

3. Analysis of Water Supply Currently Available to Region C

This section gives an overall summary of the water supplies available to Region C. Appendix I includes further details on the development of this information. Under the Texas Water Development Board (TWDB) regional water planning guidelines⁽¹⁾, each region is to identify currently available water supplies to 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). For run-of-the-river supplies, this 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, and for some aquifers, Managed Available Groundwater (MAG) numbers have been developed by the TWDB to define the long-term available groundwater supply. Where applicable, groundwater conservation district rules are also considered.

Currently available water supplies to users are those water supplies that have been permitted or contracted and that have infrastructure in place to transport and treat the water. Some water supplies that are permitted or contracted for use do not yet have the infrastructure in place. Connecting such supplies is considered a water management strategy for use of this water in the future, and water management strategies are discussed in Section 4 of this report.

3.1 Overall Water Supply Availability

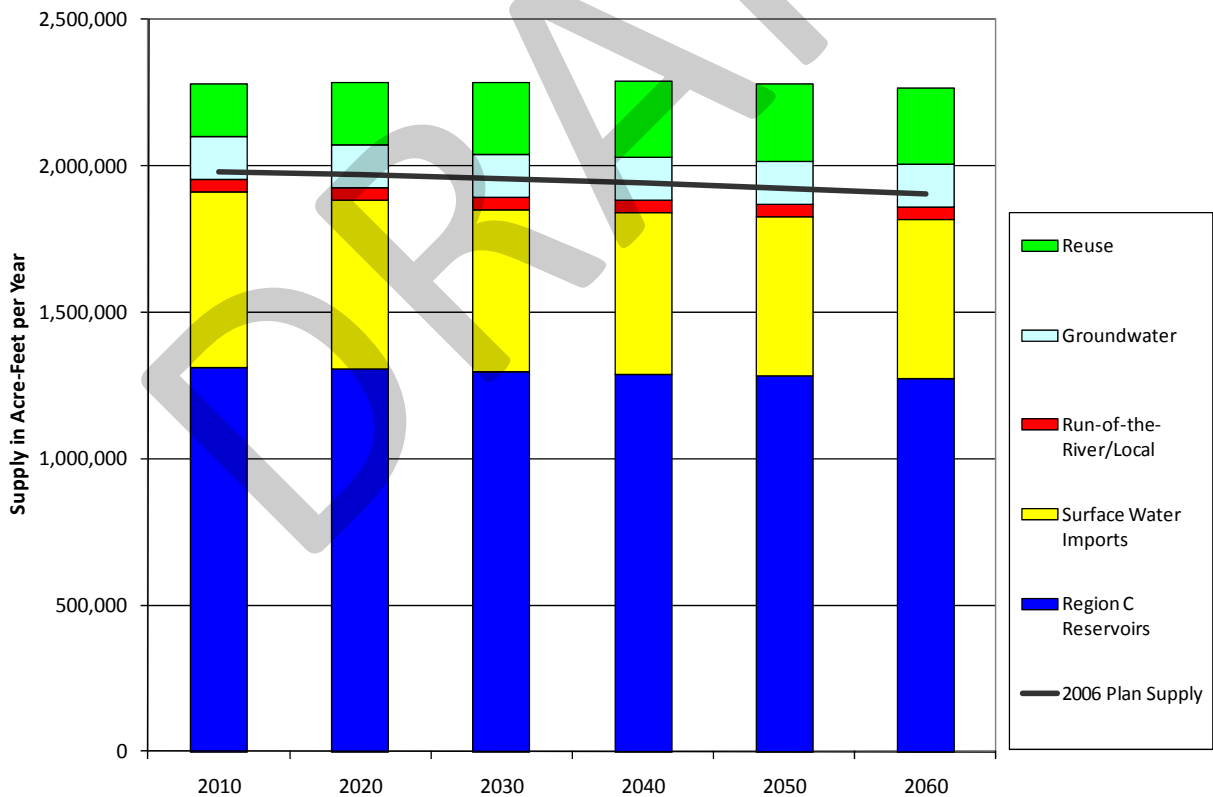
Table 3.1 and Figure 3.1 summarize the overall water supply availability in Region C, including both connected and unconnected water sources. Table 3.1 and Figure 3.1 show that in 2010:

- About 58 percent of the water supply available to Region C is from in-region reservoirs.
- Groundwater is approximately 6 percent of the overall supply available to Region C.
- Local supplies are only 2 percent of the overall supply available to Region C.
- Currently authorized reuse is about 8 percent of the overall supply available to Region C.
- Importation of water from other regions is approximately 26 percent of the water available to Region C.

Table 3.1
Overall Water Supply Availability in Region C
 - Values in Acre-Feet per Year -

Summary	2010	2020	2030	2040	2050	2060
Reservoirs in Region C	1,312,724	1,305,260	1,297,491	1,289,595	1,281,699	1,273,803
Local Irrigation	20,205	20,205	20,205	20,205	20,205	20,205
Other Local Supply	23,701	23,701	23,701	23,701	23,701	23,701
Surface Water Imports	598,775	576,120	552,672	549,222	545,782	542,352
Groundwater	146,152	146,152	146,152	146,152	146,152	146,152
Reuse	181,046	214,636	245,656	260,265	260,422	261,011
REGION C TOTAL	2,282,602	2,286,073	2,285,876	2,289,139	2,277,960	2,267,223

Figure 3.1
Overall Water Supply Availability in Region C



- If all of the available supplies could be utilized, Region C would have 2,267,223 acre-feet per year available in 2060. The total water availability is more than in the 2006 *Region C Water Plan*⁽²⁾ primarily due to the following changes:

- Greater availability from reservoirs in Region C because of increased supplies from some reservoirs (based on changes to the WAMs) and on new water rights obtained since 2006.
- Higher groundwater availability in the Managed Available Groundwater in the Trinity and Woodbine aquifers^(3,4) when compared to previous availability estimates.
- Greater availability from reuse due to the development.
- Currently connected and available supplies are less than overall water supplies and are discussed in Section 3.2. The sources of the information in Table 3.1 are discussed in greater detail below.

Surface Water Availability

Reservoirs. In its guidelines for Regional Water Planning⁽¹⁾, the TWDB requires that water availability for reservoirs be based on results of the TCEQ-approved Water Availability Models (WAMs)^(5, 6, 7, 8, 9). In Region C, most of the in-region reservoirs are located in the Trinity River Basin. Region C also uses water supplies originating in the Neches, Red, Sabine, Brazos, and Sulphur River Basins.

The WAM models were developed for the purpose of reviewing and granting new surface water right permits. The assumptions in the WAM models are based on the legal interpretation of water rights, and in some cases do not accurately reflect current operations. For planning purposes, adjustments were made to the WAMs to better reflect current and future surface water conditions in the region. Generally, changes made to the WAM included:

- Assessment of reservoir sedimentation rates and calculation of area-capacity conditions for current (2000) and future (2060) conditions.
- Inclusion of subordination agreements.
- Inclusion of system operations where appropriate.
- Other specific corrections by river basin, as appropriate.

According to the modified WAM results, the total available supply from Region C reservoirs is calculated at 1,312,724 acre-feet per year in 2010 and 1,273,803 acre-feet per year in 2060. The total available supply from imports from reservoirs in other regions is 598,775 acre-feet per year in 2010 and 542,352 acre-feet per year in 2060. Table 3.2 lists the reservoir water supplies available for use in Region C. More detail on the determination of available supplies from reservoirs is included in Appendix I.

Local Irrigation Supply. The local irrigation surface water supply is based on existing run-of-the-river water rights for irrigation not associated with major reservoirs. The total irrigation local supply in Region C is estimated at 20,205 acre-feet per year throughout the planning period. More detail on the determination of available supplies for run-of-the-river supply is shown in Table 3.3, as well as Appendix I.

Table 3.2
Surface Water Supplies Currently Available to Region C
 - Values in Acre-Feet per Year -

Reservoir	2010	2020	2030	2040	2050	2060
Systems in Region C						
Lost Creek/Jacksboro System	1,597	1,597	1,597	1,597	1,597	1,597
West Fork System (TRWD)	109,833	109,167	108,500	107,833	107,167	106,500
Elm Fork/Lewisville/Ray Roberts (Dallas)	211,699	210,269	208,839	207,409	205,979	204,549
Grapevine (Dallas)	7,583	7,367	7,150	6,933	6,717	6,500
Subtotal of Systems in Region C	330,713	328,399	326,086	323,773	321,459	319,146
Reservoirs in Region C						
Cedar Creek	175,000	175,000	175,000	175,000	175,000	175,000
Richland-Chambers (TRWD)	210,000	210,000	210,000	210,000	210,000	210,000
Richland-Chambers (Corsicana) and Lake Halbert	13,872	13,863	13,855	13,847	13,838	13,830
Moss	7,410	7,410	7,410	7,410	7,410	7,410
Lake Texoma (Texas' Share – NTMWD)	190,300	190,300	190,300	190,300	190,300	190,300
Lake Texoma (Texas' Share – GTUA)	25,000	25,000	25,000	25,000	25,000	25,000
Lake Texoma (Texas' Share – Denison)	24,400	24,400	24,400	24,400	24,400	24,400
Lake Texoma (Texas' Share – TXU)	16,400	16,400	16,400	16,400	16,400	16,400
Lake Texoma (Texas' Share – RRA)	2,250	2,250	2,250	2,250	2,250	2,250
Randell	1,400	1,400	1,400	1,400	1,400	1,400
Valley	0	0	0	0	0	0
Bonham	5,340	5,340	5,340	5,340	5,340	5,340
Ray Roberts (Denton)	18,980	18,720	18,460	18,200	17,940	17,680
Lewisville (Denton)	7,918	7,817	7,715	7,613	7,512	7,410

Table 3.2, Continued

Reservoir	2010	2020	2030	2040	2050	2060
Benbrook	6,833	6,833	6,833	6,833	6,833	6,833
Weatherford	2,967	2,923	2,880	2,837	2,793	2,750
Grapevine (PCMUD)	17,050	16,900	16,750	16,600	16,450	16,300
Grapevine (Grapevine)	2,017	1,983	1,950	1,917	1,883	1,850
Arlington	9,850	9,700	9,550	9,400	9,250	9,100
Joe Pool	15,192	14,883	14,575	14,267	13,958	13,650
Mountain Creek	6,400	6,400	6,400	6,400	6,400	6,400
North	0	0	0	0	0	0
Lake Ray Hubbard (Dallas)	57,427	56,113	54,800	53,487	52,173	50,860
White Rock	3,500	3,200	2,900	2,600	2,300	2,000
Terrell	2,283	2,267	2,250	2,233	2,217	2,200
Clark	210	210	210	210	210	210
Bardwell	9,600	9,600	9,295	8,863	8,432	8,000
Waxahachie	2,905	2,800	2,695	2,590	2,485	2,380
Forest Grove	8,767	8,693	8,620	8,547	8,473	8,400
Trinidad City Lake	450	450	450	450	450	450
Trinidad	3,050	3,050	3,050	3,050	3,050	3,050
Navarro Mills	19,342	18,333	17,325	16,317	15,308	14,300
Fairfield	870	870	870	870	870	870
Bryson	0	0	0	0	0	0
Mineral Wells	2,508	2,495	2,483	2,470	2,458	2,445
Teague City Lake	189	189	189	189	189	189
Lake Lavon	112,033	110,767	109,500	108,233	106,967	105,700
Muenster	300	300	300	300	300	300
Subtotal of Individual Reservoirs in Region C	982,011	976,860	971,405	965,822	960,240	954,657
Subtotal of Reservoirs in Region C	1,312,724	1,305,260	1,297,491	1,289,595	1,281,699	1,273,803
Imports						
Chapman (UTRWD)	47,132	47,132	47,132	47,132	47,132	47,132
Chapman (Irving)	44,484	44,484	44,484	44,484	44,484	44,484
Chapman (UTRWD)	13,268	13,268	13,268	13,268	13,268	13,268
Tawakoni (Dallas)	183,619	182,251	180,882	179,515	178,146	176,777
Fork (Dallas)	120,000	119,943	119,095	118,248	117,400	116,551
Upper Sabine Basin (NTMWD)	49,718	29,646	9,573	9,501	9,428	9,356
Palestine (Dallas)	112,881	111,776	110,670	109,563	108,455	107,347
Lake Livingston (TXU)	20,000	20,000	20,000	20,000	20,000	20,000
Lake Aquilla	264	276	285	295	309	329

Table 3.2, Continued

Imports	2010	2020	2030	2040	2050	2060
Lake Athens (Athens MWA)	3,908	3,856	3,804	3,751	3,699	3,647
Lake Granbury	231	231	231	231	231	231
Vulcan Materials (from BRA-Possum Kingdom)	2,000	2,000	2,000	2,000	2,000	2,000
Parker County (from Lake Palo Pinto)	1,270	1,257	1,248	1,234	1,230	1,230
Subtotal of Imports	598,775	576,120	552,672	549,222	545,782	542,352
TOTAL	1,911,499	1,881,380	1,850,163	1,838,817	1,827,481	1,816,155

**Table 3.3
Run-of-the-River and Other Local Water Supplies**

County	Run-of-the-River Supply (Acre-Feet per Year)				Other Local Supply (Acre-Feet per Year)	
	Irrigation	Manufacturing	Mining	Municipal	Livestock	Mining
Collin	408	0	0	0	1,002	195
Cooke	23	0	0	0	1,187	237
Dallas	791	368	0	0	712	1,525
Denton	0	0	0	0	935	103
Ellis	3	0	0	0	1,688	0
Fannin	14,758	0	72	69	1,583	0
Freestone	87	0	0	41	1,043	120
Grayson	2,394	30	0	0	1,683	0
Henderson	415	0	0	0	341	0
Jack	110	0	0	0	1,665	370
Kaufman	64	0	0	0	1,622	86
Navarro	226	0	0	252	1,603	0
Parker	239	0	0	33	1,922	20
Rockwall	0	0	0	0	168	33
Tarrant	549	959	0	0	442	342
Wise	139	0	133	0	1,117	0
TOTAL	20,205	1,357	205	395	18,713	3,031

Other Local Supplies. Other local supplies include run-of-the-river supplies associated with water rights and used for municipal, manufacturing, mining, and power generation. It also includes local surface water supplies used for mining and livestock. For livestock and mining supplies that are not associated with water rights (such as stock ponds and privately-owned water for mining), supplies are assumed to be the same as was reported in the 2006 *Region C Water*

Plan⁽²⁾. The total other local supply available in Region C is 23,701 acre-feet per year. More detail on the determination of available other local supplies is included in Table 3.3 and Appendix I.

Reuse. The reuse supply considered as available to the region is from existing projects based on current permits, authorizations, and facilities. Categories of reuse include (1) currently permitted and operating indirect reuse projects, in which water is reused after being returned to the stream; (2) existing reuse projects for industrial purposes (including recycled water for mining use); and (3) authorized direct reuse projects for which facilities are already developed. The specific reuse projects included are discussed in Appendix I.

Indirect reuse project sponsors in Region C include the North Texas Municipal Water District (NTMWD), Trinity River Authority (TRA), Tarrant Regional Water District (TRWD), and the Upper Trinity Regional Water District (UTRWD). In addition, there are a number of existing direct reuse projects for landscape irrigation, golf course irrigation, cooling water, park irrigation, and natural gas industry use in Region C. Many of these projects were included in the 2006 *Region C Water Plan*⁽²⁾. Significant new reuse projects since the last plan include:

- The expansion of the City of Fort Worth's Village Creek Reclaimed Water Delivery System to serve the Cities of Arlington and Euless, Dallas-Fort Worth International Airport, and other potential retail customers within the City of Fort Worth is currently under construction and is anticipated to be online by the end of 2010.
- The TRWD Richland-Chambers Reservoir reuse project began operation in 2009 and diverts return flows into off-channel, wetland impoundments for water quality treatment purposes before delivery into the Richland-Chambers Reservoir for storage and diversion.
- The NTMWD is now authorized to divert up to an additional 35,941 acre-feet per year (for a total of 71,882 acre-feet per year) of return flows from the District's Wilson Creek Wastewater Treatment Plant in Lake Lavon.
- The NTMWD East Fork Raw Water Supply Project began operation in 2009 and can currently convey nearly 48,000 acre-feet per year of return flows to Lake Lavon for subsequent reuse. The NTMWD East Fork Raw Water Supply Project diverts return flows from the East Fork of the Trinity River to a constructed wetland for polishing

treatment and ultimately returns this water to Lake Lavon. The water right for the project authorizes diversions up to 157,393 acre-feet per year, as return flows increase and become available.

- Dallas Water Utilities and NTMWD have entered into an agreement which would allow NTMWD to exchange return flows from its WWTPs discharging into Lake Ray Hubbard for Dallas return flows discharged to the main stem of the Trinity River. Under this agreement, Dallas will obtain the right to divert the NTMWD return flows from Lake Ray Hubbard and will pump an equal amount of flow from the main stem of the Trinity River to the NTMWD East Fork Water Supply Project wetland for use by NTMWD. In addition, once water rights for Elm Fork return flows (from NTMWD WWTPs discharging to Lake Lewisville) have been secured by NTMWD, NTMWD will support Dallas efforts to secure bed and banks transport, storage and diversion rights for the Elm Fork return flows. In exchange, Dallas will pump a quantity equal to NTMWD's discharge of its future Elm Fork return flows to the East Fork Water Supply Project wetland for use by NTMWD.

It is anticipated that reuse will increase significantly in Region C over the next 50 years, but proposed and potential direct reuse projects are not included as currently available supplies. There are a number of reuse projects being considered as potentially feasible management strategies as part of this planning process. Recommended water management strategies for reuse are discussed in Chapter 4 of this report.

Table 3.4 summarizes the currently available reuse supplies by county in Region C. The total available supply from reuse in Region C by 2010 is 181,046 acre-feet per year, increasing to 261,011 acre-feet per year in 2060.

Table 3.4
Currently Permitted and Available Reuse Supplies by County
 - Values in Acre-Feet per Year -

County	2010	2020	2030	2040	2050	2060
Collin	52,227	63,168	74,109	74,109	74,109	74,109
Cooke	9	9	9	9	9	9
Dallas	8,831	8,831	8,831	8,831	8,831	8,831
Denton	4,612	6,069	7,302	8,423	9,993	11,786
Ellis	7,096	7,744	8,431	8,492	8,492	8,492
Fannin	0	0	0	0	0	0
Freestone	0	0	0	0	0	0
Grayson	0	0	0	0	0	0
Henderson	8,473	8,333	8,193	8,053	7,914	7,775
Jack	412	412	411	411	410	410
Kaufman	61,345	83,506	103,460	118,358	118,358	118,358
Navarro	16,800	16,800	16,800	16,800	16,800	16,800
Parker	13	13	13	13	13	13
Rockwall	784	784	784	784	784	784
Tarrant	4,514	4,893	5,161	5,339	5,473	5,583
Wise	15,930	14,074	12,152	10,643	9,236	8,061
TOTAL	181,046	214,636	245,656	260,265	260,422	261,011

Groundwater Availability

Groundwater supplies in Region C are obtained from two major aquifers (Carrizo-Wilcox and Trinity), four minor aquifers (Woodbine, Nacatoch, Sparta, and Queen City), and locally undifferentiated formations, referred to as “other aquifer”.

The TWDB guidelines⁽¹⁾ state that Managed Available Groundwater (MAG) estimates provided by the TWDB are to be used to determine available groundwater supplies unless the MAG estimates are not available. MAG estimates are developed by the TWDB using Desired Future Conditions (DFCs) submitted by Groundwater Management Areas (GMAs). The TWDB created sixteen GMAs in Texas. GMA 8 covers all of Region C except for Jack County, Henderson County, and a small portion of Navarro County.

The GMAs are responsible for developing DFCs for aquifers within their respective areas. The TWDB quantifies MAG estimates based on the DFCs provided by the GMAs. For the 2011

regional water plans, the planning groups were required to use MAG estimates available as of January 1, 2009 as the basis for existing groundwater supplies⁽¹⁾. MAG estimates were available for the Woodbine aquifer prior to the January 1st deadline. MAG estimates were available for the Trinity aquifer in March of 2009. The DFCs for the Nacatoch aquifer have been submitted, but the MAG estimates are not yet available. Neither DFCs nor MAG estimates are available for the Carrizo-Wilcox, Queen City, or Sparta aquifers.

Carrizo-Wilcox Aquifer. Supplies from the Carrizo-Wilcox aquifer are available in Freestone, Henderson, and Navarro counties in Region C. The available supply from the Carrizo-Wilcox aquifer is assumed to be the same as that shown in the 2006 *Region C Water Plan*⁽²⁾.

For the 2006 *Region C Water Plan*⁽²⁾ update, Region C requested that the TWDB run both the Northern Carrizo-Wilcox and Central Carrizo-Wilcox Groundwater Availability Models (GAMs)⁽¹⁰⁾, and the two models resulted in significantly different water availabilities. After discussing the results with the groundwater conservation districts in the region, Region C assumed that the currently available groundwater supply from the Carrizo-Wilcox aquifer was equivalent to twice the current use from the aquifer in Freestone, Henderson, and Navarro counties. Table 3.5 shows the resulting groundwater availability by county to Region C from the Carrizo-Wilcox aquifer. As with reservoirs, this number represents the amount of water available from the aquifer, without considering limitations imposed by or current availability due to the capacity of wells and other facilities. The amount of groundwater currently available in Region C is discussed in Section 3.2.

Trinity and Woodbine Aquifers. The Woodbine aquifer overlies the Trinity aquifer. The Woodbine aquifer is in Collin, Dallas, Denton, Ellis, Fannin, Grayson, Kaufman, Navarro, and Parker counties in Region C. The Trinity aquifer is in Collin, Cooke, Dallas, Denton, Ellis, Fannin, Grayson, Jack, Navarro, Parker, Tarrant, and Wise counties in Region C. Most of the pumping from the Trinity aquifer in Region C is from three layers: Paluxy, Hensel, and Hosston. MAG estimates provided by the TWDB were used to determine groundwater availability from the Trinity and Woodbine aquifers. These availability numbers are shown in Table 3.5.

Groundwater Conservation Districts. There are currently seven Groundwater Conservation Districts (GCDs) that include one or more Region C counties:

- Upper Trinity GCD (Wise and Parker Counties)
- Northern Trinity GCD (Tarrant County)
- Neches and Trinity Valleys GCD (includes Henderson County)
- Mid-East Texas GCD (includes Freestone County)
- Prairielands GCD (includes Ellis County)
- North Texas GCD (Collin, Cooke, and Denton Counties)
- Red River GCD (Grayson and Fannin Counties).

Summary. In Region C, MAG estimates for the Trinity and Woodbine aquifers were available for this cycle of regional water planning. For the Carrizo-Wilcox, Nacatoch, Sparta, Queen City, and other aquifers, available groundwater supplies were assumed to be the same as was shown in the 2006 *Region C Water Plan*⁽²⁾. The total available supply from groundwater in Region C is 146,152 acre-feet per year throughout the planning period. More detail on the determination of available supplies from groundwater is included in Appendix I.

Table 3.5
Groundwater Supplies in Region C
 - Values in Acre-Feet per Year -

Aquifer	County	2010	2020	2030	2040	2050	2060
Carrizo-Wilcox	Freestone	6,653	6,653	6,653	6,653	6,653	6,653
Carrizo-Wilcox	Henderson	5,370	5,370	5,370	5,370	5,370	5,370
Carrizo-Wilcox	Navarro	180	180	180	180	180	180
Carrizo-Wilcox Subtotal		12,203	12,203	12,203	12,203	12,203	12,203
Trinity	Collin	2,100	2,100	2,100	2,100	2,100	2,100
Trinity	Cooke	6,850	6,850	6,850	6,850	6,850	6,850
Trinity	Dallas	5,458	5,458	5,458	5,458	5,458	5,458
Trinity	Denton	19,333	19,333	19,333	19,333	19,333	19,333
Trinity	Ellis	3,959	3,959	3,959	3,959	3,959	3,959
Trinity	Fannin	700	700	700	700	700	700
Trinity	Grayson	9,400	9,400	9,400	9,400	9,400	9,400
Trinity	Jack	100	100	100	100	100	100
Trinity	Kaufman	1,181	1,181	1,181	1,181	1,181	1,181
Trinity	Navarro	1,873	1,873	1,873	1,873	1,873	1,873
Trinity	Parker	15,248	15,248	15,248	15,248	15,248	15,248
Trinity	Rockwall	958	958	958	958	958	958

Table 3.5, Continued

Aquifer	County	2010	2020	2030	2040	2050	2060
Trinity	Tarrant	18,747	18,747	18,747	18,747	18,747	18,747
Trinity	Wise	9,282	9,282	9,282	9,282	9,282	9,282
Trinity Subtotal		95,189	95,189	95,189	95,189	95,189	95,189
Woodbine	Collin	2,509	2,509	2,509	2,509	2,509	2,509
Woodbine	Cooke	154	154	154	154	154	154
Woodbine	Dallas	2,313	2,313	2,313	2,313	2,313	2,313
Woodbine	Denton	4,126	4,126	4,126	4,126	4,126	4,126
Woodbine	Ellis	5,441	5,441	5,441	5,441	5,441	5,441
Woodbine	Fannin	3,297	3,297	3,297	3,297	3,297	3,297
Woodbine	Grayson	12,087	12,087	12,087	12,087	12,087	12,087
Woodbine	Kaufman	200	200	200	200	200	200
Woodbine	Navarro	300	300	300	300	300	300
Woodbine	Parker	0	0	0	0	0	0
Woodbine	Rockwall	144	144	144	144	144	144
Woodbine	Tarrant	632	632	632	632	632	632
Woodbine Subtotal		31,203	31,203	31,203	31,203	31,203	31,203
Nacatoch	Henderson, Kaufman, Navarro, & Rockwall	558	558	558	558	558	558
Queen City	Freestone & Henderson	873	873	873	873	873	873
Other	All	6,126	6,126	6,126	6,126	6,126	6,126
Minor Aquifers Subtotal		7,557	7,557	7,557	7,557	7,557	7,557
TOTAL		146,152	146,152	146,152	146,152	146,152	146,152

3.2 Currently Available Water Supplies

Table 3.6 and Figure 3.2 show the currently available water supplies in Region C by different source types. Table 3.7 shows the currently available supplies to water user groups by county. Currently available supplies are supplies that can be used with currently existing water rights, contracts, and facilities. They are less than the overall supplies available to the region because the facilities needed to use some supplies have not yet been developed. (Common constraints limiting currently available supplies include the availability and capacity of transmission systems, treatment plants, and wells.) The comparison of overall water supply availability and currently available water supplies for Region C shows the following:

- The total currently available supply in Region C for 2060 is 1,887,130 acre-feet per year, of which 1,874,132 acre-feet per year is available to users in Region C (a portion is used to

supply customers in adjacent regions). This is 380,093 acre-feet per year less than the overall supply. The difference is due primarily to transmission and treatment plant capacity limitations. This includes 196,881 acre-feet per year of unconnected supplies for Dallas Water Utilities (Lake Fork Reservoir and Lake Palestine).

- The currently available supplies from in-region reservoirs, local sources, groundwater and current reuse are nearly fully allocated by 2060. Some of the differences can be attributed to sources that are not currently used for water supplies (White Rock Lake, Lake Mineral Wells and Forest Grove Reservoir).
- Groundwater supplies, which represent only 6 percent of the total available supply to the region, are nearly 84 percent utilized by current water users. The total amount of groundwater supply that is available for future development is only 23,751 acre-feet per year.
- Permitted surface water imports to Region C are shown to be more than 540,000 acre-feet per year in 2060 in Table 3.1. Approximately 36% of these supplies are not currently connected to water supply systems. The connection of these supplies will be considered as water management strategies in Section 4.

Table 3.6
Currently Available Water Supplies to Water Users by Source Type
 - Values in Acre-Feet per Year -

Category	2010	2020	2030	2040	2050	2060
Reservoirs in Region C	1,067,974	1,053,836	1,052,771	1,039,079	1,036,285	1,028,336
Local Irrigation	19,455	19,455	19,455	19,455	19,455	19,455
Other Local Supply	22,862	22,814	22,846	22,884	22,931	22,989
Surface Water Imports	487,137	465,146	448,432	442,530	441,278	437,839
Groundwater	117,500	117,500	117,500	117,500	117,500	117,500
Reuse	181,046	214,636	245,656	260,265	260,422	261,011
REGION C TOTAL	1,895,973	1,893,386	1,906,660	1,901,713	1,897,871	1,887,130

Figure 3.2
Currently Available Supplies to Region C Water Users

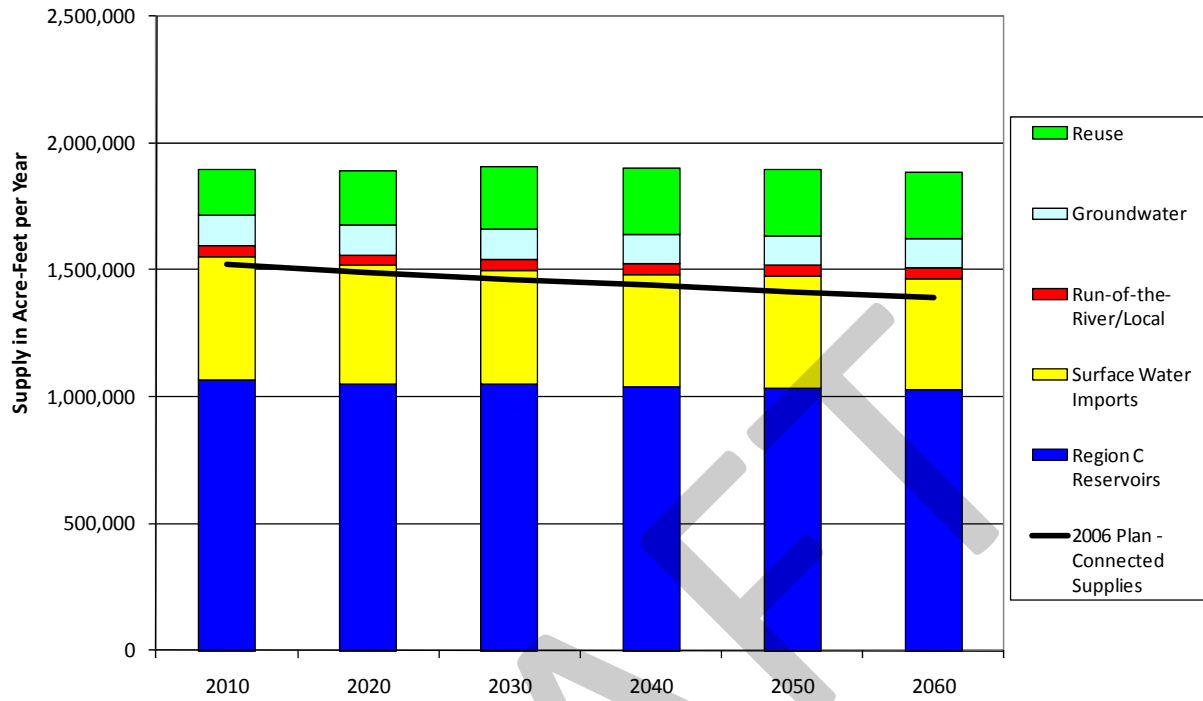


Table 3.7
Currently Available Supplies by County
- Values in Acre-Feet per Year -

County	2010	2020	2030	2040	2050	2060
Collin	228,615	234,455	240,675	251,536	252,967	250,883
Cooke	9,815	9,816	9,816	9,816	9,816	9,816
Dallas	629,744	608,165	92,676	62,712	45,751	31,178
Denton	168,426	171,608	177,140	175,995	176,068	172,914
Ellis	41,574	46,753	50,555	53,367	56,115	56,280
Fannin	35,740	35,323	35,525	36,068	36,718	37,254
Freestone	33,081	33,036	32,899	32,980	32,961	32,943
Grayson	42,924	43,731	44,283	44,282	44,282	44,208
Henderson	14,201	14,060	14,036	14,050	14,121	14,192
Jack	5,346	5,346	5,345	5,345	5,344	5,344
Kaufman	119,930	136,684	147,442	160,733	171,456	182,840
Navarro	16,295	16,273	16,223	16,178	16,133	16,097
Parker	30,914	39,731	43,929	43,852	43,245	41,923
Rockwall	25,112	30,664	32,233	33,950	33,346	33,371
Tarrant	436,848	410,008	403,472	399,979	398,077	395,812
Wise	46,487	47,639	48,167	48,745	48,917	49,078
Subtotal	1,885,053	1,883,292	1,894,416	1,889,588	1,885,316	1,874,132
Other Regions	10,920	10,095	12,244	12,125	12,555	12,997
TOTAL	1,895,973	1,893,386	1,906,660	1,901,713	1,897,871	1,887,130

3.3 Water Availability by Wholesale Water Provider (WWP)

As part of the Senate Bill One planning process, the Texas Water Development Board requires development of water availability for each designated wholesale water provider. A wholesale water provider is defined as “any person or entity, including river authorities and irrigation districts, that has contracts to sell more than 1,000 acre-feet of water wholesale in any one year during the five years immediately preceding the adoption of the last Regional Water Plan.”⁽³⁾ The planning groups are also required to designate any person or entity expected to contract to sell at least 1,000 acre-feet per year of wholesale water during the planning period as a WWP. There are 37 entities in Region C that qualify as wholesale water providers (18 cities, 2 river authorities, and 17 water districts). Twelve of the wholesale water providers provide a large amount of wholesale water supplies to a number of customers and are discussed below as regional wholesale water providers. The remaining 25 supply less water to fewer customers and are discussed as local wholesale water providers. The 12 regional wholesale water providers are:

- Dallas Water Utilities
- Tarrant Regional Water District
- North Texas Municipal Water District
- City of Fort Worth
- Sabine River Authority
- Trinity River Authority
- Upper Neches River Municipal Water Authority
- Upper Trinity Regional Water District
- Sulphur River Water District
- Dallas County Park Cities Municipal Utility District
- Greater Texoma Utility Authority
- City of Corsicana

The 25 local wholesale water providers include:

- City of Cedar Hill
- City of Denton
- City of Ennis
- City of Forney
- City of Gainesville
- City of Garland
- City of Mansfield

- City of McKinney
- City of Midlothian
- City of North Richland Hills
- City of Rockwall
- City of Seagoville
- City of Terrell
- City of Waxahachie
- City of Weatherford
- Athens Municipal Water Authority
- Bartonville Water Supply Corporation
- East Cedar Creek Freshwater Supply District
- Lake Cities Municipal Utility Authority
- Mustang Special Utility District
- Palo Pinto Municipal Water District #1
- Rockett Special Utility District
- Walnut Creek Special Utility District
- West Cedar Creek Municipal Utility District
- Wise County Water Supply District

3.4 Water Supplies Currently Available to Regional Wholesale Water Providers

Table 3.8 gives a summary of the supplies currently available to regional wholesale water providers serving Region C. As discussed in Section 3.2, currently available supplies are limited by existing physical facilities, including raw water transmission facilities, groundwater wells, and water treatment facilities (if needed).

Table 3.8
Currently Available Supplies to Regional Wholesale Water Providers in Region C

Provider	Source	Water Supply Currently Available (Acre-Feet per Year)					
		2010	2020	2030	2040	2050	2060
Dallas Water Utilities	Lake Ray Roberts/Lake Lewisville System	211,699	210,269	208,839	207,409	205,979	204,549
	Lake Grapevine	7,583	7,367	7,150	6,933	6,717	6,500
	Lake Ray Hubbard	57,427	56,113	54,800	53,487	52,173	50,860
	Lake Tawakoni	183,619	182,251	180,882	179,515	178,146	176,777
	Lake Fork	36,000	36,000	36,000	36,000	36,000	36,000
	Direct Reuse (Cedar Crest GC)	561	561	561	561	561	561
	Indirect Reuse						
	White Rock Lake (Irrigation Only)	3,500	3,200	2,900	2,600	2,300	2,000
	DWU Total	500,389	495,761	491,132	486,505	481,876	477,247
Tarrant Regional Water District	West Fork System	109,833	109,167	108,500	107,833	107,167	106,500
	Lake Benbrook	6,833	6,833	6,833	6,833	6,833	6,833
	Cedar Creek Lake	175,000	175,000	175,000	175,000	175,000	175,000
	Richland-Chambers Res.	210,000	210,000	210,000	210,000	210,000	210,000
	Richland-Chambers Reuse	16,800	16,800	16,800	16,800	16,800	16,800
	TRWD Total	518,466	517,800	517,133	516,466	515,800	515,133
North Texas Municipal Water District	Lake Lavon	112,033	110,767	109,500	108,233	106,967	105,700
	Lake Texoma	77,300	77,300	77,300	77,300	77,300	77,300
	Lake Chapman	47,132	47,132	47,132	47,132	47,132	47,132
	Wilson Creek Reuse	50,000	60,941	71,882	71,882	71,882	71,882
	Lake Bonham	5,340	5,340	5,340	5,340	5,340	5,340
	East Fork Reuse	51,790	67,148	87,102	102,000	102,000	102,000
	Interim GTUA	15,500	0	0	0	0	0
	Upper Sabine Basin	49,718	29,646	9,573	9,501	9,428	9,356
	Direct Reuse	2,631	2,631	2,631	2,631	2,631	2,631
	NTMWD Total	408,813	398,274	407,829	421,388	420,049	418,710
City of Fort Worth	TRWD Supplies	252,159	253,838	262,673	272,922	286,373	297,456
	Direct Reuse	897	897	897	897	897	897
	Fort Worth Total	253,056	254,735	263,570	273,819	287,270	298,353

Table 3.8, Continued

Provider	Source	Water Supply Currently Available (Acre-Feet per Year)					
		2010	2020	2030	2040	2050	2060
Sabine River Authority	Lake Tawakoni (Dallas)	183,619	182,251	180,882	179,515	178,146	176,777
	Lake Tawakoni (NTMWD)	9,718	9,646	9,573	9,501	9,428	9,356
	Lake Tawakoni (Others)	36,469	36,197	35,925	35,651	35,379	35,107
	Upper Sabine Basin Supply (NTMWD)	40,000	20,000	0	0	0	0
	Lake Fork (Dallas) - Trinity Basin	120,000	119,943	119,095	118,248	117,400	116,551
	Lake Fork (Dallas) - Sabine Basin	791	0	0	0	0	0
	Lake Fork (Others)	52,244	51,877	51,510	51,142	50,775	50,409
	Toledo Bend Lake	750,000	750,000	750,000	750,000	750,000	750,000
	Sabine Run-of-River	147,100	147,100	147,100	147,100	147,100	147,100
	SRA Total	1,339,942	1,317,013	1,294,085	1,291,157	1,288,228	1,285,300
	SRA Total Dallas and NTMWD	313,337	311,840	309,550	307,263	304,974	302,684
Trinity River Authority	Joe Pool Lake	15,192	14,883	14,575	14,267	13,958	13,650
	Navarro Mills Lake	19,342	18,333	17,325	16,317	15,308	14,300
	Bardwell Lake	9,600	9,600	9,295	8,863	8,432	8,000
	Lake Livingston (Region C)	20,000	20,000	20,000	20,000	20,000	20,000
	Reuse (Region C)	13,248	13,379	13,379	13,379	13,379	13,379
	Subtotal	77,381	76,196	74,574	72,826	71,077	69,329
	TRWD	58,196	62,425	59,788	58,965	59,471	57,770
	TRA Total in Region C	135,577	138,621	134,362	131,790	130,548	127,099
Upper Neches River Municipal Water Authority	Lake Palestine (Dallas)	112,881	111,776	110,670	109,563	108,455	107,347
	Lake Palestine (Other Committed)	94,577	93,641	92,705	91,770	90,837	89,903
	Lake Palestine (Uncommitted)	0	0	0	0	0	0
	UNRMWA Total	207,458	205,417	203,375	201,333	199,292	197,250

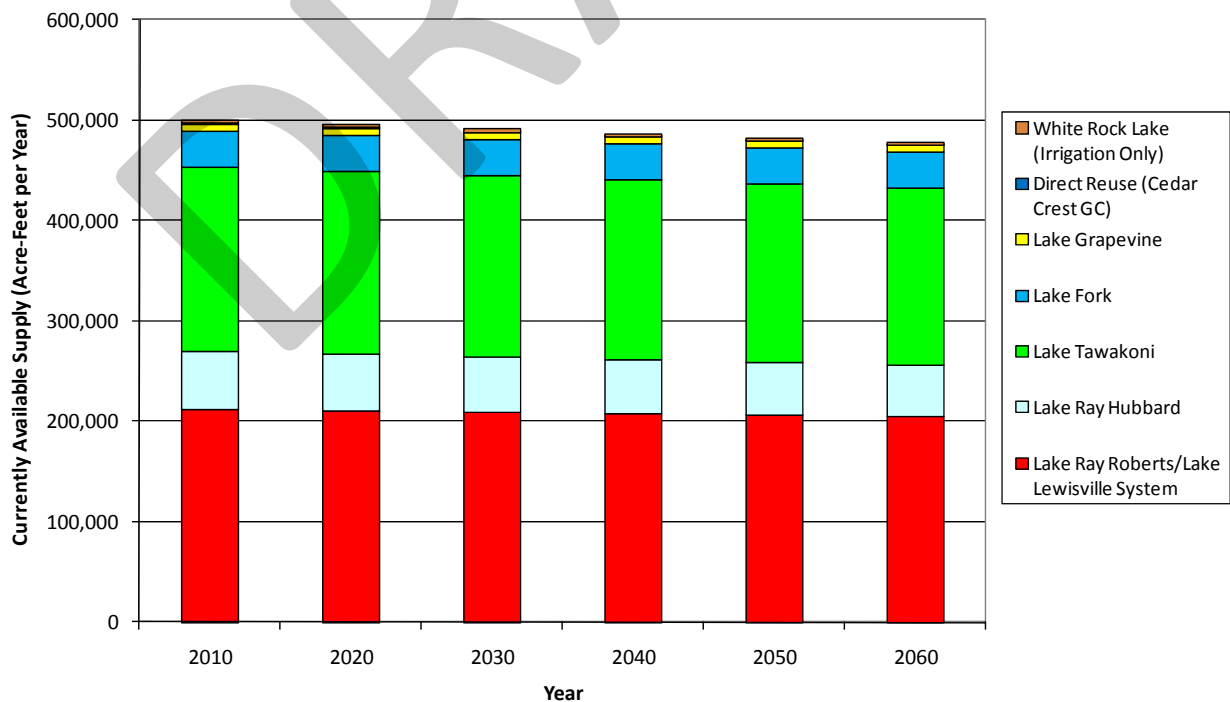
Table 3.8, Continued

Provider	Source	Water Supply Currently Available (Acre-Feet per Year)					
		2010	2020	2030	2040	2050	2060
Upper Trinity Regional Water District	Lake Chapman	13,268	13,268	13,268	13,268	13,268	13,268
	DWU Contract	5,000	42,235	53,086	55,441	57,279	58,943
	Denton	3,675	0	0	0	0	0
	Chapman Reuse	8,441	8,301	8,161	8,021	7,882	7,743
	Additional DWU (Chapman Reuse)	5,627	5,307	5,307	5,307	5,307	5,307
	Direct Reuse	897	897	897	897	897	897
	UTRWD Total	36,908	70,008	80,719	82,934	84,633	86,158
Sulphur River Water District	Lake Chapman (UTRWD)	13,268	13,268	13,268	13,268	13,268	13,268
	Lake Chapman (NTMWD through Cooper)	883	883	883	883	883	883
	Lake Chapman (Other)	14,933	14,933	14,933	14,933	14,933	14,933
	SRWD Total	29,084	29,084	29,084	29,084	29,084	29,084
	SRWD to Region C	14,151	14,151	14,151	14,151	14,151	14,151
Dallas County Park Cities MUD	Lake Grapevine	17,050	16,900	16,750	16,600	16,450	16,300
Greater Texoma Utility Authority	Lake Texoma Raw Water	25,000	25,000	25,000	25,000	25,000	25,000
	Delivery Limited by WTP Capacity	12,892	12,892	12,892	12,892	12,892	12,892
City of Corsicana	Navarro Mills Lake (from TRA)	19,342	18,333	17,325	16,317	15,308	14,300
	Richland Chambers and Halbert	13,872	13,863	13,855	13,847	13,838	13,830
	Total (Limited by WTP Capacity)	13,452	13,452	13,452	13,452	13,452	13,452

Dallas Water Utilities

Figure 3.3 shows the currently available supply for Dallas Water Utilities (DWU). DWU's currently available supply sources include Lake Ray Hubbard, Lake Tawakoni (in Region D), the Ray Roberts/Lewisville Lake/Elm Fork System, Dallas' share of Grapevine Lake, White Rock Lake (irrigation only), direct reuse, indirect reuse of specified return flows above its lakes, and a portion of DWU's share of the Lake Fork supply (in Region D). The first phase of DWU's connection to Lake Fork (a pipeline from Lake Fork to Tawakoni) was completed since the last round of planning. The next phase of the connection (a 144" pipeline to replace the existing 84" and 72" pipelines from Tawakoni to Dallas) is scheduled to be completed in the next five years. The first phase allows DWU to utilize approximately 30% of their Lake Fork supply. Lake Palestine (in Region I) is a significant supply source for DWU that is not currently connected to DWU's system. The estimated reliable supply for DWU from currently available sources (excluding 70% of Lake Fork Reservoir and all of Lake Palestine) is 500,389 acre-feet per year as of the year 2010 and 477,247 acre-feet per year in 2060.

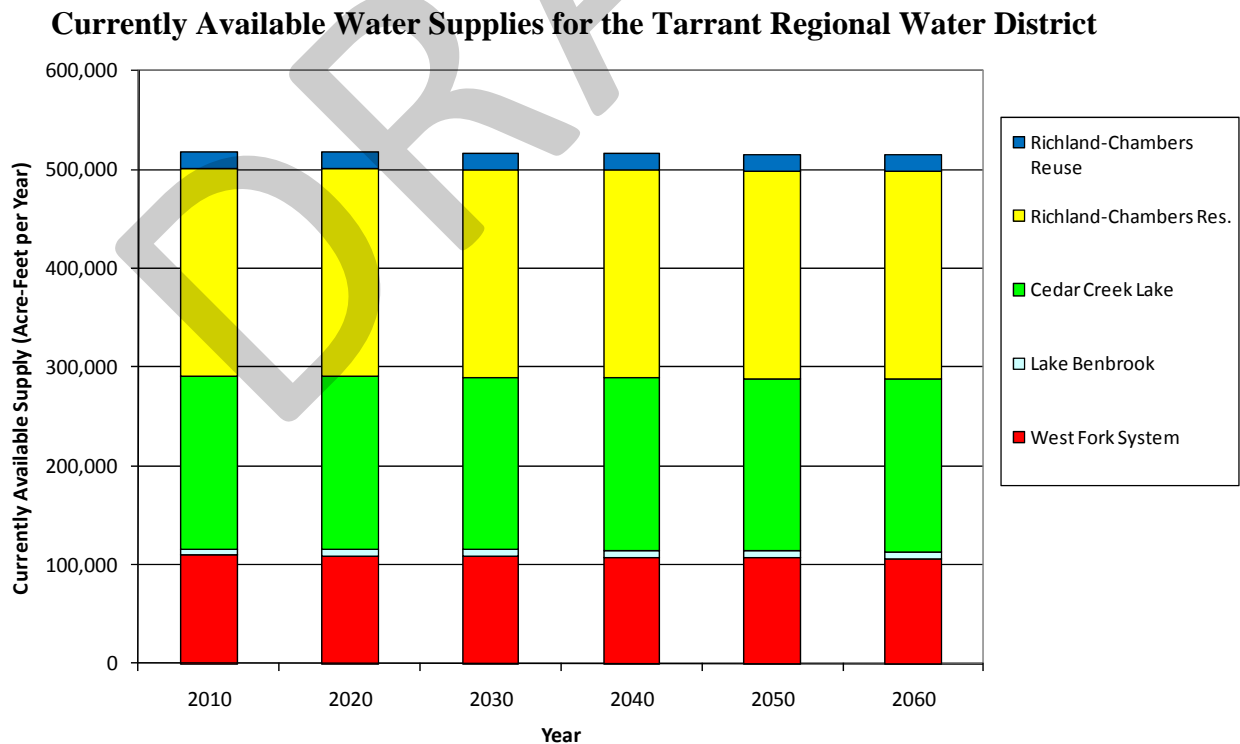
Figure 3.3
Currently Available Water Supplies for Dallas Water Utilities



Tarrant Regional Water District

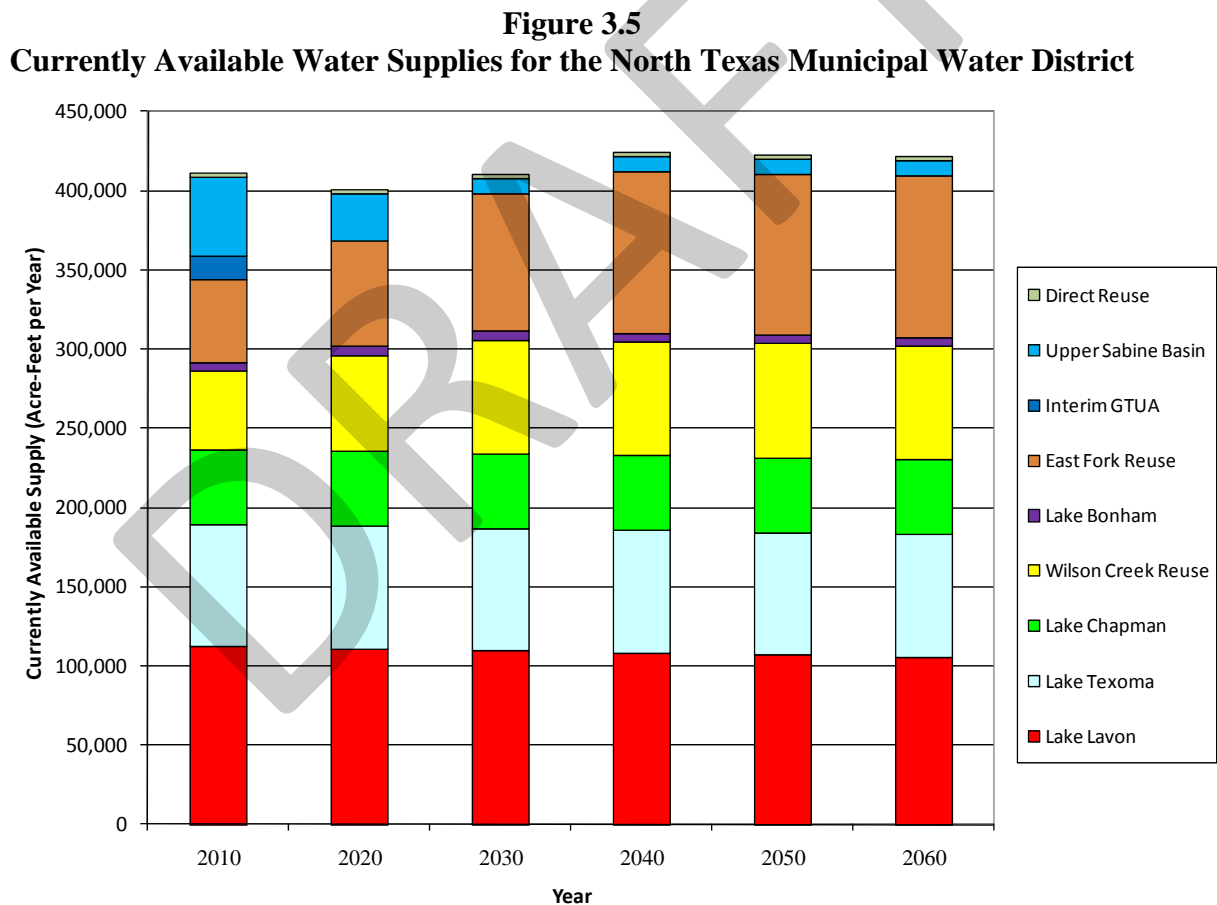
Figure 3.4 shows the currently available water supply for Tarrant Regional Water District (TRWD). TRWD's water supply system includes Cedar Creek Reservoir, Richland-Chambers Reservoir, Richland-Chambers reuse supply, Benbrook Lake, Lake Bridgeport, Eagle Mountain Lake and Lake Worth (owned by Fort Worth). Lakes Bridgeport, Eagle Mountain, and Worth are operated as the West Fork system. The currently available water supply as of 2060 is 515,133 acre-feet per year on a firm yield basis. The Richland-Chambers Reservoir reuse project is an existing water supply source that was a water management strategy for TRWD in the 2006 *Region C Water Plan*⁽²⁾. This project adds 16,800 acre-feet per year of currently available supply to the TRWD system. The water is used for municipal, mining, industrial, and agricultural purposes. Further development of the Richland-Chambers Reservoir reuse project is a water management strategy for TRWD and is discussed in Chapter 4. TRWD also has a water right allowing it to divert return flows from the Trinity River into Cedar Creek Reservoir. This project is a water management strategy for TRWD and is discussed in more detail in Chapter 4.

Figure 3.4



North Texas Municipal Water District

Figure 3.5 shows the currently available supply for the North Texas Municipal Water District (NTMWD). NTMWD's sources of supply include Lake Lavon, Lake Texoma, Chapman Lake (in Region D), direct reuse from several NTMWD wastewater treatment plants, return flows into the Lake Lavon watershed, Bonham Lake, return flows from the East Fork Raw Water Supply Project, raw water from the Upper Sabine Basin, and an interim raw water supply from GTUA. The East Fork Raw Water Supply Project, Upper Sabine Basin supply, interim GTUA supply, additional yield from Lake Lavon, and additional Wilson Creek Wastewater Treatment Plant reuse were all water management strategies for NTMWD in the 2006 *Region C Water Plan*⁽²⁾.



City of Fort Worth

Fort Worth obtains raw water from the Tarrant Regional Water District and sells treated water to wholesale and retail customers. The City currently provides reuse water for golf course irrigation and is expanding its system to provide reuse water to the City of Arlington, City of

Eules, Dallas-Fort Worth International Airport, and additional retail customers within the Fort Worth city limits. As shown in Table 3.8, Fort Worth's currently available supply is between 253,000 acre-feet per year and 299,000 acre-feet per year throughout the planning period.

Sabine River Authority

As shown in Table 3.8, the Sabine River Authority (SRA) has water supplies available from Lake Tawakoni and Lake Fork Reservoir in Region D and from Toledo Bend Reservoir and a run-of-the-river water right in Region I. SRA supplies water to Region C from Lake Tawakoni and Lake Fork Reservoir through sales to Dallas Water Utilities and North Texas Municipal Water District. SRA also supplies water to other water suppliers in the Upper Sabine Basin, mostly located in Region D (but with some service in Region C). SRA's supplies from Lake Tawakoni and Lake Fork Reservoir are fully committed, but SRA has significant uncommitted supplies in Toledo Bend Reservoir.

Trinity River Authority

The Trinity River Authority (TRA) has water rights in Joe Pool Lake, Navarro Mills Lake, and Bardwell Lake in Region C. TRA also imports water from Lake Livingston in Region H (by an upstream diversion from the Trinity River) and has permits and authorization for three reuse projects, two of which are in operation. TRA purchases water from the Tarrant Regional Water District for its Tarrant County water supply project and has plans to purchase water from TRWD for use in Ellis County. Based on the WAM and reuse permit amounts, TRA's independent supply in Region C from current sources is projected to be 69,329 acre-feet as of 2060. This is in addition to the water it purchases from the Tarrant Regional Water District. The TRA has also received several recent water right amendments that will allow the diversion of up to 251,328 acre-feet per year of return flows for beneficial use.

Upper Neches River Municipal Water Authority

The Upper Neches River Municipal Water Authority (UNRMWA) holds water rights in Lake Palestine in Region I and has a contract to provide water to Dallas Water Utilities in Region C. UNRMWA also provides water from Lake Palestine to suppliers in Region I. DWU has not yet developed the facilities to deliver Lake Palestine water to DWU and plans to connect this supply in the future.

Upper Trinity Regional Water District

As shown in Table 3.8, the Upper Trinity Regional Water District (UTRWD) has water supply available from Chapman Lake (in Region D, purchased from the Sulphur River Water District), Dallas Water Utilities, City of Denton, and reuse projects. UTRWD provides treated water to customers in Denton County and surrounding counties. UTRWD has recently received a water right amendment which allows the District to divert from Lake Lewisville up to 9,664 acre-feet per year of return flows, originating from UTRWD's Lake Chapman water, for municipal and industrial purposes.

Sulphur River Water District

The Sulphur River Water District (SRWD) holds water rights in Chapman Lake in Region C. SRWD supplies Chapman Lake raw water to UTRWD in Region C and suppliers in Region D.

Dallas County Park Cities MUD

Dallas Cities Park Cities Municipal Utility District (PCMUD) holds water rights in Grapevine Lake and supplies treated water to Highland Park and University Park in Dallas County. PCMUD also has a contract with the City of Grapevine allowing Grapevine to reuse return flows discharged to Grapevine Lake from Grapevine's Peach Street WWTP.

Greater Texoma Utility Authority

The Greater Texoma Utility Authority (GTUA) has water rights for 25,000 acre-feet per year from Lake Texoma and sells raw water to Sherman, which operates a desalination and treatment plant. Additional information regarding the Sherman Desalination Facility is provided in Appendix I. The yield of Lake Texoma is sufficient to provide 25,000 acre-feet per year through the year 2060. Congress allocated 50,000 acre-feet of storage in Lake Texoma from hydropower to municipal use for the GTUA. GTUA has applied for a water right for this additional 50,000 acre-feet of storage and an additional 56,500 acre-feet per year of supply. This strategy is discussed and recommended in Section 4E.

City of Corsicana

The City of Corsicana purchases water from Navarro Mills Lake from the Trinity River Authority. The firm yield of the lake ranges from 19,342 acre-feet per year in 2010 to 14,300 acre-feet per year in 2060. The currently available supply for the City of Corsicana is limited by

the capacity of its Navarro Mills water treatment plant to 11,210 acre-feet per year. Corsicana also has water rights in Lake Halbert and Richland-Chambers Reservoir, which was recently connected to the City's system. With the connection to Richland-Chambers Reservoir, the combined firm yield from Corsicana's share of Richland-Chambers Reservoir and from Lake Halbert is 13,830 acre-feet per year as of 2060. The currently available supply to Corsicana from Richland-Chambers Reservoir and Lake Halbert is 2,242 acre-feet per year because it is limited by the water treatment plant capacity at Lake Halbert.

3.5 Current Water Supplies Available to Local Wholesale Water Providers

The supplies currently available to local wholesale water providers are summarized in Table 3.9. Many of the local wholesale water providers purchase their water from the regional suppliers and sell that water to their customers. Entities buying and selling water in this manner include:

- Bartonville Water Supply Corporation purchases some of their supply from Upper Trinity Regional Water District.
- City of Cedar Hill purchases water from Dallas Water Utilities.
- City of Denton plans to purchase some of their supply from Dallas Water Utilities.
- The City of Ennis purchases water from the Trinity River Authority (Bardwell Lake) and the Tarrant Regional Water District through the Trinity River Authority.
- City of Forney purchases water from North Texas Municipal Water District and purchases reuse water from Garland for Steam Electric Power.
- City of Garland purchase water from North Texas Municipal Water District and sells reuse water to Forney for Steam Electric Power.
- City of Mansfield purchases water from the Tarrant Regional Water District.
- City of McKinney purchases water from North Texas Municipal Water District.
- City of Midlothian purchases water from Trinity River Authority (Joe Pool Lake, with plans for Tarrant Regional Water District supplies through the Trinity River Authority as well).
- City of North Richland Hills purchases water from Tarrant Regional Water District through Fort Worth and Trinity River Authority.
- City of Rockwall purchases the water from North Texas Municipal Water District.
- City of Seagoville purchases water from Dallas Water Utilities.
- City of Terrell purchases water from North Texas Municipal Water District.
- City of Waxahachie purchases some of its water from the Trinity River Authority (Bardwell Lake) and the Tarrant Regional Water District through the Trinity River Authority.

- City of Weatherford purchases some of its water from Tarrant Regional Water District.
- East Cedar Creek Freshwater Supply District purchases water from Tarrant Regional Water District (Cedar Creek Reservoir).
- Lake Cities Municipal Utility Authority purchases water from Upper Trinity Regional Water District.
- Mustang Special Utility District purchases water from Upper Trinity Regional Water District.
- Rockett Special Utility District purchases water from Midlothian, Waxahachie, and the Tarrant Regional Water District through the Trinity River Authority.
- Walnut Creek Special Utility District purchases water from Tarrant Regional Water District.
- West Cedar Creek Municipal Utility District purchases water from Tarrant Regional Water District.
- Wise County Water Supply District purchases water from Tarrant Regional Water District.

The remaining local wholesale water providers supply water to their customers from their own water supplies.

3.6 Water Availability by Water User Group (WUG)

As part of the regional water planning process, the TWDB requires development of information on currently available water supplies for each water user group (WUG) by river basin and county. (Water user groups are cities with populations greater than 500, water suppliers who serve an average of at least 0.25 million gallons per day (mgd) annually, “county-other” municipal uses, and countywide manufacturing, irrigation, mining, livestock, and steam electric uses.) The availability figures by water user group are limited by contracts and existing physical facilities, including transmission facilities, groundwater wells, and water treatment. The supplies available to each WUG are shown in Appendix B.

As the information on currently available water supply for WUGs was developed, several important points became apparent:

- Most water user groups in Region C will need additional facilities over the next 50 years to meet growing demands.
- Current groundwater use in a few areas exceeds the long-term reliable supply.
- There are some significant water supplies that can be made available by the development of additional water transmission facilities. Examples include Dallas Water Utilities’ share of Lake Fork Reservoir in the Sabine Basin and Lake Palestine in the Neches Basin.

Table 3.9
Currently Available Supplies to Local Wholesale Water Providers in Region C

Provider	Source	Water Supply Currently Available (Acre-Feet per Year)					
		2010	2020	2030	2040	2050	2060
Athens Municipal Water Authority	Lake Athens (firm yield)	6,064	5,983	5,903	5,822	5,741	5,660
	Lake Athens (operational yield)	2,900	2,900	2,900	2,900	2,900	2,900
	Reuse for Fish Hatchery						
	Total (limited by operation)	2,900	2,900	2,900	2,900	2,900	2,900
Bartonville WSC	UTRWD	1,634	1,663	1,242	1,022	880	816
	Trinity Aquifer	450	450	450	450	450	450
	Total	2,084	2,113	1,692	1,472	1,330	1,266
Cedar Hill	Trinity Aquifer	275	275	275	275	275	275
	DWU	8,022	10,650	11,515	10,567	9,443	8,175
	Total	8,297	10,925	11,790	10,842	9,718	8,450
Denton	Lake Lewisville	7,918	7,817	7,715	7,613	7,512	7,410
	Lake Ray Roberts	18,980	18,720	18,460	18,200	17,940	17,680
	Indirect Reuse	1,682	2,130	2,915	3,475	4,372	5,381
	DWU	0	0	619	11,036	17,649	22,403
	Subtotal (limited by WTP capacity)	28,580	28,667	29,709	31,949	31,949	31,949
	Reuse (Steam Electric Power and Irrigation)	1,233	2,242	2,690	3,251	3,924	4,708
Total	29,813	30,909	32,399	35,200	35,873	36,657	
East Cedar Creek	TRWD (limited by contract)	1,157	1,157	1,157	1,157	1,157	1,157
Ennis	Bardwell Lake (TRA)	4,357	4,429	4,405	4,301	4,179	4,058
	TRA (TRWD Sources)	0	441	1,420	2,354	3,323	4,267
	Direct Reuse	2,098	2,615	3,302	3,363	3,363	3,363
	Total	6,455	7,485	9,127	10,018	10,865	11,688
Forney	NTMWD	2,218	3,286	3,535	3,711	3,755	3,855
	Reuse from Garland (Steam Electric only)	8,979	15,600	15,600	15,600	15,600	15,600
	Total	11,197	18,886	19,135	19,311	19,355	19,455
Gainesville	Trinity Aquifer	1,977	1,977	1,977	1,977	1,977	1,977
	Moss Lake (limited by WTP)	1,121	1,121	1,121	1,121	1,121	1,121
	Direct Reuse	9	9	9	9	9	9
	Total	3,107	3,107	3,107	3,107	3,107	3,107

Table 3.9, Continued

Provider	Source	Water Supply Currently Available (Acre-Feet per Year)					
		2010	2020	2030	2040	2050	2060
Garland	NTMWD	44,934	34,261	30,420	27,343	24,670	23,078
	Reuse sold to Forney (Steam Electric only)	8,979	15,600	15,600	15,600	15,600	15,600
	Total	53,913	49,861	46,020	42,943	40,270	38,678
Lake Cities MUA	UTRWD	2,151	2,781	3,160	3,391	3,376	3,376
	Trinity Aquifer	150	150	150	150	150	150
	Woodbine Aquifer	324	324	324	324	324	324
	Total	2,625	3,255	3,634	3,865	3,850	3,850
Mansfield	TRWD	12,582	12,582	12,582	12,582	12,582	12,582
McKinney	NTMWD	36,348	43,803	52,559	60,590	59,735	55,881
Midlothian	Trinity Aquifer	0	0	0	0	0	0
	Joe Pool Lake	6,011	5,593	5,174	4,756	4,338	3,920
	Total	6,011	5,593	5,174	4,756	4,338	3,920
Mustang SUD	Trinity Aquifer	1,162	1,162	1,162	1,162	1,162	1,162
	UTRWD Sources	0	295	495	1,227	1,701	2,089
	Total	1,162	1,457	1,657	2,389	2,863	3,251
North Richland Hills	TRWD (through Ft Worth & TRA)	13,039	11,765	10,810	9,855	8,974	8,012
	Trinity Aquifer	233	233	233	233	233	233
	Total	13,272	11,998	11,043	10,088	9,207	8,245
Rockwall	NTMWD	10,423	14,336	15,353	16,203	15,102	14,127
Rockett SUD	Midlothian	1,544	1,682	1,682	1,682	1,682	1,682
	Waxahachie	0	0	0	0	0	0
	TRA (TRWD Sources)	4,973	5,392	5,897	6,033	5,776	5,154
	Trinity Aquifer	0	0	0	0	0	0
	Total	6,517	7,074	7,579	7,715	7,458	6,836
Seagoville	DWU	1,759	1,968	2,158	2,204	2,201	2,053

Table 3.9, Continued

Provider	Source	Water Supply Currently Available (Acre-Feet per Year)					
		2010	2020	2030	2040	2050	2060
Terrell	North Texas Municipal Water District	4,027	8,460	10,508	12,324	12,707	13,480
Walnut Creek SUD	TRWD	3,321	4,298	5,903	6,646	6,696	6,507
	Total (limited by WTP capacity)	3,321	3,360	3,360	3,360	3,360	3,360
Waxahachie	Lake Waxahachie	2,905	2,800	2,695	2,590	2,485	2,380
	TRA (Bardwell)	3,855	3,669	3,483	3,297	3,111	2,925
	TRA (Reuse)	4,998	5,129	5,129	5,129	5,129	5,129
	Subtotal	11,520	11,371	11,092	10,813	10,533	10,254
	Total (limited to WTP capacity)	8,408	8,408	8,408	8,408	8,408	8,408
	TRA (TRWD Sources)	2,009	2,189	2,317	3,430	5,322	5,605
	Total	10,417	10,597	10,725	11,838	13,730	14,013
Weatherford	Lake Weatherford	2,967	2,923	2,880	2,837	2,793	2,750
	Benbrook Lake (TRWD)	1,802	1,937	2,082	2,228	2,377	2,531
	Trinity aquifer	50	50	50	50	50	50
	Total	4,819	4,910	5,012	5,115	5,220	5,331
West Cedar Creek	TRWD (limited by contract)	1,714	1,714	1,714	1,714	1,714	1,714
Wise Co. WSD	Tarrant Regional Water District	1,710	1,710	2,014	2,278	2,619	2,693

3.7 Summary of Current Water Supply in Region C

1. Region C water suppliers are currently using most of the reliable supply available from in-region reservoirs. The current use from some in-region reservoirs exceeds the reliable supplies that would be available in an extended drought. (In all cases where this is being done, the water suppliers have developed or are developing access to other supplies.)
2. The projected overall water supply available to Region C in 2060 from current sources is 2,267,223 acre-feet per year. (This figure does not consider supply limitations due to the capacities of current raw water transmission facilities and wells.) The sources of supply for Region C in 2060 include:
 - 1,273,803 acre-feet per year (56%) from in-region reservoirs
 - 146,152 acre-feet per year (6%) from groundwater
 - 43,906 acre-feet per year (2%) from local supplies
 - 261,011 acre-feet per year (12%) from reuse
 - 542,352 acre-feet per year (24%) from imports from other regions
3. The supply available to Region C from existing sources in 2060 (2.27 million acre-feet per year) is significantly less than the projected 2060 water use, which is over 2.9 million acre-feet per year.
4. Considering supply limitations due to the capacities of current raw water transmission facilities and wells, the currently available supply for Region C water users in 2060 is 1,874,132 acre-feet per year, with 12,997 acre-feet per year for water users in other regions. The total available supply is 1,887,130 acre-feet per year, which is 380,093 acre-feet per year less than the overall supply from existing sources. Most water user groups will have to make improvements to their facilities to provide for projected needs.
5. Several major water suppliers will require additional raw water transmission facilities to make full use of their existing sources.
6. Current groundwater use in a few areas in Region C exceeds the projected long-term water supply availability. Supplies from other sources will be needed in these areas so that groundwater use can be reduced to sustainable levels.
7. Some sources of supply will probably not be utilized fully during the period covered by this plan, but these will generally be the smaller local supplies.
8. The two operating desalination facilities in Region C are capable of treating 8,550 acre-feet per year of brackish water within Region C. The City of Sherman facility treats water from Lake Texoma, and the City of Bardwell facility treats local groundwater. Additional information regarding desalination in Region C is provided in Appendix I.

CHAPTER 3 LIST OF REFERENCES

- (1) Texas Water Development Board, *Exhibit C General Guidelines for Regional Water Plan Development (2007-2011)*, Austin, [Online] Available URL: <http://www.twdb.state.tx.us/wrpi/rwp/docu.htm>, September 8, 2008.
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- (7) Espey Consulting, Inc., PBS&J, Halff Associates, Inc., Crespo Consulting Services, Inc., and CivilTech Engineering, Inc.: *Water Availability Models for the Red and Canadian River Basins*, prepared for the Texas Natural Resource Conservation Commission, Austin, March 2002.
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- (9) R.J. Brandes Company: *Final Report Water Availability Modeling for the Sulphur River Basin*, prepared for the Texas Natural Resource Conservation Commission, Austin, June 1999.
- (10) Intera and Parsons, *Final Report Groundwater Availability Model for the Northern Carrizo-Wilcox Aquifer*, prepared for the Texas Water Development Board, Austin, January 31, 2003.