – Water User Group (WUG) Needs/Surpluses**, included in **Appendix A**, is a compilation of this information for all WUGs. The identified needs/surpluses are also found on **TWDB DB22 Report #3 – Water User Group (WUG) Category Summary,** along with the population and demand projections for each WUG. The water supply needs are outlined below in **Figure 1-2** by category of use. Irrigation needs are the largest. Municipal and steam electric power needs are shown to increase over the planning horizon, while mining need is projected to decrease.

Figure 1-2: Water Supply Needs by Use Type (Acre-Feet per Year)



1.5 SOURCE WATER BALANCE

TWDB DB22 Report #9 – Source Water Balance (Availability-WUG Supply), included in **Appendix A**, shows the remaining balance of supply after all allocations of water to WUGs have been made. As shown in **DB22 Report #9**, all balances are zero or greater than zero, indicating that no sources are over-allocated. As shown in **Table 1-9**, there are some groundwater sources available for new development, but much of water from the Blaine Aquifer and some of the Seymour Aquifer is impaired due to salinity and/or nitrates. While there is a surplus supply shown for reservoirs, this amount is associated with treatment wastes from desalination, and water reserved for Lake Wichita from Lake Kemp (recreational use). There is no real surplus from reservoirs.

Table 1-9: Source Water Surplus (Acre-Feet per Year)

Source	2020	2030	2040	2050	2060	2070
RESERVOIRS	1,860	1,688	1,505	1,303	1,117	930
RUN-OF-RIVER	5,936	5,936	5,936	5,936	5,936	5,936
LOCAL SUPPLY	55	55	55	55	55	55
GROUNDWATER	50,222	32,731	39,966	41,490	43,716	52,942
REUSE	0	0	0	0	0	0
TOTAL	**58,073**	**40,410**	**47,462**	**48,784**	**50,824**	**59,863**

1.6 COMPARISON TO 2016 REGIONAL WATER PLAN

Using its online database (DB22), TWDB developed comparisons of information from this 2021 Regional Water Plan to information from the 2016 Regional Water Plan. The comparisons were calculated for each Water User Group and for each supply source type by county, which are contained in **TWDB DB22 Report #10a –Water User Group (WUG) Data Comparison to 2016 Regional Water Plan (RWP)** and **TWDB DB22 Report #10b – Source Data Comparison to 2016 Regional Water Plan (RWP)**. Both reports are included in **Appendix A**.

While there were differences in supplies and demands for most water user groups, some of the biggest differences are associated with source availability. The Source Data Comparison Report shows that three counties had significant increases in groundwater source availability between the 2016 and 2021 plans, while groundwater in most counties remained the same or had a slight decrease. Groundwater availability in King County decreased by 90% between the 2016 and 2021 plans over the planning horizon. This is associated with a correction in availability of the Blaine Aquifer in the Groundwater Availability Model (GAM). Surface water availability from reservoirs has decreased overall from the 2016 Region B Plan for both firm yield and safe supply. This is a result of the use of safe yield for the Lake Kemp/Diversion System, and the hydrologic modeling being extended through the entirety of the recent drought (2011-2015), which represents the new drought of record for most of the region. Also, Wichita Falls' reuse project to Lake Arrowhead is now online, which provides a significant new source.

2.0 DETERMINING SOURCE AVAILABILITY

2.1 SURFACE WATER

2.1.1 Hydrologic Models

Surface water supplies in Region B are obtained from the Red, Brazos, and Trinity river basins. Reservoirs provide the majority of surface water supply, and 94 percent of reservoir supply is from the Little Wichita and Wichita River supplies (Lake Kickapoo, Lake Arrowhead, Kemp/Diversion system). In accordance with regional planning rules and guidelines, surface water supplies must be determined using the latest version of the TCEQ Water Availability Models (WAMs) with full authorization unless a hydrologic variance is granted by the TWDB. The Red River WAM covers a period-of-record from 1948 to 1998. This period does not include the recent drought, which is the new drought of record for much of the region. The RWPG requested hydrologic variances to more accurately reflect the current conditions and operations in the region. These requested variances are detailed in the request letter to TWDB dated January 10, 2018, which is included in **Appendix B**. TWDB approved the RWPG's variance request in a letter dated June 27, 2018, also included in **Appendix B**.

Reliable supplies for the City of Wichita Falls from Lakes Arrowhead, Kickapoo and Kemp were calculated retaining a 20% reserve at the end of the drought of record. The reliable supplies from other reservoirs for the 2021 Region B Plan use "safe yield". The safe yield is defined as the amount that can be diverted from the reservoir each year while leaving a one-year supply in storage at the end of the drought of record. Yields from Lakes Olney and Cooper were calculated using hydrology from 1948 to June 2015. The firm and safe yields of Amon Carter were calculated with the updated Trinity WAM. **Table 2-1** presents the yields for major reservoirs in Region B.

Existing water supplies provided by run-of-river water rights were determined using Run 3 of the Red River, Trinity, and Brazos WAMs. Supplies are assumed to be constant for all planning decades.

Table 2-1: Estimated Firm Yield and Reliable Supply for Major Reservoirs in Region B

Scenario	2020	2030	2040	2050	2060	2070
LAKE KICKAPOO						
Firm Yield (ac-ft/yr)	11,006	10,749	10,492	10,235	9,978	9,720
Reliable Supply (ac-ft/yr)	5,600	5,220	4,960	4,700	4,440	3,700
LAKE ARROWHEAD[1]						
Firm Yield (ac-ft/yr)	21,664	21,359	21,054	20,749	20,444	20,140
Reliable Supply (ac-ft/yr)	11,300	10,500	10,160	9,820	9,480	7,300
KEMP/DIVERSION SYSTEM						
Firm Yield (ac-ft/yr)	44,000	39,760	35,520	31,280	27,040	22,800
Reliable Supply (ac-ft/yr)	29,000	26,100	23,200	20,300	17,400	14,500
AMON CARTER						
Firm Yield (ac-ft/yr)	1,689	1,588	1,487	1,387	1,286	1,185
Safe Yield (ac-ft/yr)	1,270	1,182	1,094	1,006	918	830
LAKES OLNEY AND COOPER						
Firm Yield (ac-ft/yr)	268	260	252	245	237	229
Safe Yield (ac-ft/yr)	194	181	168	156	143	130

[1]The Lake Arrowhead safe yield was reduced by 900 acre-feet to account for releases to the City of Henrietta.

2.1.2 Versions and Dates of Hydrologic Models

The following information is required for the hydrologic models used to determine Source Water Availability. More discussion on Source Water Availability is included in **Section 1.2** of this report. The required details for each hydrologic model used is included in **Table 2-2**. Modifications to the surface water availability analysis are described in **Appendix B**, which contains the RWPG's letter of request for hydrologic variances. TWDB's response letter approving the requested modifications is also included in **Appendix B**. The analyses of surface water availability were carried out by Freese and Nichols, Inc.

Table 2-2: Hydrologic Models Used in Determining Surface Water Availability

WAM Version	Date Used	Run Used	Model Inputs/ Outputs Files Used	Comments
Red WAM	August 2018	TCEQ WAM Run 3	red3.dat red3.OUT	Used to determine run-of-river supplies
Trinity WAM	March 2018	Region C Modified WAM Run 3	2021RegCBase_AmonCarterFY_2020.dat 2021RegCBase_AmonCarterFY_2070.dat 2021RegCBase_AmonCarterSY_2020.dat 2021RegCBase_AmonCarterSY_2070.dat 2021RegCBase_AmonCarterFT_2020.OUT 2021RegCBase_AmonCarterFY_2070.OUT 2021RegCBase_AmonCarterSY_2020.OUT 2021RegCBase_AmonCarterSY_2070.OUT	Used for firm and safe yields for Amon Carter
Red River Water Supply Reservoirs	March 2017	Spreadsheet Model with Extended Hydrology	KempDiversion20%min_June2015.xlsb KempDiversion20%min_June2015_2070 KempDiversionFirmYield_June2015.xlsb KempDiversionFirmYield_June2015_2070.xlsb KickArrowRinggl_20%min_Dec2015_NoLyons.xlsb KickArrowRinggl_20%min_Dec2015_NoLyons_2070 KickArrowRinggl_FirmYield_Dec2015_NoLyons.xlsb KickArrowRinggl_FirmYield_Dec2015_NoLyons_2070.xlsb	Used to determine firm and safe yields
	April 2018	Spreadsheet Model with Extended Hydrology	Nocona_ResSpreadsheet_2020FY.xlsb Nocona_ResSpreadsheet_2070FY.xlsb	Used to determine firm yields
	January 2018	Spreadsheet Model with Extended Hydrology	StandAloneSafeYields.xlsb StandAloneSafeYields2070.xlsb StandAloneFirmYields.xlsb StandAloneYields2070.xlsb	Used to determine safe and firm yields of Lakes Olney and Cooper

2.2 GROUNDWATER

2.2.1 Written Summary of Modeled Available Groundwater (MAGs)

The geographic area of Region B includes two of the state-designated Groundwater Management Areas (GMAs), GMA6 and GMA8. The MAGs for Region B for this planning cycle came from GAM RUN 17-029

(for aquifers within GMA8) and GAM RUN 16-031 (for aquifers in GMA6). The Cross Timbers Aquifer has not yet been included in the joint planning process for GMA 6 or GMA8.

Table 2-3 documents the GAM runs used to develop the groundwater availability for Region B, and **Table 2-4** lists the modeled available groundwater supplies. GR 17-029 includes the MAG volumes for the Trinity Aquifer in Montague County using the Northern Trinity and Woodbine Aquifers GAM. GR 16-031 summarizes the MAG volumes for the Seymour and Blaine Aquifers in Foard, Hardeman, Baylor, and Cottle counties using the Seymour Aquifer GAM and the Seymour Aquifer in Haskell, Knox, and Baylor Counties GAM. The Blaine Aquifer was declared non-relevant in King County, and the Seymour Aquifer was declared non-relevant in Archer, Clay, Wichita, and Wilbarger counties.

Table 2-3: GAM Models Used in Determining Ground Water Availability

GAM Version	Date Results Published / Date of Model Run	Model Inputs/ Outputs Files Used	Comments
GR 17-029	January 19, 2018	Version 2.0 Northern Trinity and Woodbine Aquifers GAM	Trinity Aquifer in GMA8
GR 16-031	June 30, 2017	Version 1.01 Seymour Aquifer GAM (Except for Pod 7) Seymour Aquifer in Haskell, Knox, and Baylor Counties GAM (Pod 7)	Seymour and Blaine Aquifers in GMA6
Version 1.01 Modified Seymour Aquifer GAM	Run on January 22, 2018	Adjusted_Pumping_20180122 (folder includes all input, output files)	Seymour Aquifer in Wilbarger County

Table 2-4: Modeled Available Groundwater Supplies in Region B

Aquifer	County	Modeled Available Groundwater (ac-ft/yr)					
		2020	2030	2040	2050	2060	2070
SEYMOUR (POD 4)	FOARD	11,897	4,945	5,389	8,066	7,815	3,943
	HARDEMAN	20,378	13,040	18,885	17,520	20,002	32,868
SEYMOUR (PODS 7, 8)	BAYLOR	7,215	7,329	6,977	6,730	6,607	6,929
BLAINE	COTTLE	14,766	11,621	11,653	11,621	11,653	11,621
	FOARD	6,582	6,564	6,582	6,564	6,582	6,564
	HARDEMAN	8,488	8,465	8,488	8,465	8,488	8,465
TRINITY	MONTAGUE	3,886	3,875	3,886	3,875	3,886	3,875

2.2.2 Documented Methodologies Utilized for Non-MAG Availabilities

Non-MAG availabilities are determined by the RWPG for groundwater aquifers that the Joint Planning Process did not define a Desired Future Condition. This includes all aquifers declared non-relevant, including portions of major and minor aquifers, Cross Timbers Aquifer, and "Other Aquifer". For this planning cycle, these non-MAG availabilities are listed in **Table 2-5**. A memorandum describing the process for determining groundwater supplies is included in **Appendix C**. Region B approved this methodology at the May 2, 2018 RWPG meeting. For Other Aquifer availability for the 2021 Regional Water Plan, the availability values from the 2016 Region B Water Plan are used. Groundwater that was previously categorized as Other Aquifer is now listed as Cross Timbers Aquifer in Archer, Baylor, Clay, Montague, Wichita, and Young counties. Other Aquifer supplies are found in only Cottle, Foard, Hardeman, King, and Wilbarger counties.

The Seymour Aquifer availability values from the 2016 Region B Water Plan are used for Wichita, Archer, and Clay counties. These values are based on the MAGs developed during the previous Joint Planning Process. A modified run of the Seymour Aquifer GAM was used to evaluate the available supply in Wilbarger County after considering historical pumping and estimated recharge. For the Blaine Aquifer in King County, the groundwater availability reflects the historical use.

Table 2-5: Estimated Available Groundwater Supplies for Non-Relevant Aquifers and Other Aquifer

Aquifer	County	Estimated Available Groundwater Supplies (ac-ft/yr)					
		2020	2030	2040	2050	2060	2070
SEYMOUR	ARCHER	35	35	35	35	35	35
	CLAY	787	787	787	787	787	787
	WICHITA	2,295	2,295	2,288	2,291	2,291	2,291
	WILBARGER	30,000	30,000	30,000	30,000	30,000	30,000
BLAINE	KING	400	400	400	400	400	400
CROSS-TIMBERS	ARCHER	625	625	625	625	625	625
	BAYLOR	60	60	60	60	60	60
	CLAY	2,000	2,000	2,000	2,000	2,000	2,000
	MONTAGUE	4,000	4,000	4,000	4,000	4,000	4,000
	WICHITA	840	840	840	840	840	840
	YOUNG	700	700	700	700	700	700
OTHER AQUIFER	COTTLE	1,800	1,800	1,800	1,800	1,800	1,800
	FOARD	200	200	200	200	200	200
	HARDEMAN	50	50	50	50	50	50
	KING	650	650	650	650	650	650
	WILBARGER	3,050	3,050	3,050	3,050	3,050	3,050

2.2.3 Declaration that No GAM Models were Used

The Region B Water Planning Group and its consultants did not perform any groundwater availability modeling for the Cross Timbers and Other Aquifers. No GAMs were used to assess supplies from the Seymour Aquifer in Archer, Clay and Wichita Counties, and the Blaine Aquifer in King County.

3.0 POTENTIALLY FEASIBLE WATER MANAGEMENT STRATEGIES

3.1 PROCESS FOR IDENTIFYING POTENTIALLY FEASIBLE WMS

The process for identifying potentially feasible water management strategies was presented at the January 10, 2018 RWPG meeting. There were no public comments and the RWPG approved the methodology. A copy of the presentation of the methodology is presented in **Appendix D**.

3.2 LIST OF POTENTIALLY FEASIBLE WMS

A list of potentially feasible water management strategies is included in **Appendix E**. These strategies are based on preliminary discussions with wholesale water providers, water user survey responses, and recommendations from the 2016 regional water plan. During analysis and development of the regional water plan, other strategies may be identified and included in this list. The types of strategies considered include:

- Conservation (municipal and irrigation)
- Drought management
- Reuse
- Reallocation of storage/ change of use
- Purchase water from a provider (voluntary transfer)
- Conjunctive use (may be combined with other strategy types)
- Expansion of existing supplies
- Develop additional groundwater or surface water
- Regional water supply
- Improvement of water quality
- Emergency transfer of water
- System optimization, subordination, and enhancement
- Brush control
- Precipitation enhancement
- Desalination
- Aquifer, storage and recovery (may be combined with other strategy types)
- Interbasin transfers
- Chloride control

4.0 SIMPLIFIED PLANNING OPTION

The Region B Water Planning Group will not pursue the simplified planning option offered by TWDB for the fifth cycle of regional water planning.

5.0 PUBLIC COMMENT

Per the TWDB Regional Planning Rules [31 TAC Section 357.21(c)(7)(C)], written comments from the public were accepted for the period of 14 days after the public meeting on August 22, 2018 when this Technical Memorandum was presented and considered for approval by the RWPG. Public comments were also accepted at this meeting; however, no public comments we received at the meeting or during the comment period from August 22, 2018 to September 5, 2018.

APPENDIX A
DB22 Reports

TWDB Report #1
Region B Water User Group (WUG) Population

	WUG POPULATION					
	2020	2030	2040	2050	2060	2070
BAYLOR SUD	19	19	19	20	20	20
COUNTY-OTHER	39	34	32	32	32	32
BRAZOS BASIN TOTAL	**58**	**53**	**51**	**52**	**52**	**52**
ARCHER CITY	1,727	1,727	1,727	1,727	1,727	1,727
ARCHER COUNTY MUD 1	806	807	817	817	817	817
BAYLOR SUD	111	113	113	114	115	116
HOLLIDAY	1,606	1,832	1,920	1,920	1,920	1,920
LAKESIDE CITY	937	971	971	971	971	971
SCOTLAND	552	698	698	698	698	698
WICHITA VALLEY WSC	1,877	1,962	1,998	1,998	1,998	1,998
WINDTHORST WSC	988	1,033	1,045	1,045	1,045	1,045
COUNTY-OTHER	677	585	558	556	555	554
RED BASIN TOTAL	**9,281**	**9,728**	**9,847**	**9,846**	**9,846**	**9,846**
BAYLOR SUD	22	22	22	23	23	23
COUNTY-OTHER	48	42	40	39	39	39
TRINITY BASIN TOTAL	**70**	**64**	**62**	**62**	**62**	**62**
ARCHER COUNTY TOTAL	**9,409**	**9,845**	**9,960**	**9,960**	**9,960**	**9,960**
BAYLOR SUD	625	637	642	646	649	653
SEYMOUR	2,712	2,712	2,712	2,712	2,712	2,712
COUNTY-OTHER	110	95	88	83	78	74
BRAZOS BASIN TOTAL	**3,447**	**3,444**	**3,442**	**3,441**	**3,439**	**3,439**
BAYLOR SUD	268	273	275	277	279	280
COUNTY-OTHER	11	9	9	8	8	7
RED BASIN TOTAL	**279**	**282**	**284**	**285**	**287**	**287**
BAYLOR COUNTY TOTAL	**3,726**	**3,726**	**3,726**	**3,726**	**3,726**	**3,726**
DEAN DALE SUD	2,150	2,218	2,218	2,218	2,218	2,218
HENRIETTA	3,321	3,425	3,425	3,425	3,425	3,425
RED RIVER AUTHORITY OF TEXAS	1,542	1,542	1,542	1,542	1,542	1,542
WINDTHORST WSC	469	480	480	480	480	480
COUNTY-OTHER	3,184	3,328	3,328	3,328	3,328	3,328
RED BASIN TOTAL	**10,666**	**10,993**	**10,993**	**10,993**	**10,993**	**10,993**
COUNTY-OTHER	488	510	510	510	510	510
TRINITY BASIN TOTAL	**488**	**510**	**510**	**510**	**510**	**510**
CLAY COUNTY TOTAL	**11,154**	**11,503**	**11,503**	**11,503**	**11,503**	**11,503**
PADUCAH	1,196	1,196	1,196	1,196	1,196	1,196
RED RIVER AUTHORITY OF TEXAS	49	49	49	49	49	49
COUNTY-OTHER	307	307	307	307	307	307
RED BASIN TOTAL	**1,552**	**1,552**	**1,552**	**1,552**	**1,552**	**1,552**
COTTLE COUNTY TOTAL	**1,552**	**1,552**	**1,552**	**1,552**	**1,552**	**1,552**
CROWELL	986	995	995	995	995	995
RED RIVER AUTHORITY OF TEXAS	363	363	363	363	363	363

Region B Water User Group (WUG) Population

	WUG POPULATION					
	2020	2030	2040	2050	2060	2070
COUNTY-OTHER	40	43	43	43	43	43
RED BASIN TOTAL	**1,389**	**1,401**	**1,401**	**1,401**	**1,401**	**1,401**
FOARD COUNTY TOTAL	**1,389**	**1,401**	**1,401**	**1,401**	**1,401**	**1,401**
QUANAH	2,728	2,797	2,821	2,876	2,905	2,927
RED RIVER AUTHORITY OF TEXAS	524	584	637	690	741	789
COUNTY-OTHER	1,022	1,002	962	941	906	871
RED BASIN TOTAL	**4,274**	**4,383**	**4,420**	**4,507**	**4,552**	**4,587**
HARDEMAN COUNTY TOTAL	**4,274**	**4,383**	**4,420**	**4,507**	**4,552**	**4,587**
COUNTY-OTHER	29	35	35	35	35	35
BRAZOS BASIN TOTAL	**29**	**35**	**35**	**35**	**35**	**35**
RED RIVER AUTHORITY OF TEXAS	217	217	217	217	217	217
COUNTY-OTHER	54	64	64	64	64	64
RED BASIN TOTAL	**271**	**281**	**281**	**281**	**281**	**281**
KING COUNTY TOTAL	**300**	**316**	**316**	**316**	**316**	**316**
NOCONA	3,155	3,271	3,323	3,381	3,419	3,446
NOCONA HILLS WSC	536	556	565	575	581	586
RED RIVER AUTHORITY OF TEXAS	316	352	385	417	447	476
COUNTY-OTHER	3,776	3,905	3,957	4,016	4,051	4,073
RED BASIN TOTAL	**7,783**	**8,084**	**8,230**	**8,389**	**8,498**	**8,581**
BOWIE	5,828	6,042	6,139	6,247	6,316	6,367
SAINT JO	1,051	1,089	1,107	1,126	1,139	1,148
COUNTY-OTHER	5,845	6,045	6,124	6,217	6,270	6,305
TRINITY BASIN TOTAL	**12,724**	**13,176**	**13,370**	**13,590**	**13,725**	**13,820**
MONTAGUE COUNTY TOTAL	**20,507**	**21,260**	**21,600**	**21,979**	**22,223**	**22,401**
BURKBURNETT	11,004	11,405	11,721	11,941	12,153	12,331
DEAN DALE SUD	1,066	1,103	1,134	1,156	1,176	1,194
ELECTRA	2,694	2,793	2,869	2,924	2,975	3,019
HARROLD WSC	43	45	47	48	49	50
IOWA PARK	6,492	6,728	6,913	7,044	7,168	7,274
SHEPPARD AIR FORCE BASE	6,088	6,088	6,088	6,088	6,088	6,088
WICHITA FALLS	104,830	108,653	111,648	113,752	115,762	117,471
WICHITA VALLEY WSC	3,145	3,256	3,343	3,404	3,462	3,512
COUNTY-OTHER	265	502	685	814	938	1,043
RED BASIN TOTAL	**135,627**	**140,573**	**144,448**	**147,171**	**149,771**	**151,982**
WICHITA COUNTY TOTAL	**135,627**	**140,573**	**144,448**	**147,171**	**149,771**	**151,982**
HARROLD WSC	333	348	359	368	375	381
RED RIVER AUTHORITY OF TEXAS	1,050	1,171	1,279	1,386	1,487	1,584
VERNON	11,758	12,398	12,785	13,175	13,447	13,653
COUNTY-OTHER	1,324	1,335	1,305	1,279	1,233	1,178

Region B Water User Group (WUG) Population

	WUG POPULATION					
	2020	2030	2040	2050	2060	2070
RED BASIN TOTAL	**14,465**	**15,252**	**15,728**	**16,208**	**16,542**	**16,796**
WILBARGER COUNTY TOTAL	**14,465**	**15,252**	**15,728**	**16,208**	**16,542**	**16,796**
BAYLOR SUD	195	198	200	201	203	204
OLNEY	3,370	3,485	3,568	3,655	3,740	3,822
COUNTY-OTHER	336	432	502	576	647	717
BRAZOS BASIN TOTAL	**3,901**	**4,115**	**4,270**	**4,432**	**4,590**	**4,743**
COUNTY-OTHER	3	4	4	5	6	6
TRINITY BASIN TOTAL	**3**	**4**	**4**	**5**	**6**	**6**
YOUNG COUNTY TOTAL	**3,904**	**4,119**	**4,274**	**4,437**	**4,596**	**4,749**
REGION B TOTAL POPULATION	**206,307**	**213,930**	**218,928**	**222,760**	**226,142**	**228,973**

TWDB Report #2
Region B Water User Group (WUG) Demand

	WUG DEMAND (ACRE-FEET PER YEAR)					
	2020	2030	2040	2050	2060	2070
BAYLOR SUD	4	4	4	4	4	4
COUNTY-OTHER	7	6	6	5	5	5
MINING	8	10	7	6	4	4
LIVESTOCK	10	10	10	10	10	10
BRAZOS BASIN TOTAL	**29**	**30**	**27**	**25**	**23**	**23**
ARCHER CITY	263	255	248	244	244	244
ARCHER COUNTY MUD 1	147	144	143	141	141	141
BAYLOR SUD	24	24	24	24	24	24
HOLLIDAY	231	255	262	259	258	258
LAKESIDE CITY	125	125	121	120	119	119
SCOTLAND	194	242	240	239	239	239
WICHITA VALLEY WSC	221	222	220	216	215	215
WINDTHORST WSC	294	303	303	301	301	301
COUNTY-OTHER	118	101	95	95	94	94
MANUFACTURING	3	3	3	3	3	3
MINING	348	415	295	239	183	183
LIVESTOCK	2,102	2,102	2,102	2,102	2,102	2,102
IRRIGATION	1,251	1,251	1,251	1,251	1,251	1,251
RED BASIN TOTAL	**5,321**	**5,442**	**5,307**	**5,234**	**5,174**	**5,174**
BAYLOR SUD	5	5	5	5	5	5
COUNTY-OTHER	8	7	7	7	7	7
MINING	49	58	42	34	26	26
LIVESTOCK	53	53	53	53	53	53
TRINITY BASIN TOTAL	**115**	**123**	**107**	**99**	**91**	**91**
ARCHER COUNTY TOTAL	**5,465**	**5,595**	**5,441**	**5,358**	**5,288**	**5,288**
BAYLOR SUD	138	137	136	136	136	137
SEYMOUR	490	476	465	464	463	463
COUNTY-OTHER	15	12	11	10	10	9
MINING	6	6	6	6	6	6
LIVESTOCK	1,059	1,059	1,059	1,059	1,059	1,059
IRRIGATION	3,650	3,650	3,650	3,650	3,650	3,650
BRAZOS BASIN TOTAL	**5,358**	**5,340**	**5,327**	**5,325**	**5,324**	**5,324**
BAYLOR SUD	59	59	58	59	59	59
COUNTY-OTHER	1	1	1	1	1	1
MINING	8	8	7	7	7	7
LIVESTOCK	131	131	131	131	131	131
IRRIGATION	1,299	1,299	1,299	1,299	1,299	1,299
RED BASIN TOTAL	**1,498**	**1,498**	**1,496**	**1,497**	**1,497**	**1,497**
BAYLOR COUNTY TOTAL	**6,856**	**6,838**	**6,823**	**6,822**	**6,821**	**6,821**
DEAN DALE SUD	163	159	151	149	149	149
HENRIETTA	664	669	657	650	649	649
RED RIVER AUTHORITY OF TEXAS	379	372	366	365	364	364
WINDTHORST WSC	140	141	139	138	138	138
COUNTY-OTHER	391	395	383	377	376	376
MINING	539	691	514	414	314	314
LIVESTOCK	1,855	1,855	1,855	1,855	1,855	1,855
IRRIGATION	1,304	1,304	1,304	1,304	1,304	1,304

Region B Water User Group (WUG) Demand

	WUG DEMAND (ACRE-FEET PER YEAR)					
	2020	2030	2040	2050	2060	2070
RED BASIN TOTAL	**5,435**	**5,586**	**5,369**	**5,252**	**5,149**	**5,149**
COUNTY-OTHER	60	60	59	58	58	58
MINING	74	95	70	57	43	43
LIVESTOCK	246	246	246	246	246	246
IRRIGATION	325	325	325	325	325	325
TRINITY BASIN TOTAL	**705**	**726**	**700**	**686**	**672**	**672**
CLAY COUNTY TOTAL	**6,140**	**6,312**	**6,069**	**5,938**	**5,821**	**5,821**
PADUCAH	290	283	282	281	281	281
RED RIVER AUTHORITY OF TEXAS	12	12	12	12	12	12
COUNTY-OTHER	42	41	40	40	40	40
MINING	41	41	38	34	31	31
LIVESTOCK	551	551	551	551	551	551
IRRIGATION	3,926	3,926	3,926	3,926	3,926	3,926
RED BASIN TOTAL	**4,862**	**4,854**	**4,849**	**4,844**	**4,841**	**4,841**
COTTLE COUNTY TOTAL	**4,862**	**4,854**	**4,849**	**4,844**	**4,841**	**4,841**
CROWELL	138	133	131	131	131	130
RED RIVER AUTHORITY OF TEXAS	89	87	86	86	86	86
COUNTY-OTHER	7	8	8	8	8	8
MINING	12	12	12	12	11	11
LIVESTOCK	401	401	401	401	401	401
IRRIGATION	3,213	3,213	3,213	3,213	3,213	3,213
RED BASIN TOTAL	**3,860**	**3,854**	**3,851**	**3,851**	**3,850**	**3,849**
FOARD COUNTY TOTAL	**3,860**	**3,854**	**3,851**	**3,851**	**3,850**	**3,849**
QUANAH	396	391	387	394	397	400
RED RIVER AUTHORITY OF TEXAS	129	141	151	163	175	186
COUNTY-OTHER	163	154	144	141	135	130
MANUFACTURING	440	483	483	483	483	483
MINING	17	17	18	18	18	18
LIVESTOCK	646	646	646	646	646	646
IRRIGATION	12,498	12,498	12,498	12,498	12,498	12,498
RED BASIN TOTAL	**14,289**	**14,330**	**14,327**	**14,343**	**14,352**	**14,361**
HARDEMAN COUNTY TOTAL	**14,289**	**14,330**	**14,327**	**14,343**	**14,352**	**14,361**
COUNTY-OTHER	8	9	9	9	9	9
MINING	141	123	107	93	81	81
LIVESTOCK	155	155	155	155	155	155
BRAZOS BASIN TOTAL	**304**	**287**	**271**	**257**	**245**	**245**
RED RIVER AUTHORITY OF TEXAS	53	52	52	51	51	51
COUNTY-OTHER	14	16	16	16	16	16
MINING	239	208	182	158	138	138
LIVESTOCK	264	264	264	264	264	264
RED BASIN TOTAL	**570**	**540**	**514**	**489**	**469**	**469**
KING COUNTY TOTAL	**874**	**827**	**785**	**746**	**714**	**714**
NOCONA	740	751	750	758	765	771
NOCONA HILLS WSC	105	106	106	107	108	108
RED RIVER AUTHORITY OF TEXAS	78	85	91	99	106	112
COUNTY-OTHER	457	456	449	449	451	454
MANUFACTURING	1	1	1	1	1	1

Region B Water User Group (WUG) Demand

	WUG DEMAND (ACRE-FEET PER YEAR)					
	2020	2030	2040	2050	2060	2070
MINING	1,747	1,237	771	332	373	373
LIVESTOCK	1,278	1,278	1,278	1,278	1,278	1,278
IRRIGATION	292	292	292	292	292	292
RED BASIN TOTAL	**4,698**	**4,206**	**3,738**	**3,316**	**3,374**	**3,389**
BOWIE	995	1,003	997	1,002	1,011	1,019
SAINT JO	155	156	155	155	157	158
COUNTY-OTHER	707	706	695	695	699	702
MINING	1,892	1,340	835	359	404	404
LIVESTOCK	426	426	426	426	426	426
IRRIGATION	292	292	292	292	292	292
TRINITY BASIN TOTAL	**4,467**	**3,923**	**3,400**	**2,929**	**2,989**	**3,001**
MONTAGUE COUNTY TOTAL	**9,165**	**8,129**	**7,138**	**6,245**	**6,363**	**6,390**
BURKBURNETT	1,461	1,460	1,457	1,462	1,483	1,505
DEAN DALE SUD	81	79	77	78	79	80
ELECTRA	884	902	916	932	947	961
HARROLD WSC	12	13	13	13	13	14
IOWA PARK	884	884	882	885	898	911
SHEPPARD AIR FORCE BASE	979	951	929	919	917	917
WICHITA FALLS	16,873	16,987	17,055	17,159	17,422	17,677
WICHITA VALLEY WSC	370	369	368	368	373	379
COUNTY-OTHER	33	61	84	99	114	127
MANUFACTURING	1,025	1,100	1,100	1,100	1,100	1,100
MINING	62	61	55	49	44	44
STEAM ELECTRIC POWER	31	31	31	31	31	31
LIVESTOCK	975	975	975	975	975	975
IRRIGATION	39,156	39,156	39,156	39,156	39,156	39,156
RED BASIN TOTAL	**62,826**	**63,029**	**63,098**	**63,226**	**63,552**	**63,877**
WICHITA COUNTY TOTAL	**62,826**	**63,029**	**63,098**	**63,226**	**63,552**	**63,877**
HARROLD WSC	94	97	98	101	102	104
RED RIVER AUTHORITY OF TEXAS	258	282	304	328	351	374
VERNON	1,882	1,922	1,933	1,981	2,018	2,048
COUNTY-OTHER	210	204	196	192	185	176
MANUFACTURING	958	1,048	1,048	1,048	1,048	1,048
MINING	20	20	19	19	18	18
STEAM ELECTRIC POWER	7,711	7,711	7,711	7,711	7,711	7,711
LIVESTOCK	965	965	965	965	965	965
IRRIGATION	29,289	29,289	29,289	29,289	29,289	29,289
RED BASIN TOTAL	**41,387**	**41,538**	**41,563**	**41,634**	**41,687**	**41,733**
WILBARGER COUNTY TOTAL	**41,387**	**41,538**	**41,563**	**41,634**	**41,687**	**41,733**
BAYLOR SUD	43	43	42	42	43	43
OLNEY	556	558	558	566	577	590
COUNTY-OTHER	41	51	57	65	73	81
LIVESTOCK	122	122	122	122	122	122
IRRIGATION	3	3	3	3	3	3
BRAZOS BASIN TOTAL	**765**	**777**	**782**	**798**	**818**	**839**
COUNTY-OTHER	0	0	1	1	1	1

Region B Water User Group (WUG) Demand

	WUG DEMAND (ACRE-FEET PER YEAR)					
	2020	2030	2040	2050	2060	2070
TRINITY BASIN TOTAL	0	0	1	1	1	1
YOUNG COUNTY TOTAL	765	777	783	799	819	840
REGION B TOTAL DEMAND	156,489	156,083	154,727	153,806	154,108	154,535

TWDB Report #3
Region B Water User Group (WUG) Category Summary*

MUNICIPAL	2020	2030	2040	2050	2060	2070
POPULATION	188,749	195,653	200,375	203,907	207,092	209,787
DEMAND (acre-feet per year)	31,098	31,339	31,374	31,587	32,011	32,426
EXISTING SUPPLIES (acre-feet per year)	37,650	35,971	35,012	33,906	32,880	29,640
NEEDS (acre-feet per year)	342	513	593	1,381	2,486	5,601

COUNTY-OTHER	2020	2030	2040	2050	2060	2070
POPULATION	17,558	18,277	18,553	18,853	19,050	19,186
DEMAND (acre-feet per year)	2,282	2,288	2,261	2,268	2,282	2,294
EXISTING SUPPLIES (acre-feet per year)	3,214	3,194	3,191	3,172	3,159	3,116
NEEDS (acre-feet per year)	38	19	13	12	11	11

MANUFACTURING	2020	2030	2040	2050	2060	2070
DEMAND (acre-feet per year)	2,427	2,635	2,635	2,635	2,635	2,635
EXISTING SUPPLIES (acre-feet per year)	2,490	2,594	2,566	2,498	2,446	2,312
NEEDS (acre-feet per year)	25	86	114	144	189	323

MINING	2020	2030	2040	2050	2060	2070
DEMAND (acre-feet per year)	5,203	4,342	2,978	1,837	1,701	1,701
EXISTING SUPPLIES (acre-feet per year)	3,628	3,743	2,502	1,704	1,661	1,661
NEEDS (acre-feet per year)	1,616	678	556	201	137	137

STEAM ELECTRIC POWER	2020	2030	2040	2050	2060	2070
DEMAND (acre-feet per year)	7,742	7,742	7,742	7,742	7,742	7,742
EXISTING SUPPLIES (acre-feet per year)	6,038	5,436	4,834	4,232	3,630	3,026
NEEDS (acre-feet per year)	1,704	2,306	2,908	3,510	4,112	4,716

LIVESTOCK	2020	2030	2040	2050	2060	2070
DEMAND (acre-feet per year)	11,239	11,239	11,239	11,239	11,239	11,239
EXISTING SUPPLIES (acre-feet per year)	11,365	11,365	11,365	11,365	11,365	11,365
NEEDS (acre-feet per year)	0	0	0	0	0	0

IRRIGATION	2020	2030	2040	2050	2060	2070
DEMAND (acre-feet per year)	96,498	96,498	96,498	96,498	96,498	96,498
EXISTING SUPPLIES (acre-feet per year)	76,065	74,245	72,428	70,510	68,692	66,874
NEEDS (acre-feet per year)	21,166	22,981	24,794	26,607	28,421	30,234

*WUG supplies and projected demands are entered for each of a WUG's region-county-basin divisions. The needs shown in the WUG Category Summary report are calculated by first deducting the WUG split's projected demand from its total existing water supply volume. If the WUG split has a greater existing supply volume than projected demand in any given decade, this amount is considered a surplus volume. Before aggregating the difference between supplies and demands to the WUG category level, calculated surpluses are updated to zero so that only the WUGs with needs in the decade are included with the Needs totals.

TWDB Report #4
Region B Source Availability

GROUNDWATER SOURCE TYPE				SOURCE AVAILABILITY (ACRE-FEET PER YEAR)					
SOURCE NAME	COUNTY	BASIN	SALINITY *	2020	2030	2040	2050	2060	2070
BLAINE AQUIFER	COTTLE	RED	FRESH	14,766	11,621	11,653	11,621	11,653	11,621
BLAINE AQUIFER	FOARD	RED	FRESH	6,582	6,564	6,582	6,564	6,582	6,564
BLAINE AQUIFER	HARDEMAN	RED	FRESH	8,488	8,465	8,488	8,465	8,488	8,465
BLAINE AQUIFER	KING	BRAZOS	FRESH	0	0	0	0	0	0
BLAINE AQUIFER	KING	RED	FRESH	400	400	400	400	400	400
CROSS TIMBERS AQUIFER	ARCHER	BRAZOS	FRESH	20	20	20	20	20	20
CROSS TIMBERS AQUIFER	ARCHER	RED	FRESH	585	585	585	585	585	585
CROSS TIMBERS AQUIFER	ARCHER	TRINITY	FRESH	20	20	20	20	20	20
CROSS TIMBERS AQUIFER	BAYLOR	BRAZOS	FRESH	25	25	25	25	25	25
CROSS TIMBERS AQUIFER	BAYLOR	RED	FRESH	35	35	35	35	35	35
CROSS TIMBERS AQUIFER	CLAY	RED	FRESH	1,495	1,495	1,495	1,495	1,495	1,495
CROSS TIMBERS AQUIFER	CLAY	TRINITY	FRESH	505	505	505	505	505	505
CROSS TIMBERS AQUIFER	MONTAGUE	RED	FRESH	2,280	2,280	2,280	2,280	2,280	2,280
CROSS TIMBERS AQUIFER	MONTAGUE	TRINITY	FRESH	1,720	1,720	1,720	1,720	1,720	1,720
CROSS TIMBERS AQUIFER	WICHITA	RED	FRESH	840	840	840	840	840	840
CROSS TIMBERS AQUIFER	YOUNG	BRAZOS	FRESH	650	650	650	650	650	650
CROSS TIMBERS AQUIFER	YOUNG	TRINITY	FRESH	50	50	50	50	50	50
OTHER AQUIFER	COTTLE	RED	FRESH	1,800	1,800	1,800	1,800	1,800	1,800
OTHER AQUIFER	FOARD	RED	FRESH	200	200	200	200	200	200
OTHER AQUIFER	HARDEMAN	RED	FRESH	50	50	50	50	50	50
OTHER AQUIFER	KING	BRAZOS	FRESH	250	250	250	250	250	250
OTHER AQUIFER	KING	RED	FRESH	400	400	400	400	400	400
OTHER AQUIFER	WILBARGER	RED	FRESH	3,050	3,050	3,050	3,050	3,050	3,050
SEYMOUR AQUIFER	ARCHER	RED	FRESH	35	35	35	35	35	35
SEYMOUR AQUIFER	BAYLOR	BRAZOS	FRESH	6,921	7,036	6,683	6,437	6,313	6,636
SEYMOUR AQUIFER	BAYLOR	RED	FRESH	294	294	294	294	294	294
SEYMOUR AQUIFER	CLAY	RED	FRESH	787	787	787	787	787	787
SEYMOUR AQUIFER	FOARD	RED	FRESH	11,897	4,945	5,389	8,066	7,815	3,943
SEYMOUR AQUIFER	HARDEMAN	RED	FRESH	20,378	13,040	18,885	17,520	20,002	32,868
SEYMOUR AQUIFER	WICHITA	RED	FRESH	2,295	2,295	2,288	2,291	2,291	2,291
SEYMOUR AQUIFER	WILBARGER	RED	FRESH	30,000	30,000	30,000	30,000	30,000	30,000
TRINITY AQUIFER	MONTAGUE	RED	FRESH	154	154	154	154	154	154
TRINITY AQUIFER	MONTAGUE	TRINITY	FRESH	3,732	3,721	3,732	3,721	3,732	3,721
			GROUNDWATER TOTAL SOURCE AVAILABILITY	**120,704**	**103,332**	**109,345**	**110,330**	**112,521**	**121,754**

REUSE SOURCE TYPE				SOURCE AVAILABILITY (ACRE-FEET PER YEAR)					
SOURCE NAME	COUNTY	BASIN	SALINITY *	2020	2030	2040	2050	2060	2070
DIRECT REUSE	MONTAGUE	TRINITY	FRESH	348	351	349	0	0	0
INDIRECT REUSE	WICHITA	RED	FRESH	8,968	8,968	8,968	8,968	8,968	8,968
			REUSE TOTAL SOURCE AVAILABILITY	**9,316**	**9,319**	**9,317**	**8,968**	**8,968**	**8,968**

SURFACE WATER SOURCE TYPE				SOURCE AVAILABILITY (ACRE-FEET PER YEAR)					
SOURCE NAME	COUNTY	BASIN	SALINITY *	2020	2030	2040	2050	2060	2070
AMON G. CARTER LAKE/RESERVOIR	RESERVOIR	TRINITY	FRESH	1,270	1,182	1,094	1,006	918	830

*Salinity field indicates whether the source availability is considered 'fresh' (less than 1,000 mg/L), 'brackish' (1,000 to 10,000 mg/L), 'saline' (10,001 mg/L to 34,999 mg/L), or 'seawater' (35,000 mg/L or greater). Sources can also be labeled as 'fresh/brackish' or 'brackish/saline', if a combination of the salinity types is appropriate.

Region B Source Availability

SURFACE WATER SOURCE TYPE				SOURCE AVAILABILITY (ACRE-FEET PER YEAR)					
SOURCE NAME	COUNTY	BASIN	SALINITY *	2020	2030	2040	2050	2060	2070
BRAZOS LIVESTOCK LOCAL SUPPLY	ARCHER	BRAZOS	FRESH	10	10	10	10	10	10
BRAZOS LIVESTOCK LOCAL SUPPLY	BAYLOR	BRAZOS	FRESH	843	843	843	843	843	843
BRAZOS LIVESTOCK LOCAL SUPPLY	KING	BRAZOS	FRESH	55	55	55	55	55	55
BRAZOS LIVESTOCK LOCAL SUPPLY	YOUNG	BRAZOS	FRESH	122	122	122	122	122	122
BRAZOS RUN-OF-RIVER	BAYLOR	BRAZOS	FRESH	17	17	17	17	17	17
ELECTRA CITY LAKE/RESERVOIR	RESERVOIR	RED	FRESH	0	0	0	0	0	0
FARMERS CREEK/NOCONA LAKE/RESERVOIR	RESERVOIR	RED	FRESH	1,260	1,260	1,260	1,260	1,260	1,260
KEMP-DIVERSION LAKE/RESERVOIR SYSTEM	RESERVOIR	RED	FRESH	29,000	26,100	23,200	20,300	17,400	14,500
LITTLE WICHITA RIVER LAKE/RESERVOIR SYSTEM	RESERVOIR	RED	FRESH	16,900	15,720	15,120	14,520	13,920	11,000
NORTH FORK BUFFALO CREEK LAKE/RESERVOIR	RESERVOIR	RED	FRESH	0	0	0	0	0	0
OLNEY-COOPER LAKE/RESERVOIR SYSTEM	RESERVOIR	RED	FRESH	194	181	168	156	143	130
RED LIVESTOCK LOCAL SUPPLY	ARCHER	RED	FRESH	2,029	2,029	2,029	2,029	2,029	2,029
RED LIVESTOCK LOCAL SUPPLY	BAYLOR	RED	FRESH	104	104	104	104	104	104
RED LIVESTOCK LOCAL SUPPLY	CLAY	RED	FRESH	1,580	1,580	1,580	1,580	1,580	1,580
RED LIVESTOCK LOCAL SUPPLY	COTTLE	RED	FRESH	171	171	171	171	171	171
RED LIVESTOCK LOCAL SUPPLY	FOARD	RED	FRESH	370	370	370	370	370	370
RED LIVESTOCK LOCAL SUPPLY	HARDEMAN	RED	FRESH	400	400	400	400	400	400
RED LIVESTOCK LOCAL SUPPLY	KING	RED	FRESH	87	87	87	87	87	87
RED LIVESTOCK LOCAL SUPPLY	MONTAGUE	RED	FRESH	1,221	1,221	1,221	1,221	1,221	1,221
RED LIVESTOCK LOCAL SUPPLY	WICHITA	RED	FRESH	916	916	916	916	916	916
RED LIVESTOCK LOCAL SUPPLY	WILBARGER	RED	FRESH	790	790	790	790	790	790
RED OTHER LOCAL SUPPLY	HARDEMAN	RED	FRESH	7	7	7	7	7	7
RED RUN-OF-RIVER	ARCHER	RED	FRESH	285	285	285	285	285	285
RED RUN-OF-RIVER	CLAY	RED	FRESH	3,971	3,971	3,971	3,971	3,971	3,971
RED RUN-OF-RIVER	COTTLE	RED	FRESH	11	11	11	11	11	11
RED RUN-OF-RIVER	HARDEMAN	RED	FRESH	146	146	146	146	146	146
RED RUN-OF-RIVER	MONTAGUE	RED	FRESH	108	108	108	108	108	108
RED RUN-OF-RIVER	WICHITA	RED	FRESH	3,607	3,607	3,607	3,607	3,607	3,607
RED RUN-OF-RIVER	WILBARGER	RED	FRESH	952	952	952	952	952	952
SANTA ROSA LAKE/RESERVOIR	RESERVOIR	RED	FRESH	50	50	50	50	50	50
TRINITY LIVESTOCK LOCAL SUPPLY	ARCHER	TRINITY	FRESH	51	51	51	51	51	51
TRINITY LIVESTOCK LOCAL SUPPLY	CLAY	TRINITY	FRESH	221	221	221	221	221	221
TRINITY LIVESTOCK LOCAL SUPPLY	MONTAGUE	TRINITY	FRESH	407	407	407	407	407	407
SURFACE WATER TOTAL SOURCE AVAILABILITY				**67,155**	**62,974**	**59,373**	**55,773**	**52,172**	**46,251**

REGION B TOTAL SOURCE AVAILABILITY				**197,175**	**175,625**	**178,035**	**175,071**	**173,661**	**176,973**

*Salinity field indicates whether the source availability is considered 'fresh' (less than 1,000 mg/L), 'brackish' (1,000 to 10,000 mg/L), 'saline' (10,001 mg/L to 34,999 mg/L), or 'seawater' (35,000 mg/L or greater). Sources can also be labeled as 'fresh/brackish' or 'brackish/saline', if a combination of the salinity types is appropriate.

TWDB Report #5

Region B Water User Group (WUG) Existing Water Supply

WUG NAME	SOURCE REGION	SOURCE DESCRIPTION	EXISTING SUPPLY (ACRE-FEET PER YEAR)					
			2020	2030	2040	2050	2060	2070
BAYLOR SUD	B	SEYMOUR AQUIFER | BAYLOR COUNTY	6	6	6	6	6	6
COUNTY-OTHER	B	CROSS TIMBERS AQUIFER | ARCHER COUNTY	7	6	6	5	5	5
MINING	B	CROSS TIMBERS AQUIFER | ARCHER COUNTY	8	10	7	6	4	4
LIVESTOCK	B	CROSS TIMBERS AQUIFER | ARCHER COUNTY	1	1	1	1	1	1
LIVESTOCK	B	LOCAL SURFACE WATER SUPPLY	10	10	10	10	10	10
		BRAZOS BASIN TOTAL	**32**	**33**	**30**	**28**	**26**	**26**
ARCHER CITY	B	LITTLE WICHITA RIVER LAKE/RESERVOIR SYSTEM	178	164	156	147	138	108
ARCHER CITY	B	RED INDIRECT REUSE	94	93	93	91	89	88
ARCHER COUNTY MUD 1	B	LITTLE WICHITA RIVER LAKE/RESERVOIR SYSTEM	51	46	44	42	40	30
ARCHER COUNTY MUD 1	B	RED INDIRECT REUSE	27	26	26	26	25	25
BAYLOR SUD	B	SEYMOUR AQUIFER | BAYLOR COUNTY	32	32	32	32	32	32
HOLLIDAY	B	LITTLE WICHITA RIVER LAKE/RESERVOIR SYSTEM	166	169	165	155	145	113
HOLLIDAY	B	RED INDIRECT REUSE	88	96	98	96	93	92
LAKESIDE CITY	B	LITTLE WICHITA RIVER LAKE/RESERVOIR SYSTEM	108	99	94	89	84	65
LAKESIDE CITY	B	RED INDIRECT REUSE	57	56	56	55	54	53
SCOTLAND	B	LITTLE WICHITA RIVER LAKE/RESERVOIR SYSTEM	121	112	106	101	94	74
SCOTLAND	B	RED INDIRECT REUSE	64	64	63	62	61	60
WICHITA VALLEY WSC	B	LITTLE WICHITA RIVER LAKE/RESERVOIR SYSTEM	430	397	376	354	328	254
WICHITA VALLEY WSC	B	RED INDIRECT REUSE	228	227	223	218	212	207
WINDTHORST WSC	B	LITTLE WICHITA RIVER LAKE/RESERVOIR SYSTEM	171	158	151	144	135	105
WINDTHORST WSC	B	RED INDIRECT REUSE	91	90	90	88	87	86
COUNTY-OTHER	B	CROSS TIMBERS AQUIFER | ARCHER COUNTY	80	82	82	83	83	83
MANUFACTURING	B	CROSS TIMBERS AQUIFER | ARCHER COUNTY	3	3	3	3	3	3
MINING	B	CROSS TIMBERS AQUIFER | ARCHER COUNTY	64	64	64	64	64	64
LIVESTOCK	B	CROSS TIMBERS AQUIFER | ARCHER COUNTY	190	190	190	190	190	190
LIVESTOCK	B	LOCAL SURFACE WATER SUPPLY	2,029	2,029	2,029	2,029	2,029	2,029
IRRIGATION	B	CROSS TIMBERS AQUIFER | ARCHER COUNTY	200	200	200	200	200	200
IRRIGATION	B	KEMP-DIVERSION LAKE/RESERVOIR SYSTEM	575	517	460	403	345	288
IRRIGATION	B	RED RUN-OF-RIVER	7	7	7	7	7	7
		RED BASIN TOTAL	**5,054**	**4,921**	**4,808**	**4,679**	**4,538**	**4,256**
BAYLOR SUD	B	SEYMOUR AQUIFER | BAYLOR COUNTY	7	7	7	7	7	7
COUNTY-OTHER	B	CROSS TIMBERS AQUIFER | ARCHER COUNTY	8	7	7	7	7	7
MINING	B	CROSS TIMBERS AQUIFER | ARCHER COUNTY	8	8	8	8	8	8
LIVESTOCK	B	CROSS TIMBERS AQUIFER | ARCHER COUNTY	4	4	4	4	4	4
LIVESTOCK	B	LOCAL SURFACE WATER SUPPLY	51	51	51	51	51	51
		TRINITY BASIN TOTAL	**78**	**77**	**77**	**77**	**77**	**77**
		ARCHER COUNTY TOTAL	**5,164**	**5,031**	**4,915**	**4,784**	**4,641**	**4,359**
BAYLOR SUD	G	MILLERS CREEK LAKE/RESERVOIR	6	5	4	2	1	0
BAYLOR SUD	B	SEYMOUR AQUIFER | BAYLOR COUNTY	138	138	138	138	138	138
SEYMOUR	B	SEYMOUR AQUIFER | BAYLOR COUNTY	600	600	600	600	600	600
COUNTY-OTHER	B	CROSS TIMBERS AQUIFER | BAYLOR COUNTY	5	5	5	5	5	5
COUNTY-OTHER	B	SEYMOUR AQUIFER | BAYLOR COUNTY	19	19	19	19	19	19
MINING	B	SEYMOUR AQUIFER | BAYLOR COUNTY	10	10	10	10	10	10
LIVESTOCK	B	CROSS TIMBERS AQUIFER | BAYLOR COUNTY	13	13	13	13	13	13
LIVESTOCK	B	LOCAL SURFACE WATER SUPPLY	800	800	800	800	800	800
LIVESTOCK	B	SEYMOUR AQUIFER | BAYLOR COUNTY	246	246	246	246	246	246
IRRIGATION	B	BRAZOS RUN-OF-RIVER	17	17	17	17	17	17

Region B Water User Group (WUG) Existing Water Supply

WUG NAME	SOURCE REGION	SOURCE DESCRIPTION	EXISTING SUPPLY (ACRE-FEET PER YEAR)					
			2020	2030	2040	2050	2060	2070
IRRIGATION	B	SEYMOUR AQUIFER | BAYLOR COUNTY	3,688	3,688	3,688	3,688	3,688	3,688
		BRAZOS BASIN TOTAL	**5,542**	**5,541**	**5,540**	**5,538**	**5,537**	**5,536**
BAYLOR SUD	B	SEYMOUR AQUIFER | BAYLOR COUNTY	66	66	66	66	66	66
COUNTY-OTHER	B	SEYMOUR AQUIFER | BAYLOR COUNTY	1	1	1	1	1	1
MINING	B	CROSS TIMBERS AQUIFER | BAYLOR COUNTY	10	10	10	10	10	10
LIVESTOCK	B	CROSS TIMBERS AQUIFER | BAYLOR COUNTY	2	2	2	2	2	2
LIVESTOCK	B	LOCAL SURFACE WATER SUPPLY	99	99	99	99	99	99
LIVESTOCK	B	SEYMOUR AQUIFER | BAYLOR COUNTY	30	30	30	30	30	30
IRRIGATION	B	SEYMOUR AQUIFER | BAYLOR COUNTY	1,312	1,312	1,312	1,312	1,312	1,312
		RED BASIN TOTAL	**1,520**	**1,520**	**1,520**	**1,520**	**1,520**	**1,520**
		BAYLOR COUNTY TOTAL	**7,062**	**7,061**	**7,060**	**7,058**	**7,057**	**7,056**
DEAN DALE SUD	B	LITTLE WICHITA RIVER LAKE/RESERVOIR SYSTEM	185	170	161	152	141	110
DEAN DALE SUD	B	RED INDIRECT REUSE	99	97	95	93	91	90
HENRIETTA	B	RED RUN-OF-RIVER	1,090	1,090	1,090	1,090	1,090	1,090
RED RIVER AUTHORITY OF TEXAS	B	LITTLE WICHITA RIVER LAKE/RESERVOIR SYSTEM	382	360	348	335	320	275
WINDTHORST WSC	B	LITTLE WICHITA RIVER LAKE/RESERVOIR SYSTEM	82	74	69	66	62	49
WINDTHORST WSC	B	RED INDIRECT REUSE	43	42	41	41	40	39
COUNTY-OTHER	B	CROSS TIMBERS AQUIFER | CLAY COUNTY	324	324	324	324	324	324
COUNTY-OTHER	B	SEYMOUR AQUIFER | CLAY COUNTY	80	80	80	80	80	80
MINING	B	CROSS TIMBERS AQUIFER | CLAY COUNTY	526	655	528	440	352	352
MINING	B	RED RUN-OF-RIVER	1	1	1	1	1	1
MINING	B	SEYMOUR AQUIFER | CLAY COUNTY	25	35	0	0	0	0
LIVESTOCK	B	CROSS TIMBERS AQUIFER | CLAY COUNTY	225	225	225	225	225	225
LIVESTOCK	B	LOCAL SURFACE WATER SUPPLY	1,580	1,580	1,580	1,580	1,580	1,580
LIVESTOCK	B	SEYMOUR AQUIFER | CLAY COUNTY	50	50	50	50	50	50
IRRIGATION	B	CROSS TIMBERS AQUIFER | CLAY COUNTY	275	275	275	275	275	275
IRRIGATION	B	KEMP-DIVERSION LAKE/RESERVOIR SYSTEM	46	41	37	32	28	23
IRRIGATION	B	RED RUN-OF-RIVER	529	529	529	529	529	529
IRRIGATION	B	SEYMOUR AQUIFER | CLAY COUNTY	500	500	500	500	500	500
		RED BASIN TOTAL	**6,042**	**6,128**	**5,933**	**5,813**	**5,688**	**5,592**
COUNTY-OTHER	B	CROSS TIMBERS AQUIFER | CLAY COUNTY	60	60	60	60	60	60
MINING	B	CROSS TIMBERS AQUIFER | CLAY COUNTY	74	95	72	60	48	48
LIVESTOCK	B	CROSS TIMBERS AQUIFER | CLAY COUNTY	25	25	25	25	25	25
LIVESTOCK	B	LOCAL SURFACE WATER SUPPLY	221	221	221	221	221	221
IRRIGATION	B	CROSS TIMBERS AQUIFER | CLAY COUNTY	325	325	325	325	325	325
		TRINITY BASIN TOTAL	**705**	**726**	**703**	**691**	**679**	**679**
		CLAY COUNTY TOTAL	**6,747**	**6,854**	**6,636**	**6,504**	**6,367**	**6,271**
PADUCAH	B	BLAINE AQUIFER | COTTLE COUNTY	494	494	494	494	494	494
RED RIVER AUTHORITY OF TEXAS	B	OTHER AQUIFER | COTTLE COUNTY	14	14	14	14	14	14
COUNTY-OTHER	B	OTHER AQUIFER | COTTLE COUNTY	200	200	200	200	200	200
MINING	B	BLAINE AQUIFER | COTTLE COUNTY	41	41	38	34	31	31
LIVESTOCK	B	BLAINE AQUIFER | COTTLE COUNTY	380	380	380	380	380	380
LIVESTOCK	B	LOCAL SURFACE WATER SUPPLY	171	171	171	171	171	171
IRRIGATION	B	BLAINE AQUIFER | COTTLE COUNTY	2,700	2,700	2,700	2,700	2,700	2,700
IRRIGATION	B	OTHER AQUIFER | COTTLE COUNTY	1,400	1,400	1,400	1,300	1,300	1,300
IRRIGATION	B	RED RUN-OF-RIVER	11	11	11	11	11	11

Region B Water User Group (WUG) Existing Water Supply

WUG NAME	SOURCE REGION	SOURCE DESCRIPTION	EXISTING SUPPLY (ACRE-FEET PER YEAR)					
			2020	2030	2040	2050	2060	2070
		RED BASIN TOTAL	**5,411**	**5,411**	**5,408**	**5,304**	**5,301**	**5,301**
		COTTLE COUNTY TOTAL	**5,411**	**5,411**	**5,408**	**5,304**	**5,301**	**5,301**
CROWELL	A	GREENBELT LAKE/RESERVOIR	103	103	105	90	84	77
CROWELL	A	OGALLALA AQUIFER | DONLEY COUNTY	63	57	52	41	34	29
RED RIVER AUTHORITY OF TEXAS	A	GREENBELT LAKE/RESERVOIR	195	203	210	181	169	154
RED RIVER AUTHORITY OF TEXAS	A	OGALLALA AQUIFER | DONLEY COUNTY	119	111	104	81	69	58
COUNTY-OTHER	B	SEYMOUR AQUIFER | FOARD COUNTY	20	20	20	20	20	20
MINING	B	OTHER AQUIFER | FOARD COUNTY	12	12	12	12	11	11
LIVESTOCK	B	BLAINE AQUIFER | FOARD COUNTY	23	23	23	23	23	23
LIVESTOCK	B	LOCAL SURFACE WATER SUPPLY	370	370	370	370	370	370
LIVESTOCK	B	SEYMOUR AQUIFER | FOARD COUNTY	8	8	8	8	8	8
IRRIGATION	B	SEYMOUR AQUIFER | FOARD COUNTY	3,300	3,300	3,300	3,300	3,300	3,300
		RED BASIN TOTAL	**4,213**	**4,207**	**4,204**	**4,126**	**4,088**	**4,050**
		FOARD COUNTY TOTAL	**4,213**	**4,207**	**4,204**	**4,126**	**4,088**	**4,050**
QUANAH	A	GREENBELT LAKE/RESERVOIR	295	303	310	272	256	236
QUANAH	A	OGALLALA AQUIFER | DONLEY COUNTY	180	166	154	122	105	88
RED RIVER AUTHORITY OF TEXAS	A	GREENBELT LAKE/RESERVOIR	104	108	112	97	90	83
RED RIVER AUTHORITY OF TEXAS	A	OGALLALA AQUIFER | DONLEY COUNTY	64	60	56	43	37	31
COUNTY-OTHER	A	GREENBELT LAKE/RESERVOIR	30	31	32	28	26	24
COUNTY-OTHER	A	OGALLALA AQUIFER | DONLEY COUNTY	18	17	16	12	11	9
COUNTY-OTHER	B	SEYMOUR AQUIFER | HARDEMAN COUNTY	175	175	175	175	175	175
MANUFACTURING	A	GREENBELT LAKE/RESERVOIR	142	147	152	131	123	112
MANUFACTURING	A	OGALLALA AQUIFER | DONLEY COUNTY	86	81	76	59	50	42
MANUFACTURING	B	SEYMOUR AQUIFER | HARDEMAN COUNTY	300	300	300	300	300	300
MINING	B	BLAINE AQUIFER | HARDEMAN COUNTY	12	12	12	12	12	12
MINING	B	OTHER AQUIFER | HARDEMAN COUNTY	7	7	7	7	7	7
LIVESTOCK	B	BLAINE AQUIFER | HARDEMAN COUNTY	158	158	158	158	158	158
LIVESTOCK	B	LOCAL SURFACE WATER SUPPLY	400	400	400	400	400	400
LIVESTOCK	B	OTHER AQUIFER | HARDEMAN COUNTY	34	34	34	34	34	34
LIVESTOCK	B	SEYMOUR AQUIFER | HARDEMAN COUNTY	57	57	57	57	57	57
IRRIGATION	B	BLAINE AQUIFER | HARDEMAN COUNTY	6,350	6,350	6,350	6,350	6,350	6,350
IRRIGATION	B	RED RUN-OF-RIVER	146	146	146	146	146	146
IRRIGATION	B	SEYMOUR AQUIFER | HARDEMAN COUNTY	6,000	6,000	6,000	6,000	6,000	6,000
		RED BASIN TOTAL	**14,558**	**14,552**	**14,547**	**14,403**	**14,337**	**14,264**
		HARDEMAN COUNTY TOTAL	**14,558**	**14,552**	**14,547**	**14,403**	**14,337**	**14,264**
COUNTY-OTHER	B	OTHER AQUIFER | KING COUNTY	12	12	12	12	12	12
MINING	B	OTHER AQUIFER | KING COUNTY	141	123	107	93	81	81
LIVESTOCK	B	LOCAL SURFACE WATER SUPPLY	55	55	55	55	55	55
LIVESTOCK	B	OTHER AQUIFER | KING COUNTY	100	100	100	100	100	100
		BRAZOS BASIN TOTAL	**308**	**290**	**274**	**260**	**248**	**248**
RED RIVER AUTHORITY OF TEXAS	B	OTHER AQUIFER | KING COUNTY	64	62	62	61	61	61
COUNTY-OTHER	B	BLAINE AQUIFER | KING COUNTY	30	30	30	30	30	30
MINING	B	OTHER AQUIFER | KING COUNTY	239	208	182	158	138	138
LIVESTOCK	B	BLAINE AQUIFER | KING COUNTY	150	150	150	150	150	150

Region B Water User Group (WUG) Existing Water Supply

WUG NAME	SOURCE REGION	SOURCE DESCRIPTION	EXISTING SUPPLY (ACRE-FEET PER YEAR)					
			2020	2030	2040	2050	2060	2070
LIVESTOCK	B	LOCAL SURFACE WATER SUPPLY	87	87	87	87	87	87
LIVESTOCK	B	OTHER AQUIFER | KING COUNTY	30	30	30	30	30	30
		RED BASIN TOTAL	**600**	**567**	**541**	**516**	**496**	**496**
		KING COUNTY TOTAL	**908**	**857**	**815**	**776**	**744**	**744**
NOCONA	B	FARMERS CREEK/NOCONA LAKE/RESERVOIR	1,112	1,101	1,098	1,113	1,113	1,113
NOCONA HILLS WSC	B	TRINITY AQUIFER | MONTAGUE COUNTY	118	118	118	118	118	118
RED RIVER AUTHORITY OF TEXAS	B	TRINITY AQUIFER | MONTAGUE COUNTY	94	102	109	119	127	134
COUNTY-OTHER	B	CROSS TIMBERS AQUIFER | MONTAGUE COUNTY	410	410	410	410	410	410
COUNTY-OTHER	B	FARMERS CREEK/NOCONA LAKE/RESERVOIR	47	46	46	46	46	46
MANUFACTURING	B	FARMERS CREEK/NOCONA LAKE/RESERVOIR	1	1	1	1	1	1
MINING	B	CROSS TIMBERS AQUIFER | MONTAGUE COUNTY	960	960	480	336	384	384
LIVESTOCK	B	CROSS TIMBERS AQUIFER | MONTAGUE COUNTY	57	57	57	57	57	57
LIVESTOCK	B	LOCAL SURFACE WATER SUPPLY	1,221	1,221	1,221	1,221	1,221	1,221
IRRIGATION	B	CROSS TIMBERS AQUIFER | MONTAGUE COUNTY	200	200	200	200	200	200
IRRIGATION	B	FARMERS CREEK/NOCONA LAKE/RESERVOIR	100	100	100	100	100	100
IRRIGATION	B	RED RUN-OF-RIVER	108	108	108	108	108	108
		RED BASIN TOTAL	**4,428**	**4,424**	**3,948**	**3,829**	**3,885**	**3,892**
BOWIE	B	AMON G. CARTER LAKE/RESERVOIR	1,154	1,066	980	892	803	714
SAINT JO	B	TRINITY AQUIFER | MONTAGUE COUNTY	211	211	211	211	211	211
COUNTY-OTHER	B	AMON G. CARTER LAKE/RESERVOIR	116	116	114	114	115	116
COUNTY-OTHER	B	CROSS TIMBERS AQUIFER | MONTAGUE COUNTY	290	290	290	290	290	290
COUNTY-OTHER	B	TRINITY AQUIFER | MONTAGUE COUNTY	500	500	500	500	500	500
MINING	B	CROSS TIMBERS AQUIFER | MONTAGUE COUNTY	1,040	1,040	520	364	416	416
MINING	B	DIRECT REUSE	348	351	349	0	0	0
LIVESTOCK	B	CROSS TIMBERS AQUIFER | MONTAGUE COUNTY	19	19	19	19	19	19
LIVESTOCK	B	LOCAL SURFACE WATER SUPPLY	407	407	407	407	407	407
IRRIGATION	B	CROSS TIMBERS AQUIFER | MONTAGUE COUNTY	150	150	150	150	150	150
IRRIGATION	B	TRINITY AQUIFER | MONTAGUE COUNTY	315	315	315	315	315	315
		TRINITY BASIN TOTAL	**4,550**	**4,465**	**3,855**	**3,262**	**3,226**	**3,138**
		MONTAGUE COUNTY TOTAL	**8,978**	**8,889**	**7,803**	**7,091**	**7,111**	**7,030**
BURKBURNETT	B	LITTLE WICHITA RIVER LAKE/RESERVOIR SYSTEM	1,092	999	949	899	844	654
BURKBURNETT	B	RED INDIRECT REUSE	579	570	564	555	543	533
BURKBURNETT	B	SEYMOUR AQUIFER | WICHITA COUNTY	968	968	968	968	968	968
DEAN DALE SUD	B	LITTLE WICHITA RIVER LAKE/RESERVOIR SYSTEM	92	85	82	79	75	59
DEAN DALE SUD	B	RED INDIRECT REUSE	49	48	49	49	48	48
ELECTRA	B	LITTLE WICHITA RIVER LAKE/RESERVOIR SYSTEM	451	413	394	374	351	273
ELECTRA	B	RED INDIRECT REUSE	240	237	234	231	227	224
HARROLD WSC	B	LITTLE WICHITA RIVER LAKE/RESERVOIR SYSTEM	6	6	6	5	5	4
HARROLD WSC	B	RED INDIRECT REUSE	3	3	3	3	3	3
IOWA PARK	B	LITTLE WICHITA RIVER LAKE/RESERVOIR SYSTEM	705	641	611	579	544	424
IOWA PARK	B	RED INDIRECT REUSE	374	366	362	357	350	346
SHEPPARD AIR FORCE BASE	B	LITTLE WICHITA RIVER LAKE/RESERVOIR SYSTEM	706	630	586	550	515	402
SHEPPARD AIR FORCE BASE	B	RED INDIRECT REUSE	375	360	348	340	332	328
WICHITA FALLS	B	KEMP-DIVERSION LAKE/RESERVOIR SYSTEM	2,948	2,652	2,357	2,063	1,768	1,474
WICHITA FALLS	B	LITTLE WICHITA RIVER LAKE/RESERVOIR SYSTEM	9,931	9,264	8,975	8,685	8,429	6,655
WICHITA FALLS	B	RED INDIRECT REUSE	5,745	5,769	5,807	5,852	5,915	5,954
WICHITA VALLEY WSC	B	LITTLE WICHITA RIVER LAKE/RESERVOIR SYSTEM	679	624	594	568	537	422

Region B Water User Group (WUG) Existing Water Supply

WUG NAME	SOURCE REGION	SOURCE DESCRIPTION	EXISTING SUPPLY (ACRE-FEET PER YEAR)					
			2020	2030	2040	2050	2060	2070
WICHITA VALLEY WSC	B	RED INDIRECT REUSE	361	356	352	351	346	343
COUNTY-OTHER	B	LITTLE WICHITA RIVER LAKE/RESERVOIR SYSTEM	213	197	186	177	167	130
COUNTY-OTHER	B	RED INDIRECT REUSE	114	111	111	109	108	106
COUNTY-OTHER	B	SEYMOUR AQUIFER | WICHITA COUNTY	100	100	100	100	100	100
MANUFACTURING	B	LITTLE WICHITA RIVER LAKE/RESERVOIR SYSTEM	569	563	539	511	481	380
MANUFACTURING	B	RED INDIRECT REUSE	302	322	318	316	311	310
MANUFACTURING	B	SEYMOUR AQUIFER | WICHITA COUNTY	129	129	129	129	129	129
MINING	B	SEYMOUR AQUIFER | WICHITA COUNTY	62	61	55	49	44	44
STEAM ELECTRIC POWER	B	LITTLE WICHITA RIVER LAKE/RESERVOIR SYSTEM	18	17	16	15	15	12
STEAM ELECTRIC POWER	B	RED INDIRECT REUSE	10	10	10	10	9	9
LIVESTOCK	B	CROSS TIMBERS AQUIFER | WICHITA COUNTY	59	59	59	59	59	59
LIVESTOCK	B	LOCAL SURFACE WATER SUPPLY	916	916	916	916	916	916
IRRIGATION	B	CROSS TIMBERS AQUIFER | WICHITA COUNTY	600	600	600	600	600	600
IRRIGATION	B	KEMP-DIVERSION LAKE/RESERVOIR SYSTEM	17,561	15,804	14,048	12,292	10,536	8,780
IRRIGATION	B	RED RUN-OF-RIVER	300	300	300	300	300	300
		RED BASIN TOTAL	**46,257**	**43,180**	**40,628**	**38,091**	**35,575**	**30,989**
		WICHITA COUNTY TOTAL	**46,257**	**43,180**	**40,628**	**38,091**	**35,575**	**30,989**
HARROLD WSC	B	LITTLE WICHITA RIVER LAKE/RESERVOIR SYSTEM	48	45	42	41	38	30
HARROLD WSC	B	RED INDIRECT REUSE	25	25	25	25	24	24
RED RIVER AUTHORITY OF TEXAS	B	SEYMOUR AQUIFER | WILBARGER COUNTY	310	338	365	394	421	444
VERNON	B	SEYMOUR AQUIFER | WILBARGER COUNTY	2,232	2,114	2,087	2,058	2,031	2,022
COUNTY-OTHER	B	RED RUN-OF-RIVER	115	115	115	115	115	115
COUNTY-OTHER	B	SEYMOUR AQUIFER | WILBARGER COUNTY	150	150	150	150	150	149
MANUFACTURING	B	SEYMOUR AQUIFER | WILBARGER COUNTY	958	1,048	1,048	1,048	1,048	1,035
MINING	B	OTHER AQUIFER | WILBARGER COUNTY	10	10	10	10	10	10
MINING	B	RED RUN-OF-RIVER	30	30	30	30	30	30
STEAM ELECTRIC POWER	B	KEMP-DIVERSION LAKE/RESERVOIR SYSTEM	6,010	5,409	4,808	4,207	3,606	3,005
LIVESTOCK	B	LOCAL SURFACE WATER SUPPLY	790	790	790	790	790	790
LIVESTOCK	B	SANTA ROSA LAKE/RESERVOIR	50	50	50	50	50	50
LIVESTOCK	B	SEYMOUR AQUIFER | WILBARGER COUNTY	125	125	125	125	125	125
IRRIGATION	B	OTHER AQUIFER | WILBARGER COUNTY	3,040	3,040	3,040	3,040	3,040	3,040
IRRIGATION	B	RED RUN-OF-RIVER	807	807	807	807	807	807
IRRIGATION	B	SEYMOUR AQUIFER | WILBARGER COUNTY	25,500	25,500	25,500	25,500	25,500	25,500
		RED BASIN TOTAL	**40,200**	**39,596**	**38,992**	**38,390**	**37,785**	**37,176**
		WILBARGER COUNTY TOTAL	**40,200**	**39,596**	**38,992**	**38,390**	**37,785**	**37,176**
BAYLOR SUD	B	SEYMOUR AQUIFER | BAYLOR COUNTY	52	52	52	52	52	52
OLNEY	B	LITTLE WICHITA RIVER LAKE/RESERVOIR SYSTEM	516	487	470	452	432	372
OLNEY	B	OLNEY-COOPER LAKE/RESERVOIR SYSTEM	169	156	143	131	118	105
COUNTY-OTHER	B	CROSS TIMBERS AQUIFER | YOUNG COUNTY	80	80	90	90	90	90
LIVESTOCK	B	LOCAL SURFACE WATER SUPPLY	122	122	122	122	122	122
LIVESTOCK	G	LOCAL SURFACE WATER SUPPLY	0	0	0	0	0	0
IRRIGATION	B	CROSS TIMBERS AQUIFER | YOUNG COUNTY	3	3	3	3	3	3
IRRIGATION	G	OTHER AQUIFER | YOUNG COUNTY	0	0	0	0	0	0
IRRIGATION	G	SEYMOUR AQUIFER | YOUNG COUNTY	0	0	0	0	0	0
		BRAZOS BASIN TOTAL	**942**	**900**	**880**	**850**	**817**	**744**
COUNTY-OTHER	B	CROSS TIMBERS AQUIFER | YOUNG COUNTY	10	10	10	10	10	10
		TRINITY BASIN TOTAL	**10**	**10**	**10**	**10**	**10**	**10**

Region B Water User Group (WUG) Existing Water Supply

WUG NAME	SOURCE REGION	SOURCE DESCRIPTION	EXISTING SUPPLY (ACRE-FEET PER YEAR)					
			2020	2030	2040	2050	2060	2070
YOUNG COUNTY TOTAL			952	910	890	860	827	754
REGION B TOTAL EXISTING WATER SUPPLY			140,450	136,548	131,898	127,387	123,833	117,994

TWDB Report #6
Region B Water User Group (WUG) Needs/Surplus*

	(NEEDS)/SURPLUS (ACRE-FEET PER YEAR)					
	2020	2030	2040	2050	2060	2070
ARCHER COUNTY - BRAZOS BASIN						
BAYLOR SUD	2	2	2	2	2	2
COUNTY-OTHER	0	0	0	0	0	0
MINING	0	0	0	0	0	0
LIVESTOCK	1	1	1	1	1	1
ARCHER COUNTY - RED BASIN						
ARCHER CITY	9	2	1	(6)	(17)	(48)
ARCHER COUNTY MUD 1	(69)	(72)	(73)	(73)	(76)	(86)
BAYLOR SUD	8	8	8	8	8	8
HOLLIDAY	23	10	1	(8)	(20)	(53)
LAKESIDE CITY	40	30	29	24	19	(1)
SCOTLAND	(9)	(66)	(71)	(76)	(84)	(105)
WICHITA VALLEY WSC	437	402	379	356	325	246
WINDTHORST WSC	(32)	(55)	(62)	(69)	(79)	(110)
COUNTY-OTHER	(38)	(19)	(13)	(12)	(11)	(11)
MANUFACTURING	0	0	0	0	0	0
MINING	(284)	(351)	(231)	(175)	(119)	(119)
LIVESTOCK	117	117	117	117	117	117
IRRIGATION	(469)	(527)	(584)	(641)	(699)	(756)
ARCHER COUNTY - TRINITY BASIN						
BAYLOR SUD	2	2	2	2	2	2
COUNTY-OTHER	0	0	0	0	0	0
MINING	(41)	(50)	(34)	(26)	(18)	(18)
LIVESTOCK	2	2	2	2	2	2
BAYLOR COUNTY - BRAZOS BASIN						
BAYLOR SUD	6	6	6	4	3	1
SEYMOUR	110	124	135	136	137	137
COUNTY-OTHER	9	12	13	14	14	15
MINING	4	4	4	4	4	4
LIVESTOCK	0	0	0	0	0	0
IRRIGATION	55	55	55	55	55	55
BAYLOR COUNTY - RED BASIN						
BAYLOR SUD	7	7	8	7	7	7
COUNTY-OTHER	0	0	0	0	0	0
MINING	2	2	3	3	3	3
LIVESTOCK	0	0	0	0	0	0
IRRIGATION	13	13	13	13	13	13
CLAY COUNTY - RED BASIN						
DEAN DALE SUD	121	108	105	96	83	51
HENRIETTA	426	421	433	440	441	441
RED RIVER AUTHORITY OF TEXAS	3	(12)	(18)	(30)	(44)	(89)
WINDTHORST WSC	(15)	(25)	(29)	(31)	(36)	(50)
COUNTY-OTHER	13	9	21	27	28	28
MINING	13	0	15	27	39	39
LIVESTOCK	0	0	0	0	0	0

*WUG supplies and projected demands are entered for each of a WUG's region-county-basin divisions. The needs shown in the WUG Needs/Surplus report are calculated by first deducting the WUG split's projected demand from its total existing water supply volume. If the WUG split has a greater existing supply volume than projected demand in any given decade, this amount is considered a surplus volume. Surplus volumes are shown as positive values, and needs are shown as negative values in parentheses.

Region B Water User Group (WUG) Needs/Surplus*

IRRIGATION	46	41	37	32	28	23
CLAY COUNTY - TRINITY BASIN						
COUNTY-OTHER	0	0	1	2	2	2
MINING	0	0	2	3	5	5
LIVESTOCK	0	0	0	0	0	0
IRRIGATION	0	0	0	0	0	0
COTTLE COUNTY - RED BASIN						
PADUCAH	204	211	212	213	213	213
RED RIVER AUTHORITY OF TEXAS	2	2	2	2	2	2
COUNTY-OTHER	158	159	160	160	160	160
MINING	0	0	0	0	0	0
LIVESTOCK	0	0	0	0	0	0
IRRIGATION	185	185	185	85	85	85
FOARD COUNTY - RED BASIN						
CROWELL	28	27	26	0	(13)	(24)
RED RIVER AUTHORITY OF TEXAS	225	227	228	176	152	126
COUNTY-OTHER	13	12	12	12	12	12
MINING	0	0	0	0	0	0
LIVESTOCK	0	0	0	0	0	0
IRRIGATION	87	87	87	87	87	87
HARDEMAN COUNTY - RED BASIN						
QUANAH	79	78	77	0	(36)	(76)
RED RIVER AUTHORITY OF TEXAS	39	27	17	(23)	(48)	(72)
COUNTY-OTHER	60	69	79	74	77	78
MANUFACTURING	88	45	45	7	(10)	(29)
MINING	2	2	1	1	1	1
LIVESTOCK	3	3	3	3	3	3
IRRIGATION	(2)	(2)	(2)	(2)	(2)	(2)
KING COUNTY - BRAZOS BASIN						
COUNTY-OTHER	4	3	3	3	3	3
MINING	0	0	0	0	0	0
LIVESTOCK	0	0	0	0	0	0
KING COUNTY - RED BASIN						
RED RIVER AUTHORITY OF TEXAS	11	10	10	10	10	10
COUNTY-OTHER	16	14	14	14	14	14
MINING	0	0	0	0	0	0
LIVESTOCK	3	3	3	3	3	3
MONTAGUE COUNTY - RED BASIN						
NOCONA	372	350	348	355	348	342
NOCONA HILLS WSC	13	12	12	11	10	10
RED RIVER AUTHORITY OF TEXAS	16	17	18	20	21	22
COUNTY-OTHER	0	0	7	7	5	2
MANUFACTURING	0	0	0	0	0	0
MINING	(787)	(277)	(291)	4	11	11
LIVESTOCK	0	0	0	0	0	0
IRRIGATION	116	116	116	116	116	116

*WUG supplies and projected demands are entered for each of a WUG's region-county-basin divisions. The needs shown in the WUG Needs/Surplus report are calculated by first deducting the WUG split's projected demand from its total existing water supply volume. If the WUG split has a greater existing supply volume than projected demand in any given decade, this amount is considered a surplus volume. Surplus volumes are shown as positive values, and needs are shown as negative values in parentheses.

Region B Water User Group (WUG) Needs/Surplus*

MONTAGUE COUNTY - TRINITY BASIN						
BOWIE	159	63	(17)	(110)	(208)	(305)
SAINT JO	56	55	56	56	54	53
COUNTY-OTHER	199	200	209	209	206	204
MINING	(504)	51	34	5	12	12
LIVESTOCK	0	0	0	0	0	0
IRRIGATION	173	173	173	173	173	173
WICHITA COUNTY - RED BASIN						
BURKBURNETT	1,178	1,077	1,024	960	872	650
DEAN DALE SUD	60	54	54	50	44	27
ELECTRA	(193)	(252)	(288)	(327)	(369)	(464)
HARROLD WSC	(3)	(4)	(4)	(5)	(5)	(7)
IOWA PARK	195	123	91	51	(4)	(141)
SHEPPARD AIR FORCE BASE	102	39	5	(29)	(70)	(187)
WICHITA FALLS	1,751	698	84	(559)	(1,310)	(3,594)
WICHITA VALLEY WSC	670	611	578	551	510	386
COUNTY-OTHER	394	347	313	287	261	209
MANUFACTURING	(25)	(86)	(114)	(144)	(179)	(281)
MINING	0	0	0	0	0	0
STEAM ELECTRIC POWER	(3)	(4)	(5)	(6)	(7)	(10)
LIVESTOCK	0	0	0	0	0	0
IRRIGATION	(20,695)	(22,452)	(24,208)	(25,964)	(27,720)	(29,476)
WILBARGER COUNTY - RED BASIN						
HARROLD WSC	(21)	(27)	(31)	(35)	(40)	(50)
RED RIVER AUTHORITY OF TEXAS	52	56	61	66	70	70
VERNON	350	192	154	77	13	(26)
COUNTY-OTHER	55	61	69	73	80	88
MANUFACTURING	0	0	0	0	0	(13)
MINING	20	20	21	21	22	22
STEAM ELECTRIC POWER	(1,701)	(2,302)	(2,903)	(3,504)	(4,105)	(4,706)
LIVESTOCK	0	0	0	0	0	0
IRRIGATION	58	58	58	58	58	58
YOUNG COUNTY - BRAZOS BASIN						
BAYLOR SUD	9	9	10	10	9	9
OLNEY	129	85	55	17	(27)	(113)
COUNTY-OTHER	39	29	33	25	17	9
LIVESTOCK	0	0	0	0	0	0
IRRIGATION	0	0	0	0	0	0
YOUNG COUNTY - TRINITY BASIN						
COUNTY-OTHER	10	10	9	9	9	9

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TWDB Report #9

Region B Source Water Balance (Availability - WUG Supply)

GROUNDWATER SOURCE TYPE				SOURCE WATER BALANCE (ACRE-FEET PER YEAR)					
SOURCE NAME	COUNTY	BASIN	SALINITY*	2020	2030	2040	2050	2060	2070
BLAINE AQUIFER	COTTLE	RED	FRESH	11,151	8,006	8,041	8,013	8,048	8,016
BLAINE AQUIFER	FOARD	RED	FRESH	6,559	6,541	6,559	6,541	6,559	6,541
BLAINE AQUIFER	HARDEMAN	RED	FRESH	1,968	1,945	1,968	1,945	1,968	1,945
BLAINE AQUIFER	KING	BRAZOS	FRESH	0	0	0	0	0	0
BLAINE AQUIFER	KING	RED	FRESH	220	220	220	220	220	220
CROSS TIMBERS AQUIFER	ARCHER	BRAZOS	FRESH	4	2	5	6	8	8
CROSS TIMBERS AQUIFER	ARCHER	RED	FRESH	48	46	46	45	45	45
CROSS TIMBERS AQUIFER	ARCHER	TRINITY	FRESH	0	1	1	1	1	1
CROSS TIMBERS AQUIFER	BAYLOR	BRAZOS	FRESH	7	7	7	7	7	7
CROSS TIMBERS AQUIFER	BAYLOR	RED	FRESH	23	23	23	23	23	23
CROSS TIMBERS AQUIFER	CLAY	RED	FRESH	145	16	143	231	319	319
CROSS TIMBERS AQUIFER	CLAY	TRINITY	FRESH	21	0	23	35	47	47
CROSS TIMBERS AQUIFER	MONTAGUE	RED	FRESH	653	653	1,133	1,277	1,229	1,229
CROSS TIMBERS AQUIFER	MONTAGUE	TRINITY	FRESH	221	221	741	897	845	845
CROSS TIMBERS AQUIFER	WICHITA	RED	FRESH	181	181	181	181	181	181
CROSS TIMBERS AQUIFER	YOUNG	BRAZOS	FRESH	567	567	557	557	557	557
CROSS TIMBERS AQUIFER	YOUNG	TRINITY	FRESH	40	40	40	40	40	40
OTHER AQUIFER	COTTLE	RED	FRESH	186	186	186	286	286	286
OTHER AQUIFER	FOARD	RED	FRESH	188	188	188	188	189	189
OTHER AQUIFER	HARDEMAN	RED	FRESH	9	9	9	9	9	9
OTHER AQUIFER	KING	BRAZOS	FRESH	0	18	34	48	60	60
OTHER AQUIFER	KING	RED	FRESH	64	97	123	148	168	168
OTHER AQUIFER	WILBARGER	RED	FRESH	0	0	0	0	0	0
SEYMOUR AQUIFER	ARCHER	RED	FRESH	35	35	35	35	35	35
SEYMOUR AQUIFER	BAYLOR	BRAZOS	FRESH	813	926	573	327	203	526
SEYMOUR AQUIFER	BAYLOR	RED	FRESH	163	165	165	165	165	165
SEYMOUR AQUIFER	CLAY	RED	FRESH	132	122	157	157	157	157
SEYMOUR AQUIFER	FOARD	RED	FRESH	8,569	1,617	2,061	4,738	4,487	615
SEYMOUR AQUIFER	HARDEMAN	RED	FRESH	13,846	6,508	12,353	10,988	13,470	26,336
SEYMOUR AQUIFER	WICHITA	RED	FRESH	1,036	1,037	1,036	1,045	1,050	1,050
SEYMOUR AQUIFER	WILBARGER	RED	FRESH	725	725	725	725	725	725
TRINITY AQUIFER	MONTAGUE	RED	FRESH	60	52	45	35	27	20
TRINITY AQUIFER	MONTAGUE	TRINITY	FRESH	2,588	2,577	2,588	2,577	2,588	2,577
GROUNDWATER TOTAL SOURCE WATER BALANCE				**50,222**	**32,731**	**39,966**	**41,490**	**43,716**	**52,942**

REUSE SOURCE TYPE				SOURCE WATER BALANCE (ACRE-FEET PER YEAR)					
SOURCE NAME	COUNTY	BASIN	SALINITY*	2020	2030	2040	2050	2060	2070
DIRECT REUSE	MONTAGUE	TRINITY	FRESH	0	0	0	0	0	0
INDIRECT REUSE	WICHITA	RED	FRESH	0	0	0	0	0	0
REUSE TOTAL SOURCE WATER BALANCE				**0**	**0**	**0**	**0**	**0**	**0**

SURFACE WATER SOURCE TYPE				SOURCE WATER BALANCE (ACRE-FEET PER YEAR)					
SOURCE NAME	COUNTY	BASIN	SALINITY*	2020	2030	2040	2050	2060	2070
AMON G. CARTER LAKE/RESERVOIR	RESERVOIR	TRINITY	FRESH	0	0	0	0	0	0
BRAZOS LIVESTOCK LOCAL SUPPLY	ARCHER	BRAZOS	FRESH	0	0	0	0	0	0

*Salinity field indicates whether the source availability is considered 'fresh' (less than 1,000 mg/L), 'brackish' (1,000 to 10,000 mg/L), 'saline' (10,001 mg/L to 34,999 mg/L), or 'seawater' (35,000 mg/L or greater). Sources can also be labeled as 'fresh/brackish' or 'brackish/saline', if a combination of the salinity types is appropriate.

Region B Source Water Balance (Availability - WUG Supply)

SURFACE WATER SOURCE TYPE				SOURCE WATER BALANCE (ACRE-FEET PER YEAR)					
SOURCE NAME	COUNTY	BASIN	SALINITY*	2020	2030	2040	2050	2060	2070
BRAZOS LIVESTOCK LOCAL SUPPLY	BAYLOR	BRAZOS	FRESH	43	43	43	43	43	43
BRAZOS LIVESTOCK LOCAL SUPPLY	KING	BRAZOS	FRESH	0	0	0	0	0	0
BRAZOS LIVESTOCK LOCAL SUPPLY	YOUNG	BRAZOS	FRESH	0	0	0	0	0	0
BRAZOS RUN-OF-RIVER	BAYLOR	BRAZOS	FRESH	0	0	0	0	0	0
ELECTRA CITY LAKE/RESERVOIR	RESERVOIR	RED	FRESH	0	0	0	0	0	0
FARMERS CREEK/NOCONA LAKE/RESERVOIR	RESERVOIR	RED	FRESH	0	12	15	0	0	0
KEMP-DIVERSION LAKE/RESERVOIR SYSTEM	RESERVOIR	RED	FRESH	1,860	1,676	1,490	1,303	1,117	930
LITTLE WICHITA RIVER LAKE/RESERVOIR SYSTEM	RESERVOIR	RED	FRESH	0	0	0	0	0	0
NORTH FORK BUFFALO CREEK LAKE/RESERVOIR	RESERVOIR	RED	FRESH	0	0	0	0	0	0
OLNEY-COOPER LAKE/RESERVOIR SYSTEM	RESERVOIR	RED	FRESH	0	0	0	0	0	0
RED LIVESTOCK LOCAL SUPPLY	ARCHER	RED	FRESH	0	0	0	0	0	0
RED LIVESTOCK LOCAL SUPPLY	BAYLOR	RED	FRESH	5	5	5	5	5	5
RED LIVESTOCK LOCAL SUPPLY	CLAY	RED	FRESH	0	0	0	0	0	0
RED LIVESTOCK LOCAL SUPPLY	COTTLE	RED	FRESH	0	0	0	0	0	0
RED LIVESTOCK LOCAL SUPPLY	FOARD	RED	FRESH	0	0	0	0	0	0
RED LIVESTOCK LOCAL SUPPLY	HARDEMAN	RED	FRESH	0	0	0	0	0	0
RED LIVESTOCK LOCAL SUPPLY	KING	RED	FRESH	0	0	0	0	0	0
RED LIVESTOCK LOCAL SUPPLY	MONTAGUE	RED	FRESH	0	0	0	0	0	0
RED LIVESTOCK LOCAL SUPPLY	WICHITA	RED	FRESH	0	0	0	0	0	0
RED LIVESTOCK LOCAL SUPPLY	WILBARGER	RED	FRESH	0	0	0	0	0	0
RED OTHER LOCAL SUPPLY	HARDEMAN	RED	FRESH	7	7	7	7	7	7
RED RUN-OF-RIVER	ARCHER	RED	FRESH	278	278	278	278	278	278
RED RUN-OF-RIVER	CLAY	RED	FRESH	2,351	2,351	2,351	2,351	2,351	2,351
RED RUN-OF-RIVER	COTTLE	RED	FRESH	0	0	0	0	0	0
RED RUN-OF-RIVER	HARDEMAN	RED	FRESH	0	0	0	0	0	0
RED RUN-OF-RIVER	MONTAGUE	RED	FRESH	0	0	0	0	0	0
RED RUN-OF-RIVER	WICHITA	RED	FRESH	3,307	3,307	3,307	3,307	3,307	3,307
RED RUN-OF-RIVER	WILBARGER	RED	FRESH	0	0	0	0	0	0
SANTA ROSA LAKE/RESERVOIR	RESERVOIR	RED	FRESH	0	0	0	0	0	0
TRINITY LIVESTOCK LOCAL SUPPLY	ARCHER	TRINITY	FRESH	0	0	0	0	0	0
TRINITY LIVESTOCK LOCAL SUPPLY	CLAY	TRINITY	FRESH	0	0	0	0	0	0
TRINITY LIVESTOCK LOCAL SUPPLY	MONTAGUE	TRINITY	FRESH	0	0	0	0	0	0
SURFACE WATER TOTAL SOURCE WATER BALANCE				**7,851**	**7,679**	**7,496**	**7,294**	**7,108**	**6,921**

REGION B TOTAL SOURCE WATER BALANCE	**58,073**	**40,410**	**47,462**	**48,784**	**50,824**	**59,863**

*Salinity field indicates whether the source availability is considered 'fresh' (less than 1,000 mg/L), 'brackish' (1,000 to 10,000 mg/L), 'saline' (10,001 mg/L to 34,999 mg/L), or 'seawater' (35,000 mg/L or greater). Sources can also be labeled as 'fresh/brackish' or 'brackish/saline', if a combination of the salinity types is appropriate.

TWDB Report #10a

Region B Water User Group (WUG) Data Comparison to 2016 Regional Water Plan (RWP)*

	2020 PLANNING DECADE			2070 PLANNING DECADE		
	2016 RWP	2021 RWP	DIFFERENCE (%)	2016 RWP	2021 RWP	DIFFERENCE (%)
ARCHER COUNTY | COUNTY-OTHER WUG TYPE						
EXISTING WUG SUPPLY TOTAL	179	95	-46.9%	172	95	-44.8%
PROJECTED DEMAND TOTAL	74	133	79.7%	36	106	194.4%
WATER SUPPLY NEEDS TOTAL	0	38	100.0%	0	11	100.0%
ARCHER COUNTY | IRRIGATION WUG TYPE						
EXISTING WUG SUPPLY TOTAL	726	782	7.7%	370	495	33.8%
PROJECTED DEMAND TOTAL	1,214	1,251	3.0%	1,106	1,251	13.1%
WATER SUPPLY NEEDS TOTAL	488	469	-3.9%	736	756	2.7%
ARCHER COUNTY | LIVESTOCK WUG TYPE						
EXISTING WUG SUPPLY TOTAL	2,589	2,285	-11.7%	2,356	2,285	-3.0%
PROJECTED DEMAND TOTAL	2,096	2,165	3.3%	2,096	2,165	3.3%
WATER SUPPLY NEEDS TOTAL	0	0	0.0%	0	0	0.0%
ARCHER COUNTY | MANUFACTURING WUG TYPE						
EXISTING WUG SUPPLY TOTAL	1	3	200.0%	1	3	200.0%
PROJECTED DEMAND TOTAL	1	3	200.0%	1	3	200.0%
WATER SUPPLY NEEDS TOTAL	0	0	0.0%	0	0	0.0%
ARCHER COUNTY | MINING WUG TYPE						
EXISTING WUG SUPPLY TOTAL	150	80	-46.7%	146	76	-47.9%
PROJECTED DEMAND TOTAL	405	405	0.0%	213	213	0.0%
WATER SUPPLY NEEDS TOTAL	255	325	27.5%	67	137	104.5%
ARCHER COUNTY | MUNICIPAL WUG TYPE						
EXISTING WUG SUPPLY TOTAL	1,109	1,919	73.0%	939	1,405	49.6%
PROJECTED DEMAND TOTAL	1,525	1,508	-1.1%	1,580	1,550	-1.9%
WATER SUPPLY NEEDS TOTAL	535	110	-79.4%	693	403	-41.8%
BAYLOR COUNTY | COUNTY-OTHER WUG TYPE						
EXISTING WUG SUPPLY TOTAL	342	25	-92.7%	223	25	-88.8%
PROJECTED DEMAND TOTAL	131	16	-87.8%	121	10	-91.7%
WATER SUPPLY NEEDS TOTAL	0	0	0.0%	0	0	0.0%
BAYLOR COUNTY | IRRIGATION WUG TYPE						
EXISTING WUG SUPPLY TOTAL	2,922	5,017	71.7%	2,899	5,017	73.1%
PROJECTED DEMAND TOTAL	3,310	4,949	49.5%	3,018	4,949	64.0%
WATER SUPPLY NEEDS TOTAL	388	0	-100.0%	119	0	-100.0%
BAYLOR COUNTY | LIVESTOCK WUG TYPE						
EXISTING WUG SUPPLY TOTAL	1,054	1,190	12.9%	1,054	1,190	12.9%
PROJECTED DEMAND TOTAL	1,184	1,190	0.5%	1,184	1,190	0.5%
WATER SUPPLY NEEDS TOTAL	130	0	-100.0%	130	0	-100.0%
BAYLOR COUNTY | MINING WUG TYPE						
EXISTING WUG SUPPLY TOTAL	15	20	33.3%	15	20	33.3%
PROJECTED DEMAND TOTAL	14	14	0.0%	13	13	0.0%
WATER SUPPLY NEEDS TOTAL	0	0	0.0%	0	0	0.0%
BAYLOR COUNTY | MUNICIPAL WUG TYPE						
EXISTING WUG SUPPLY TOTAL	600	810	35.0%	600	804	34.0%
PROJECTED DEMAND TOTAL	496	687	38.5%	469	659	40.5%

*WUG supplies and projected demands are entered for each of a WUG's region-county-basin divisions. The needs shown in the WUG Data Comparison to 2016 RWP report are calculated by first deducting the WUG split's projected demand from its total existing water supply volume. If the WUG split has a greater existing supply volume than projected demand in any given decade, this amount is considered a surplus volume. Before aggregating the difference between supplies and demands to the WUG county and category level, calculated surpluses are updated to zero so that only the WUGs with needs in the decade are included with the Needs totals.

Region B Water User Group (WUG) Data Comparison to 2016 Regional Water Plan (RWP)*

	2020 PLANNING DECADE			2070 PLANNING DECADE		
	2016 RWP	2021 RWP	DIFFERENCE (%)	2016 RWP	2021 RWP	DIFFERENCE (%)
WATER SUPPLY NEEDS TOTAL	0	0	0.0%	0	0	0.0%
CLAY COUNTY | COUNTY-OTHER WUG TYPE						
EXISTING WUG SUPPLY TOTAL	643	464	-27.8%	609	464	-23.8%
PROJECTED DEMAND TOTAL	577	451	-21.8%	547	434	-20.7%
WATER SUPPLY NEEDS TOTAL	0	0	0.0%	0	0	0.0%
CLAY COUNTY | IRRIGATION WUG TYPE						
EXISTING WUG SUPPLY TOTAL	1,459	1,675	14.8%	1,433	1,652	15.3%
PROJECTED DEMAND TOTAL	1,438	1,629	13.3%	1,324	1,629	23.0%
WATER SUPPLY NEEDS TOTAL	0	0	0.0%	0	0	0.0%
CLAY COUNTY | LIVESTOCK WUG TYPE						
EXISTING WUG SUPPLY TOTAL	2,092	2,101	0.4%	2,092	2,101	0.4%
PROJECTED DEMAND TOTAL	2,092	2,101	0.4%	2,092	2,101	0.4%
WATER SUPPLY NEEDS TOTAL	0	0	0.0%	0	0	0.0%
CLAY COUNTY | MINING WUG TYPE						
EXISTING WUG SUPPLY TOTAL	786	626	-20.4%	401	401	0.0%
PROJECTED DEMAND TOTAL	613	613	0.0%	357	357	0.0%
WATER SUPPLY NEEDS TOTAL	0	0	0.0%	0	0	0.0%
CLAY COUNTY | MUNICIPAL WUG TYPE						
EXISTING WUG SUPPLY TOTAL	1,384	1,881	35.9%	1,350	1,653	22.4%
PROJECTED DEMAND TOTAL	962	1,346	39.9%	927	1,300	40.2%
WATER SUPPLY NEEDS TOTAL	45	15	-66.7%	64	139	117.2%
COTTLE COUNTY | COUNTY-OTHER WUG TYPE						
EXISTING WUG SUPPLY TOTAL	200	200	0.0%	200	200	0.0%
PROJECTED DEMAND TOTAL	46	42	-8.7%	43	40	-7.0%
WATER SUPPLY NEEDS TOTAL	0	0	0.0%	0	0	0.0%
COTTLE COUNTY | IRRIGATION WUG TYPE						
EXISTING WUG SUPPLY TOTAL	4,013	4,111	2.4%	3,713	4,011	8.0%
PROJECTED DEMAND TOTAL	4,004	3,926	-1.9%	3,655	3,926	7.4%
WATER SUPPLY NEEDS TOTAL	0	0	0.0%	0	0	0.0%
COTTLE COUNTY | LIVESTOCK WUG TYPE						
EXISTING WUG SUPPLY TOTAL	544	551	1.3%	544	551	1.3%
PROJECTED DEMAND TOTAL	544	551	1.3%	544	551	1.3%
WATER SUPPLY NEEDS TOTAL	0	0	0.0%	0	0	0.0%
COTTLE COUNTY | MINING WUG TYPE						
EXISTING WUG SUPPLY TOTAL	41	41	0.0%	31	31	0.0%
PROJECTED DEMAND TOTAL	41	41	0.0%	31	31	0.0%
WATER SUPPLY NEEDS TOTAL	0	0	0.0%	0	0	0.0%
COTTLE COUNTY | MUNICIPAL WUG TYPE						
EXISTING WUG SUPPLY TOTAL	494	508	2.8%	494	508	2.8%
PROJECTED DEMAND TOTAL	297	302	1.7%	288	293	1.7%
WATER SUPPLY NEEDS TOTAL	0	0	0.0%	0	0	0.0%
FOARD COUNTY | COUNTY-OTHER WUG TYPE						
EXISTING WUG SUPPLY TOTAL	85	20	-76.5%	85	20	-76.5%
PROJECTED DEMAND TOTAL	75	7	-90.7%	72	8	-88.9%

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Region B Water User Group (WUG) Data Comparison to 2016 Regional Water Plan (RWP)*

	2020 PLANNING DECADE			2070 PLANNING DECADE		
	2016 RWP	2021 RWP	DIFFERENCE (%)	2016 RWP	2021 RWP	DIFFERENCE (%)
WATER SUPPLY NEEDS TOTAL	0	0	0.0%	0	0	0.0%
FOARD COUNTY | IRRIGATION WUG TYPE						
EXISTING WUG SUPPLY TOTAL	4,511	3,300	-26.8%	4,511	3,300	-26.8%
PROJECTED DEMAND TOTAL	3,939	3,213	-18.4%	3,595	3,213	-10.6%
WATER SUPPLY NEEDS TOTAL	0	0	0.0%	0	0	0.0%
FOARD COUNTY | LIVESTOCK WUG TYPE						
EXISTING WUG SUPPLY TOTAL	399	401	0.5%	399	401	0.5%
PROJECTED DEMAND TOTAL	399	401	0.5%	399	401	0.5%
WATER SUPPLY NEEDS TOTAL	0	0	0.0%	0	0	0.0%
FOARD COUNTY | MINING WUG TYPE						
EXISTING WUG SUPPLY TOTAL	12	12	0.0%	11	11	0.0%
PROJECTED DEMAND TOTAL	12	12	0.0%	11	11	0.0%
WATER SUPPLY NEEDS TOTAL	0	0	0.0%	0	0	0.0%
FOARD COUNTY | MUNICIPAL WUG TYPE						
EXISTING WUG SUPPLY TOTAL	138	480	247.8%	131	318	142.7%
PROJECTED DEMAND TOTAL	138	227	64.5%	131	216	64.9%
WATER SUPPLY NEEDS TOTAL	0	0	0.0%	0	24	100.0%
HARDEMAN COUNTY | COUNTY-OTHER WUG TYPE						
EXISTING WUG SUPPLY TOTAL	140	223	59.3%	140	208	48.6%
PROJECTED DEMAND TOTAL	130	163	25.4%	131	130	-0.8%
WATER SUPPLY NEEDS TOTAL	0	0	0.0%	0	0	0.0%
HARDEMAN COUNTY | IRRIGATION WUG TYPE						
EXISTING WUG SUPPLY TOTAL	5,448	12,496	129.4%	5,448	12,496	129.4%
PROJECTED DEMAND TOTAL	7,939	12,498	57.4%	7,246	12,498	72.5%
WATER SUPPLY NEEDS TOTAL	2,491	2	-99.9%	1,798	2	-99.9%
HARDEMAN COUNTY | LIVESTOCK WUG TYPE						
EXISTING WUG SUPPLY TOTAL	631	649	2.9%	631	649	2.9%
PROJECTED DEMAND TOTAL	631	646	2.4%	631	646	2.4%
WATER SUPPLY NEEDS TOTAL	0	0	0.0%	0	0	0.0%
HARDEMAN COUNTY | MANUFACTURING WUG TYPE						
EXISTING WUG SUPPLY TOTAL	276	528	91.3%	332	454	36.7%
PROJECTED DEMAND TOTAL	276	440	59.4%	332	483	45.5%
WATER SUPPLY NEEDS TOTAL	0	0	0.0%	0	29	100.0%
HARDEMAN COUNTY | MINING WUG TYPE						
EXISTING WUG SUPPLY TOTAL	19	19	0.0%	19	19	0.0%
PROJECTED DEMAND TOTAL	17	17	0.0%	18	18	0.0%
WATER SUPPLY NEEDS TOTAL	0	0	0.0%	0	0	0.0%
HARDEMAN COUNTY | MUNICIPAL WUG TYPE						
EXISTING WUG SUPPLY TOTAL	507	643	26.8%	507	438	-13.6%
PROJECTED DEMAND TOTAL	462	525	13.6%	462	586	26.8%
WATER SUPPLY NEEDS TOTAL	0	0	0.0%	0	148	100.0%
KING COUNTY | COUNTY-OTHER WUG TYPE						
EXISTING WUG SUPPLY TOTAL	281	42	-85.1%	281	42	-85.1%
PROJECTED DEMAND TOTAL	79	22	-72.2%	80	25	-68.8%

*WUG supplies and projected demands are entered for each of a WUG's region-county-basin divisions. The needs shown in the WUG Data Comparison to 2016 RWP report are calculated by first deducting the WUG split's projected demand from its total existing water supply volume. If the WUG split has a greater existing supply volume than projected demand in any given decade, this amount is considered a surplus volume. Before aggregating the difference between supplies and demands to the WUG county and category level, calculated surpluses are updated to zero so that only the WUGs with needs in the decade are included with the Needs totals.

Region B Water User Group (WUG) Data Comparison to 2016 Regional Water Plan (RWP)*

	2020 PLANNING DECADE			2070 PLANNING DECADE		
	2016 RWP	2021 RWP	DIFFERENCE (%)	2016 RWP	2021 RWP	DIFFERENCE (%)
WATER SUPPLY NEEDS TOTAL	0	0	0.0%	0	0	0.0%
KING COUNTY | IRRIGATION WUG TYPE						
EXISTING WUG SUPPLY TOTAL	28	0	-100.0%	28	0	-100.0%
PROJECTED DEMAND TOTAL	28	0	-100.0%	28	0	-100.0%
WATER SUPPLY NEEDS TOTAL	0	0	0.0%	0	0	0.0%
KING COUNTY | LIVESTOCK WUG TYPE						
EXISTING WUG SUPPLY TOTAL	394	422	7.1%	394	422	7.1%
PROJECTED DEMAND TOTAL	394	419	6.3%	394	419	6.3%
WATER SUPPLY NEEDS TOTAL	0	0	0.0%	0	0	0.0%
KING COUNTY | MINING WUG TYPE						
EXISTING WUG SUPPLY TOTAL	380	380	0.0%	219	219	0.0%
PROJECTED DEMAND TOTAL	380	380	0.0%	219	219	0.0%
WATER SUPPLY NEEDS TOTAL	0	0	0.0%	0	0	0.0%
KING COUNTY | MUNICIPAL WUG TYPE						
EXISTING WUG SUPPLY TOTAL	0	64	100.0%	0	61	100.0%
PROJECTED DEMAND TOTAL	0	53	100.0%	0	51	100.0%
WATER SUPPLY NEEDS TOTAL	0	0	0.0%	0	0	0.0%
MONTAGUE COUNTY | COUNTY-OTHER WUG TYPE						
EXISTING WUG SUPPLY TOTAL	1,383	1,363	-1.4%	1,385	1,362	-1.7%
PROJECTED DEMAND TOTAL	1,312	1,164	-11.3%	1,320	1,156	-12.4%
WATER SUPPLY NEEDS TOTAL	0	0	0.0%	0	0	0.0%
MONTAGUE COUNTY | IRRIGATION WUG TYPE						
EXISTING WUG SUPPLY TOTAL	873	873	0.0%	873	873	0.0%
PROJECTED DEMAND TOTAL	872	584	-33.0%	872	584	-33.0%
WATER SUPPLY NEEDS TOTAL	0	0	0.0%	0	0	0.0%
MONTAGUE COUNTY | LIVESTOCK WUG TYPE						
EXISTING WUG SUPPLY TOTAL	1,715	1,704	-0.6%	1,715	1,704	-0.6%
PROJECTED DEMAND TOTAL	1,591	1,704	7.1%	1,591	1,704	7.1%
WATER SUPPLY NEEDS TOTAL	0	0	0.0%	0	0	0.0%
MONTAGUE COUNTY | MANUFACTURING WUG TYPE						
EXISTING WUG SUPPLY TOTAL	6	1	-83.3%	12	1	-91.7%
PROJECTED DEMAND TOTAL	5	1	-80.0%	10	1	-90.0%
WATER SUPPLY NEEDS TOTAL	0	0	0.0%	0	0	0.0%
MONTAGUE COUNTY | MINING WUG TYPE						
EXISTING WUG SUPPLY TOTAL	2,324	2,348	1.0%	800	800	0.0%
PROJECTED DEMAND TOTAL	3,639	3,639	0.0%	777	777	0.0%
WATER SUPPLY NEEDS TOTAL	1,315	1,291	-1.8%	0	0	0.0%
MONTAGUE COUNTY | MUNICIPAL WUG TYPE						
EXISTING WUG SUPPLY TOTAL	2,548	2,689	5.5%	2,274	2,290	0.7%
PROJECTED DEMAND TOTAL	1,828	2,073	13.4%	1,884	2,168	15.1%
WATER SUPPLY NEEDS TOTAL	0	0	0.0%	0	305	100.0%
WICHITA COUNTY | COUNTY-OTHER WUG TYPE						
EXISTING WUG SUPPLY TOTAL	282	427	51.4%	253	336	32.8%
PROJECTED DEMAND TOTAL	333	33	-90.1%	367	127	-65.4%

*WUG supplies and projected demands are entered for each of a WUG's region-county-basin divisions. The needs shown in the WUG Data Comparison to 2016 RWP report are calculated by first deducting the WUG split's projected demand from its total existing water supply volume. If the WUG split has a greater existing supply volume than projected demand in any given decade, this amount is considered a surplus volume. Before aggregating the difference between supplies and demands to the WUG county and category level, calculated surpluses are updated to zero so that only the WUGs with needs in the decade are included with the Needs totals.

Region B Water User Group (WUG) Data Comparison to 2016 Regional Water Plan (RWP)*

	2020 PLANNING DECADE			2070 PLANNING DECADE		
	2016 RWP	2021 RWP	DIFFERENCE (%)	2016 RWP	2021 RWP	DIFFERENCE (%)
WATER SUPPLY NEEDS TOTAL	51	0	-100.0%	114	0	-100.0%
WICHITA COUNTY | IRRIGATION WUG TYPE						
EXISTING WUG SUPPLY TOTAL	27,198	18,461	-32.1%	14,739	9,680	-34.3%
PROJECTED DEMAND TOTAL	45,267	39,156	-13.5%	42,927	39,156	-8.8%
WATER SUPPLY NEEDS TOTAL	18,069	20,695	14.5%	28,188	29,476	4.6%
WICHITA COUNTY | LIVESTOCK WUG TYPE						
EXISTING WUG SUPPLY TOTAL	956	975	2.0%	956	975	2.0%
PROJECTED DEMAND TOTAL	917	975	6.3%	917	975	6.3%
WATER SUPPLY NEEDS TOTAL	0	0	0.0%	0	0	0.0%
WICHITA COUNTY | MANUFACTURING WUG TYPE						
EXISTING WUG SUPPLY TOTAL	1,489	1,000	-32.8%	1,476	819	-44.5%
PROJECTED DEMAND TOTAL	2,743	1,025	-62.6%	3,162	1,100	-65.2%
WATER SUPPLY NEEDS TOTAL	1,254	25	-98.0%	1,686	281	-83.3%
WICHITA COUNTY | MINING WUG TYPE						
EXISTING WUG SUPPLY TOTAL	62	62	0.0%	44	44	0.0%
PROJECTED DEMAND TOTAL	62	62	0.0%	44	44	0.0%
WATER SUPPLY NEEDS TOTAL	0	0	0.0%	0	0	0.0%
WICHITA COUNTY | MUNICIPAL WUG TYPE						
EXISTING WUG SUPPLY TOTAL	14,201	25,304	78.2%	12,543	19,114	52.4%
PROJECTED DEMAND TOTAL	21,163	21,544	1.8%	22,154	22,444	1.3%
WATER SUPPLY NEEDS TOTAL	7,429	196	-97.4%	9,778	4,393	-55.1%
WICHITA COUNTY | STEAM ELECTRIC POWER WUG TYPE						
EXISTING WUG SUPPLY TOTAL	185	28	-84.9%	156	21	-86.5%
PROJECTED DEMAND TOTAL	360	31	-91.4%	360	31	-91.4%
WATER SUPPLY NEEDS TOTAL	175	3	-98.3%	204	10	-95.1%
WILBARGER COUNTY | COUNTY-OTHER WUG TYPE						
EXISTING WUG SUPPLY TOTAL	515	265	-48.5%	512	264	-48.4%
PROJECTED DEMAND TOTAL	430	210	-51.2%	471	176	-62.6%
WATER SUPPLY NEEDS TOTAL	0	0	0.0%	0	0	0.0%
WILBARGER COUNTY | IRRIGATION WUG TYPE						
EXISTING WUG SUPPLY TOTAL	30,521	29,347	-3.8%	29,015	29,347	1.1%
PROJECTED DEMAND TOTAL	31,603	29,289	-7.3%	28,843	29,289	1.5%
WATER SUPPLY NEEDS TOTAL	1,082	0	-100.0%	0	0	0.0%
WILBARGER COUNTY | LIVESTOCK WUG TYPE						
EXISTING WUG SUPPLY TOTAL	913	965	5.7%	913	965	5.7%
PROJECTED DEMAND TOTAL	913	965	5.7%	913	965	5.7%
WATER SUPPLY NEEDS TOTAL	0	0	0.0%	0	0	0.0%
WILBARGER COUNTY | MANUFACTURING WUG TYPE						
EXISTING WUG SUPPLY TOTAL	1,133	958	-15.4%	1,368	1,035	-24.3%
PROJECTED DEMAND TOTAL	1,133	958	-15.4%	1,511	1,048	-30.6%
WATER SUPPLY NEEDS TOTAL	0	0	0.0%	143	13	-90.9%
WILBARGER COUNTY | MINING WUG TYPE						
EXISTING WUG SUPPLY TOTAL	40	40	0.0%	40	40	0.0%
PROJECTED DEMAND TOTAL	20	20	0.0%	18	18	0.0%

*WUG supplies and projected demands are entered for each of a WUG's region-county-basin divisions. The needs shown in the WUG Data Comparison to 2016 RWP report are calculated by first deducting the WUG split's projected demand from its total existing water supply volume. If the WUG split has a greater existing supply volume than projected demand in any given decade, this amount is considered a surplus volume. Before aggregating the difference between supplies and demands to the WUG county and category level, calculated surpluses are updated to zero so that only the WUGs with needs in the decade are included with the Needs totals.

Region B Water User Group (WUG) Data Comparison to 2016 Regional Water Plan (RWP)*

	2020 PLANNING DECADE			2070 PLANNING DECADE		
	2016 RWP	2021 RWP	DIFFERENCE (%)	2016 RWP	2021 RWP	DIFFERENCE (%)
WATER SUPPLY NEEDS TOTAL	0	0	0.0%	0	0	0.0%
WILBARGER COUNTY | MUNICIPAL WUG TYPE						
EXISTING WUG SUPPLY TOTAL	2,087	2,615	25.3%	1,855	2,520	35.8%
PROJECTED DEMAND TOTAL	1,883	2,234	18.6%	2,049	2,526	23.3%
WATER SUPPLY NEEDS TOTAL	0	21	100.0%	194	76	-60.8%
WILBARGER COUNTY | STEAM ELECTRIC POWER WUG TYPE						
EXISTING WUG SUPPLY TOTAL	8,886	6,010	-32.4%	4,663	3,005	-35.6%
PROJECTED DEMAND TOTAL	10,000	7,711	-22.9%	10,000	7,711	-22.9%
WATER SUPPLY NEEDS TOTAL	1,114	1,701	52.7%	5,337	4,706	-11.8%
YOUNG COUNTY | COUNTY-OTHER WUG TYPE						
EXISTING WUG SUPPLY TOTAL	90	90	0.0%	100	100	0.0%
PROJECTED DEMAND TOTAL	65	41	-36.9%	105	82	-21.9%
WATER SUPPLY NEEDS TOTAL	0	0	0.0%	5	0	-100.0%
YOUNG COUNTY | IRRIGATION WUG TYPE						
EXISTING WUG SUPPLY TOTAL	0	3	100.0%	0	3	100.0%
PROJECTED DEMAND TOTAL	0	3	100.0%	0	3	100.0%
WATER SUPPLY NEEDS TOTAL	0	0	0.0%	0	0	0.0%
YOUNG COUNTY | LIVESTOCK WUG TYPE						
EXISTING WUG SUPPLY TOTAL	0	122	100.0%	0	122	100.0%
PROJECTED DEMAND TOTAL	0	122	100.0%	0	122	100.0%
WATER SUPPLY NEEDS TOTAL	0	0	0.0%	0	0	0.0%
YOUNG COUNTY | MUNICIPAL WUG TYPE						
EXISTING WUG SUPPLY TOTAL	908	737	-18.8%	863	529	-38.7%
PROJECTED DEMAND TOTAL	557	599	7.5%	590	633	7.3%
WATER SUPPLY NEEDS TOTAL	0	0	0.0%	0	113	100.0%
REGION B						
EXISTING WUG SUPPLY TOTAL	132,907	140,450	5.7%	109,333	117,994	7.9%
PROJECTED DEMAND TOTAL	162,659	156,489	-3.8%	154,279	154,535	0.2%
WATER SUPPLY NEEDS TOTAL	34,821	24,891	-28.5%	49,256	41,022	-16.7%

*WUG supplies and projected demands are entered for each of a WUG's region-county-basin divisions. The needs shown in the WUG Data Comparison to 2016 RWP report are calculated by first deducting the WUG split's projected demand from its total existing water supply volume. If the WUG split has a greater existing supply volume than projected demand in any given decade, this amount is considered a surplus volume. Before aggregating the difference between supplies and demands to the WUG county and category level, calculated surpluses are updated to zero so that only the WUGs with needs in the decade are included with the Needs totals.

TWDB Report #10b
Region B Source Data Comparison to 2016 Regional Water Plan (RWP)

	2020 PLANNING DECADE			2070 PLANNING DECADE		
	2016 RWP	2021 RWP	DIFFERENCE (%)	2016 RWP	2021 RWP	DIFFERENCE (%)
ARCHER COUNTY						
GROUNDWATER AVAILABILITY TOTAL (acre-feet per year)	660	660	0.0%	660	660	0.0%
SURFACE WATER AVAILABILITY TOTAL (acre-feet per year)	2,724	2,375	-12.8%	2,724	2,375	-12.8%
BAYLOR COUNTY						
GROUNDWATER AVAILABILITY TOTAL (acre-feet per year)	3,870	7,275	88.0%	3,847	6,990	81.7%
SURFACE WATER AVAILABILITY TOTAL (acre-feet per year)	916	964	5.2%	916	964	5.2%
CLAY COUNTY						
GROUNDWATER AVAILABILITY TOTAL (acre-feet per year)	2,787	2,787	0.0%	2,787	2,787	0.0%
SURFACE WATER AVAILABILITY TOTAL (acre-feet per year)	6,096	5,772	-5.3%	6,096	5,772	-5.3%
COTTLE COUNTY						
GROUNDWATER AVAILABILITY TOTAL (acre-feet per year)	6,269	16,566	164.3%	6,269	13,421	114.1%
SURFACE WATER AVAILABILITY TOTAL (acre-feet per year)	462	182	-60.6%	462	182	-60.6%
FOARD COUNTY						
GROUNDWATER AVAILABILITY TOTAL (acre-feet per year)	5,129	18,679	264.2%	4,914	10,707	117.9%
SURFACE WATER AVAILABILITY TOTAL (acre-feet per year)	368	370	0.5%	368	370	0.5%
HARDEMAN COUNTY						
GROUNDWATER AVAILABILITY TOTAL (acre-feet per year)	5,678	28,916	409.3%	5,679	41,383	628.7%
SURFACE WATER AVAILABILITY TOTAL (acre-feet per year)	555	553	-0.4%	555	553	-0.4%
KING COUNTY						
GROUNDWATER AVAILABILITY TOTAL (acre-feet per year)	11,490	1,050	-90.9%	11,490	1,050	-90.9%
SURFACE WATER AVAILABILITY TOTAL (acre-feet per year)	694	142	-79.5%	694	142	-79.5%
MONTAGUE COUNTY						
GROUNDWATER AVAILABILITY TOTAL (acre-feet per year)	6,674	7,886	18.2%	6,674	7,875	18.0%
REUSE AVAILABILITY TOTAL (acre-feet per year)	324	348	7.4%	0	0	0.0%
SURFACE WATER AVAILABILITY TOTAL (acre-feet per year)	1,773	1,736	-2.1%	1,773	1,736	-2.1%
RESERVOIR COUNTY						
SURFACE WATER AVAILABILITY TOTAL (acre-feet per year)	59,412	48,674	-18.1%	38,771	27,770	-28.4%
WICHITA COUNTY						
GROUNDWATER AVAILABILITY TOTAL (acre-feet per year)	3,135	3,135	0.0%	3,131	3,131	0.0%
SURFACE WATER AVAILABILITY TOTAL (acre-feet per year)	10,672	4,523	-57.6%	10,672	4,523	-57.6%
WILBARGER COUNTY						
GROUNDWATER AVAILABILITY TOTAL (acre-feet per year)	34,021	33,050	-2.9%	33,525	33,050	-1.4%
SURFACE WATER AVAILABILITY TOTAL (acre-feet per year)	2,587	1,742	-32.7%	2,587	1,742	-32.7%
YOUNG COUNTY						
SURFACE WATER AVAILABILITY TOTAL (acre-feet per year)	321	122	-62.0%	321	122	-62.0%
REGION B						
GROUNDWATER AVAILABILITY TOTAL (acre-feet per year)	79,713	120,004	50.5%	78,976	121,054	53.3%
REUSE AVAILABILITY TOTAL (acre-feet per year)	324	348	7.4%	0	0	NaN
SURFACE WATER AVAILABILITY TOTAL (acre-feet per year)	86,580	67,155	-22.4%	65,939	46,251	-29.9%

APPENDIX B
WAM Modification Request and TWDB Approval

Regional Water Planning Group - Area B

in cooperation with the Texas Water Development Board

Post Office Box 240
Wichita Falls, Texas
76307-0240
3000 Hammon Road
76310-7500
Phone (940) 723-2236
Fax (940) 723-8531
rwpg-b@rra.texas.gov

January 10, 2018

Mr. Jeff Walker
Executive Administrator
Texas Water Development Board
P.O. Box 13231
Austin, Texas 78711-3231

Re: Hydrologic Variance Requests for Water Availability Determination of Current Surface Water Supplies in the Region B

Deàr Mr. Walker:

Surface water supplies in Region B are obtained from the Red River Basin and Trinity River Basin. A small portion of the region lies in the Brazos River Basin, but there is little surface water supplied to Region B from this river basin. The major surface water supplies in Region B include the Wichita System (Lakes Arrowhead and Kickapoo) and the Lake Kemp-Diversion system in the Red River Basin and Lake Amon Carter in the Trinity River Basin. Water users in Region B also receive water from Greenbelt Reservoir in the Panhandle Region and smaller in-region lakes (e.g., Lakes Nocona and Olney-Cooper).

In accordance with regional planning rules and guidelines, surface water supplies must be determined using the latest version of the TCEQ Water Availability Models (WAMs) with full authorization unless a hydrologic variance is granted by the TWDB. Regional planning rules also require the use and reporting of the firm yield for all surface water reservoirs.

The TCEQ-approved WAMs for the Red River and Trinity River Basins, with modifications, have been used for determining the available surface water supplies for the region for previously developed water plans. The period of record for the hydrology for the TCEQ-approved Red WAM is 1948 to 1998 and the period of record for the hydrology for the TCEQ-approved Trinity WAM is 1940 to 1996. However, these modifications alone do not capture the recent drought conditions and the record low inflows experienced throughout the region.

Considering the limited hydrologic record for the Red River WAM, the Region B Planning Group respectfully requests the following hydrologic variance requests. For consistency with adjoining regions, Region B intends to use the modified version of the Trinity River WAM developed for Region C to assess surface water supplies in the Trinity River Basin. As intended by Senate Bill 1, the assessment of surface water availability in Region B will be conducted to accurately reflect water supplies that are available for use.

Safe Yield

Region B requests the use of safe yield or other defined reliable supply (risk assessment or minimum reserve capacity) for the allocation and distribution of surface water supplies from reservoirs within the region. Safe yield is the amount of water that can be used during the critical drought while leaving a one-year supply available at the end of the critical drought. Safe yield is consistent with the current operations of many surface water sources in the region and previous regional water planning. In accordance with the TWDB planning rules, firm yields will also be determined and reported in the plan.

Red River Basin

During the 2016 round of planning, yield analyses were conducted for reservoirs in the Red River Basin in Region B using reservoir-specific operation models with hydrology from the Red River WAM through 1998 and calculated inflows from 1999 to 2013. After this analysis was completed, drought conditions and record low inflows persisted in the region into 2015, impacting the reliable supply from these sources. By June 2015, most of the area lakes refilled or nearly filled, signaling the end of the drought of record. Considering this, it is proposed to extend the hydrology for Region B water supply reservoirs in the Red River Basin through 2015. The reservoir-specific operation models will be used to determine the firm and safe yields of these sources.

City of Wichita Falls Supplies

During the drought from 2011-2015, Wichita Falls' water sources were significantly impacted. Operations and treatment became much more difficult as the capacities of the lakes continued to decline. To maintain operations and treatability of these supplies, it is requested that the reliable supplies for Lakes Arrowhead, Kickapoo, and Kemp-Diversion system be calculated maintaining a 20 percent reserve capacity. This provides a reasonable estimate of the minimum useable quantity of water available to the City of Wichita Falls. The reservoir operation models discussed above (extended hydrology through 2015) will be used to assess the reliable supplies of these sources.

City of Olney Supplies

The City of Olney experienced similar drought conditions as the City of Wichita Falls which impacted their system of Lakes Olney and Cooper. It is requested that supplies be calculated using a reservoir operation model with hydrology from the Red River WAM through 1998 and calculated inflows from 1999 to 2015 developed for their Long-Range Water Supply Study.

Greenbelt Reservoir

For Greenbelt Reservoir, it is requested to use the supplies developed by the Panhandle Water Planning Group.

Run of the river water rights will be evaluated using the TCEQ-approved Red River WAM.

Trinity River Basin

Supplies from Lake Amon Carter and run of the river water rights will be evaluated using the Trinity River WAM modified by Region C.

Please contact Ms. Simone Kiel of Freese and Nichols, Inc. at (817) 735-7446 if you have any questions regarding our request.

Sincerely,

REGIONAL WATER PLANNING GROUP – AREA B

Russell Schreiber
Chair

Texas Water Development Board

P.O. Box 13231, 1700 N. Congress Ave.
Austin, TX 78711-3231, www.twdb.texas.gov
Phone (512) 463-7847, Fax (512) 475-2053

June 27, 2018

Mr. Russell Schreiber
Region B Chair
City of Wichita Falls
P.O. Box 1431
Wichita Falls, Texas 76307

RE: Region B Regional Water Planning Group (RWPG) request for approval to modify existing surface water availability hydrologic assumptions for development of the 2021 Region B Regional Water Plan (RWP)

Dear Mr. Schreiber:

The Texas Water Development Board (TWDB) has reviewed Region B's request dated January 10, 2018 for approval of alternative hydrologic assumptions to be used in determining existing surface water source availability. This letter confirms that the TWDB approves the following assumptions:

1. The use of a one-year safe yield for all existing Region B reservoirs within the Red River Basin, except for Lake Arrowhead, Lake Kickapoo, and the Kemp-Diversion reservoir system.
2. The use of a 20 percent capacity safe yield for the City of Wichita Falls' water supply sources including Lake Arrowhead, Lake Kickapoo, and the Kemp-Diversion reservoir system.
3. The use of four reservoir-specific operation models with extended hydrology through 2015.
4. The use of surface water availabilities for Greenbelt Reservoir, based upon the hydrologic variance approved for use by the Region A RWPG.
5. The use of surface water availabilities for Lake Amon G. Carter, based upon the hydrologic variance approved for use by the Region C RWPG.

Although the TWDB approves the use of safe yield (a one-year reserve or a 20 percent capacity reserve, as specified above) for developing estimates of certain surface water availabilities, firm yield for each reservoir must still be reported to TWDB in the online planning database and plan documents.

For the purpose of evaluating potentially feasible water management strategies, the appropriate Texas Commission on Environmental Quality's WAM RUN3 is to be used,

unless a hydrologic variance request for future surface water source availabilities is submitted and approved.

While the TWDB authorizes the above modifications to evaluate existing surface water availabilities for the development of the 2021 Region B RWP, it is the responsibility of the RWPG to ensure that the resulting estimates of existing surface water availabilities are reasonable for drought of record planning purposes and will reflect conditions expected in the event of an actual drought of record; and in all other regards will be evaluated in accordance with the contract Exhibit C, *Second Amended General Guidelines for Fifth Cycle of Regional Water Plan Development.*

If you have any questions, please do not hesitate to contact Connie Townsend, project manager for Region B, at 512-463-8290 or via email at connie.townsend@twdb.texas.gov.

Sincerely,

Jeff Walker
Executive Administrator

c: Mr. Randy Whiteman, Red River Authority
Mr. Kerry Maroney, Biggs & Matthews
Ms. Simone Kiel, Freese & Nichols, Inc.
Mr. Robert Adams, Alan Plummer Associates, Inc.
Ms. Amy Kaarlela, Freese & Nichols, Inc.
Ms. Connie Townsend, TWDB

APPENDIX C
Methodology for Developing Groundwater Availabilities

MEMORANDUM

FREESE AND NICHOLS

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4055 International Plaza, Suite 200 • Fort Worth, Texas 76109 • 817-735-7300 • fax 817-735-7491 www.freese.com

TO: Region B Water Planning Group

CC: Kerry Maroney (BMI)

FROM: Courtney Corso, Simone Kiel

SUBJECT: Groundwater Supplies in Region B Water Planning Area

DATE: 4/24/2018 (Updated June 2018)

PROJECT: BMI16471

Executive Summary

This technical memorandum discusses the development of groundwater supplies for regional planning purposes. As required by regional planning rules, Managed Available Groundwater (MAG) values must be used if developed through the Groundwater Joint Planning Process. If no MAGs are developed by the TWDB, then the RWPG develops the groundwater availability values. Table ES-1 presents a summary of the groundwater supplies by aquifer for Region B. More details on how these supplies were developed are provided in this technical memorandum.

As shown in Table ES-1, groundwater supplies in Region B are greater than estimated for the 2016 Regional Water Plan (RWP). This is due in part to the much higher Managed Available Groundwater (MAG) estimates for the Seymour Aquifer in Hardeman and Foard Counties. There are also higher MAG values for the Blaine Aquifer in Cottle, Foard and Hardeman Counties.

For this round of planning, there is a newly named aquifer, the Cross-Timbers Aquifer. This aquifer was formerly called the Paleozoic Aquifer. Supply estimates for the Cross-Timber Aquifer and "Other Aquifer" (unclassified alluvium) are the same as determined for the 2016 RWP. In total, the groundwater supplies available to Region B range from 104,337 to 123,164 acre-feet per year. The Seymour Aquifer continues to be a significant source of groundwater for the region.

Table ES-1 Summary of Groundwater Supplies in Region B (ac-ft/yr)

Aquifer	2020	2030	2040	2050	2060	2070
Seymour	72,733	57,887	64,132	65,474	67,479	76,714
Blaine	30,236	27,050	27,123	27,050	27,123	27,050
Trinity	3,886	3,875	3,886	3,875	3,886	3,875
Cross-Timbers/Other	15,525	15,525	15,525	15,525	15,525	15,525
Total	**122,380**	**104,337**	**110,666**	**111,924**	**114,013**	**123,164**
Total 2016 RWP	80,413	80,175	80,140	80,019	79,676	79,676

Introduction

Groundwater in the Regional Water Planning Process

Long-term groundwater supply estimates for regional water planning are based on Modeled Available Groundwater (MAG). MAG values are determined by the Texas Water Development Board (TWDB) and represent the "amount of water that […] may be produced on an average annual basis to achieve a desired future condition."[1] Under the joint planning process, Groundwater Conservation Districts (GCDs) within each Groundwater Management Area (GMA) coordinate to determine these desired future conditions (DFCs), which might specify, for example, the maximum average drawdown in each aquifer within a GCD over a 50-year period. According to TWDB rules, the MAG values determined by the TWDB must be used to represent existing groundwater supplies in the regional water plans.

Many counties throughout Texas are not part of a GCD. For these areas, DFCs may be determined directly by the GMA. However, both GCDs and GMAs may designate aquifers in some areas to be non-relevant to the joint planning process, in which case no DFC is set. Subsequently, no MAG is developed by the TWDB, and determination of groundwater availability is left up to the discretion of the regional water planning groups (RWPGs). RWPGs may use values from previous planning cycles, groundwater availability models (GAMs), or other methods.

Groundwater Resources in Region B Water Planning Area

In the Region B Water Planning Area, groundwater is found in the Seymour, the Trinity, the Blaine, and the Cross Timbers aquifers (Figure 1Figure 2), as well as some unclassified local supplies, referred to as "Other Aquifer" for planning purposes. The Seymour Aquifer consists of a collection of isolated patches of alluvial sediments, which are called "pods." Due to the independence of each pod, the DFCs for the Seymour Aquifer are typically associated with a specific pod (Figure 3). There are four pods located in Region B (Pods, 4, 5, 7 and 8).

Within Region B, desired future conditions have been set by GMAs 6 and 8. Most of the region lies in GMA 6; however, the portion of the Trinity Aquifer in Region B is limited to Montague County in GMA 8. The Cross Timbers Aquifer was recently designated as a minor aquifer by the TWDB and exists in both GMAs, but no DFCs have yet been set. In previous regional planning rounds, available groundwater from the Cross Timbers has been referred to as "Other Aquifer" source water.

Two GCDs are partly in Region B: Gateway GCD includes Hardeman and Foard Counties, and Baylor County is part of the Rolling Plains GCD (Figure 3). It should be noted that the DFCs set by these districts apply to the entire district, including those counties which are outside of Region B. MAGs are determined based on the area associated with a DFC rather than the boundaries of a planning region.

[1] "Second Amended General Guidelines for Fifth Cycle of Regional Water Plan Development" (TWDB, December 2017)

Figure 1. Major Aquifers in Region B

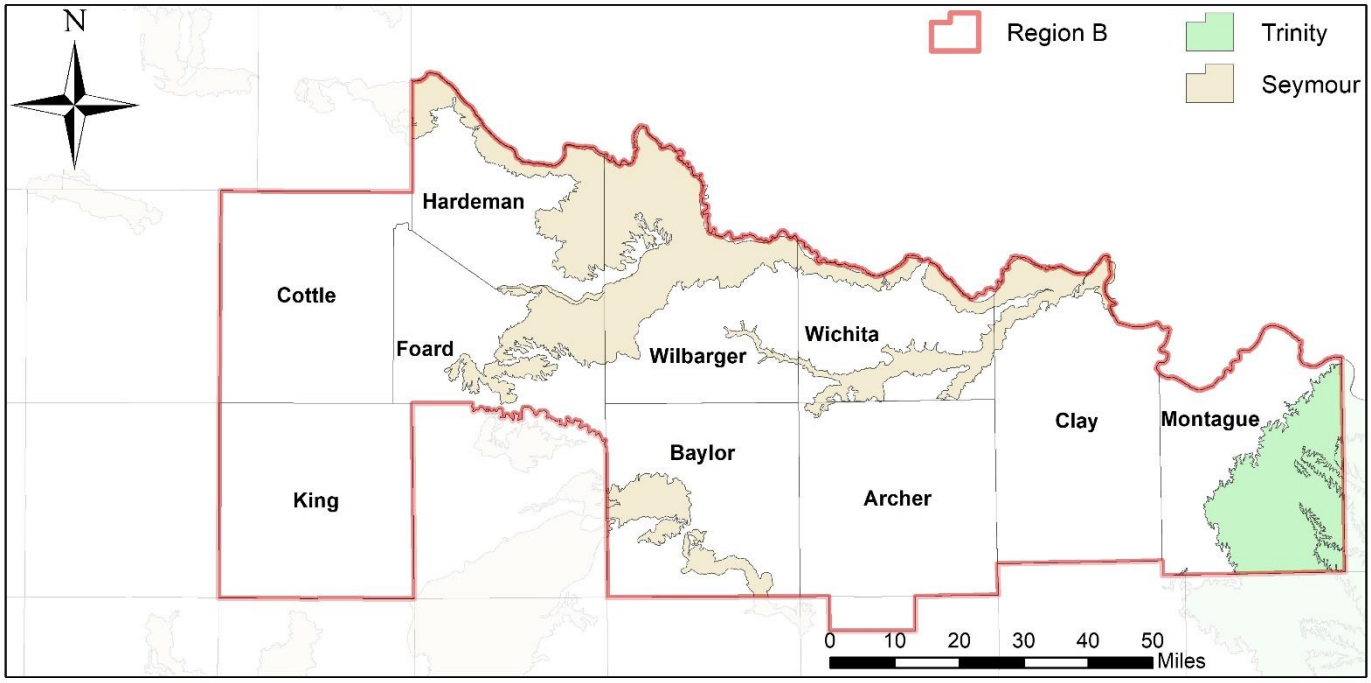


Figure 2. Minor Aquifers in Region B

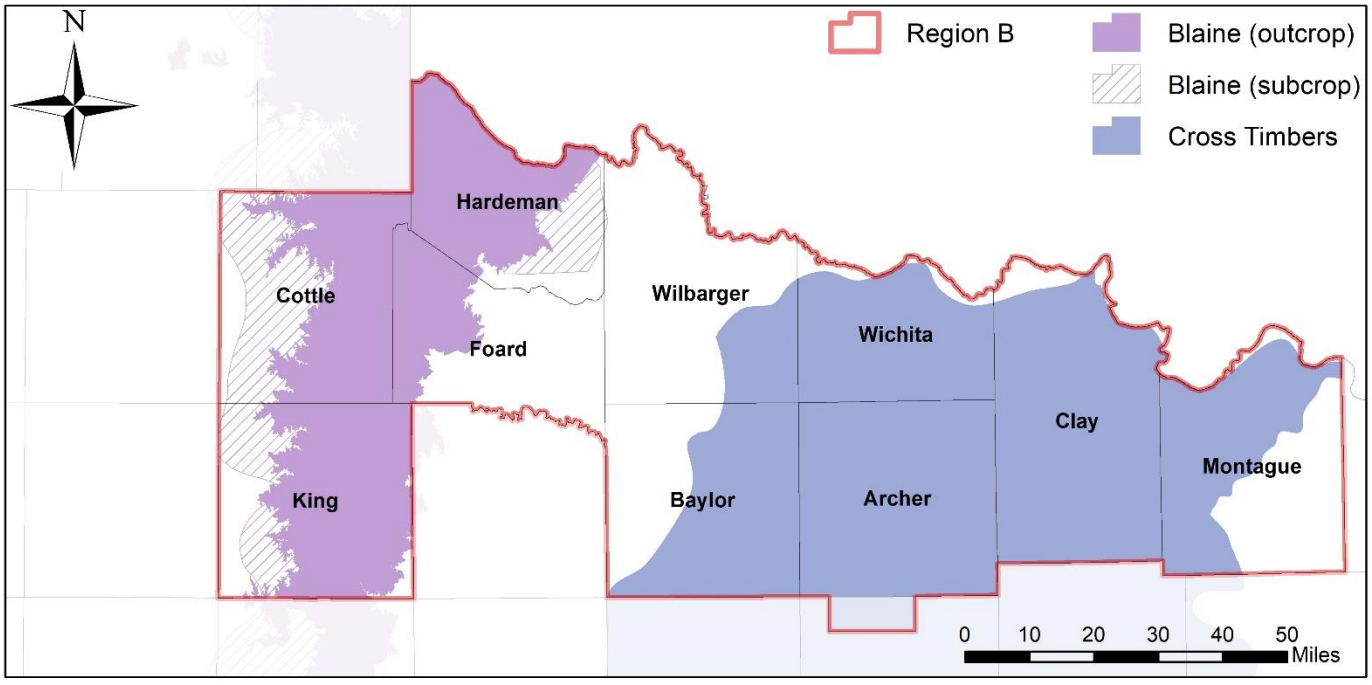
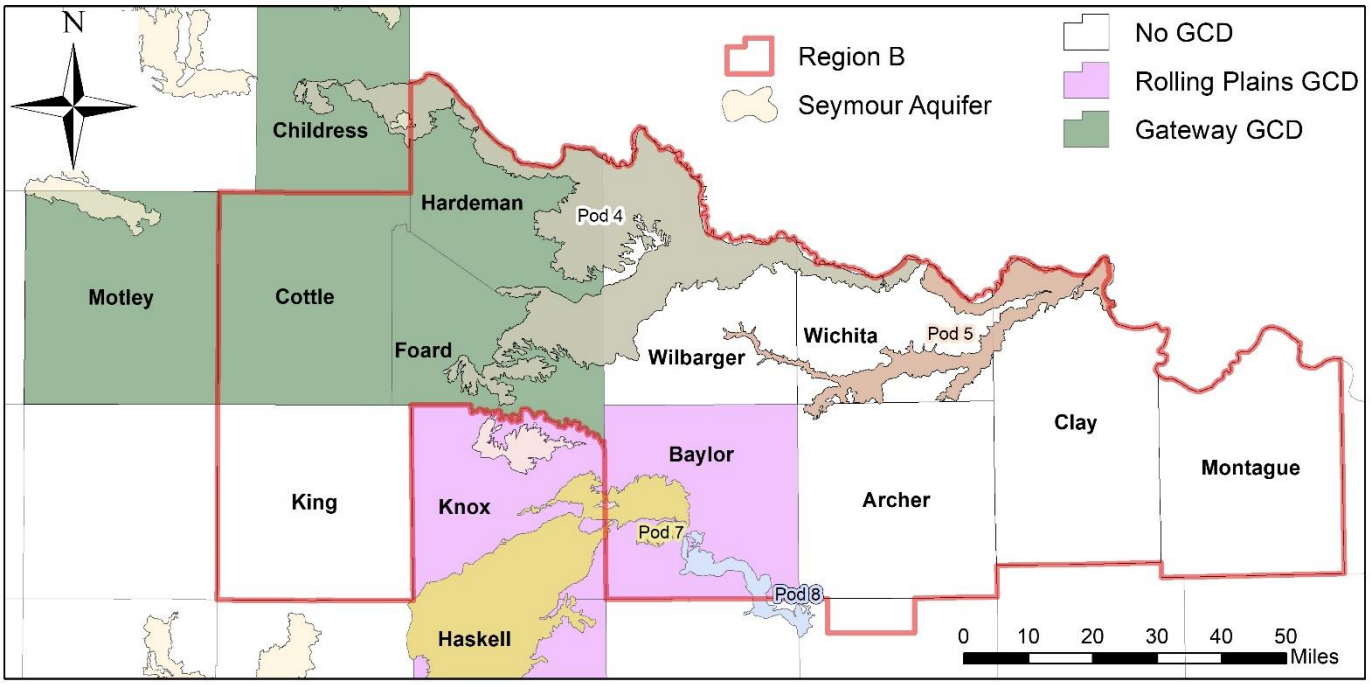


Figure 3. Groundwater Conservation Districts and Pods of the Seymour Aquifer in Region B



Modeled Available Groundwater in Region B

All desired future conditions in Region B are based on a maximum desired amount of drawdown of the groundwater table. For example, Gateway GCD set a DFC of 1 ft average decline (drawdown) for 2020 – 2070. This means that use of groundwater resources in the district should be managed such that the reduction in water table elevation from 2020 to 2070, when averaged spatially over the full extent of Pod 4 in Childress, Hardeman, and Foard Counties, should not exceed 1 foot. However, based on TWDB rules regarding MAG determination, the baseline for assessing a DFC must be a historical condition, so 2020 could not be used as the starting condition. So TWDB determined drawdown as the change in water levels from 2010 to 2070.

GMA 6

As of 11/17/2016, GMA 6 has defined DFCs for the Seymour Aquifer in Foard, Hardeman, and Baylor Counties and the Blaine Aquifer in Cottle, Foard, and Hardeman Counties. In Hardeman and Foard Counties, the desired future condition for Pod 4 of the Seymour Aquifer is no more than 1 foot of average decline in groundwater table elevation from 2020 to 2070. The DFC for Pods 7 and 8 of the Seymour Aquifer in Baylor County is no more than 18 feet decline in groundwater table elevation from 2020 to 2070. In Archer, Clay, Wichita, and Wilbarger Counties, the Seymour Aquifer was declared non-relevant. Desired future conditions for the Blaine Aquifer are no more than 2 feet decline in groundwater level in Cottle and Hardeman Counties, and no more than 10 feet decline in Foard County. The Blaine Aquifer was declared non-relevant in King County. Information on the development of MAG values based on these DFCs can be found in the TWDB report for GAM Run 16-031. The Cross Timbers Aquifer has not yet been included in the joint planning process for GMA 6. DFCs and associated MAGs for GMA 6 are summarized in Table 1.

GMA 8

Desired future conditions for the Trinity Aquifer in Montague County were adopted 1/31/2017. Although this was past the deadline (1/5/17) for mandatory inclusion in the 2021 RWP, TWDB has already developed the updated MAG values based on this DFC (GAM Run 17-029, completed January 2018). As such, the updated MAGs will be

used for 2021 RWP supplies (Table 1). The Cross Timbers Aquifer has not yet been included in the joint planning process for GMA 8.

Table 1. Modeled Available Groundwater in Region B

Aquifer	County	Modeled Available Groundwater (ac-ft/yr)					
		2020	2030	2040	2050	2060	2070
Seymour (Pod 4)	Foard	11,897	4,945	5,389	8,066	7,815	3,943
	Hardeman	20,378	13,040	18,885	17,520	20,002	32,868
Seymour (Pods 7, 8)	Baylor	7,215	7,329	6,977	6,730	6,607	6,929
Blaine	Cottle	14,766	11,621	11,653	11,621	11,653	11,621
	Foard	6,582	6,564	6,582	6,564	6,582	6,564
	Hardeman	8,488	8,465	8,488	8,465	8,488	8,465
Trinity	Montague	3,886	3,875	3,886	3,875	3,886	3,875

Other Groundwater Supplies in Region B

The Region B Groundwater Technical Committee (Technical Committee) met on February 16, 2018, to discuss methodologies for developing groundwater supplies for regional planning for groundwater sources that do not have defined MAGs (non-relevant aquifers and Other Aquifer). For the 2021 RWP, the method for determining these supplies is being determined on a case-by-case basis depending on groundwater availability models, committee input, and the availability of historical pumping data.

Seymour Aquifer in Gateway GCD

As previously discussed in this memorandum, in regional planning the MAGs developed by TWDB must be used to represent groundwater supplies when available. However, the Technical Committee discussed the published MAGs and agreed that the input pumping targets for Foard and Hardeman counties in the Seymour MAG run were too high, resulting in decadal variations in MAG values. For planning purposes, the minimum decadal value will be considered for supply distribution and water management development. In addition, the 2021 RWP will include a note that the higher MAG values given for some decades may not be consistently available for future development.

Seymour Aquifer in Wichita, Archer, and Clay Counties

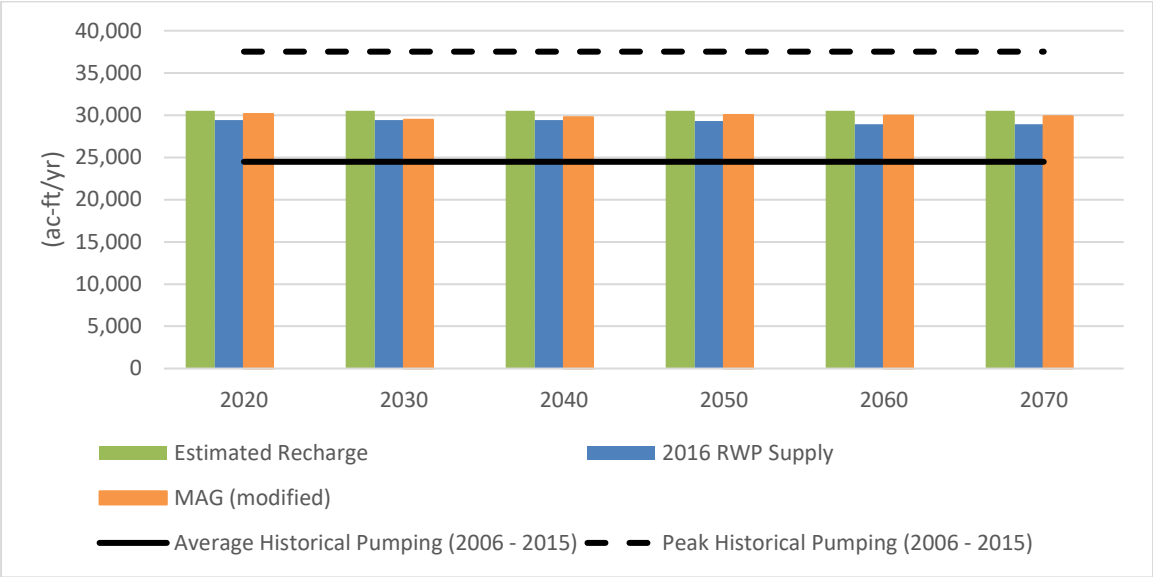
The Technical Committee decided to use the supply values from the 2016 Region B RWP for the Seymour Aquifer in Wichita, Archer, and Clay Counties, as no additional information has since become available. These values are based on the MAG values determined during the previous Joint Planning Process.

Seymour Aquifer in Wilbarger County

Available supply for the Seymour Aquifer in Wilbarger County was estimated using a modified GAM run of the model used to assess the DFCs for GMA 6. Since Wilbarger County was declared non-relevant, no changes were made to the original GAM model for pumping in Wilbarger County. This underestimated current use of the Seymour Aquifer in the county. The Technical Committee agreed the pumping levels for Wilbarger County were too low and recommended using the 2016 RWP estimates or the modified GAM model. The results of the modified GAM model were very similar to the estimates used in the 2016 RWP, so these model results are recommended

for Wilbarger County Seymour Aquifer supplies. Figure 4 shows the historical recharge, modified GAM results and the 2016 RWP estimates.

Figure 4. Comparison of Recharge and Supply Values for Wilbarger County



Blaine Aquifer in King County

The Technical Committee discussed the modeling of the Blaine aquifer. They stated that the MAG analyses used for the 2016 RWP overstated the availability of the Blaine aquifer. Some of this discrepancy is associated with the original Blaine GAM, and some appears to be water quality related. The Blaine can be very high in minerals (calcium, etc.), which limits its use in some areas. The Technical Committee agreed that the 2021 RWP should reflect supplies at the level of historical use in King County and thus should be set at 400 ac-ft/yr.

Cross Timbers and Other Aquifers

The Technical Committee discussed the non-modeled aquifers, which include the Cross Timbers (formerly known as the Paleozoic aquifer) and Other aquifer (alluvial sediments). The Technical Committee agreed that there was not any additional information available to warrant further study of these groundwater sources, and Region B should retain the groundwater supplies for "Other Aquifers" from the 2016 RWP. The supplies in the 2016 RWP that were associated with the Cross Timbers will be renamed as such and removed from the general "Other Aquifer" category. Supplies from alluvial sediments not associated with the Cross Timbers formation will continue to be classified as "Other Aquifer".

Upon review of the wells listed in the TWDB database for the Cross-Timber Aquifer, there is current production from this formation in Archer, Baylor, Clay, Montague, Wichita and Young Counties. While the formation is present in southwestern Wilbarger County, there are no known wells that produce useable water. There are approximately 120 wells in the non-Seymour alluvial sediments or other formations. The TWDB estimates the water produced from these formations varies from approximately 2,000 to 4,500 acre-feet per year between years 2000 to 2015. The average historical use is approximately 3,050 acre-feet per year in recent years (2010 – 2015). For Wilbarger County, the Other Aquifer supplies are estimated using the average recent historical use. The Other Aquifer supplies for counties that do not contain the Cross Timbers Aquifer (Cottle, Foard, Hardeman and King) will retain the supply estimates from the 2016 RWP.

MAG Peaking Factors

TWDB has introduced a new option for the 5th cycle of regional planning, under which RWPGs may seek to define a "peaking factor" to increase the available groundwater supplies above the published MAGs. After review of the MAGs and historical use, the Groundwater Technical Committee decided to recommend to the RWPG not to pursue this option for any aquifer in Region B at this time.

Draft Groundwater Supplies for Region B

As the Groundwater Technical Committee did not elect to use MAG Peaking Factors, MAG values as published by TWDB (Table 1) will be used to represent groundwater supplies in the 2021 Region B RWP, where available. Pending approval of the RWPG and TWDB, draft groundwater supplies in non-relevant aquifers will be represented as determined by the Groundwater Technical Committee (Table 2).

Table 2. Estimated Available Groundwater Supplies for Non-Relevant Aquifers (ac-ft/yr)

Aquifer	County	Estimated Available Groundwater Supplies (ac-ft/yr)						*Source*
		2020	2030	2040	2050	2060	2070	
Seymour	Archer	35	35	35	35	35	35	*2016 RWP*
	Clay	787	787	787	787	787	787	*2016 RWP*
	Wichita	2,295	2,295	2,288	2,291	2,291	2,291	*2016 RWP*
	Wilbarger	30,000	30,000	30,000	30,000	30,000	30,000	*modified GAM run*
Blaine	King	400	400	400	400	400	400	*decided by GTC*
Cross-Timbers	Archer	625	625	625	625	625	625	*2016 RWP*
	Baylor	60	60	60	60	60	60	*2016 RWP*
	Clay	2,000	2,000	2,000	2,000	2,000	2,000	*2016 RWP*
	Montague	4,000	4,000	4,000	4,000	4,000	4,000	*2016 RWP*
	Wichita	840	840	840	840	840	840	*2016 RWP*
	Young	700	700	700	700	700	700	*2016 RWP*
Other Aquifer	Cottle	1,800	1,800	1,800	1,800	1,800	1,800	*2016 RWP*
	Foard	200	200	200	200	200	200	*2016 RWP*
	Hardeman	50	50	50	50	50	50	*2016 RWP*
	King	650	650	650	650	650	650	*2016 RWP*
	Wilbarger	3,050	3,050	3,050	3,050	3,050	3,050	*Historical use (2010-2015)*

APPENDIX D
Identifying Potentially Feasible WMSs

Methodology

Identifying Potentially Feasible Water Management Strategies

Region B
2021 Water Plan

Feasible Strategies

From TAC 357.12b

"A RWPG shall hold a public meeting to determine the process for identifying potentially feasible water management strategies; the process shall be documented and shall include input received at a public meeting; ..."

Feasible Strategies

- Considerations
  - A strategy must use proven technology
  - A strategy should be appropriate for regional planning
  - A strategy should have an identifiable sponsor
  - Must consider end use. Includes water quality, economics, geographic constraints, etc.
  - Must meet existing regulations

Feasible Strategies by Type

- Water conservation
  - Review for applicability and consider for all WUGs with a need
  - Consider water conservation for all municipal WUGs with gpcd > 140
- Drought management
  - Emergency measures
  - Generally, not recommended for long-term water supply

Feasible Strategies by Type

- Expanded use of existing supplies
  - New groundwater wells
    - Consider groundwater availability
  - Conjunctive use of groundwater & surface water
  - New infrastructure
  - Aquifer storage and recovery
- Voluntary transfer
  - Contracts
  - Sales, leases and options
  - Interbasin transfers of surface water

Feasible Strategies by Type

- New water supplies
  - Surface water (reservoirs and new diversions)
  - Groundwater (new well fields)
- Wastewater reuse
  - Update based on current practices and planned implementation
    - Identify opportunity for expansion
  - Identify generators of wastewater and potential new recipients for reuse

Feasible Strategies by Type

- Desalination of brackish water
  - Includes both groundwater and surface water sources
- Emergency Transfer of Water
- Yield enhancement
  - Brush management
  - Recharge enhancement
- Water quality enhancements
  - Chloride Control Project

Strategies Not Appropriate for Region B

- Rainwater harvesting
- Cancellation of water rights

Identification Process

- Identify entities with needs
- Review recommended strategies in 2016 plan
- Identify potential new or changed strategies
  - Assess feasibility by strategy type
- Contact entity for input
  - Contact RWPG representative for county-wide WUGs
- Verify recommendations

Evaluations

- Quantity, cost and reliability
- Environmental factors
- Impacts on water resources and other WMS
- Impacts on agriculture/ rural
- Impacts on natural resources
- Impacts on key water quality parameters
- Other relevant considerations

Alternative Strategies

- Selected with entity input
- Evaluated using same considerations for selected strategies

APPENDIX E
List of Potentially Feasible WMSs

REGION B DRAFT LIST OF POTENTIALLY FEASIBLE WATER MANAGEMENT STRATEGIES	
ENTITY NAME	**POTENTIALLY FEASIBLE WMSs**
ARCHER CITY	MUNICIPAL CONSERVATION FULFILLMENT OF EXISTING CONTRACT WITH WICHITA FALLS PURCHASE ADDITIONAL SUPPLY FROM WICHITA FALLS
ARCHER COUNTY MUD 1	MUNICIPAL CONSERVATION PURCHASE ADDITIONAL SUPPLY FROM WICHITA FALLS
BAYLOR SUD	MUNICIPAL CONSERVATION
BOWIE	MUNICIPAL CONSERVATION DIRECT REUSE FOR MINING
BURKBURNETT	MUNICIPAL CONSERVATION FULFILLMENT OF EXISTING CONTRACT WITH WICHITA FALLS
CROWELL	MUNICIPAL CONSERVATION PURCHASE ADDITIONAL SUPPLY FROM GREENBELT MIWA
DEAN DALE SUD	MUNICIPAL CONSERVATION FULFILLMENT OF EXISTING CONTRACT WITH WICHITA FALLS
ELECTRA	MUNICIPAL CONSERVATION FULFILLMENT OF EXISTING CONTRACT WITH WICHITA FALLS PURCHASE ADDITIONAL SUPPLY FROM WICHITA FALLS
HARROLD WSC	MUNICIPAL CONSERVATION
HENRIETTA	MUNICIPAL CONSERVATION
HOLLIDAY	MUNICIPAL CONSERVATION FULFILLMENT OF EXISITING CONTRACT WITH WICHITA FALLS
IOWA PARK	MUNICIPAL CONSERVATION FULFILLMENT OF EXISTING CONTRACT WITH WICHITA FALLS
LAKESIDE CITY	MUNICIPAL CONSERVATION FULFILLMENT OF EXISITING CONTRACT WITH WICHITA FALLS
NOCONA	MUNICIPAL CONSERVATION
NOCONA HILLS WSC	MUNICIPAL CONSERVATION
OLNEY	CONSERVATION INDIRECT REUSE
PADUCAH	MUNICIPAL CONSERVATION
QUANAH	MUNICIPAL CONSERVATION PURCHASE ADDITIONAL SUPPLY FROM GREENBELT MIWA

ENTITY NAME	POTENTIALLY FEASIBLE WMSs
RED RIVER AUTHORITY OF TEXAS	MUNICIPAL CONSERVATION PURCHASE FROM GREENBELT MIWA DEVELOP GROUNDWATER WELLS RED RIVER CHLORIDE CONTROL PROJECT
SAINT JO	MUNICIPAL CONSERVATION
SCOTLAND	MUNICIPAL CONSERVATION FULFILLMENT OF EXISTING CONTRACT WITH WICHITA FALLS PURCHASE ADDITIONAL SUPPLY FROM WICHITA FALLS
SEYMOUR	MUNICIPAL CONSERVATION
SHEPPARD AIR FORCE BASE	MUNICIPAL CONSERVATION PURCHASE ADDITIONAL SUPPLY FROM WICHITA FALLS
VERNON	MUNICIPAL CONSERVATION DIRECT REUSE (FOR SUPPLY TO MANUFACTURING USERS)
WICHITA COUNTY WATER IMPROVEMENT DISTRICT NO. 2	CANAL CONVERSION TO PIPELINE RED RIVER CHLORIDE CONTROL PROJECT REALLOCATION FROM LAKE KEMP
WICHITA FALLS	MUNICIPAL CONSERVATION WICHITA RIVER SUPPLY DEVELOPMENT OF LAKE RINGGOLD PRECIPITATION ENHANCEMENT REALLOCATION OF LAKE KEMP GROUNDWATER FROM LOCAL SEYMOUR AQUIFER
WICHITA VALLEY WSC	MUNICIPAL CONSERVATION FULFILLMENT OF EXISTING CONTRACT WITH WICHITA FALLS
WINDTHORST WSC	MUNICIPAL CONSERVATION FULFILLMENT OF EXISTING CONTRACT WITH WICHITA FALLS PURCHASE ADDITIONAL SUPPLY FROM WICHITA FALLS
COUNTY-OTHER, BAYLOR	MUNICIPAL CONSERVATION
COUNTY-OTHER, CLAY	MUNICIPAL CONSERVATION PURCHASE WATER FROM HENRIETTA
COUNTY-OTHER, FOARD	MUNICIPAL CONSERVATION PURCHASE ADDITIONAL SUPPLY FROM GREENBELT MIWA THROUH CROWELL AND RED RIVER AUTHORITY
COUNTY-OTHER, HARDEMAN	MUNICIPAL CONSERVATION PURCHASE ADDITIONAL SUPPLY FROM GREENBELT MIWA THROUH RED RIVER AUTHORITY
COUNTY-OTHER, MONTAGUE	MUNICIPAL CONSERVATION PURCHASE ADDITIONAL SUPPLY FROM BOWIE AND/OR NOCONA

ENTITY NAME	POTENTIALLY FEASIBLE WMSs
COUNTY-OTHER, WICHITA	MUNICIPAL CONSERVATION FULFILLMENT OF EXISTING CONTRACT WITH WICHITA FALLS PURCHASE ADDITIONAL SUPPLY FROM WICHITA FALLS
COUNTY-OTHER, WILBARGER	MUNICIPAL CONSERVATION PURCHASE WATER FROM VERNON
COUNTY-OTHER, YOUNG	MUNICIPAL CONSERVATION PURCHASE WATER FROM OLNEY
MANUFACTURING, HARDEMAN	PURCHASE ADDITIONAL SUPPLY FROM QUANAH
MANUFACTURING, WICHITA	FULFILLMENT OF EXISTING CONTRACT WITH WICHITA FALLS
MANUFACTURING, WILBARGER	PURCHASE WATER FROM VERNON
MANUFACTURING (ALL OTHER COUNTIES)	CONSERVATION
STEAM ELECTRIC POWER, WICHITA	FULFILLMENT OF EXISTING CONTRACT WITH WICHITA FALLS
STEAM ELECTRIC POWER, WILBARGER	CONSERVATION (ALTERNATIVE COOLING)
IRRIGATION (ALL COUNTIES)	CONSERVATION
MINING (ALL COUNTIES)	CONSERVATION