

4 Identification of Water Needed

Texas Water Development Board (TWDB) guidelines require that reserves and needs for additional water supply be determined for each water user group in the region based on the comparison of current water supply and projected demand. The specific surpluses and needs shown should be treated with caution because their development requires certain assumptions which are detailed to the right.

The resulting comparison shows the reserves and needs that will exist in Region C if no steps are taken to connect existing water supplies or develop additional water supplies. This comparison is specifically required by Texas Water Development Board planning guidelines ⁽¹⁾. Development of infrastructure to make existing supplies available to users and development of new supplies are treated as water management strategies, and they will be discussed in **Chapter 5**.

Surpluses and needs shown in this chapter are based on certain assumptions:

- TWDB guidelines require that the comparison between supply and demand be based on currently connected supplies, without considering the future connection of already developed supplies ⁽¹⁾.
- The division of existing supplies among users can be made in many ways. For example, the amount of groundwater available in a county on a sustainable basis was divided among users based on historical use and on well capacities. The actual future groundwater use may differ from these assumptions.

Chapter Outline

Section 4.1 – Regional Comparison of Supply and Demand

Section 4.2 – Comparison of Connected Supply and Projected Demand by Major Water Provider

Section 4.3 – Comparison of Connected Supply and Projected Demand by Other Water Providers

Section 4.3 – Summary of Projected Water Shortages

Section 4.5 – Second-Tier Needs Analysis

Related Appendices

Appendix D – DB22 Reports

4.1 Regional Comparison of Supply and Demand

Table 4.1 and **Figure 4.1** provide a comparison of total currently connected water supply and total projected water demand in Region C, considering all water user groups. If only water user groups with projected shortages (and not reserves) are considered, there is a need for approximately 67,000 acre-feet per year of additional supply by 2020, growing to a need for 1.32 million acre-feet per year of additional supply by 2070, based on currently connected supplies.

Figure 4.2 shows the projected distribution of shortages. Approximately ninety percent of the projected shortage in 2070 is for municipal users. It should be noted that most of the “shortages” shown for 2020 are fully met with expected conservation savings which is treated as a water management strategy rather than a currently available supply. This is discussed in more detail in **Section 4.5** regarding the second-tier needs analysis.

Table 4.2 shows the comparison of supply and demands by county. In 2020, all 16 counties show a net need for more water. On a regional basis, over 280 water users in

Region C are predicted to have a need for additional water by 2070. In general, the largest water needs are in Collin, Dallas, Denton and Tarrant Counties

The comparison of supply and demand in **Table 4.1** and **Figure 4.1** focuses on currently connected supplies. These currently connected supplies differ from “existing supplies” in TWDB’s online regional planning database (DB22) because DB22 does not recognize connected but unused supplies. For example, all of the groundwater in Region C is considered existing in DB22, but the connected supplies presented here do not consider unused groundwater an existing/connected supply. Region C also has a significant amount of unconnected supplies that could be made available to the region. An unconnected water supply is an existing and permitted supply that is not currently available due to infrastructure limitations.

Table 4.3 and **Figure 4.3** show the comparison of total supply with demand for Region C, including connected and unconnected supply and surface water imports from other regions. By 2050, the projected demand for Region C exceeds total connected and unconnected supply.

Table 4.1 Comparison of Connected Supply with Projected Demand by Decade

| | Values in Acre-Feet per Year | | | | | |
|---|------------------------------|-----------|-----------|-----------|-----------|-----------|
| | 2020 | 2030 | 2040 | 2050 | 2060 | 2070 |
| Connected Supply in Region C | 1,664,694 | 1,623,326 | 1,615,038 | 1,606,713 | 1,603,142 | 1,590,440 |
| Projected Demand | 1,733,893 | 1,936,605 | 2,151,925 | 2,390,623 | 2,641,476 | 2,898,540 |
| Total Regional Need | 69,199 | 313,279 | 536,887 | 783,910 | 1,038,334 | 1,308,100 |
| Regional Need Considering Only WUGs with Needs | 65,972 | 306,639 | 529,620 | 769,499 | 1,015,780 | 1,278,427 |
| Counties with Needs | 16 | 16 | 16 | 16 | 16 | 16 |
| User Groups with Needs | 156 | 238 | 257 | 268 | 276 | 281 |

Figure 4.2 Comparison of Connected Supply with Projected Demand by Decade for Region C

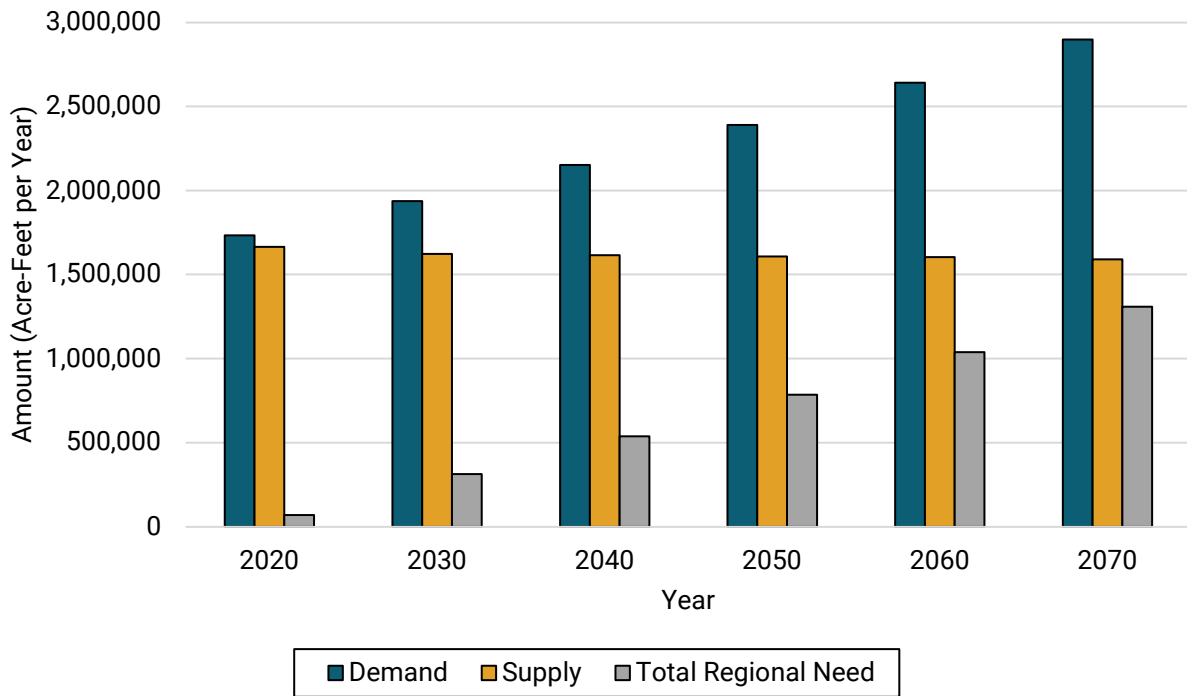


Figure 4.1 Projected Shortage by Use Type for Region C in 2070

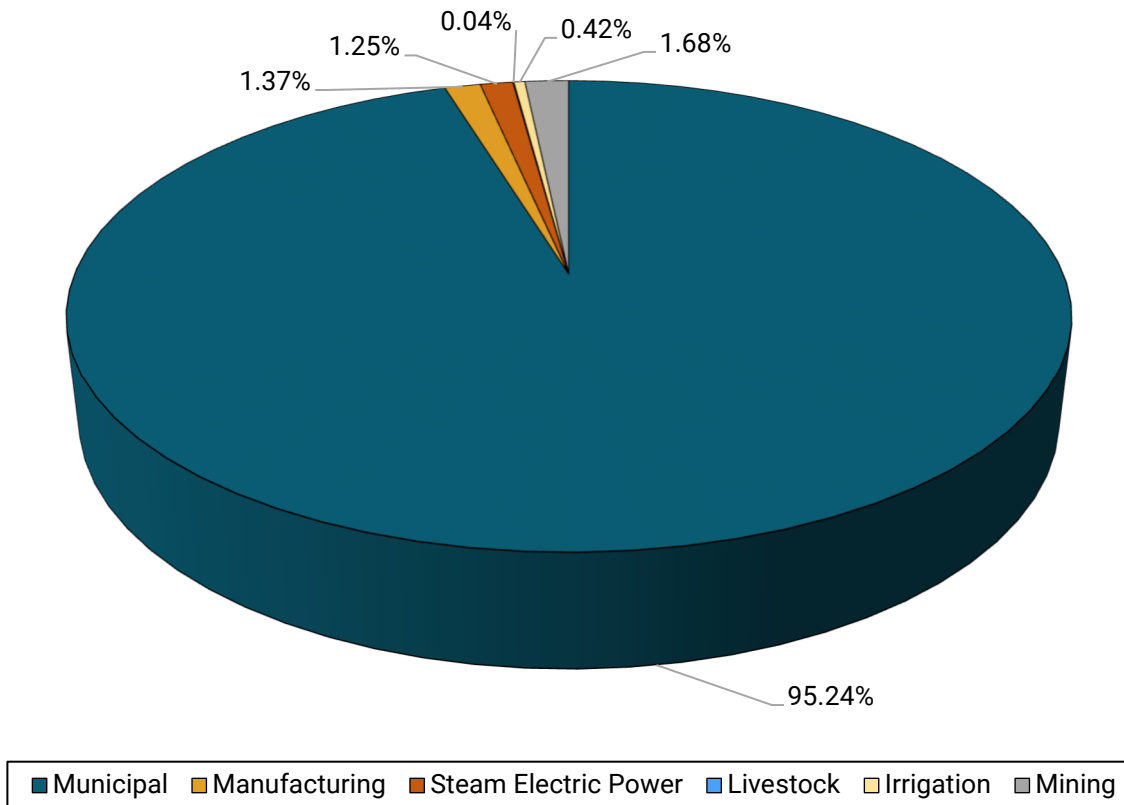


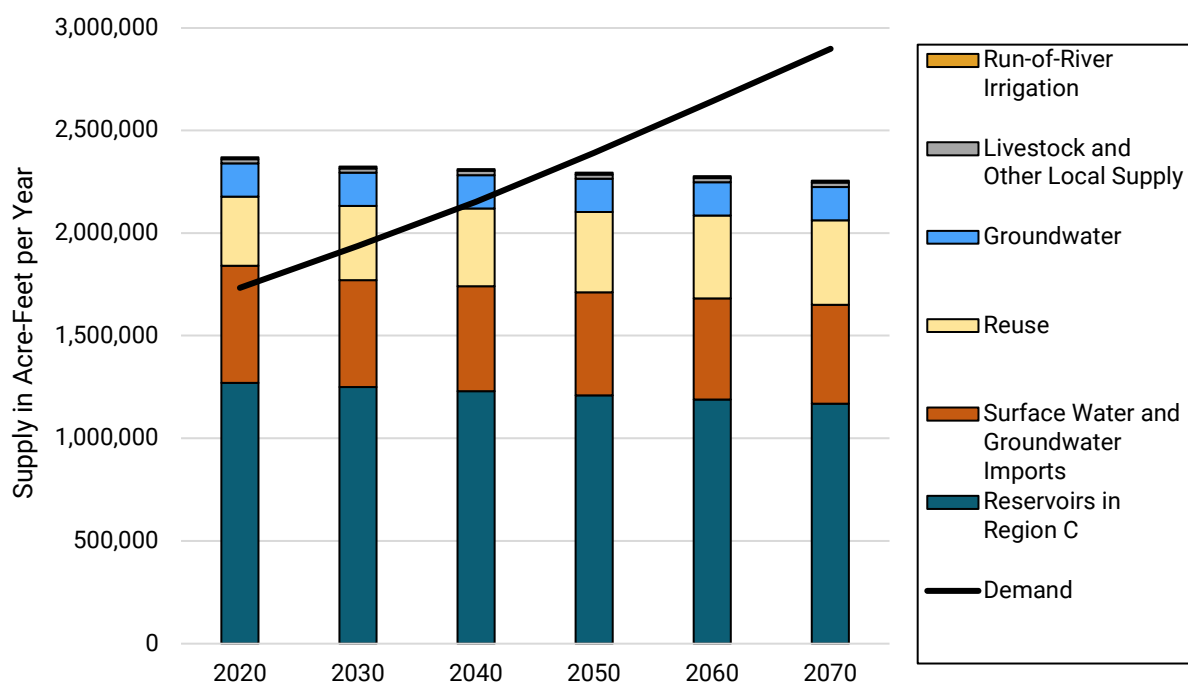
Table 4.2 Need by County for Region C (Acre-Feet per Year)

| County | 2020 | 2030 | 2040 | 2050 | 2060 | 2070 |
|--------------|---------------|----------------|----------------|----------------|------------------|------------------|
| Collin | 2,557 | 50,183 | 90,354 | 142,013 | 192,375 | 237,749 |
| Cooke | 588 | 220 | 301 | 447 | 1,828 | 5,922 |
| Dallas | 16,473 | 73,982 | 126,168 | 174,502 | 211,482 | 240,513 |
| Denton | 3,954 | 39,717 | 75,403 | 118,823 | 168,623 | 210,453 |
| Ellis | 3,365 | 10,621 | 15,249 | 24,845 | 39,005 | 64,739 |
| Fannin | 4,358 | 4,618 | 5,006 | 7,088 | 10,890 | 15,112 |
| Freestone | 11,199 | 11,790 | 12,821 | 14,377 | 15,755 | 19,226 |
| Grayson | 1,167 | 2,442 | 3,260 | 5,050 | 10,955 | 27,722 |
| Henderson | 861 | 1,311 | 1,740 | 2,405 | 4,752 | 8,515 |
| Jack | 162 | 768 | 1,238 | 1,614 | 1,905 | 2,190 |
| Kaufman | 997 | 5,572 | 10,590 | 16,698 | 26,279 | 39,375 |
| Navarro | 217 | 262 | 355 | 1,775 | 3,321 | 5,664 |
| Parker | 2,864 | 9,035 | 13,244 | 24,002 | 39,331 | 55,985 |
| Rockwall | 126 | 4,820 | 9,399 | 13,808 | 19,392 | 24,256 |
| Tarrant | 10,131 | 80,903 | 150,213 | 202,090 | 244,365 | 286,599 |
| Wise | 6,953 | 10,395 | 14,279 | 19,962 | 25,522 | 34,407 |
| Total | 65,972 | 306,639 | 529,620 | 769,499 | 1,015,780 | 1,278,427 |

Table 4.3 Comparison of Total Connected and Unconnected Supply with Demand (Acre-Feet per Year)

| | 2020 | 2030 | 2040 | 2050 | 2060 | 2070 |
|---|-----------|-----------|-----------|-----------|-----------|-----------|
| Total Connected and Unconnected Supply | 2,368,784 | 2,323,328 | 2,311,736 | 2,293,710 | 2,276,815 | 2,254,229 |
| Demand | 1,733,893 | 1,936,605 | 2,151,925 | 2,390,623 | 2,641,476 | 2,898,540 |
| Reserve (Need) | 634,891 | 386,723 | 159,811 | (96,913) | (364,661) | (644,311) |

Figure 4.3 Comparison of Connected and Unconnected Supply and Demand for Region C



4.2 Comparison of Connected Supply and Projected Demand by Major Water Provider

Under the planning rules, a major water provider (MWP) is defined as “a water user group or a wholesale water provider of particular significance to the region’s water supply as determined by the regional water planning group.”⁽¹⁾ The Region C Water Planning Group has designated six major water providers for Region C. In addition, two other wholesale water providers are considered “regional” water providers. **Table 4.4** shows the projected reserves or needs for additional supply for each major and regional water provider. Steps to meet these projected needs will be discussed in **Chapter 5D**.

Table 4.4 Reserve or (Need) by Major Water Provider Using Only Connected Supplies (Acre-Feet per Year)

| Water Provider | Projected Reserve or (Need) for Current and Future Customers | | | | | |
|---|--|----------|-----------|-----------|-----------|-----------|
| | 2020 | 2030 | 2040 | 2050 | 2060 | 2070 |
| Major Water Providers | | | | | | |
| Tarrant Regional Water District | (8,094) | (98,569) | (182,781) | (270,701) | (353,698) | (454,958) |
| <i>Municipal</i> | (2,958) | (89,331) | (170,082) | (254,479) | (334,406) | (431,521) |
| <i>Irrigation</i> | 0 | (265) | (492) | (670) | (793) | (899) |
| <i>Livestock</i> | 0 | 0 | 0 | 0 | 0 | 0 |
| <i>Manufacturing</i> | 0 | (770) | (1,362) | (1,749) | (2,356) | (3,276) |
| <i>Mining</i> | (5,136) | (6,253) | (7,402) | (9,145) | (10,616) | (13,005) |
| <i>Steam Electric Power</i> | 0 | (1,950) | (3,443) | (4,658) | (5,527) | (6,257) |
| North Texas Municipal Water District | (1,766) | (82,267) | (141,385) | (216,720) | (295,275) | (368,961) |
| <i>Municipal</i> | (1,759) | (80,956) | (139,515) | (214,201) | (292,155) | (365,380) |
| <i>Irrigation</i> | 8 | 8 | 8 | 8 | 8 | 8 |
| <i>Livestock</i> | 0 | 0 | 0 | 0 | 0 | 0 |
| <i>Manufacturing</i> | (13) | (1,140) | (1,623) | (2,186) | (2,703) | (3,102) |
| <i>Mining</i> | 0 | 0 | 0 | 0 | 0 | 0 |
| <i>Steam Electric Power</i> | (2) | (179) | (255) | (341) | (425) | (487) |
| Fort Worth | (6,640) | (64,018) | (125,332) | (170,675) | (210,072) | (250,890) |
| <i>Municipal</i> | (6,640) | (62,767) | (123,031) | (167,570) | (206,378) | (246,685) |
| <i>Irrigation</i> | 0 | 0 | 0 | 0 | 0 | 0 |
| <i>Livestock</i> | 0 | 0 | 0 | 0 | 0 | 0 |
| <i>Manufacturing</i> | 0 | (1,251) | (2,301) | (3,105) | (3,694) | (4,205) |
| <i>Mining</i> | 0 | 0 | 0 | 0 | 0 | 0 |
| <i>Steam Electric Power</i> | 0 | 0 | 0 | 0 | 0 | 0 |
| Dallas Water Utilities | (20,466) | (47,873) | (107,474) | (174,706) | (238,482) | (281,878) |
| <i>Municipal</i> | (20,066) | (46,295) | (103,815) | (169,232) | (231,779) | (274,329) |
| <i>Irrigation</i> | 434 | 212 | (201) | (510) | (685) | (820) |
| <i>Livestock</i> | 0 | 0 | 0 | 0 | 0 | 0 |

| Water Provider | Projected Reserve or (Need) for Current and Future Customers | | | | | |
|--|--|----------|----------|-----------|-----------|-----------|
| | 2020 | 2030 | 2040 | 2050 | 2060 | 2070 |
| <i>Manufacturing</i> | (744) | (1,690) | (3,174) | (4,343) | (5,041) | (5,554) |
| <i>Mining</i> | (50) | (14) | (112) | (384) | (704) | (874) |
| <i>Steam Electric Power</i> | (40) | (86) | (172) | (237) | (273) | (301) |
| Trinity River Authority | (2,177) | (66,871) | (90,145) | (106,993) | (124,794) | (153,235) |
| <i>Municipal</i> | (1,153) | (63,890) | (86,060) | (101,759) | (118,635) | (146,142) |
| <i>Irrigation</i> | 300 | 221 | 196 | 177 | 161 | 152 |
| <i>Livestock</i> | 0 | 0 | 0 | 0 | 0 | 0 |
| <i>Manufacturing</i> | (1,320) | (1,439) | (1,580) | (1,882) | (2,128) | (2,440) |
| <i>Mining</i> | 0 | (387) | (510) | (692) | (869) | (1,086) |
| <i>Steam Electric Power</i> | (4) | (1,376) | (2,191) | (2,837) | (3,323) | (3,719) |
| Upper Trinity Regional Water District | 7,522 | (14,197) | (37,823) | (64,393) | (85,440) | (107,774) |
| <i>Municipal</i> | 7,473 | (13,521) | (36,108) | (60,745) | (80,929) | (102,256) |
| <i>Irrigation</i> | 19 | (589) | (1,178) | (2,353) | (2,353) | (2,353) |
| <i>Livestock</i> | 0 | 0 | 0 | 0 | 0 | 0 |
| <i>Manufacturing</i> | 0 | (12) | (23) | (26) | (29) | (32) |
| <i>Mining</i> | 30 | (75) | (514) | (1,269) | (2,129) | (3,133) |
| <i>Steam Electric Power</i> | 0 | 0 | 0 | 0 | 0 | 0 |
| Regional Water Providers | | | | | | |
| Greater Texoma Utility Authority | 2,743 | (21,816) | (37,947) | (45,883) | (58,163) | (74,153) |
| Corsicana | 2,138 | 978 | (58) | (1,404) | (2,979) | (5,346) |

4.3 Comparison of Connected Supply and Projected Demand by Other Water Providers

Projected supplies, demands, reserves, and shortages are summarized for each wholesale water provider and water user group in **Chapters 5D** and **5E**. As shown on **Table 4.1** there are over 280 water user groups with projected water shortages by 2070.

Chapter 5E of this plan discusses the selection of water management strategies to address the requirements for additional supply. Many water user groups in Region C are served by wholesale water providers, and the needs of these water user groups will be addressed by obtaining additional supplies from the wholesale water providers. Other water user groups will require the development of individual water management strategies to address their needs.

4.4 Summary of Projected Water Shortages

All of the Region C counties have net needs beginning in 2020. There are over 150 water user groups that are projected to need more supply in 2020, growing to over 280 water user groups by 2070.

If no new supplies are developed, the total projected overall shortage in Region C is approximately 69,000 acre-feet per year by 2020, growing to over 1.31 million acre-feet per year by 2070. Many of the shortages in 2020 are fully addressed by water conservation measures.

Additionally, there are substantial unconnected supplies in Region C that could be made available by completing water transmission facilities. However, many Region C water suppliers depend on the region’s major and regional water providers for all or part of their supplies. Most of the major and regional water providers will need to connect or develop additional supplies by 2020, and all will need additional supplies by 2040.

4.5 Second-Tier Needs Analysis

Regional planning rules require a second-tier needs analysis for all WUGs and MWP for which conservation and direct reuse are recommended WMSs. The second-tier needs analysis determines water needs that would remain if recommended conservation and direct reuse strategies were fully implemented.

TWDB has provided a second-tier water needs analysis report from DB22. This report is included in **Appendix D. Table 4.5** summarizes the second-tier needs by WUG category and **Table 4.6** summarizes second-tier needs by major water provider.

Table 4.5 Second-Tier Water Needs by WUG Category

| WUG Category | Values in Acre-Feet per Year | | | | | |
|----------------------|------------------------------|----------------|----------------|----------------|----------------|------------------|
| | 2020 | 2030 | 2040 | 2050 | 2060 | 2070 |
| Municipal | 8,235 | 137,873 | 340,473 | 547,150 | 755,861 | 966,163 |
| County Other | 1,668 | 2,052 | 2,327 | 7,500 | 18,597 | 43,334 |
| Manufacturing | 402 | 5,342 | 9,072 | 12,148 | 14,601 | 17,532 |
| Mining | 5,770 | 5,308 | 6,126 | 7,283 | 8,780 | 11,247 |
| Steam Electric Power | 6,824 | 9,041 | 10,597 | 11,873 | 12,835 | 13,663 |
| Livestock | 478 | 478 | 478 | 478 | 478 | 478 |
| Irrigation | 4,582 | 4,616 | 4,638 | 4,664 | 4,838 | 5,151 |
| Total | 27,959 | 164,710 | 373,711 | 591,096 | 815,990 | 1,057,568 |

Table 4.6 Second-Tier Water Needs by Major Water Provider

| Values in Acre-Feet per Year | | | | | | |
|---------------------------------------|-------------|----------------|----------------|----------------|------------------|------------------|
| WUG Category | 2020 | 2030 | 2040 | 2050 | 2060 | 2070 |
| Tarrant Regional Water District | 0 | 37,845 | 130,727 | 214,079 | 291,500 | 386,000 |
| North Texas Municipal Water District | 0 | 53,681 | 107,924 | 174,580 | 243,720 | 308,263 |
| Fort Worth | 0 | 14,814 | 80,173 | 124,748 | 163,463 | 203,772 |
| Dallas Water Utilities | 0 | 8,156 | 54,409 | 112,788 | 170,435 | 209,008 |
| Trinity River Authority | 0 | 59,719 | 78,901 | 95,906 | 113,562 | 141,854 |
| Upper Trinity Regional Water District | 0 | 9,589 | 31,638 | 55,897 | 75,879 | 97,047 |
| Total | 0 | 183,804 | 483,772 | 777,998 | 1,058,558 | 1,345,943 |

4.6 Chapter 4 List of References

- (1) Texas Water Development Board, *Exhibit C Second Amended General Guidelines for Fifth Cycle Regional Water Plan Development* (April 2018), Austin, [Online] URL: http://www.twdb.texas.gov/waterplanning/rwp/planningdocu/2021/doc/current_docs/contract_docs/2ndAmendedExhibitC.pdf?d=1570051503683, April, 2018.