

Region C Water Planning Group

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4 Identification of Water Need

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:

- TWDB guidelines require that the comparison 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.

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.

In the remainder of this section, projected water demands are compared to currently available water supplies, and projected water shortages and reserves are identified for Region C as a whole (Section 4.1), for wholesale water providers (Section 4.2), and for water user groups (Section 4.3). In addition, the projected shortages are summarized (Section 4.4), and finally, the projected shortages after the second-tier needs analysis are discussed (Section 4.5).

4.1 Regional Comparison of Supply and Demand

Table 4.1 and Figure 4.1 summarize the 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 125,000 acre-feet per year of additional supply by 2020, growing to a need for 1.36 million acre-feet per year of additional supply by 2070, based on currently connected supplies.

Table 4.1
Comparison of Connected Supply with Projected Demand by Decade in Region C (Acre-Feet per Year)

| Item | 2020 | 2030 | 2040 | 2050 | 2060 | 2070 |
|--|-----------|-----------|-----------|-----------|-------------|-------------|
| Connected Supply in Region C | 1,684,444 | 1,663,069 | 1,658,616 | 1,659,618 | 1,648,866 | 1,631,341 |
| Projected Demand | 1,723,325 | 1,944,991 | 2,182,948 | 2,425,837 | 2,676,836 | 2,939,880 |
| Total Regional Reserve or (Need) | (38,881) | (281,922) | (524,332) | (766,219) | (1,027,970) | (1,308,539) |
| Regional Reserve or (Need) Considering Only Water User Groups With Needs | (125,037) | (367,207) | (604,016) | (834,272) | (1,086,226) | (1,356,372) |
| Counties with Needs | 16 | 16 | 16 | 16 | 16 | 16 |
| User Groups with Needs | 170 | 242 | 257 | 268 | 275 | 283 |

Figure 4.1
Comparison of Connected Supply with Projected Demand by Decade for Region C

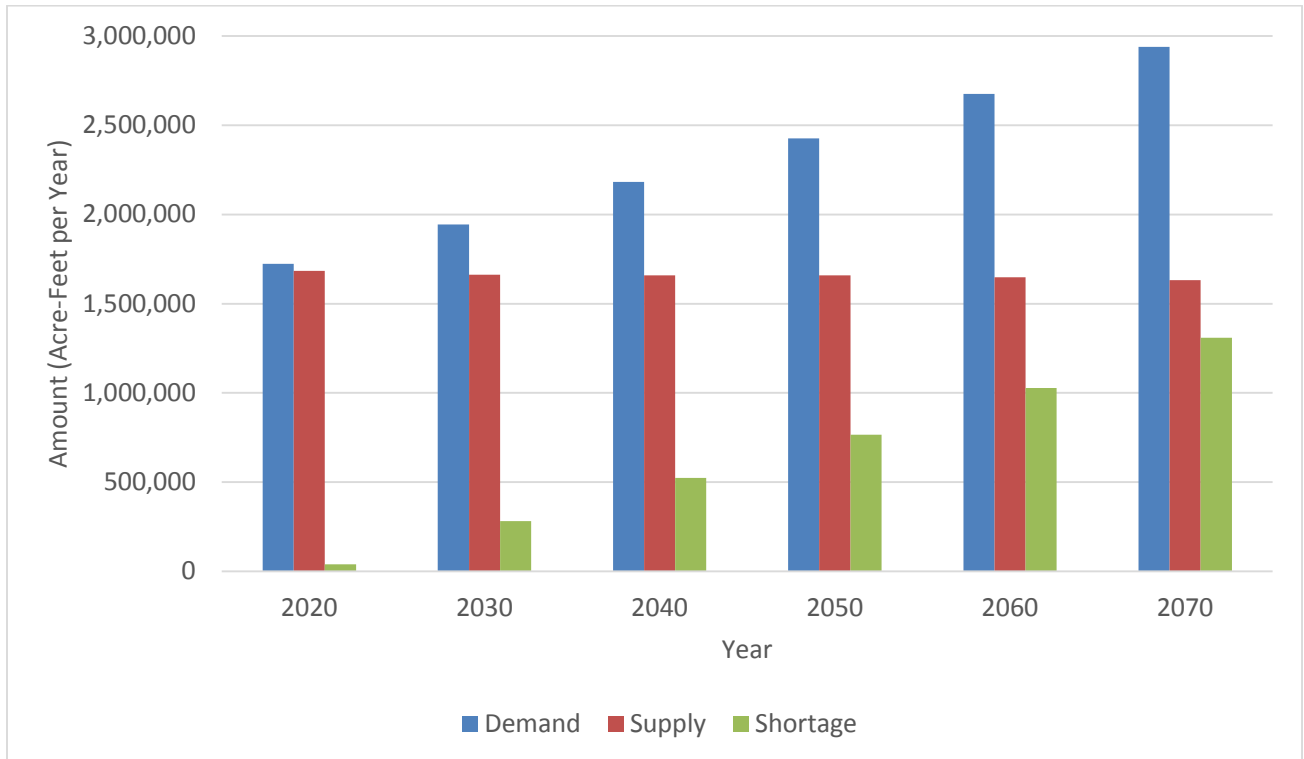


Figure 4.2
Projected Shortage by Use Type for Region C in 2070

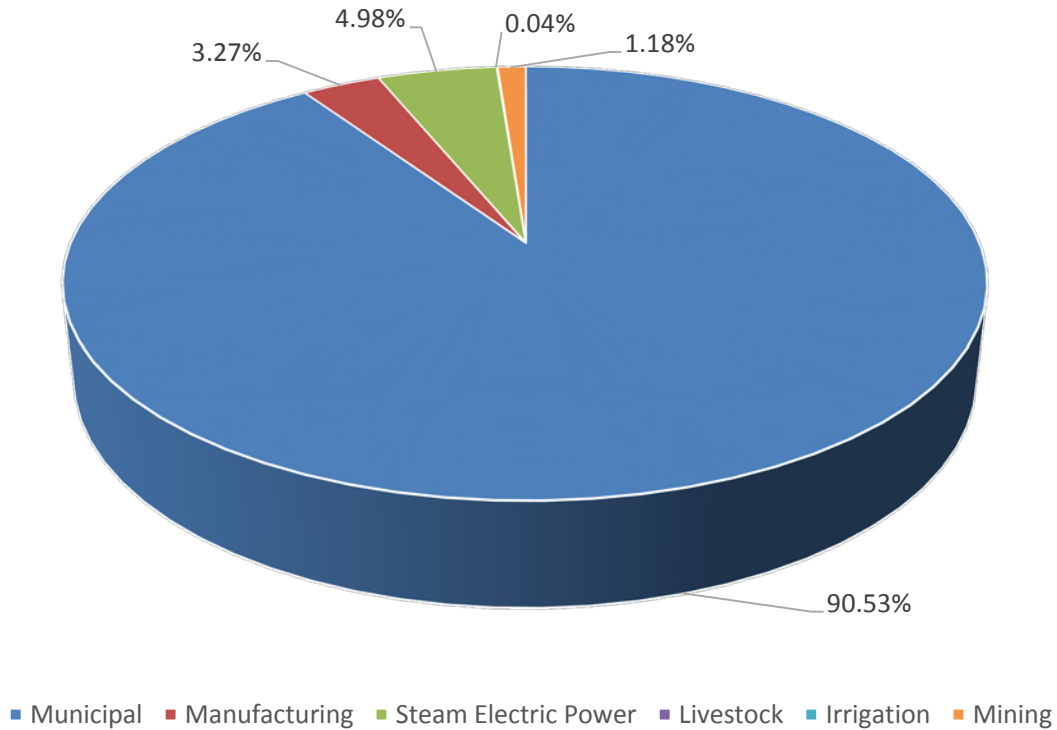


Figure 4.2 shows the projected distribution of shortages. Approximately ninety percent of the projected shortage in 2070 is for municipal users. It should be noted that most of the “shortages” shown for 2020 are fully met with expected conservation savings which is treated as a water management strategy rather than a currently available supply. This is discussed in more detail in Section 4.6 regarding the second-tier needs analysis.

Table 4.2 shows the comparison of supply and demands by county. In 2020, 16 out of the 16 counties show a net need for more water. On a regional basis, 283 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, with lesser but significant needs in other 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 (DB17) because DB17 does not recognize connected but unused supplies. For example, all of the groundwater in Region C is considered existing in DB17, 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.

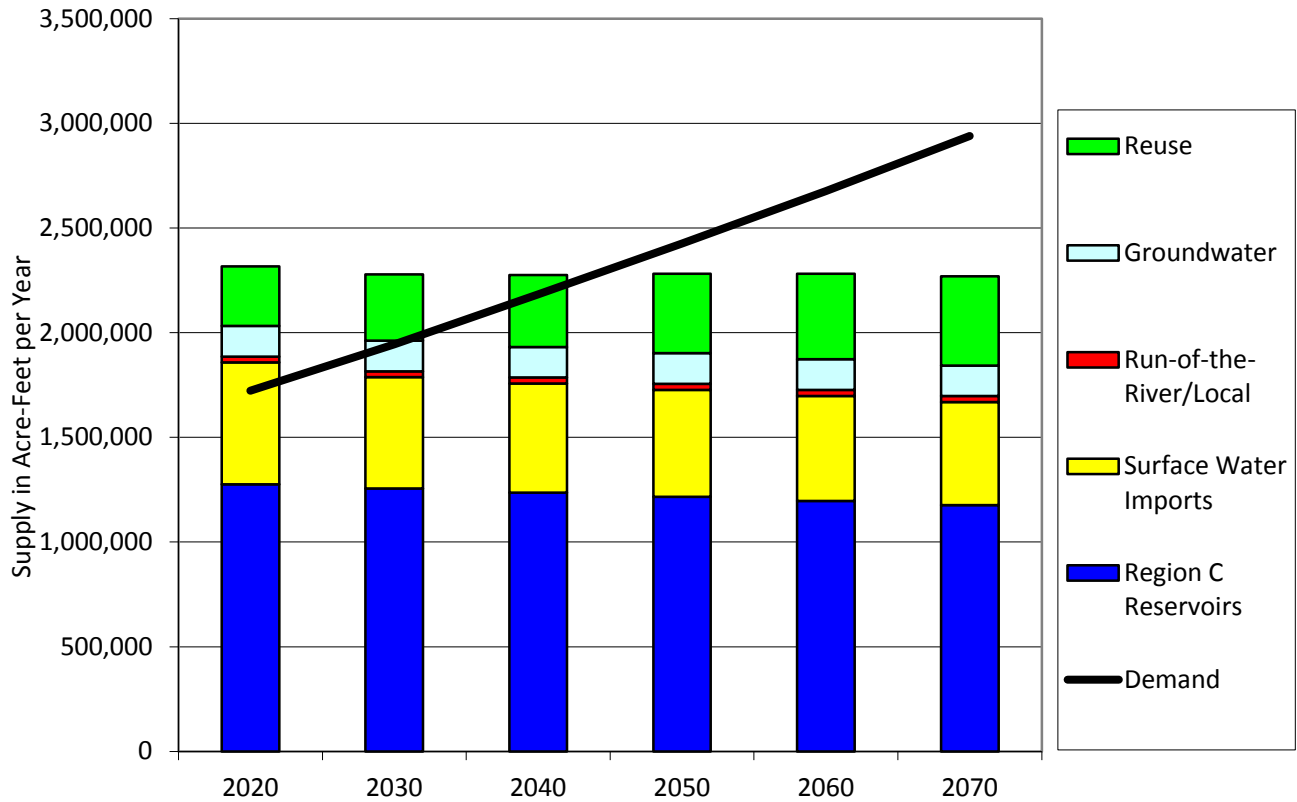
**Table 4.2
Reserve or (Need) by County for Region C (Acre-Feet per Year)**

| County | 2020 | 2030 | 2040 | 2050 | 2060 | 2070 |
|---------------|------------------|------------------|------------------|------------------|--------------------|--------------------|
| Collin | (18,865) | (65,722) | (105,470) | (145,168) | (177,270) | (207,655) |
| Cooke | (849) | (288) | (300) | (461) | (1,058) | (5,017) |
| Dallas | (42,674) | (101,656) | (159,703) | (206,626) | (248,412) | (280,615) |
| Denton | (12,241) | (47,075) | (86,617) | (128,970) | (174,830) | (216,283) |
| Ellis | (1,611) | (5,680) | (14,495) | (24,579) | (43,984) | (73,554) |
| Fannin | (56) | (5,123) | (6,839) | (9,423) | (13,856) | (18,776) |
| Freestone | (4,544) | (4,320) | (4,431) | (7,883) | (15,060) | (24,863) |
| Grayson | (86) | (8,106) | (10,067) | (13,483) | (21,829) | (36,244) |
| Henderson | (1,846) | (5,208) | (6,633) | (8,146) | (12,249) | (18,249) |
| Jack | (981) | (1,430) | (1,734) | (2,120) | (2,496) | (2,938) |
| Kaufman | (1,860) | (5,699) | (9,813) | (15,757) | (24,954) | (38,113) |
| Navarro | (8,000) | (17,038) | (17,838) | (19,144) | (21,055) | (23,704) |
| Parker | (3,349) | (6,752) | (11,025) | (18,031) | (32,667) | (51,749) |
| Rockwall | (1,645) | (6,407) | (9,200) | (12,319) | (16,717) | (22,345) |
| Tarrant | (24,130) | (82,442) | (151,925) | (207,390) | (257,690) | (305,928) |
| Wise | (2,300) | (4,261) | (7,926) | (14,772) | (22,099) | (30,339) |
| Total | (125,037) | (367,207) | (604,016) | (834,272) | (1,086,226) | (1,356,372) |

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

| Item | 2020 | 2030 | 2040 | 2050 | 2060 | 2070 |
|--|-------------|-------------|-------------|-------------|-------------|-------------|
| Total Connected and Unconnected Supply | 2,316,273 | 2,279,349 | 2,275,427 | 2,282,147 | 2,281,830 | 2,270,143 |
| Demand | 1,723,325 | 1,944,991 | 2,182,948 | 2,425,837 | 2,676,836 | 2,939,880 |
| Reserve/(Need) | 592,948 | 334,358 | 92,479 | (143,690) | (395,006) | (669,737) |

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



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

Under the planning rules, a wholesale water provider (WWP) is defined as an entity that sold or had contracts to sell more than 1,000 acre-feet of water on a wholesale basis in recent years or that is projected to sell more than 1,000 acre-feet per year on a wholesale basis during the planning period ⁽¹⁾. The Region C Water Planning Group has designated 41 wholesale water providers for Region C. Table 4.4 summarizes the comparison of supply and demand and shows the reserves or needs for additional supply for each wholesale water provider. As a group, the wholesale water providers are projected to have a need for additional supply in each decade of the planning period. Steps to meet these projected needs will be discussed in Section 5C.

Two wholesale water providers do not have a projected shortage in Region C within the planning period: Dallas County Park Cities Municipal Utility District and Sabine River Authority. The Sulphur River Basin Authority does not currently provide water supply, but is expected to do so in the future. The need listed

for SRBA is equivalent to the anticipated future contract amounts. Five wholesale water providers (Dallas Water Utilities, Tarrant Regional Water District, North Texas Municipal Water District, Trinity River Authority and Upper Trinity Regional Water District) provide water to meet approximately 90 percent of the total demand in Region C.

4.3 Comparison of Connected Supply and Projected Demand by Water User Group

Projected supplies, demands, reserves, and shortages are summarized for each water user group in Appendix C. As shown on Table 4.1, there are 283 water user groups with projected water shortages by 2070.

Chapter 5D of this report 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.

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

| Wholesale Water Provider | Projected Needs for Current and Future Customers | | | | | |
|--|--|----------|-----------|-----------|-----------|-----------|
| | 2020 | 2030 | 2040 | 2050 | 2060 | 2070 |
| Argyle Water Supply Corporation | 0 | (373) | (1,044) | (1,398) | (1,535) | (1,714) |
| Arlington | 0 | (6,792) | (15,031) | (22,414) | (28,829) | (34,470) |
| Athens Municipal Water Authority | 1,283 | 921 | 599 | 170 | (2,597) | (5,987) |
| Corsicana | 1,989 | (4,355) | (5,343) | (6,885) | (8,986) | (11,662) |
| Cross Timbers Water Supply Corporation | 0 | (176) | (347) | (492) | (562) | (679) |
| Dallas County Park Cities Municipal Utility District | 5,222 | 5,094 | 5,067 | 4,980 | 4,841 | 4,692 |
| Dallas Water Utilities | (20,117) | (71,412) | (137,609) | (198,449) | (327,509) | (296,881) |
| Denison | 0 | (736) | (1,421) | (2,182) | (3,711) | (6,241) |
| Denton | (3,204) | (11,891) | (21,639) | (34,217) | (56,291) | (74,217) |
| East Cedar Creek Freshwater Supply District | 0 | (169) | (414) | (687) | (1,132) | (1,867) |
| Ennis | (156) | (510) | (1,313) | (3,218) | (8,745) | (19,014) |
| Forney | (564) | (1,883) | (2,843) | (3,965) | (6,013) | (9,815) |
| Fort Worth | (12,227) | (65,035) | (127,398) | (172,425) | (214,360) | (257,766) |
| Gainesville | 750 | 1,053 | 1,087 | 679 | (774) | (5,022) |
| Garland | (3,304) | (9,890) | (12,404) | (14,006) | (15,814) | (17,761) |
| Grand Prairie | (5,704) | (9,118) | (13,521) | (15,903) | (18,263) | (19,715) |
| Greater Texoma Utility Authority | (329) | (18,197) | (21,589) | (27,460) | (44,384) | (67,017) |
| Lake Cities Municipal Utility Authority | 0 | (409) | (868) | (1,261) | (1,385) | (1,529) |

| Wholesale Water Provider | Projected Needs for Current and Future Customers | | | | | |
|--|--|-----------|-----------|-----------|-----------|-----------|
| | 2020 | 2030 | 2040 | 2050 | 2060 | 2070 |
| Mansfield | (11,730) | (15,141) | (19,946) | (28,699) | (34,482) | (40,709) |
| Midlothian | (1,550) | (3,263) | (5,646) | (8,017) | (10,354) | (12,491) |
| Mustang Special Utility District | 0 | (2,245) | (5,022) | (7,862) | (9,924) | (11,941) |
| North Richland Hills | (5,335) | (6,058) | (6,294) | (6,571) | (6,878) | (7,353) |
| North Texas Municipal Water District | (30,540) | (103,975) | (152,935) | (201,898) | (256,574) | (316,373) |
| Princeton | (102) | (375) | (638) | (1,477) | (2,484) | (3,772) |
| Rockett Special Utility District | (3,370) | (5,796) | (8,560) | (10,961) | (15,010) | (22,435) |
| Rockwall | (1,156) | (4,882) | (6,916) | (8,782) | (11,452) | (14,651) |
| Sabine River Authority ^a | 642,875 | 624,319 | 346,838 | 142,727 | 86,754 | 9,196 |
| Seagoville | (1,138) | (1,556) | (2,094) | (2,759) | (4,206) | (5,922) |
| Sherman | (187) | (1,013) | (2,965) | (5,249) | (10,660) | (20,153) |
| Sulphur River Basin Authority ^c | 0 | 0 | 0 | 72,670 | 127,120 | 489,800 |
| Tarrant Regional Water District | (33,311) | (102,377) | (176,044) | (259,326) | (349,689) | (460,608) |
| Terrell | (421) | (2,039) | (4,052) | (6,967) | (10,426) | (14,239) |
| Trinity River Authority | (76,476) | (71,427) | (76,617) | (83,666) | (92,676) | (118,810) |
| Upper Neches River Municipal Water Authority ^{a, b} | (4,831) | (6,849) | (8,869) | (10,892) | (12,919) | (14,940) |
| Upper Trinity Regional Water District | 8,731 | (7,936) | (33,168) | (57,700) | (72,862) | (94,203) |
| Walnut Creek Special Utility District | 0 | (288) | (779) | (1,585) | (3,472) | (5,930) |
| Waxahachie | 2,367 | 1,025 | (3,381) | (5,738) | (9,124) | (14,017) |
| Weatherford | (2,255) | (2,632) | (3,310) | (7,584) | (15,969) | (26,618) |
| West Cedar Creek Municipal Utility District | (322) | (639) | (989) | (1,461) | (2,714) | (4,432) |
| Wise County Water Supply District | (1,708) | (2,471) | (3,334) | (6,048) | (8,380) | (10,703) |

^a Obtained from the East Texas Regional Water Planning Area Plan

^b Does not include potential future customers

^c Does not currently supply water. Need is equivalent to anticipated contract amounts from Sulphur Basin Supplies strategy.

4.4 Summary of Projected Water Shortages

- If no new supplies are developed, the total of projected shortages in Region C is approximately 39,000 acre-feet per year by 2020, growing to over 1.3 million acre-feet per year by 2070.
- Many of the shortages in 2020 are fully addressed by water conservation measures.
- There are substantial unconnected supplies in Region C that could be made available by completing water transmission facilities.
- All of the Region C counties have net needs for more water beginning in 2020.
- There are 170 water user groups are projected to need more supply in 2020, growing to 283 water user groups by 2070.
- Many Region C water suppliers depend on the region's wholesale water providers for all or part of their supplies. All but two of the wholesale water providers will need to develop additional supplies by 2070.

4.5 Second-Tier Needs Analysis

A new requirement for this round of planning is the performance of a second-tier needs analysis for all WUGs and WWPs 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 DB17. This report is included in Appendix U. Table 4.5 summarizes the second-tier needs by WUG category.

Table 4.5
Second-Tier Water Needs by WUG Category (Acre-Feet per Year)

| WUG Category | 2020 | 2030 | 2040 | 2050 | 2060 | 2070 |
|----------------------|---------------|----------------|----------------|----------------|----------------|------------------|
| Municipal | 58,688 | 201,823 | 403,588 | 603,410 | 822,948 | 1,057,690 |
| Manufacturing | 2,649 | 11,184 | 19,228 | 26,446 | 33,893 | 41,392 |
| Mining | 6,105 | 5,689 | 6,931 | 8,327 | 9,720 | 11,854 |
| Steam Electric Power | 9,006 | 29,380 | 34,264 | 41,737 | 50,538 | 60,489 |
| Livestock | 0 | 0 | 0 | 0 | 0 | 0 |
| Irrigation | 393 | 406 | 418 | 429 | 437 | 440 |
| Total | 76,841 | 248,482 | 464,429 | 680,349 | 917,536 | 1,171,865 |

CHAPTER 4

LIST OF REFERENCES

- (1) Texas Water Development Board, *Exhibit C First Amended General Guidelines for Regional Water Plan Development (October 2012) Fourth Cycle of Regional Planning, Austin*, [Online] URL: http://www.twdb.texas.gov/waterplanning/rwp/planningdocu/2016/doc/current_docs/contract_docs/2012_exhC_1st_amended_gen_guidelines.pdf, October 2012.

