







Glossary

ACRE-FOOT

Volume of water needed to cover 1 acre to a depth of 1 foot. It equals 325,851 gallons.

AQUIFER

Geologic formation that contains sufficient saturated permeable material to yield significant quantities of water to wells and springs. The formation could be sand, gravel, limestone, sandstone, or fractured igneous rocks.

AVAILABILITY

Maximum amount of water available during the drought of record, regardless of whether the supply is physically or legally available.

BRACKISH WATER

Water with total dissolved solids between 1,000 and 10,000 milligrams per liter.

CAPITAL COST

Portion of the estimated cost of a water management strategy that includes both the direct costs of constructing facilities, such as materials, labor, and equipment, and the indirect expenses associated with construction activities, such as costs for engineering studies, legal counsel, land acquisition, contingencies, environmental mitigation, interest during construction, and permitting costs.

CONJUNCTIVE USE

The combined use of groundwater and surface water sources that optimizes the beneficial characteristics of each source.

COUNTY-OTHER

An aggregation of residential, commercial, and institutional water users in cities with less than 500 people or utilities that provide less than an average of 250,000 gallons per day, as well as unincorporated rural areas in a given county.

DESALINATION

Process of removing salt from seawater or brackish water.

DROUGHT

Term is generally applied to periods of less than average precipitation over a certain period of time. Associated definitions include *meteorological drought* (abnormally dry weather), *agricultural drought* (adverse impact on crop or range production), and *hydrologic drought* (below average water content in aquifers and/or reservoirs).

DROUGHT OF RECORD

Period of time during recorded history when natural hydrological conditions provided the least amount of water supply. For Texas as a whole, the drought of record is generally considered to be from about 1950 to 1957.

ESTUARY

Bay or inlet, often at the mouth of a river, in which large quantities of freshwater and seawater mix together.

EXISTING WATER SUPPLY

Maximum amount of water available from existing sources for use during drought of record conditions that is physically and legally available for use.

FIRM YIELD

Maximum water volume a reservoir can provide each year under a repeat of the drought of record.

FLOOD CONTROL STORAGE

Storage in a lake or reservoir, between two designated water surface elevations, that is dedicated to storing floodwater so that flood damages downstream are eliminated or reduced.

FRESHWATER INFLOW NEEDS

Freshwater flows required to maintain the natural salinity and nutrient and sediment delivery in a bay or estuary that supports their unique biological communities and ensures a healthy ecosystem.

GROUNDWATER AVAILABILITY MODEL

Numerical groundwater flow models used by TWDB to determine groundwater availability of the major and minor aquifers in Texas.

GROUNDWATER MANAGEMENT AREA

Area designated and delineated by TWDB as an area suitable for management of groundwater resources.

INFRASTRUCTURE

Physical means for meeting water and wastewater needs, such as dams, wells, conveyance systems, and water treatment plants.

INSTREAM FLOW

Water flow and water quality regime adequate to maintain an ecologically sound environment in streams and rivers.

INTERBASIN TRANSFER

Physical conveyance of surface water from one river basin to another.

MAJOR RESERVOIR

Reservoir having a storage capacity of 5,000 acre-feet or more.

MODELED AVAILABLE GROUNDWATER

The total amount of groundwater, including both permitted and exempt uses, that can be produced from the aquifer in an average year, that achieves the desired future condition for the aquifer.

NEEDS

Projected water demands in excess of existing water supplies for a water user group or a wholesale water provider.

PLANNING GROUP

Team of regional and local leaders of different backgrounds and various social, environmental, and economic interests responsible for developing and adopting a regional water plan for their planning area at five-year intervals.

RECHARGE

Amount of water that infiltrates to the water table of an aquifer.

RECOMMENDED WATER MANAGEMENT STRATEGY

Specific project or action to increase water supply or maximize existing supply to meet a specific need.

REUSE

Use of surface water that has already been beneficially used once under a water right or the use of groundwater that has already been used.

RUN-OF-RIVER DIVERSION

Water right permit that allows the permit holder to divert water directly out of a stream or river.

SAFE YIELD

The annual amount of water that can be withdrawn from a reservoir for a period of time longer than the drought of record.

SEDIMENTATION

Action or process of depositing sediment in a reservoir, usually silts, sands, or gravel.

STORAGE

Natural or artificial impoundment and accumulation of water in surface or underground reservoirs, usually for later withdrawal or release.

SUBORDINATION AGREEMENT

Contracts between junior and senior water right holders where the senior water right holder agrees not to assert its priority right against the junior.

UNMET NEEDS

Portion of the demand for water that exceeds water supply after inclusion of all recommended water management strategies in a regional water plan.

WATER AVAILABILITY MODEL

Numerical surface water flow models to determine the availability of surface water for permitting in the state.

WATER DEMAND

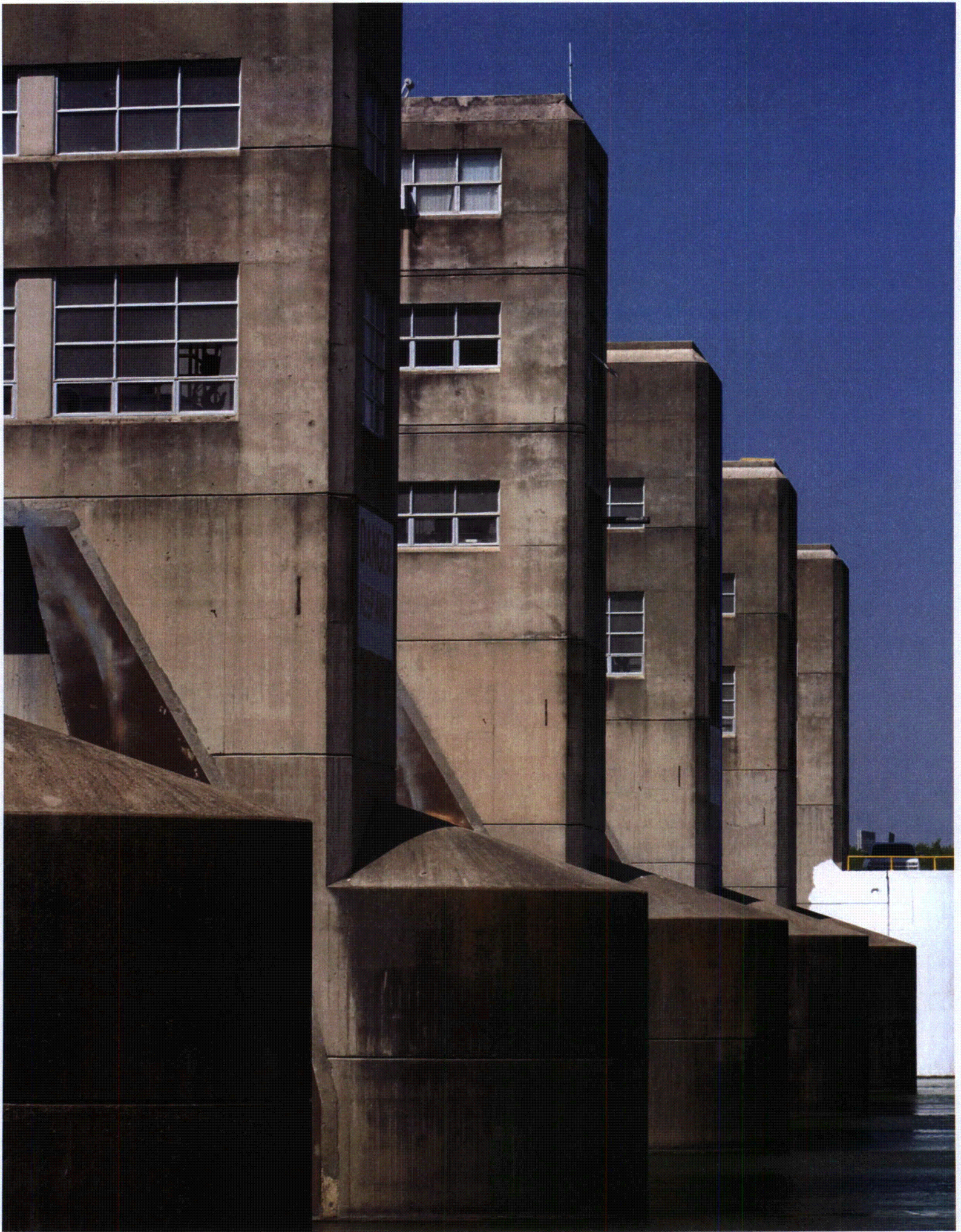
Quantity of water projected to meet the overall necessities of a water user group in a specific future year.

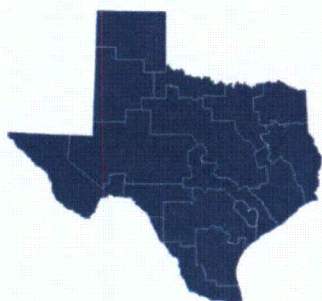
WATER USER GROUP

Identified user or group of users for which water demands and water supplies have been identified and analyzed and plans developed to meet water needs. Water user groups are defined at the county level for the manufacturing, irrigation, livestock, steam-electric power generation, and mining water use categories. Municipal water user groups include (a) incorporated cities and selected Census Designated Places with a population of 500 or more; (b) individual or groups of selected water utilities serving smaller municipalities or unincorporated areas; and (c) rural areas not included in a listed city or utility, aggregated for each county.

WHOLESALE WATER PROVIDER

Person or entity, including river authorities and irrigation districts, that had 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.





Appendices

APPENDIX A.1. ACRONYMS

| Region | Acronym | Key |
|--------|---------|--|
| A | CRMWA | Canadian River Municipal Water Authority |
| B | None | None |
| C | DWU | Dallas Water Utilities |
| C | GTUA | Greater Texoma Utility Authority |
| C | NTMWD | North Texas Municipal Water District |
| C | TRA | Trinity River Authority |
| C | TRWD | Tarrant Regional Water District |
| C | UTRWD | Upper Trinity Regional Water District |
| D | None | None |
| E | EPWU | El Paso Water Utility |
| E | LVWD | Lower Valley Water District |
| F | None | None |
| G | BRA | Brazos River Authority |
| H | BRA | Brazos River Authority |
| H | CHCRWA | Central Harris County Regional Water Authority |
| H | CLCND | Chambers-Liberty Counties Navigation District |
| H | GCWA | Gulf Coast Water Authority |
| H | LNVA | Lower Neches Valley Authority |
| H | MUD | Municipal Utility District |
| H | NCWA | North Channel Water Authority |
| H | NFBWA | North Fort Bend Water Authority |
| H | NHCRWA | North Harris County Regional Water Authority |
| H | SJRA | San Jacinto River Authority |
| H | TRA | Trinity River Authority |
| H | WCID | Water Control and Improvement District |
| H | WHCRWA | West Harris County Regional Water Authority |
| I | None | None |
| J | UGRA | Upper Guadalupe River Authority |
| K | LCRA | Lower Colorado River Authority |
| K | SAWS | San Antonio Water System |
| L | CRWA | Canyon Regional Water Authority |
| L | GBRA | Guadalupe-Blanco River Authority |
| L | LCRA | Lower Colorado River Authority |
| L | LNRA | Lavaca Navidad River Authority |
| L | LGWSP | Lower Guadalupe Water Supply Project |
| L | SAWS | San Antonio Water System |
| L | SSLGC | Schertz-Seguin Local Government Corporation |
| L | TWA | Texas Water Alliance |
| M | None | None |
| N | None | None |
| O | CRMWA | Canadian River Municipal Water Authority |
| O | WRMWD | White River Municipal Water District |
| P | None | None |

APPENDIX A.2. RECOMMENDED WATER MANAGEMENT STRATEGIES AND COST ESTIMATES

| Recommended Water Management Strategy | Total Capital Costs | First Decade Estimated Annual Average Unit Cost (\$/acre-foot/year) | Water Supply Volume (acre-feet/year) | | | | | | Year 2060 Estimated Annual Average Unit Cost (\$/acre-foot/year) |
|--|----------------------|---|--------------------------------------|----------------|----------------|----------------|----------------|----------------|--|
| | | | 2010 | 2020 | 2030 | 2040 | 2050 | 2060 | |
| Region A | | | | | | | | | |
| CRMWA acquisition of water rights | \$88,200,000 | na | - | - | - | - | - | - | na |
| CRMWA Roberts County well field | \$21,824,000 | \$239 | - | - | 15,000 | 15,000 | 15,000 | 15,000 | \$112 |
| Drill additional groundwater well | \$98,400,920 | \$288 - \$2,911 | 2,718 | 8,718 | 12,013 | 16,472 | 20,519 | 23,000 | up to \$1,311 |
| Irrigation conservation | \$0 | \$19 - \$25 | - | 297,114 | 485,080 | 540,861 | 549,383 | 552,385 | \$18 - \$27 |
| Municipal conservation | \$0 | \$490 | - | 1,963 | 3,641 | 3,979 | 4,278 | 4,529 | \$490 |
| Palo Duro reservoir | \$114,730,000 | \$2,976 | - | - | 3,875 | 3,833 | 3,792 | 3,750 | \$408 |
| Potter County well field | \$128,511,300 | \$1,518 | - | 9,467 | 10,292 | 11,182 | 11,141 | 10,831 | \$293 |
| Precipitation enhancement | \$0 | \$6 | - | 15,206 | 15,206 | 15,206 | 15,206 | 15,206 | \$6 |
| Roberts County well field - Amarillo | \$287,377,200 | \$1,447 | - | - | - | 11,210 | 11,210 | 22,420 | \$889 |
| Voluntary transfer from other users | \$0 | na | - | - | 100 | 100 | 1,100 | 1,100 | na |
| Voluntary transfer from other users ¹ | \$0 | na | 200 | 800 | 2,458 | 3,579 | 5,311 | 6,563 | na |
| Region A Subtotal | \$739,043,420 | | 2,718 | 332,468 | 545,207 | 617,843 | 631,629 | 648,221 | |
| Region B | | | | | | | | | |
| Construct Lake Ringgold | \$382,900,000 | \$1,408 | - | - | - | - | 27,000 | 27,000 | \$1,408 |
| Develop other aquifer supplies | \$957,975 | \$615 | 245 | 245 | 245 | 245 | 245 | 245 | \$274 |
| Develop Trinity Aquifer supplies | \$1,059,638 | \$615 | 271 | 271 | 271 | 271 | 271 | 271 | \$274 |
| Develop Trinity Aquifer supplies (includes overdrafting) | \$265,887 | \$615 | 68 | 68 | 68 | 68 | 68 | 68 | \$274 |
| Enclose canal laterals in pipe | \$7,658,469 | \$52 | 13,034 | 13,034 | 13,034 | 13,034 | 13,034 | 13,034 | \$1 |
| Increase water conservation pool at Lake Kemp | \$130,000 | na | - | 24,834 | 24,776 | 24,718 | 24,660 | 24,600 | na |
| Municipal conservation | \$0 | \$0 - \$1,667 | 197 | 764 | 799 | 841 | 857 | 1,668 | \$0 - \$556 |
| Nitrate removal plant | \$647,000 | \$1,363 - \$2,550 | 50 | 50 | 50 | 50 | 50 | 50 | \$388 - \$800 |
| Purchase water from local provider | \$2,798,700 | \$1,059 - \$2,266 | 1,508 | 1,046 | 1,046 | 1,046 | 1,046 | 1,046 | \$936 - \$1,642 |
| Wastewater reuse | \$1,206,500 | \$950 | - | - | - | 171 | 171 | 171 | \$950 |
| Wichita River diversion | \$5,380,000 | \$73 | - | - | - | 8,850 | 8,850 | 8,850 | \$20 |
| Emergency interconnect Millers Creek Reservoir ¹ | \$714,000 | \$1,252 | 250 | 250 | 250 | 250 | 250 | 250 | \$1,000 |
| Purchase water from local provider ¹ | \$0 | \$1,059 | - | 462 | 462 | 462 | 462 | 462 | \$1,059 |
| Wichita Basin chloride control project ¹ | \$95,450,000 | \$286 | 26,500 | 26,500 | 26,500 | 26,500 | 26,500 | 26,500 | \$47 |
| Region B Subtotal | \$499,168,169 | | 15,373 | 40,312 | 40,289 | 49,294 | 76,252 | 77,003 | |
| Region C | | | | | | | | | |
| Additional dry year supply | \$1,750,000 | na | 25,000 | - | - | - | - | - | na |
| Additional pipeline from Lake Tawakoni (more Lake Fork supply) | \$496,243,000 | \$558 | - | 77,994 | 75,777 | 73,563 | 71,346 | 69,128 | \$108 |
| Collin-Grayson Municipal Alliance System | \$77,366,000 | \$3,045 | - | 3,255 | 8,614 | 14,192 | 20,604 | 27,412 | \$982 |
| Cooke County project | \$50,280,000 | \$1,658 | - | 2,240 | 2,240 | 3,360 | 4,480 | 4,480 | \$394 |
| Dallas Water Utilities reuse | \$82,920,000 | \$233 | - | 34,902 | 41,326 | 39,907 | 47,001 | 50,382 | \$42 |

APPENDIX A.2. RECOMMENDED WATER MANAGEMENT STRATEGIES AND COST ESTIMATES - CONTINUED

| Recommended Water Management Strategy | Total Capital Costs | First Decade Estimated Annual Average Unit Cost (\$/acre-foot/year) | Water Supply Volume (acre-feet/year) | | | | | | Year 2060 Estimated Annual Average Unit Cost (\$/acre-foot/year) |
|--|---------------------|---|--------------------------------------|---------|---------|---------|---------|---------|--|
| | | | 2010 | 2020 | 2030 | 2040 | 2050 | 2060 | |
| Direct reuse | \$264,783,000 | \$691 | 1,552 | 14,327 | 29,283 | 38,649 | 43,184 | 46,250 | \$139 |
| Direct reuse - Frisco | \$31,448,606 | \$1,359 | - | 2,240 | 3,359 | 5,650 | 5,649 | 5,650 | \$134 |
| Ennis reuse | \$31,779,000 | \$14,739 | - | - | - | 333 | 2,199 | 3,696 | \$1,328 |
| Facility improvements | \$2,314,558,600 | na | - | - | - | - | - | - | na |
| Facility improvements - reuse sources | \$590,686,000 | na | - | - | - | - | - | - | na |
| Fannin County project | \$38,471,000 | \$3,838 | - | 1,254 | 2,400 | 3,862 | 4,439 | 5,113 | \$395 |
| Fastrill replacement (Region C component) ² | \$1,980,278,000 | \$1,724 | - | - | - | - | - | 112,100 | \$1,724 |
| Golf course conservation | \$0 | \$279 | 56 | 942 | 1,808 | 2,261 | 2,690 | 3,121 | \$278 |
| Grayson County project | \$136,016,000 | na | 200 | 7,560 | 10,920 | 13,440 | 19,040 | 24,640 | \$141 |
| Indirect reuse | \$0 | na | - | 4,368 | 4,368 | 4,368 | 4,368 | 4,368 | na |
| Indirect reuse - Jacksboro for Jack County mining | \$200,000 | na | 385 | 385 | 385 | 385 | 385 | 385 | na |
| Lake Palestine connection (integrated pipeline with TRWD) | \$887,954,000 | \$773 | - | 111,776 | 110,670 | 109,563 | 108,455 | 107,347 | \$204 |
| Lake Ralph Hall | \$286,401,000 | \$727 | - | 34,050 | 34,050 | 34,050 | 34,050 | 34,050 | \$116 |
| Lake Ralph Hall - indirect reuse | \$0 | na | 0 | 6,129 | 12,258 | 18,387 | 18,387 | 18,387 | na |
| Lake Texoma - authorized (blend) | \$336,356,000 | \$496 | - | - | 69,200 | 68,500 | 113,000 | 113,000 | \$87 |
| Lake Texoma - interim purchase from GTUA | \$0 | na | - | 21,900 | 21,900 | 21,899 | - | - | na |
| Lake Wright Patman - reallocation of flood pool | \$896,478,000 | \$762 | - | - | - | 112,100 | 112,100 | 112,100 | \$762 |
| Lower Bois d'Arc Creek Reservoir | \$615,498,000 | \$972 | - | 54,796 | 117,800 | 114,138 | 111,361 | 108,487 | \$79 |
| Main stem pump station (additional East Fork) NTMWD | \$0 | na | - | 34,900 | 15,100 | - | - | - | na |
| Main stem Trinity pump station (Lake Ray Hubbard indirect reuse - DWU) | \$142,567,000 | \$730 | - | 17,168 | 15,004 | 20,010 | 13,700 | 11,105 | \$196 |
| Manufacturing conservation | \$0 | na | 1 | 131 | 1,530 | 2,259 | 2,457 | 2,618 | \$211 |
| Marvin Nichols Reservoir | \$3,345,052,000 | \$364 | - | - | 227,400 | 227,400 | 472,300 | 472,300 | \$83 |
| Municipal conservation - basic | \$1,151,575 | \$200 | 41,967 | 97,040 | 137,705 | 175,858 | 216,941 | 264,429 | \$85 |
| Municipal conservation - expanded | \$480,774 | \$169 | 4,756 | 9,862 | 13,907 | 16,910 | 18,824 | 20,541 | \$396 |
| New wells - Carrizo Wilcox Aquifer | \$1,853,000 | \$345 | 154 | 181 | 183 | 465 | 466 | 467 | \$446 |
| New wells - Trinity Aquifer | \$7,778,150 | \$410 | 1,882 | 2,042 | 2,306 | 2,306 | 2,306 | 2,306 | \$229 |
| New wells - Woodbine Aquifer | \$14,543,000 | \$663 | 763 | 1,932 | 1,932 | 1,932 | 1,932 | 1,932 | \$339 |
| Oklahoma water to Irving | \$194,825,000 | \$810 | - | - | 25,000 | 25,000 | 25,000 | 25,000 | \$244 |
| Oklahoma water to NTMWD, TRWD, UTRWD | \$756,044,500 | \$290 | - | - | - | - | - | 115,000 | \$290 |
| Overdraft Trinity Aquifer - existing wells | \$0 | \$105 | 2,168 | - | - | - | - | - | na |
| Overdraft Trinity Aquifer - new wells | \$269,000 | \$493 | 75 | - | - | - | - | - | na |
| Purchase from water provider (1) | \$0 | na | 46 | - | - | - | - | - | na |
| Redistribution of supplies | \$0 | na | 530 | 13,979 | 18,526 | 24,028 | 33,981 | 58,031 | na |
| Subordination agreement - future-only sources | \$8,217,000 | \$2,561 | - | 280 | 220 | 219 | 217 | 215 | \$558 |
| Supplemental wells | \$495,381,934 | na | - | - | - | - | - | - | na |

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|--|-------------------------|---|--------------------------------------|----------------|------------------|------------------|------------------|------------------|--|
| | | | 2010 | 2020 | 2030 | 2040 | 2050 | 2060 | |
| Toledo Bend project (Region I entities responsible for 20 percent of cost) | \$2,406,236,000 | na | 363 | 329 | 272 | 232 | 400,229 | 400,217 | \$1,072 |
| TRA 10-Mile Creek reuse project | \$14,895,000 | \$259 | - | - | 6,760 | 6,760 | 6,760 | 6,760 | \$99 |
| TRA Denton Creek wastewater treatment plant reuse | \$9,506,000 | na | - | 3,750 | 3,750 | 3,750 | 3,750 | 3,750 | \$229 |
| TRA Ellis County reuse | \$10,384,000 | \$505 | - | - | - | - | - | 2,200 | \$505 |
| TRA Freestone County reuse | \$17,266,000 | \$323 | - | - | - | - | 6,760 | 6,760 | \$323 |
| TRA Kaufman County reuse | \$9,761,000 | \$901 | - | 1,000 | 1,000 | 1,000 | 1,000 | 1,000 | \$192 |
| TRA Las Colinas reuse | \$14,530,000 | \$284 | - | 7,000 | 7,000 | 7,000 | 7,000 | 7,000 | \$134 |
| TRA Tarrant County project | \$59,008,000 | na | - | - | - | - | - | - | na |
| TRWD third pipeline and reuse | \$914,424,000 | \$1,016 | - | 105,500 | 105,500 | 105,500 | 105,500 | 105,500 | \$324 |
| Water treatment plant - expansion | \$19,970,000 | na | - | 1,260 | 1,081 | 3,180 | 2,786 | 2,268 | \$1,090 |
| Water treatment plant - new | \$308,309,400 | na | - | 192 | 523 | 587 | 613 | 807 | \$19,346 |
| Conveyance project (1) ¹ | \$413,884,000 | \$11,561 | 194 | 10,417 | 17,255 | 19,490 | 23,046 | 25,178 | \$679 |
| Conveyance project (2) ¹ | \$69,299,100 | na | - | 1,672 | 1,299 | 1,234 | 1,226 | 1,237 | \$3,154 |
| Conveyance project (3) ¹ | \$6,465,400 | \$6,531 | - | 213 | 1,009 | 1,717 | 1,957 | 2,016 | \$1,027 |
| Grayson County project ¹ | \$146,071,000 | \$3,693 | - | 5,600 | 8,400 | 8,400 | 14,000 | 19,600 | \$514 |
| Purchase from water provider (1) ¹ | \$164,114,900 | na | 402 | 27,039 | 32,425 | 31,243 | 30,709 | 30,103 | \$1,067 |
| Purchase from water provider (2) ¹ | \$3,538,000 | \$5,950 | - | 52 | 50 | 50 | 50 | 86 | \$609 |
| Purchase from water provider (3) ¹ | \$65,481,250 | \$2,384 | - | 4,004 | 4,493 | 6,083 | 5,626 | 6,417 | \$1,706 |
| Water treatment plant - expansion - reuse sources ¹ | \$32,750,000 | na | - | - | - | - | - | - | na |
| Water treatment plant - expansion ¹ | \$2,708,430,000 | na | - | 484 | 828 | 2,279 | 2,545 | 2,618 | \$106,249 |
| Region C Subtotal | \$21,481,952,189 | | 79,898 | 674,664 | 1,131,057 | 1,303,003 | 2,045,260 | 2,360,302 | |
| Region D | | | | | | | | | |
| Drill new well | \$32,260,219 | \$2,342 | 1,094 | 1,636 | 1,969 | 3,100 | 4,888 | 6,757 | \$336 |
| Increase existing contract | \$0 | \$591 | 1,576 | 2,001 | 3,345 | 13,199 | 34,692 | 59,478 | \$476 |
| New surface water contract | \$6,247,886 | \$311 | 8,660 | 12,523 | 14,866 | 17,678 | 22,512 | 32,231 | \$144 |
| Increase existing contract ³ | \$0 | na | - | 340 | 558 | 711 | 1,280 | 1,471 | na |
| Region D Subtotal | \$38,508,104 | | 11,330 | 16,160 | 20,180 | 33,977 | 62,092 | 98,466 | |
| Region E | | | | | | | | | |
| Additional one well | \$702,770 | \$10 | - | 500 | 500 | 500 | 500 | 500 | \$10 |
| Additional wells | \$1,006,762 | \$29 | - | 175 | 175 | 350 | 350 | 350 | \$29 |
| Additional wells and desalination plant expansions | \$34,344,000 | \$1,114 | - | 1,607 | 3,304 | 4,764 | 6,245 | 7,726 | \$564 |
| Arsenic treatment facility | \$1,996,232 | \$34 | - | 276 | 276 | 276 | 276 | 276 | \$34 |
| Integrated water management strategy - conjunctive use with additional surface water | \$0 | \$525 | - | - | - | 3,600 | 3,600 | 3,600 | \$525 |

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|---|----------------------|---|--------------------------------------|---------------|---------------|---------------|----------------|----------------|--|
| | | | 2010 | 2020 | 2030 | 2040 | 2050 | 2060 | |
| Integrated water management strategy - conservation | \$0 | \$333 | - | 3,000 | 7,000 | 11,000 | 16,000 | 22,000 | \$45 |
| Integrated water management strategy - desalination of agricultural drain water | \$16,675,000 | \$930 | - | 2,700 | 2,700 | 2,700 | 2,700 | 2,700 | \$476 |
| Integrated water management strategy - direct reuse | \$25,257,000 | \$538 | - | 2,000 | 4,000 | 6,000 | 6,000 | 6,000 | \$334 |
| Integrated water management strategy - import from Dell Valley | \$214,113,000 | \$1,529 | - | - | - | - | 10,000 | 20,000 | \$1,309 |
| Integrated water management strategy - import from Diablo Farms | \$245,506,000 | \$2,353 | - | - | - | 10,000 | 10,000 | 10,000 | \$2,353 |
| Integrated water management strategy - recharge of groundwater with treated surface water | \$14,625,000 | \$542 | - | 5,000 | 5,000 | 5,000 | 5,000 | 5,000 | \$330 |
| Irrigation scheduling | \$0 | \$70 | - | 5,275 | 5,275 | 5,275 | 5,275 | 5,275 | \$70 |
| Purchase water from EPWU | \$0 | varies | 3,376 | 16,939 | 21,512 | 18,156 | 14,074 | 13,569 | varies |
| Purchase water from LVWD | \$0 | \$451 | - | 1,441 | 2,812 | 3,883 | 5,050 | 6,218 | \$1,470 |
| Tailwater reuse | \$0 | \$478 | - | 2,312 | 2,312 | 2,312 | 2,312 | 2,312 | \$478 |
| Water district delivery systems | \$147,635,869 | \$8 | - | 25,000 | 25,000 | 25,000 | 25,000 | 25,000 | \$8 |
| Integrated water management strategy - conjunctive use with additional surface water ¹ | \$140,238,000 | \$1,671 | - | 5,000 | 15,000 | 16,400 | 16,400 | 16,400 | \$525 |
| Purchase water from EPWU ¹ | \$0 | varies | - | 605 | 1,161 | 9,193 | 18,231 | 24,706 | varies |
| Region E Subtotal | \$842,099,633 | | 3,376 | 66,225 | 79,866 | 98,816 | 112,382 | 130,526 | |

Region F

| | | | | | | | | | |
|--|----------------------|--------------------|---------------|----------------|----------------|----------------|----------------|----------------|--------------------|
| Advanced treatment | \$2,582,000 | na | - | - | - | - | - | - | na |
| Bottled water program | \$3,000 | \$1,400 - \$28,400 | 1 | 1 | 1 | 1 | 1 | 1 | \$1,400 - \$28,400 |
| Brush control | \$23,020,000 | na | 8,362 | 8,362 | 8,362 | 8,362 | 8,362 | 8,362 | na |
| Desalination | \$213,760,990 | \$1,163 | - | 950 | 950 | 16,050 | 16,050 | 16,050 | \$346 |
| Develop Cenozoic Aquifer supplies | \$244,775,000 | \$251 - \$342 | - | - | 19,600 | 19,600 | 19,600 | 19,600 | \$251 - \$342 |
| Develop Dockum Aquifer supplies | \$17,855,000 | \$445 | - | 2,200 | 2,200 | 2,200 | 2,200 | 2,200 | \$445 |
| Develop Ellenburger Aquifer supplies | \$5,148,000 | \$370 | - | 200 | 200 | 200 | 200 | 200 | \$370 |
| Develop Hickory Aquifer supplies | \$174,991,000 | \$610 - \$1,670 | 160 | 6,860 | 10,160 | 12,160 | 12,160 | 12,160 | \$610 - \$1,670 |
| Irrigation conservation | \$68,650,668 | \$69 | - | 36,125 | 72,244 | 72,244 | 72,244 | 72,244 | \$69 |
| Municipal conservation | \$0 | \$498 | 3,197 | 6,988 | 8,307 | 8,897 | 9,525 | 10,179 | \$154 |
| New water treatment plant and storage facilities | \$2,436,000 | na | - | - | - | - | - | - | na |
| New/renew water supply | \$8,964,000 | \$477 | 392 | 5,622 | 15,629 | 16,180 | 17,073 | 16,866 | \$477 |
| Rehabilitation of pipeline | \$7,521,900 | \$315 | - | - | 2,281 | 2,267 | 2,254 | 2,240 | \$448 |
| Replacement well | \$13,941,000 | na | - | - | - | - | - | - | na |
| Reuse | \$130,906,000 | \$1,072 | - | 12,380 | 12,380 | 12,490 | 12,490 | 12,490 | \$383 |
| Subordination | \$0 | na | 78,832 | 77,555 | 66,391 | 65,436 | 63,241 | 62,606 | na |
| Region F Subtotal | \$914,554,558 | | 90,944 | 157,243 | 218,705 | 236,087 | 235,400 | 235,198 | |

APPENDIX A.2. RECOMMENDED WATER MANAGEMENT STRATEGIES AND COST ESTIMATES - CONTINUED

| Recommended Water Management Strategy | Total Capital Costs | First Decade Estimated Annual Average Unit Cost (\$/acre-foot/year) | Water Supply Volume (acre-feet/year) | | | | | | Year 2060 Estimated Annual Average Unit Cost (\$/acre-foot/year) |
|--|---------------------|---|--------------------------------------|--------|--------|--------|--------|--------|--|
| | | | 2010 | 2020 | 2030 | 2040 | 2050 | 2060 | |
| Region G | | | | | | | | | |
| Additional Carrizo Aquifer development (includes overdrafting) | \$23,676,071 | \$585 | 1,481 | 1,884 | 2,184 | 5,084 | 6,963 | 6,963 | \$182 |
| Additional Edwards-Trinity (Plateau) Aquifer development (includes overdrafting) | \$679,000 | \$588 | 114 | 114 | 114 | 114 | 114 | 114 | \$70 |
| Additional Gulf Coast Aquifer development | \$31,630,000 | \$638 | - | - | - | 5,600 | 5,600 | 5,600 | \$146 |
| Additional Trinity Aquifer development (includes overdrafting) | \$19,278,000 | \$264 | 723 | 322 | 522 | 1,357 | 1,708 | 2,025 | \$553 |
| Aquifer storage and recovery (Brazos River to Seymour Aquifer) | \$38,625,000 | \$701 | 6,208 | 6,208 | 6,208 | 6,208 | 6,208 | 6,208 | \$159 |
| Belton to Stillhouse pipeline | \$36,038,000 | \$133 | - | 30,000 | 30,000 | 30,000 | 30,000 | 30,000 | \$45 |
| Bosque County regional project | \$5,150,000 | \$2,895 | - | - | 190 | 190 | 190 | 190 | \$532 |
| BRA supply through the East Williamson County Regional Water Treatment System | \$44,706,000 | \$1,680 | 4,601 | 6,260 | 6,260 | 6,958 | 6,958 | 6,958 | \$430 |
| BRA surface water and treatment system expansion | \$39,971,000 | \$2,933 | 375 | 3,545 | 3,545 | 3,545 | 3,545 | 3,545 | \$573 |
| BRA system operations permit | \$204,281,000 | \$2,808 | 750 | 77,020 | 82,242 | 84,742 | 84,742 | 84,899 | \$314 |
| Brushy Creek Reservoir | \$18,553,000 | \$484 | 2,090 | 2,090 | 2,090 | 2,090 | 2,090 | 2,090 | \$67 |
| Cedar Ridge Reservoir | \$285,214,000 | \$1,168 | - | 23,380 | 23,380 | 23,380 | 23,380 | 23,380 | \$241 |
| City of Groesbeck off-channel reservoir | \$10,412,000 | \$565 | - | - | - | - | 1,755 | 1,755 | \$565 |
| Conjunctive management of Champion well field and Oak Creek Reservoir with subordination agreement | \$0 | na | 688 | 755 | 878 | 948 | 953 | 963 | na |
| Coryell County Reservoir (BRA System) | \$37,489,000 | \$1,007 | - | 3,365 | 3,365 | 3,365 | 3,365 | 3,365 | \$193 |
| Expansion of Champion well field | \$15,015,000 | \$1,643 | 1,000 | 1,000 | 1,000 | 1,000 | 1,000 | 1,000 | \$334 |
| Future phases of Lake Whitney water supply project | \$110,843,000 | \$926 | - | 7,572 | 7,572 | 7,572 | 7,572 | 7,572 | \$926 |
| Groundwater/ surface water conjunctive use (Lake Granger Augmentation) | \$643,928,000 | \$838 | 26,505 | 26,001 | 25,496 | 47,435 | 70,751 | 70,246 | \$1,154 |
| Increase treatment capacity | \$195,654,000 | \$546 | 15,176 | 28,176 | 36,016 | 40,047 | 51,330 | 58,435 | \$294 |
| Interconnection of City of Waco system with neighboring communities | \$14,652,000 | \$3,387 | 837 | 837 | 837 | 1,564 | 1,664 | 1,814 | \$1,136 |
| Irrigation water conservation | \$0 | \$235 | 3,390 | 5,519 | 7,550 | 7,376 | 7,206 | 7,041 | \$228 |
| Limestone County Carrizo-Wilcox Aquifer development | \$18,458,000 | \$562 | 2,500 | 3,000 | 3,000 | 3,600 | 3,600 | 3,600 | \$115 |
| Manufacturing water conservation | \$0 | na | 140 | 275 | 440 | 494 | 545 | 594 | na |
| Midway pipeline project (West Central Brazos distribution system) | \$13,524,731 | \$2,046 | 843 | 843 | 843 | 843 | 843 | 843 | \$648 |
| Millers Creek augmentation | \$46,948,000 | \$217 | 17,582 | 17,582 | 17,582 | 17,582 | 17,582 | 17,582 | \$217 |
| Mining water conservation | \$0 | na | 340 | 611 | 885 | 913 | 941 | 973 | na |
| Municipal water conservation | \$0 | \$475 | 4,873 | 13,572 | 14,379 | 15,865 | 18,497 | 21,347 | \$475 |
| New water treatment plant | \$3,522,000 | \$2,179 | 224 | 224 | 224 | 224 | 224 | 224 | \$808 |

APPENDIX A.2. RECOMMENDED WATER MANAGEMENT STRATEGIES AND COST ESTIMATES - CONTINUED

| Recommended Water Management Strategy | Total Capital Costs | First Decade Estimated Annual Average Unit Cost (\$/acre-foot/year) | Water Supply Volume (acre-feet/year) | | | | | | Year 2060 Estimated Annual Average Unit Cost (\$/acre-foot/year) |
|--|------------------------|---|--------------------------------------|----------------|----------------|----------------|----------------|----------------|--|
| | | | 2010 | 2020 | 2030 | 2040 | 2050 | 2060 | |
| New West Loop reuse line | \$5,495,500 | \$591 | 680 | 680 | 680 | 680 | 680 | 680 | \$120 |
| Oak Creek Reservoir with subordination agreement | \$0 | na | 1,679 | 1,671 | 1,557 | 1,435 | 1,301 | 1,154 | na |
| Phase I Lake Whitney water supply project | \$41,453,000 | \$2,852 | 2,128 | 2,128 | 2,128 | 2,128 | 2,128 | 2,128 | \$1,153 |
| Purchase water from City of Bryan | \$1,201,000 | \$262 | 1,500 | 1,500 | 1,500 | 1,500 | 1,500 | 1,500 | \$192 |
| Raise level of Gibbons Creek Reservoir | \$12,140,600 | \$237 | - | 3,870 | 3,870 | 3,870 | 3,870 | 3,870 | \$29 |
| Reallocation of source | \$0 | na | 9,081 | 35,928 | 35,928 | 40,028 | 45,728 | 52,628 | na |
| Regional surface water supply to Williamson County from | | | | | | | | | |
| Lake Travis | \$391,533,000 | \$1,308 | 600 | 34,148 | 41,187 | 41,187 | 44,459 | 44,459 | \$938 |
| Rehabilitate existing wells | \$350,000 | \$30 | - | 1,100 | 1,100 | 1,100 | 1,100 | 1,100 | \$30 |
| Restructure contract | \$0 | na | 502 | 470 | 437 | 406 | 373 | 341 | na |
| Somervell County water supply project (phases 1-4) | \$29,923,000 | \$2,841 | 840 | 840 | 840 | 840 | 840 | 840 | \$508 |
| Somervell County water supply project (phases 5-13) | \$74,228,000 | \$1,147 | - | - | 960 | 960 | 960 | 960 | \$174 |
| Steam-electric conservation | \$0 | na | 2,114 | 4,896 | 8,219 | 9,109 | 10,822 | 11,803 | na |
| Stonewall, Kent, and Garza chloride control project | \$163,226,000 | na | - | - | - | - | - | - | na |
| Storage reallocation of federal reservoirs - Lake Aquilla | \$11,447,000 | \$406 | - | - | - | 2,050 | 2,050 | 2,050 | \$406 |
| Turkey Peak Reservoir | \$50,227,000 | \$924 | - | 7,600 | 7,600 | 7,600 | 7,600 | 7,600 | \$441 |
| Voluntary redistribution | \$6,391,000 | \$312 | 11,251 | 11,942 | 13,564 | 14,425 | 15,236 | 16,558 | \$469 |
| Wastewater reuse | \$115,432,500 | \$340 | 17,043 | 38,653 | 40,523 | 51,114 | 64,830 | 70,087 | \$317 |
| Coryell County Reservoir (BRA system) ¹ | \$14,399,000 | \$2,867 | - | - | 3,365 | 3,365 | 3,365 | 3,365 | \$1,522 |
| Groundwater/surface water conjunctive use (Lake | | | | | | | | | |
| Granger augmentation) ¹ | \$229,822,000 | \$865 | - | - | - | 33,814 | 37,839 | 39,710 | \$864 |
| Increase current contract ¹ | \$0 | \$401 | 43 | 43 | 543 | 1,043 | 1,543 | 2,143 | \$831 |
| Increase treatment capacity ¹ | \$13,951,000 | \$648 | - | 2,800 | 2,800 | 2,800 | 2,800 | 2,800 | \$213 |
| Limestone County Carrizo-Wilcox Aquifer development ¹ | \$0 | \$562 | 148 | 146 | 144 | 142 | 141 | 141 | \$115 |
| New water treatment plant ¹ | \$35,822,000 | \$627 | - | 8,400 | 8,400 | 8,400 | 8,400 | 8,400 | \$255 |
| Storage reallocation of federal reservoirs - Lake Aquilla ¹ | \$0 | na | - | - | - | 375 | 745 | 999 | na |
| Turkey Peak Reservoir ¹ | \$0 | \$924 | - | 7,600 | 7,600 | 7,600 | 7,600 | 7,600 | \$441 |
| Voluntary redistribution ¹ | \$91,940,000 | \$860 | 3,529 | 19,162 | 28,296 | 29,099 | 29,903 | 30,757 | \$472 |
| Wastewater reuse ¹ | \$39,128,901 | \$436 | 9,232 | 10,831 | 11,760 | 11,760 | 11,760 | 11,760 | \$107 |
| Region G Subtotal | \$3,186,357,303 | | 137,858 | 405,581 | 436,895 | 496,528 | 562,803 | 587,084 | |
| Region H | | | | | | | | | |
| Allens Creek reservoir | \$222,752,400 | \$326 | - | 57,393 | 55,096 | 87,781 | 99,650 | 99,650 | \$39 |
| BRA system operations permit | \$0 | na | - | 6,621 | 18,870 | 25,350 | 25,350 | 25,350 | na |
| Brazoria County interruptible supplies for irrigation | \$0 | na | 104,977 | 86,759 | 64,000 | 64,000 | 64,000 | 64,000 | na |
| Brazoria off-channel reservoir | \$173,898,602 | \$1,206 | - | - | - | - | - | 24,000 | \$1,206 |
| Brazos saltwater barrier | \$44,470,739 | na | - | - | - | - | - | - | na |

APPENDIX A.2. RECOMMENDED WATER MANAGEMENT STRATEGIES AND COST ESTIMATES

| Recommended Water Management Strategy | Total Capital Costs | First Decade Estimated Annual Average Unit Cost (\$/acre-foot/year) | Water Supply Volume (acre-feet/year) | | | | | | Year 2060 Estimated Annual Average Unit Cost (\$/acre-foot/year) |
|--|---------------------|---|--------------------------------------|--------|--------|--------|---------|---------|--|
| | | | 2010 | 2020 | 2030 | 2040 | 2050 | 2060 | |
| Cities of Richmond-Rosenberg Groundwater Reduction Plan - West Fort Bend surface water treatment plant | \$117,220,150 | \$887 | - | 7,500 | 7,500 | 7,500 | 7,500 | 7,500 | \$2,325 |
| City of Houston bayous permit | \$20,956,000 | na | - | - | - | - | - | - | na |
| City of Houston Groundwater Reduction Plan participation | \$58,235,873 | \$378 | 3,762 | 11,417 | 16,809 | 19,870 | 22,399 | 24,990 | \$214 |
| City of Houston indirect reuse | \$721,822,850 | \$725 | - | - | - | 66,420 | 114,679 | 128,801 | \$799 |
| City of Missouri City Groundwater Reduction Plan - aquifer storage and recovery | \$58,967,437 | na | - | 4,147 | 4,147 | 4,147 | 4,147 | 4,147 | na |
| City of Missouri City Groundwater Reduction Plan - reuse | \$9,100,352 | na | - | 640 | 640 | 640 | 640 | 640 | na |
| City of Missouri City Groundwater Reduction Plan participation | \$6,618,706 | \$378 | - | 1,004 | 1,860 | 1,896 | 1,896 | 1,896 | \$248 |
| City of Sugar Land Groundwater Reduction Plan - reuse | \$78,783,825 | na | - | 560 | 5,040 | 5,040 | 5,040 | 5,040 | na |
| City of Sugar Land Groundwater Reduction Plan participation | \$6,360,101 | \$379 | - | 480 | 1,763 | 2,380 | 2,381 | 2,155 | \$223 |
| CLCND West Chambers System | \$20,380,000 | \$1,171 | - | 1,691 | 1,978 | 2,235 | 2,511 | 2,804 | \$73 |
| Contract with Brazosport Water Authority | \$22,363,694 | \$193 | 7,750 | 7,750 | 7,750 | 7,750 | 7,750 | 7,750 | \$94 |
| Contract with CHCRWA | \$2,048,820 | \$196 | - | 977 | 862 | 720 | 631 | 546 | \$50 |
| Contract with City of Galveston | \$10,542,328 | \$172 | - | 7,262 | 7,262 | 7,262 | 7,262 | 7,262 | \$46 |
| Contract with City of Houston | \$63,420,357 | \$596 | - | 6,128 | 4,816 | 4,742 | 5,400 | 6,027 | \$428 |
| Contract with Fort Bend County WCID #1 | \$1,815,739 | \$259 | - | 148 | 824 | 940 | 1,016 | 1,016 | \$60 |
| Contract with Galveston County WCID #1 | \$1,807,960 | \$207 | - | 766 | 909 | 940 | 975 | 1,014 | \$60 |
| Contract with GCWA | \$132,634,164 | \$406 | - | 29,718 | 30,708 | 31,618 | 32,719 | 34,057 | \$223 |
| Contract with LNVA | \$405,835 | \$1,392 | 16 | 23 | 26 | 29 | 33 | 37 | \$642 |
| Contract with NHRWA | \$42,207,965 | \$68 | - | 56,453 | 83,041 | 64,491 | 34,726 | 27,478 | \$50 |
| Contract with SJRA | \$264,926,229 | \$829 | 23,008 | 27,754 | 37,090 | 54,777 | 54,805 | 54,849 | \$206 |
| Contract with TRA | \$249,479,472 | \$1,044 | 13,823 | 17,083 | 19,972 | 22,888 | 25,732 | 28,672 | \$620 |
| Dow off-channel reservoir | \$124,468,000 | \$481 | - | 21,800 | 21,800 | 21,800 | 21,800 | 21,800 | \$389 |
| Expanded use of groundwater | \$165,928,999 | \$238 | - | 40,159 | 62,297 | 68,916 | 80,337 | 90,617 | \$175 |
| Fort Bend County MUD #25 Groundwater Reduction Plan - reuse | \$776,145 | \$568 | - | 589 | 589 | 589 | 589 | 589 | \$453 |
| Fort Bend off-channel reservoir | \$202,514,788 | \$484,074 | - | - | - | - | 90 | 45,943 | \$948 |
| Freeport desalination plant | \$255,699,000 | \$854 | - | - | - | - | 33,600 | 33,600 | \$854 |
| Fulshear reuse | \$566,625 | \$568 | - | 287 | 430 | 430 | 430 | 430 | \$453 |
| GCWA off-channel reservoir | \$197,448,012 | \$827 | - | - | 39,500 | 39,500 | 39,500 | 39,500 | \$827 |
| Industrial conservation | \$0 | na | - | 558 | 558 | 558 | 558 | 558 | na |
| Interim strategies | \$1,155,965 | \$369 | 503 | - | - | - | - | - | na |
| Interim strategies - temporary overdraft | \$85,545,570 | \$303 | 45,009 | - | - | - | - | - | na |
| Irrigation conservation | \$757,436 | \$100 | 71,275 | 71,275 | 71,275 | 71,275 | 77,881 | 77,881 | \$100 |

APPENDIX A.2. RECOMMENDED WATER MANAGEMENT STRATEGIES AND COST ESTIMATES - CONTINUED

| Recommended Water Management Strategy | Total Capital Costs | First Decade Estimated Annual Average Unit Cost (\$/acre-foot/year) | Water Supply Volume (acre-feet/year) | | | | | | Year 2060 Estimated Annual Average Unit Cost (\$/acre-foot/year) |
|---|---------------------|---|--------------------------------------|---------|---------|---------|---------|---------|--|
| | | | 2010 | 2020 | 2030 | 2040 | 2050 | 2060 | |
| Montgomery MUD #8/9 indirect reuse | \$12,245,687 | \$1,387 | - | 657 | 816 | 1,120 | 1,120 | 1,120 | \$436 |
| Municipal conservation | \$0 | \$213 | 1,680 | 3,635 | 3,954 | 4,269 | 4,716 | 5,232 | \$213 |
| Municipal conservation - large water user group | \$0 | \$213 | 31,612 | 38,940 | 42,664 | 46,276 | 50,073 | 54,484 | \$213 |
| Municipal conservation - medium water user group | \$0 | \$311 | 2,658 | 4,377 | 5,062 | 5,684 | 6,384 | 7,189 | \$311 |
| Municipal conservation - small water user group | \$0 | \$202 | 9,655 | 18,366 | 24,016 | 28,274 | 33,219 | 38,589 | \$202 |
| New groundwater wells for livestock | \$18,635 | \$61 | - | 41 | 41 | 41 | 41 | 41 | \$21 |
| NFBWA Groundwater Reduction Plan participation | \$1,638,063 | \$380 | - | 106 | 258 | 295 | 466 | 687 | \$241 |
| NHCRWA Groundwater Reduction Plan participation | \$17,814,585 | \$377 | 761 | 2,933 | 4,243 | 5,573 | 6,664 | 8,088 | \$206 |
| NHCRWA indirect reuse | \$66,778,694 | \$822 | - | - | - | 7,300 | 16,300 | 16,300 | \$589 |
| Reallocation of existing supplies | \$275,269,912 | \$351 | 59,614 | 56,931 | 54,011 | 66,006 | 76,391 | 152,895 | \$148 |
| River Plantation Groundwater Reduction Plan - reuse | \$484,926 | \$568 | 168 | 368 | 368 | 368 | 368 | 368 | \$453 |
| SJRA Water Resources Assessment Plan participation | \$89,604,231 | \$235 | - | 21,441 | 27,020 | 30,247 | 28,720 | 26,896 | \$282 |
| TRA to City of Houston contract | \$0 | na | - | - | 116,738 | 123,524 | 123,524 | 123,524 | na |
| TRA to SJRA contract | \$302,781,597 | \$4,676 | - | - | - | 7,935 | 39,096 | 76,476 | \$140 |
| Wastewater reclamation for municipal irrigation | \$48,043,249 | \$568 | - | - | 7,272 | 15,425 | 25,561 | 36,388 | \$520 |
| Wastewater reuse for industry | \$332,051,761 | \$893 | - | - | - | - | - | 67,200 | \$893 |
| WHCRWA Groundwater Reduction Plan participation | \$35,268,970 | \$378 | 2,488 | 7,689 | 10,105 | 11,683 | 13,340 | 15,104 | \$219 |
| BRA to Brazosport Water Authority contract ¹ | \$0 | na | - | 232 | 248 | 3,114 | 6,366 | 10,870 | na |
| BRA to Cities of Richmond-Rosenberg contract ¹ | \$0 | na | - | - | - | 2,182 | 6,120 | 11,290 | na |
| BRA to City of Sugar Land contract ¹ | \$0 | na | - | 2,054 | 5,894 | 7,232 | 7,750 | 9,512 | na |
| BRA to GCWA contract ¹ | \$0 | na | - | 35,558 | 80,016 | 100,410 | 112,400 | 131,128 | na |
| BRA to NRG Energy contract ¹ | \$0 | na | - | - | - | - | - | 17,000 | na |
| CHCRWA Groundwater Reduction Plan ¹ | \$0 | na | 2,375 | 4,146 | 4,789 | 4,806 | 4,806 | 4,806 | na |
| CHCRWA internal distribution ¹ | \$0 | na | 2,375 | 4,146 | 4,789 | 4,806 | 4,806 | 4,806 | na |
| CHCRWA transmission line ¹ | \$0 | na | 2,375 | 4,146 | 4,789 | 4,806 | 4,806 | 4,806 | na |
| City of Houston distribution expansion ¹ | \$261,040,000 | \$80 | - | 280,000 | 128,000 | 64,000 | 48,000 | 48,000 | \$54 |
| City of Houston to Baytown Area Water Authority contract ¹ | \$0 | na | - | 26 | 262 | 398 | 535 | 692 | na |
| City of Houston to BRA contract ¹ | \$0 | na | - | 54,996 | 50,402 | 115,772 | 139,510 | 139,510 | na |
| City of Houston to CHCRWA contract ¹ | \$0 | na | - | 1,771 | 2,414 | 2,431 | 2,431 | 2,431 | na |
| City of Houston to City of Pasadena contract ¹ | \$0 | na | 1,865 | 2,278 | 2,665 | 3,153 | 3,579 | 4,068 | na |
| City of Houston to NCWA contract ¹ | \$0 | na | 1,954 | 2,392 | 2,869 | 3,511 | 4,157 | 4,912 | na |
| City of Houston to NFBWA contract ¹ | \$0 | na | - | 888 | 35,942 | 62,322 | 82,344 | 100,884 | na |
| City of Houston to NHCRWA contract ¹ | \$0 | na | - | 56,453 | 83,041 | 83,041 | 78,041 | 83,041 | na |
| City of Houston to SJRA contract ¹ | \$0 | na | - | 36,377 | 55,538 | 54,582 | 53,581 | 52,534 | na |
| City of Houston to WHCRWA contract ¹ | \$0 | na | 1,241 | 31,837 | 46,324 | 52,759 | 55,549 | 58,402 | na |

APPENDIX A.2. RECOMMENDED WATER MANAGEMENT STRATEGIES AND COST ESTIMATES - CONTINUED

| Recommended Water Management Strategy | Total Capital Costs | First Decade Estimated Annual Average Unit Cost (\$/acre-foot/year) | Water Supply Volume (acre-feet/year) | | | | | | Year 2060 Estimated Annual Average Unit Cost (\$/acre-foot/year) |
|---|---------------------|---|--------------------------------------|---------|---------|---------|---------|---------|--|
| | | | 2010 | 2020 | 2030 | 2040 | 2050 | 2060 | |
| City of Houston treatment expansion ¹ | \$2,045,672,161 | \$479 | 16,000 | 280,000 | 128,000 | 64,000 | 48,000 | 48,000 | \$1,867 |
| City of Huntsville water treatment plant ¹ | \$61,023,906 | \$904 | 11,200 | 11,200 | 11,200 | 11,200 | 11,200 | 11,200 | \$429 |
| City of Missouri City Groundwater Reduction Plan ¹ | \$24,003,201 | \$1,110 | - | 395 | 4,644 | 8,362 | 8,362 | 12,775 | \$131 |
| City of Pearland surface water treatment plant ¹ | \$265,000,000 | \$1,656 | 6,720 | 6,720 | 6,720 | 13,420 | 13,420 | 13,420 | \$544 |
| City of Sealy groundwater treatment expansion ¹ | \$6,450,000 | \$2,176 | - | 360 | 360 | 360 | 360 | 888 | \$269 |
| City of Sugar Land Groundwater Reduction Plan ¹ | \$82,576,224 | \$11,066 | - | 1,027 | 2,947 | 3,616 | 3,875 | 4,756 | \$357 |
| Contract with Baytown Area Water Authority | \$900,444 | \$180 | - | - | 191 | 349 | 496 | 496 | \$122 |
| Contract with BRA ¹ | \$652,480,634 | \$704 | - | 49,416 | 35,211 | 62,308 | 100,156 | 145,264 | \$514 |
| Contract with Brazosport Water Authority | \$2,102,169 | na | - | 116 | 124 | 1,557 | 3,183 | 5,435 | na |
| Contract with CHCRWA ¹ | \$1,867,449 | \$196 | - | 794 | 1,129 | 1,500 | 1,668 | 1,668 | na |
| Contract with Cities of Richmond-Rosenberg ¹ | \$0 | na | - | - | - | 1,091 | 3,060 | 5,645 | na |
| Contract with City of Houston ¹ | \$183,896,349 | na | - | 14,981 | 31,413 | 30,449 | 34,995 | 34,995 | \$361 |
| Contract with City of Missouri City ¹ | \$4,807,747 | \$100 | - | 713 | 6,330 | 10,661 | 10,911 | 15,435 | \$12 |
| Contract with City of Pasadena ¹ | \$2,918,547 | \$65 | - | 967 | 1,941 | 2,765 | 3,317 | 3,317 | \$72 |
| Contract with City of Sugar Land ¹ | \$4,982,927 | na | - | 1,027 | 2,947 | 3,616 | 3,875 | 4,756 | na |
| Contract with CLCND ¹ | \$30,827,919 | \$1,383 | - | 1,691 | 1,978 | 2,235 | 2,511 | 2,804 | \$635 |
| Contract with Dow ¹ | \$155,206,615 | \$745 | - | 21,800 | 21,800 | 21,800 | 21,800 | 21,800 | \$646 |
| Contract with Fort Bend County WCID #2 ¹ | \$2,049,847 | \$233 | - | 491 | 1,092 | 1,092 | 1,092 | 1,092 | \$49 |
| Contract with GCWA ¹ | \$144,117,128 | na | - | 135 | 54,513 | 58,116 | 60,587 | 65,213 | na |
| Contract with NCWA ¹ | \$3,632,614 | \$55 | - | - | 2,088 | 3,078 | 3,852 | 3,852 | \$84 |
| Contract with NFBWA ¹ | \$44,964,481 | \$176 | - | 444 | 13,085 | 27,315 | 38,155 | 38,155 | \$85 |
| Contract with NRG Energy ¹ | \$0 | na | - | - | - | - | - | 8,500 | na |
| Contract with SJRA ¹ | \$43,842,177 | na | - | - | - | 7,935 | 39,096 | 76,476 | na |
| Contract with WHCRWA ¹ | \$44,753,636 | \$90 | - | 31,837 | 46,324 | 40,241 | 43,031 | 38,961 | \$55 |
| Fort Bend County WCID #2 Groundwater Reduction Plan ¹ | \$24,828,857 | \$571 | - | 2,296 | 5,753 | 5,753 | 5,753 | 5,753 | \$200 |
| GCWA to City of Galveston contract ¹ | \$0 | na | - | 7,262 | 7,262 | 7,262 | 7,262 | 7,262 | na |
| GCWA to City of Missouri City contract ¹ | \$0 | na | - | 713 | 6,330 | 10,661 | 10,911 | 15,435 | na |
| GCWA to Fort Bend County WCID #2 contract ¹ | \$0 | na | - | 491 | 1,092 | 1,092 | 1,092 | 1,092 | na |
| GCWA to Galveston County WCID #1 contract ¹ | \$0 | na | - | 766 | 909 | 940 | 975 | 1,014 | na |
| Harris County MUD #50 water treatment plant ¹ | \$6,131,600 | \$1,382 | 560 | 560 | 560 | 560 | 588 | 632 | \$427 |
| Lake Livingston Water Supply and Sewer Service Corporation surface water project ¹ | \$3,087,974 | \$561 | 954 | 954 | 954 | 954 | 954 | 954 | \$279 |
| Luce Bayou transfer ¹ | \$253,916,914 | \$248 | - | 128,259 | 206,276 | 207,629 | 205,171 | 270,742 | \$36 |
| NFBWA Groundwater Reduction Plan ¹ | \$0 | na | 35,009 | 61,021 | 70,363 | 84,943 | 96,103 | 106,402 | na |

APPENDIX A.2. RECOMMENDED WATER MANAGEMENT STRATEGIES AND COST ESTIMATES - CONTINUED

| Recommended Water Management Strategy | Total Capital Costs | First Decade Estimated Annual Average Unit Cost (\$/acre-foot/year) | Water Supply Volume (acre-feet/year) | | | | | | Year 2060 Estimated Annual Average Unit Cost (\$/acre-foot/year) |
|---|-------------------------|---|--------------------------------------|----------------|----------------|------------------|------------------|------------------|--|
| | | | 2010 | 2020 | 2030 | 2040 | 2050 | 2060 | |
| NFBWA internal distribution ¹ | \$225,000,000 | \$184 | 35,009 | 61,021 | 70,363 | 84,943 | 96,103 | 106,402 | \$16 |
| NFBWA shared transmission line ¹ | \$213,000,000 | \$56 | - | 21,878 | 39,405 | 52,595 | 62,606 | 71,876 | na |
| NHCRWA Groundwater Reduction Plan ¹ | \$0 | na | 34,714 | 91,167 | 117,755 | 99,625 | 81,126 | 117,755 | na |
| NHCRWA internal 2010 distribution ¹ | \$153,149,640 | \$429 | 34,714 | 34,714 | 34,714 | 34,714 | 34,714 | 34,714 | \$44 |
| NHCRWA internal 2020 distribution ¹ | \$345,292,192 | \$368 | - | 91,167 | 91,167 | 91,167 | 91,167 | 91,167 | \$38 |
| NHCRWA internal 2030 distribution ¹ | \$37,439,584 | \$31 | - | - | 117,755 | 117,755 | 117,755 | 117,755 | \$3 |
| NHCRWA transmission 2010 ¹ | \$80,690,624 | \$226 | 34,714 | 34,714 | 34,714 | 34,714 | 34,714 | 34,714 | \$23 |
| NHCRWA transmission 2020 ¹ | \$172,558,512 | \$184 | - | 91,167 | 91,167 | 91,167 | 91,167 | 91,167 | \$19 |
| NHCRWA transmission 2030 ¹ | \$0 | na | - | - | 117,755 | 117,755 | 117,755 | 117,755 | na |
| Pecan Grove Groundwater Reduction Plan ¹ | \$15,960,000 | \$2,150 | 866 | 866 | 1,731 | 1,731 | 1,731 | 1,731 | \$544 |
| SJRA to City of Houston contract ¹ | \$0 | na | - | - | 1,356 | 5,300 | 3,875 | 2,428 | na |
| SJRA Water Resources Assessment Plan participation ¹ | \$128,252,622 | \$136 | - | 36,377 | 55,538 | 54,582 | 53,581 | 52,534 | \$125 |
| SJRA Water Resources Assessment Plan ¹ | \$900,000,000 | \$1,172 | - | 36,377 | 55,538 | 62,517 | 92,677 | 129,010 | \$269 |
| WHCRWA Groundwater Reduction Plan ¹ | \$0 | na | 21,678 | 52,274 | 66,761 | 73,196 | 75,985 | 78,839 | na |
| WHCRWA internal distribution ¹ | \$552,472,000 | \$607 | 21,678 | 52,274 | 66,761 | 73,196 | 75,985 | 78,839 | \$70 |
| WHCRWA transmission line ¹ | \$290,084,193 | \$202 | 21,678 | 52,274 | 66,761 | 73,196 | 75,985 | 78,839 | \$37 |
| Region H Subtotal | \$12,019,061,335 | | 378,759 | 622,426 | 863,980 | 1,040,504 | 1,202,010 | 1,501,180 | |
| Region I | | | | | | | | | |
| Angelina County Regional Project | \$53,164,000 | \$1,577 | - | - | - | 11,210 | 11,210 | 11,210 | \$164 |
| Expand local surface water supplies | \$1,983,800 | \$164 | 50 | 150 | 707 | 990 | 1,000 | 1,190 | \$78 |
| Fastrill replacement (Region I component) ² | \$0 | na | - | - | - | - | - | 22,400 | na |
| Forest Grove Reservoir project | \$26,619,000 | \$1,173 | - | - | - | 2,240 | 2,240 | 2,240 | \$310 |
| Indirect reuse* | \$0 | \$33 | - | 2,872 | 2,872 | 2,872 | 2,872 | 2,872 | \$33 |
| Infrastructure improvements | \$1,000,000 | \$97 | 1,000 | 1,000 | 1,000 | 1,000 | 1,000 | 1,000 | \$97 |
| Lake Kurth Regional System | \$56,488,600 | \$1,233 | 6,800 | 18,400 | 18,400 | 18,400 | 18,400 | 18,400 | \$314 |
| Lake Noconiche Regional Supply System | \$24,890,050 | \$1,686 | - | 800 | 1,200 | 1,200 | 1,700 | 1,700 | \$796 |
| Lake Palestine infrastructure | \$79,389,250 | \$830 | - | - | 16,815 | 16,815 | 16,815 | 16,815 | \$418 |
| Municipal conservation | \$0 | \$579 | 111 | 480 | 811 | 1,085 | 1,381 | 1,701 | \$81 |
| New source - Lake Columbia | \$231,865,000 | \$215 | - | 75,700 | 75,700 | 75,700 | 75,700 | 75,700 | \$12 |
| New wells - Carrizo Wilcox Aquifer | \$39,623,385 | \$332 | 11,787 | 13,493 | 15,656 | 17,006 | 20,433 | 21,403 | \$175 |
| New wells - Gulf Coast Aquifer | \$6,818,213 | \$515 | 804 | 1,992 | 2,199 | 3,033 | 3,038 | 3,043 | \$159 |
| New wells - Queen City Aquifer | \$5,646,042 | \$761 | 137 | 231 | 318 | 455 | 650 | 1,097 | \$3,313 |
| New wells - Yegua Jackson Aquifer | \$2,581,793 | \$253 | 710 | 730 | 971 | 1,110 | 1,302 | 1,376 | \$216 |
| Overdraft Carrizo Wilcox Aquifer | \$4,209,789 | \$49 | 100 | 1,400 | 1,400 | 1,500 | 1,500 | 1,540 | \$176 |
| Overdraft Gulf Coast Aquifer | \$2,359,067 | \$426 | 844 | 996 | 996 | 996 | 1,149 | 1,149 | \$236 |

APPENDIX A.2. RECOMMENDED WATER MANAGEMENT STRATEGIES AND COST ESTIMATES - CONTINUED

| Recommended Water Management Strategy | Total Capital Costs | First Decade Estimated Annual Average Unit Cost (\$/acre-foot/year) | Water Supply Volume (acre-feet/year) | | | | | | Year 2060 Estimated Annual Average Unit Cost (\$/acre-foot/year) |
|--|----------------------|---|--------------------------------------|----------------|----------------|----------------|----------------|----------------|--|
| | | | 2010 | 2020 | 2030 | 2040 | 2050 | 2060 | |
| Permit amendment - Houston County Lake | \$0 | na | 3,500 | 3,500 | 3,500 | 3,500 | 3,500 | 3,500 | na |
| Permit amendment for Sam Rayburn Reservoir | \$0 | \$154 | - | 28,000 | 28,000 | 28,000 | 28,000 | 28,000 | \$154 |
| Purchase water from provider (1) | \$17,495,246 | \$186 | 5,396 | 42,367 | 46,133 | 51,148 | 51,167 | 54,200 | \$90 |
| Purchase water from provider (2) | \$109,419,358 | \$769 | 2,152 | 29,995 | 38,839 | 42,939 | 86,040 | 89,365 | \$188 |
| Purchase water from provider (3) | \$0 | \$978 | 27 | - | - | - | 5,175 | 5,175 | na |
| Reallocation of flood storage (Rayburn) | \$0 | \$25 | - | - | - | - | 122,000 | 122,000 | \$25 |
| Saltwater barrier conjunctive operation with Rayburn/Steinhagen | \$2,000,000 | \$5 | - | 111,000 | 111,000 | 111,000 | 111,000 | 111,000 | \$5 |
| Wholesale customer conservation | \$1,400,000 | \$2 | 20,000 | 30,000 | 33,000 | 35,000 | 40,000 | 40,000 | \$1 |
| Angelina-Neches River Authority Treatment and Distribution System ¹ | \$35,127,250 | na | - | - | - | - | - | - | na |
| Indirect reuse ¹ | \$0 | \$35 | - | 1,377 | 1,589 | 1,784 | 1,993 | 2,198 | \$41 |
| New water treatment plant ¹ | \$12,387,000 | \$560 | - | - | - | - | - | 2,240 | \$560 |
| Purchase water from provider (1) ¹ | \$0 | \$651 | 1,080 | 2,508 | 2,633 | 2,908 | 3,308 | 3,708 | \$642 |
| Purchase water from provider (2) ¹ | \$113,947,150 | \$586 | 13,350 | 45,201 | 33,051 | 34,351 | 45,751 | 56,251 | \$371 |
| Purchase water from provider (3) ¹ | \$56,415,750 | \$955 | - | 10,251 | 10,251 | 10,251 | 10,251 | 10,251 | \$475 |
| Region I Subtotal | \$884,829,743 | | 53,418 | 363,106 | 399,517 | 427,199 | 607,272 | 638,076 | |
| Region J | | | | | | | | | |
| Additional groundwater wells | \$240,350 | \$7 | 222 | 222 | 222 | 222 | 222 | 222 | \$7 |
| Conservation: brush management ⁴ | \$3,937,790 | \$14 | 10,500 | 10,500 | 10,500 | 10,500 | 10,500 | 10,500 | \$14 |
| Conservation: public information | \$0 | \$234 | 65 | 69 | 71 | 71 | 76 | 77 | \$251 |
| Conservation: system water audit and water loss audit | \$0 | \$43 | 514 | 553 | 570 | 572 | 593 | 604 | \$36 |
| Groundwater wells | \$247,250 | \$7 | 172 | 172 | 172 | 172 | 172 | 172 | \$7 |
| Increased water treatment and aquifer storage and recovery capacity | \$6,650,000 | \$364 | 2,240 | 2,240 | 2,240 | 2,240 | 2,240 | 2,240 | \$150 |
| Purchase water from UGRA | \$0 | \$1,000 | - | - | 3,840 | 3,840 | 3,840 | 5,450 | \$1,000 |
| Replace pressure tank | \$7,000 | na | - | - | - | - | - | - | na |
| Surface water acquisition, treatment and aquifer storage and recovery | \$36,660,000 | \$1,620 | - | 1,624 | 1,624 | 2,124 | 2,124 | 2,624 | \$518 |
| Surface water storage | \$7,050,000 | \$581 | - | 1,121 | 1,121 | 1,121 | 1,121 | 1,121 | \$581 |
| Region J Subtotal | \$54,792,390 | | 13,713 | 16,501 | 20,360 | 20,862 | 20,888 | 23,010 | |
| Region K | | | | | | | | | |
| Additional municipal conservation | \$0 | \$548 | - | - | - | 522 | 1,027 | 1,844 | \$243 |
| Amend LCRA contract | \$0 | \$98 | 3,708 | 5,265 | 6,165 | 8,503 | 10,955 | 12,911 | \$125 |
| Aquifer storage and recovery | \$168,711,000 | \$3,802 | - | - | - | 10,000 | 10,000 | 10,000 | \$3,802 |

APPENDIX A.2. RECOMMENDED WATER MANAGEMENT STRATEGIES AND COST ESTIMATES - CONTINUED

| Recommended Water Management Strategy | Total Capital Costs | First Decade Estimated Annual Average Unit Cost (\$/acre-foot/year) | Water Supply Volume (acre-feet/year) | | | | | | Year 2060 Estimated Annual Average Unit Cost (\$/acre-foot/year) | |
|--|---------------------|---|--------------------------------------|---------|---------|--------|--------|--------|--|---------|
| | | | 2010 | 2020 | 2030 | 2040 | 2050 | 2060 | | |
| Blend brackish surface water in South Texas Project | | | | | | | | | | |
| Nuclear Operating Company Reservoir | \$0 | na | - | 17,505 | 17,505 | 17,505 | 17,505 | 17,505 | 17,625 | na |
| City of Austin conservation | \$0 | \$215 | 11,030 | 18,795 | 24,036 | 25,385 | 30,401 | 36,370 | | \$47 |
| City of Austin direct reuse (municipal and manufacturing) | \$302,250,510 | \$851 | 5,143 | 13,620 | 22,077 | 30,268 | 36,218 | 40,468 | | \$851 |
| City of Austin direct reuse (steam-electric) | \$302,250,510 | \$851 | 2,315 | 3,315 | 7,315 | 8,315 | 12,315 | 13,315 | | \$851 |
| City of Austin return flows | \$0 | na | 46,853 | 45,641 | 49,862 | 62,330 | 64,645 | 74,366 | | na |
| Conjunctive use of groundwater - includes overdraft | \$0 | na | - | 62,000 | 62,000 | 62,000 | 62,000 | 62,000 | | na |
| Development of Carrizo-Wilcox Aquifer | \$12,242,071 | \$771 | - | 1,687 | 1,687 | 1,687 | 2,662 | 2,933 | | \$748 |
| Development of Ellenburger-San Saba Aquifer | \$5,601,523 | \$1,542 | 478 | 478 | 478 | 478 | 519 | 542 | | \$1,869 |
| Development of Gulf Coast Aquifer | \$164,000 | \$376 | - | - | - | - | - | 82 | | \$376 |
| Development of Hickory Aquifer | \$4,697,200 | \$1,711 | 512 | 488 | 406 | 331 | 261 | 196 | | \$3,815 |
| Development of new rice varieties | \$0 | na | - | 40,800 | 40,800 | 40,800 | 40,800 | 40,800 | | na |
| Development of other aquifer | \$3,104,788 | \$23 | 4,291 | 4,291 | 4,370 | 4,582 | 4,839 | 5,180 | | \$104 |
| Development of Queen City Aquifer | \$4,190,135 | \$1,082 | - | - | - | - | - | 580 | | \$1,082 |
| Development of saline zone of Edwards-Balcones Fault Zone Aquifer | \$19,753,964 | \$979 | - | 250 | 2,750 | 2,850 | 5,500 | 7,100 | | \$979 |
| Development of Trinity Aquifer | \$4,084,198 | \$8,140 | - | - | 75 | 200 | 301 | 400 | | \$1,657 |
| Downstream return flows | \$0 | na | - | - | 460 | 1,836 | 3,443 | 4,590 | | na |
| Drought management | \$0 | na | 461 | 461 | 461 | 461 | 461 | 1,912 | | \$38 |
| Enhanced municipal and industrial conservation | \$0 | \$400 | - | - | 2,000 | 10,000 | 20,000 | 20,000 | | \$400 |
| Expand supply from South Texas Project Nuclear Operating Company Reservoir | \$0 | na | 193 | - | - | - | - | - | | na |
| Expansion of Carrizo-Wilcox Aquifer | \$16,872,960 | \$357 | 4,350 | 5,815 | 8,476 | 9,779 | 12,950 | 12,920 | | \$484 |
| Expansion of Ellenburger-San Saba Aquifer | \$14,482,800 | \$1,989 | 681 | 756 | 788 | 1,229 | 1,633 | 2,076 | | \$1,827 |
| Expansion of Gulf Coast Aquifer | \$1,475,140 | \$85 | 4,486 | 4,261 | 3,659 | 2,573 | 1,185 | 1,409 | | \$350 |
| Expansion of Hickory Aquifer | \$611,320 | \$4,943 | 62 | 62 | 62 | 62 | 62 | 62 | | \$4,943 |
| Expansion of other aquifer | \$1,721,920 | \$626 | - | 416 | 777 | 1,366 | 2,017 | 2,814 | | \$118 |
| Expansion of Queen City Aquifer | \$0 | \$20 | 98 | 40 | 40 | 31 | 24 | 17 | | \$20 |
| Expansion of Sparta Aquifer | \$0 | \$37 | 188 | 208 | 129 | 129 | 129 | 129 | | \$37 |
| Expansion of Trinity Aquifer | \$3,609,180 | \$789 | 428 | 431 | 988 | 937 | 1,147 | 1,124 | | \$745 |
| Expansion of Yegua-Jackson Aquifer | \$0 | \$37 | - | - | - | - | - | 9 | | \$37 |
| Firm-up run-of-river with off-channel reservoir - LCRA/SAWS project (Region K Component) | \$0 | na | - | - | - | - | - | 47,000 | | na |
| Goldthwaite Channel Dam | \$1,841,800 | \$1,383 | 300 | 300 | 300 | 300 | 300 | 300 | | \$1,383 |
| House Bill 1437 on-farm conservation | \$3,817,897 | \$13 | 4,000 | 4,000 | 4,000 | 4,000 | 14,800 | 25,000 | | \$13 |
| Irrigation district conveyance improvements | \$0 | na | - | 65,000 | 65,000 | 65,000 | 65,000 | 65,000 | | na |
| LCRA Water Management Plan interruptible water supply | \$0 | na | 255,493 | 196,568 | 137,643 | 78,718 | 19,793 | - | | na |

APPENDIX A.2. RECOMMENDED WATER MANAGEMENT STRATEGIES AND COST ESTIMATES - CONTINUED

| Recommended Water Management Strategy | Total Capital Costs | First Decade Estimated Annual Average Unit Cost (\$/acre-foot/year) | Water Supply Volume (acre-feet/year) | | | | | | Year 2060 Estimated Annual Average Unit Cost (\$/acre-foot/year) |
|---|----------------------|---|--------------------------------------|----------------|----------------|----------------|----------------|----------------|--|
| | | | 2010 | 2020 | 2030 | 2040 | 2050 | 2060 | |
| Municipal conservation | \$0 | \$567 | 3,468 | 6,462 | 9,644 | 12,684 | 15,444 | 18,380 | \$90 |
| New LCRA contracts | \$17,556,000 | \$138 | - | 35,564 | 36,782 | 59,422 | 60,177 | 69,910 | \$181 |
| On-farm conservation | \$0 | na | - | 34,150 | 34,150 | 34,150 | 34,150 | 34,150 | na |
| Purchase water from City of Austin | \$2,280,200 | \$963 | 1,100 | 1,100 | 1,100 | 1,100 | 1,100 | 1,100 | \$963 |
| Purchase water from West Travis County Regional Water Supply | \$0 | \$138 | 846 | 925 | 989 | 1,015 | 990 | 958 | \$138 |
| Reuse by Highland Lakes communities | \$15,920,000 | \$550 | - | 500 | 2,000 | 5,000 | 5,000 | 5,000 | \$550 |
| Temporary drought period use of Gulf Coast Aquifer | \$0 | \$37 | - | - | - | - | - | 47 | \$37 |
| Temporary drought period use of Queen City Aquifer | \$0 | \$20 | 21 | 10 | - | - | - | - | na |
| Water allocation | \$0 | na | 67 | 110 | - | - | - | - | na |
| Water right permit amendment | \$0 | na | - | 5,500 | 5,500 | 5,500 | 5,500 | 5,500 | na |
| Water transfer | \$0 | na | 11 | 21 | 30 | 37 | 43 | 48 | na |
| House Bill 1437 for Williamson County ¹ | \$0 | \$173 | 126 | 246 | 349 | 426 | 536 | 645 | \$173 |
| New LCRA contracts ¹ | \$0 | \$138 | 300 | 300 | 300 | 300 | 300 | 300 | \$138 |
| Region K Subtotal | \$907,239,116 | | 350,583 | 576,795 | 554,504 | 571,085 | 565,296 | 646,167 | |
| Region L | | | | | | | | | |
| Aquifer storage and recovery project and phased expansion | \$0 | na | 3,800 | 16,000 | 16,000 | 16,000 | 16,000 | 16,000 | na |
| Brackish groundwater desalination (Wilcox Aquifer) | \$378,330,000 | \$1,245 - \$1,823 | - | 12,000 | 28,600 | 35,120 | 40,720 | 42,220 | \$465 - \$766 |
| Construction of Lavaca River off-channel reservoir diversion project (Region L component) | \$85,429,083 | \$701 | - | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | \$100 |
| CRWA Siesta project | \$53,481,000 | \$1,421 | - | - | 1,000 | 5,042 | 5,042 | 5,042 | \$497 |
| CRWA Wells Ranch project Phase I | \$0 | na | 5,200 | 5,200 | 5,200 | 5,200 | 5,200 | 5,200 | na |
| CRWA Wells Ranch project Phase II (including Gonzales County) | \$34,910,000 | \$725 | 5,800 | 5,800 | 5,800 | 5,800 | 5,800 | 5,800 | \$200 |
| Drought management | \$0 | na | 41,240 | - | - | - | - | - | na |
| Edwards Aquifer recharge - Type 2 projects | \$527,643,000 | \$2,005 | - | 13,451 | 13,451 | 13,451 | 13,451 | 21,577 | \$340 |
| Edwards transfers | \$0 | \$454 | 45,896 | 47,479 | 48,931 | 49,870 | 50,855 | 51,875 | na |
| Facilities expansion | \$142,282,000 | na | - | - | - | - | - | - | na |
| Firm-up- run-of-river with off-channel reservoir - LCRA/SAWS project (Region L component) | \$1,986,684,000 | \$2,394 | - | - | 90,000 | 90,000 | 90,000 | 90,000 | \$829 |
| GBRA Exelon project | \$280,598,000 | \$646 | - | 49,126 | 49,126 | 49,126 | 49,126 | 49,126 | \$224 |
| GBRA lower basin storage | \$33,800,000 | \$104 | - | - | 28,369 | 28,369 | 28,369 | 28,369 | \$60 |
| GBRA mid basin (surface water) | \$546,941,000 | \$1,879 | - | 25,000 | 25,000 | 25,000 | 25,000 | 25,000 | \$370 |
| GBRA new appropriation (lower basin) | \$246,849,000 | \$1,910 | - | - | 11,300 | 11,300 | 11,300 | 11,300 | \$223 |
| GBRA Simsboro project (overdraft) | \$330,782,000 | \$982 | - | 30,000 | 30,000 | 30,000 | 49,777 | 49,777 | \$386 |

APPENDIX A.2. RECOMMENDED WATER MANAGEMENT STRATEGIES AND COST ESTIMATES - CONTINUED

| Recommended Water Management Strategy | Total Capital Costs | First Decade Estimated Annual Average Unit Cost (\$/acre-foot/year) | Water Supply Volume (acre-feet/year) | | | | | | Year 2060 Estimated Annual Average Unit Cost (\$/acre-foot/year) |
|--|---------------------|---|--------------------------------------|--------|--------|--------|--------|--------|--|
| | | | 2010 | 2020 | 2030 | 2040 | 2050 | 2060 | |
| Hays/Caldwell Public Utility Authority Project (including Gonzales County) | \$307,717,752 | \$1,245 | - | 7,289 | 14,597 | 19,418 | 25,868 | 33,314 | \$439 |
| Industrial, steam-electric power generation, and mining water conservation | \$0 | na | 521 | 726 | 1,771 | 1,992 | 2,293 | 2,493 | na |
| Irrigation water conservation | \$0 | \$143 | 20,087 | 17,561 | 14,429 | 11,421 | 8,543 | 7,238 | \$136 |
| Livestock water conservation | \$0 | na | 3 | 1 | - | - | - | - | na |
| Local groundwater (Gulf Coast Aquifer) | \$2,194,000 | \$1,823 | - | - | - | 161 | 161 | 161 | \$637 |
| Local groundwater (Trinity Aquifer) | \$30,224,000 | \$644 | 2,016 | 3,145 | 3,468 | 3,629 | 3,952 | 4,436 | \$440 |
| Local groundwater Carrizo-Wilcox Aquifer (includes overdrafts) | \$166,718,000 | \$577 | 6,773 | 11,610 | 15,441 | 17,256 | 23,946 | 33,874 | \$464 |
| Medina Lake firm-up (aquifer storage and recovery) | \$146,237,000 | \$1,696 | 9,933 | 9,933 | 9,933 | 9,933 | 9,933 | 9,933 | \$450 |
| Municipal water conservation | \$0 | \$648 | 13,232 | 22,744 | 31,618 | 40,531 | 53,925 | 72,566 | \$572 |
| Purchase from New Braunfels Utilities/redistribution of supplies | \$0 | varies | 1,443 | 552 | 552 | 552 | 552 | 552 | varies |
| Purchase from wholesale water provider (GBRA) | \$0 | varies | 8,940 | 4,805 | - | - | - | - | na |
| Purchase from wholesale water provider (LNRA)/redistribution of supplies | \$0 | varies | 46 | 145 | 322 | 499 | 489 | 489 | varies |
| Purchase from wholesale water provider (SSLGC)/redistribution of supplies | \$0 | varies | 581 | 719 | 876 | 1,034 | 1,197 | 1,376 | varies |
| Recycled water programs | \$465,339,000 | varies | 21,666 | 26,046 | 30,151 | 34,178 | 37,706 | 41,737 | varies |
| Regional Carrizo for SAWS (including Gonzales County) | \$136,550,000 | \$1,343 | - | 11,687 | 11,687 | 11,687 | 11,687 | 11,687 | \$324 |
| Regional Carrizo for SSLGC project expansion (including Gonzales County) | \$28,189,000 | \$568 | - | 10,364 | 10,364 | 10,364 | 10,364 | 10,364 | \$331 |
| Seawater desalination | \$1,293,827,000 | \$2,284 | - | - | - | - | - | 84,012 | \$2,284 |
| Storage above Canyon Reservoir (aquifer storage and recovery) | \$37,326,000 | \$1,772 | - | 3,140 | 3,140 | 3,140 | 3,140 | 3,140 | \$587 |
| TWA Regional Carrizo (including Gonzales County) | \$313,060,000 | \$1,523 | - | 27,000 | 27,000 | 27,000 | 27,000 | 27,000 | \$512 |
| Western Canyon water treatment plant expansion | \$11,727,436 | \$315 | - | - | - | - | 5,600 | 5,600 | \$315 |
| Wimberley and Woodcreek water supply project | \$33,771,000 | \$2,429 | 1,120 | 4,480 | 4,480 | 4,480 | 4,480 | 4,480 | \$4,480 |
| Brackish groundwater desalination (Wilcox Aquifer) ¹ | \$0 | na | - | - | 3,596 | 3,596 | 9,196 | 9,196 | na |
| CRWA Siesta Project ¹ | \$0 | na | - | - | 1,000 | 5,042 | 3,711 | 4,211 | na |
| CRWA Wells Ranch Project Phase I ¹ | \$0 | \$725 | 5,200 | 5,200 | 5,200 | 5,200 | 5,200 | 5,200 | \$200 |
| CRWA Wells Ranch Project Phase II (including Gonzales County) ¹ | \$0 | \$725 | 1,296 | 4,626 | 5,800 | 5,800 | 5,800 | 5,800 | \$200 |
| Edwards transfers ¹ | \$0 | na | 5,259 | 6,220 | 8,297 | 12,483 | 20,823 | 21,138 | na |
| Facilities expansion ¹ | \$2,277,000 | na | - | - | - | - | - | - | na |
| GBRA lower basin storage ¹ | \$0 | na | - | - | 7,786 | 10,755 | 13,416 | 16,391 | na |

APPENDIX A.2. RECOMMENDED WATER MANAGEMENT STRATEGIES AND COST ESTIMATES - CONTINUED

| Recommended Water Management Strategy | Total Capital Costs | First Decade Estimated Annual Average Unit Cost (\$/acre-foot/year) | Water Supply Volume (acre-feet/year) | | | | | | Year 2060 Estimated Annual Average Unit Cost (\$/acre-foot/year) |
|---|------------------------|---|--------------------------------------|----------------|----------------|----------------|----------------|----------------|--|
| | | | 2010 | 2020 | 2030 | 2040 | 2050 | 2060 | |
| GBRA mid-basin (surface water) ¹ | \$0 | na | - | 12,855 | 13,554 | 13,988 | 14,424 | 14,794 | na |
| GBRA new appropriation (lower basin) ¹ | \$0 | na | - | - | - | 81 | 193 | 310 | na |
| GBRA Simsboro project (overdraft) ¹ | \$0 | na | - | 9,268 | 14,174 | 20,954 | 28,024 | 35,786 | na |
| Hays/Caldwell Public Utility Authority project (including Gonzales County) ¹ | \$0 | na | - | 1,370 | 7,521 | 5,344 | 5,986 | 7,502 | na |
| Local groundwater (Trinity Aquifer) ¹ | \$0 | na | 296 | 283 | 403 | 705 | 963 | 1,216 | na |
| Local groundwater Carrizo-Wilcox Aquifer (includes overdrafts) ¹ | \$0 | na | 120 | 120 | 120 | 120 | 120 | 120 | na |
| Medina Lake firm-up (aquifer storage and recovery) ¹ | \$0 | na | 500 | 500 | 500 | 500 | 500 | 500 | na |
| Recycled water programs ¹ | \$0 | na | 4,240 | 7,367 | 15,127 | 15,127 | 15,127 | 15,127 | na |
| Regional Carrizo for SSLGC project expansion (including Gonzales County) ¹ | \$0 | \$568 | - | 616 | 2,302 | 4,082 | 5,764 | 7,573 | na |
| Storage above Canyon Reservoir (aquifer storage and recovery) ¹ | \$0 | na | - | 3,140 | 3,140 | 3,140 | 3,140 | 3,140 | na |
| TWA Regional Carrizo (including Gonzales County) ¹ | \$0 | na | - | 6,828 | 13,717 | 17,591 | 21,556 | 25,575 | na |
| Western Canyon water treatment plant expansion ¹ | \$0 | \$315 | - | - | - | - | - | 650 | \$315 |
| Wimberley and Woodcreek water supply project ¹ | \$0 | na | 1,120 | 4,480 | 4,480 | 4,480 | 4,480 | 4,480 | \$1,772 |
| Region L Subtotal | \$7,622,886,271 | | 188,297 | 376,003 | 542,606 | 571,553 | 631,476 | 765,738 | |
| Region M | | | | | | | | | |
| Acquisition of water rights through contract | \$16,263,877 | \$724 | 312 | 738 | 1,665 | 2,352 | 3,198 | 4,671 | \$430 |
| Acquisition of water rights through purchase | \$631,081,709 | \$782 | 9,611 | 19,461 | 41,602 | 70,944 | 110,913 | 151,237 | \$424 |
| Acquisition of water rights through urbanization | \$56,167,089 | \$719 | 299 | 3,433 | 6,467 | 9,496 | 12,868 | 16,406 | \$430 |
| Advanced water conservation | \$22,583,710 | varies | 2,917 | 6,339 | 11,986 | 16,512 | 24,867 | 32,793 | varies |
| Banco Morales Reservoir | \$25,790,900 | \$9,370 | - | 238 | 238 | 238 | 238 | 238 | \$2,542 |
| Brackish water desalination | \$267,290,631 | \$775 | 56,553 | 63,239 | 67,221 | 73,984 | 86,708 | 92,212 | \$468 |
| Brownsville weir and reservoir | \$98,411,077 | \$585 | - | 20,643 | 20,643 | 20,643 | 20,643 | 23,643 | \$183 |
| Expand existing groundwater wells | \$27,474,302 | \$433 | 3,772 | 8,572 | 17,139 | 20,492 | 22,284 | 24,520 | \$254 |
| Irrigation conveyance system conservation | \$131,899,803 | \$12 | 11,204 | 37,711 | 63,762 | 89,347 | 114,465 | 139,217 | \$15 |
| Laredo low water weir | \$294,400,000 | na | - | - | - | - | - | - | na |
| Non-potable reuse | \$174,944,916 | \$466 | 2,417 | 9,891 | 16,425 | 28,087 | 42,938 | 64,116 | \$130 |
| On-farm water conservation | \$194,569,720 | \$315 | 1,622 | 10,419 | 26,299 | 49,073 | 78,550 | 114,619 | \$29 |
| Potable reuse | \$7,519,850 | \$717 | 1,120 | 1,120 | 1,120 | 1,120 | 1,150 | 1,290 | \$180 |
| Proposed elevated storage tank and infrastructure improvements for City of Elsa | \$8,325,386 | \$7,241 | 105 | 105 | 105 | 105 | 105 | 105 | \$102 |
| Resaca restoration | \$52,000,000 | \$5,583 | 877 | 877 | 877 | 877 | 877 | 877 | \$2,542 |

APPENDIX A.2. RECOMMENDED WATER MANAGEMENT STRATEGIES AND COST ESTIMATES - CONTINUED

| Recommended Water Management Strategy | Total Capital Costs | First Decade Estimated Annual Average Unit Cost (\$/acre-foot/year) | Water Supply Volume (acre-feet/year) | | | | | | Year 2060 Estimated Annual Average Unit Cost (\$/acre-foot/year) |
|---|------------------------|---|--------------------------------------|----------------|----------------|----------------|----------------|----------------|--|
| | | | 2010 | 2020 | 2030 | 2040 | 2050 | 2060 | |
| Seawater desalination | \$185,940,937 | \$1,611 | 125 | 125 | 143 | 6,049 | 6,421 | 7,902 | \$1,051 |
| Region M Subtotal | \$2,194,663,908 | | 90,934 | 182,911 | 275,692 | 389,319 | 526,225 | 673,846 | |
| Region N | | | | | | | | | |
| Construction of Lavaca River off-channel reservoir diversion project (Region N component) | \$138,753,917 | \$1,027 | - | - | - | - | - | 16,242 | \$1,027 |
| Garwood Pipeline | \$112,798,000 | \$685 | - | 35,000 | 35,000 | 35,000 | 35,000 | 35,000 | \$402 |
| Gulf Coast Aquifer Supplies | \$13,413,000 | \$100 - \$144 | 1,975 | 2,535 | 11,535 | 11,535 | 13,551 | 13,551 | \$24 - \$100 |
| Gulf Coast Aquifer Supplies (regional) | \$59,245,000 | \$853 | - | - | 11,000 | 11,000 | 11,000 | 18,000 | \$566 |
| Irrigation water conservation | \$0 | \$228 | 17 | 52 | 103 | 169 | 248 | 342 | \$228 |
| Manufacturing water conservation | \$0 | na | 1,260 | 1,418 | 1,576 | 1,734 | 1,892 | 2,050 | na |
| Mining water conservation | \$0 | na | 281 | 626 | 998 | 1,410 | 1,863 | 2,343 | na |
| Municipal water conservation | \$0 | \$423 - \$448 | 106 | 353 | 721 | 1,153 | 1,763 | 2,415 | \$423 - \$448 |
| O.N. Stevens Water Treatment Plant improvements | \$31,324,000 | \$178 | 42,329 | 40,048 | 38,102 | 36,366 | 34,817 | 32,996 | \$146 |
| Off-channel reservoir near Lake Corpus Christi | \$300,577,000 | \$715 | - | - | 30,340 | 30,340 | 30,340 | 30,340 | \$578 |
| Reclaimed wastewater supplies | \$0 | \$826 | 250 | 250 | 250 | 250 | 250 | 250 | \$826 |
| Voluntary redistribution | \$0 | \$685 - \$798 | 736 | 738 | 914 | 1,060 | 2,706 | 2,797 | \$685 - \$798 |
| Region N Subtotal | \$656,110,917 | | 46,954 | 81,020 | 130,539 | 130,017 | 133,430 | 156,326 | |
| Region O | | | | | | | | | |
| CRMWA Region O local groundwater development | \$56,574,000 | \$358 | - | - | 15,500 | 14,130 | 12,717 | 11,445 | \$412 |
| Irrigation water conservation | \$345,824,000 | \$63 | 479,466 | 431,517 | 388,366 | 349,528 | 314,577 | 283,118 | \$106 |
| Lake Alan Henry Pipeline for the City of Lubbock | \$294,329,000 | \$1,310 | 21,880 | 21,880 | 21,880 | 21,880 | 21,880 | 21,880 | \$1,310 |
| Lake Alan Henry Supply for Lake Alan Henry Water Supply Corporation | \$7,334,502 | \$3,349 | 270 | 270 | 270 | 270 | 270 | 270 | \$3,349 |
| Local groundwater development | \$21,438,369 | na | 10,034 | 12,711 | 15,253 | 15,871 | 16,841 | 16,175 | na |
| Lubbock brackish groundwater desalination | \$13,167,000 | \$663 | - | 3,360 | 3,360 | 3,360 | 3,360 | 3,360 | \$663 |
| Lubbock Jim Bertram Lake 7 | \$68,288,400 | \$451 | - | 17,650 | 17,650 | 17,650 | 17,650 | 17,650 | \$451 |
| Lubbock North Fork diversion operation (A) | \$153,040,000 | \$6,340 | - | 3,675 | 3,675 | 3,675 | 3,675 | 3,675 | \$6,340 |
| Municipal water conservation | \$0 | \$668 | 5,809 | 10,583 | 10,729 | 10,264 | 10,206 | 10,424 | \$550 |
| Post Reservoir - Delivered to Lake Alan Henry Pipeline | \$110,307,000 | \$695 | - | - | 25,720 | 25,720 | 25,720 | 25,720 | \$695 |
| Reclaimed water - White River Municipal Water District | \$38,089,684 | \$1,593 | - | 2,240 | 2,240 | 2,240 | 2,240 | 2,240 | \$1,593 |
| Region O Subtotal | \$1,108,391,955 | | 517,459 | 503,886 | 504,643 | 464,588 | 429,136 | 395,957 | |

APPENDIX A.2. RECOMMENDED WATER MANAGEMENT STRATEGIES AND COST ESTIMATES - CONTINUED

| Recommended Water Management Strategy | Total Capital Costs | First Decade Estimated Annual Average Unit Cost (\$/acre-foot/year) | Water Supply Volume (acre-feet/year) | | | | | | Year 2060 Estimated Annual Average Unit Cost (\$/acre-foot/year) |
|---|---------------------|---|--------------------------------------|--------|--------|--------|--------|--------|--|
| | | | 2010 | 2020 | 2030 | 2040 | 2050 | 2060 | |
| Region P | | | | | | | | | |
| Conjunctive use of groundwater (temporary overdraft) - Jackson County | \$0 | \$42 | 5,053 | 5,053 | 5,053 | 5,054 | 5,053 | 5,053 | \$42 |
| Conjunctive use of groundwater (temporary overdraft) - Wharton County | \$0 | \$42 | 62,686 | 62,686 | 62,686 | 62,686 | 62,686 | 62,686 | \$42 |
| <i>Region P Subtotal</i> | \$0 | | 67,739 | 67,739 | 67,739 | 67,740 | 67,739 | 67,739 | |

1 - Denotes strategies with supply volumes included in other strategies

2 - Estimated planning costs and water supply associated with this strategy are based on the Neches River Run-of-River strategy. This project, however is only one of several water management strategies being considered to meet these 2060 needs, and through action by the Region C Water Planning Group, any of those other strategies may be substituted into the plan to represent the 'Fastrill Reservoir Replacement' strategy. Those other strategies include: additional water conservation, Lake Texoma, Toledo Bend Reservoir, Lake O' the Pines, Lake Livingston, Ogallala groundwater in Roberts County (Region A), Marvin Nichols Reservoir, Lake Columbia, George Parkhouse Reservoir (North), George Parkhouse Reservoir (South), and Oklahoma Water.

3 - Denotes strategies with supply volumes included in Region C Strategies (including supply from Bois D'Arc reservoir)

4 - Supply would not be available during drought of record conditions

"na" = not available/applicable

APPENDIX A.3. ALTERNATIVE WATER MANAGEMENT STRATEGIES AND COST ESTIMATES

| Alternative Water Management Strategy | Total Capital Costs | First Decade Estimated Annual Average Unit Cost (\$/acre-foot/year) | Water Supply Volume (acre-feet/year) | | | | | Year 2060 Estimated Annual Average Unit Cost (\$/acre-foot/year) | |
|---|---------------------|---|--------------------------------------|---------|---------|---------|---------|--|---------|
| | | | 2010 | 2020 | 2030 | 2040 | 2050 | | 2060 |
| Region A | | | | | | | | | |
| Palo Duro Reservoir Transmission System | \$107,839,700 | \$2,891 | 0 | 0 | 3,758 | 3,758 | 3,758 | 3,750 | \$390 |
| Precipitation enhancement | \$0 | \$6 | 0 | 87,558 | 87,558 | 87,558 | 87,558 | 87,558 | \$6 |
| Voluntary transfers from other users | \$3,116,400 | \$1,870 | 0 | 0 | 300 | 500 | 800 | 1,000 | \$871 |
| Region B | | | | | | | | | |
| Develop Trinity Aquifer supplies | \$1,650,000 | \$1,200 | 171 | 171 | 171 | 171 | 171 | 171 | \$357 |
| Develop Trinity Aquifer supplies (including overdrafting) | \$654,000 | \$446 | 177 | 177 | 177 | 177 | 177 | 177 | \$125 |
| Purchase water from local provider (alternative 1) | \$364,500 | \$1,200 | 584 | 584 | 584 | 584 | 584 | 584 | \$1,145 |
| Purchase water from local provider (alternative 2) | \$239,671 | \$1,200 | 384 | 384 | 384 | 384 | 384 | 384 | \$1,145 |
| Purchase water from local provider (alternative 3) | \$848,000 | \$3,050 | 40 | 40 | 40 | 40 | 40 | 40 | \$1,200 |
| Wastewater reuse | \$57,100,000 | \$770 | 0 | 0 | 0 | 11,000 | 11,000 | 11,000 | \$317 |
| Region C | | | | | | | | | |
| Brazos groundwater project to DWU | \$801,451,000 | \$1,222 | 0 | 0 | 0 | 100,000 | 100,000 | 100,000 | \$1,222 |
| Brazos groundwater project to NTMWD | \$913,344,000 | \$1,416 | 0 | 0 | 100,000 | 100,000 | 100,000 | 100,000 | \$752 |
| Cooke County project | \$3,254,000 | \$2,110 | 0 | 200 | 200 | 200 | 200 | 200 | \$930 |
| Indirect reuse | \$195,183,000 | na | 0 | 0 | 26,000 | 26,000 | 26,000 | 26,000 | \$380 |
| Lake Columbia to DWU | \$179,945,000 | \$536 | 0 | 0 | 0 | 35,800 | 35,800 | 35,800 | \$536 |
| Lake George Parkhouse North for DWU | \$521,281,000 | \$4,650 | 0 | 0 | 0 | 112,100 | 112,100 | 112,100 | \$4,650 |
| Lake George Parkhouse North for NTMWD | \$1,029,185,000 | \$580 | 0 | 0 | 203,960 | 203,960 | 203,960 | 203,960 | \$156 |
| Lake George Parkhouse South for DWU | \$692,921,000 | \$568 | 0 | 0 | 0 | 115,260 | 115,260 | 115,260 | \$568 |
| Lake George Parkhouse South for NTMWD | \$1,282,503,000 | \$758 | 0 | 0 | 193,480 | 193,480 | 193,480 | 193,480 | \$177 |
| Lake Livingston to DWU | \$1,855,538,000 | \$982 | 0 | 0 | 0 | 200,000 | 200,000 | 200,000 | \$982 |
| Lake Livingston to NTMWD | \$2,115,111,000 | \$1,103 | 0 | 200,000 | 200,000 | 200,000 | 200,000 | 200,000 | \$334 |
| Lake Livingston to TRWD | \$2,084,210,000 | \$1,120 | 0 | 0 | 200,000 | 200,000 | 200,000 | 200,000 | \$363 |
| Lake O' the Pines to DWU | \$541,534,000 | \$705 | 0 | 0 | 0 | 89,600 | 89,600 | 89,600 | \$705 |
| Lake O' the Pines to NTMWD | \$402,431,000 | \$576 | 0 | 0 | 87,900 | 87,900 | 87,900 | 87,900 | \$244 |
| Lake Ralph Hall | \$143,201,000 | \$847 | 0 | 0 | 29,219 | 29,219 | 29,219 | 29,219 | \$135 |
| Lake Tehuacana | \$746,345,000 | \$1,118 | 0 | 0 | 56,800 | 56,800 | 56,800 | 56,800 | \$163 |
| Lake Texoma - authorized (desalinate) | \$796,532,000 | \$994 | 0 | 105,000 | 105,000 | 105,000 | 105,000 | 105,000 | \$443 |
| Lake Texoma - not authorized (blend) | \$673,749,300 | \$463 | 0 | 8,400 | 146,400 | 146,400 | 146,400 | 146,400 | \$112 |
| Lake Texoma - not authorized (desalinate) | \$925,918,000 | \$1,099 | 0 | 0 | 105,000 | 105,000 | 105,000 | 105,000 | \$459 |
| Lake Texoma to DWU (blend) | \$56,334,000 | \$306 | 0 | 20,000 | 20,000 | 20,000 | 20,000 | 20,000 | \$101 |
| Marvin Nichols Reservoir with DWU | \$322,326,000 | \$455 | 0 | 0 | 50,000 | 50,000 | 50,000 | 50,000 | \$127 |
| New wells - other aquifer | \$7,000,000 | \$219 | 0 | 4,480 | 4,480 | 4,480 | 4,480 | 4,480 | \$106 |

APPENDIX A.3. ALTERNATIVE WATER MANAGEMENT STRATEGIES AND COST ESTIMATES - CONTINUED

| Alternative Water Management Strategy | Total Capital Costs | First Decade Estimated Annual Average Unit Cost (\$/acre-foot/year) | Water Supply Volume (acre-feet/year) | | | | | Year 2060 Estimated Annual Average Unit Cost (\$/acre-foot/year) | |
|--|---------------------|---|--------------------------------------|---------|---------|---------|---------|--|---------------|
| | | | 2010 | 2020 | 2030 | 2040 | 2050 | | 2060 |
| NTMWD interim purchase from DWU (alternative strategies) | \$1,777,000 | \$464 | 0 | 11,200 | 11,200 | 0 | 0 | 0 | na |
| Oklahoma water to DWU | \$343,934,000 | \$702 | 0 | 0 | 0 | 0 | 0 | 50,000 | \$702 |
| Purchase water from local provider (alternative 1) | \$20,133,000 | \$1,084 | 0 | 0 | 6,726 | 6,726 | 6,726 | 6,726 | \$866 |
| Roberts County project to DWU | \$2,435,534,000 | \$1,109 | 0 | 0 | 0 | 200,000 | 200,000 | 200,000 | \$1,109 |
| Roberts County project to NTMWD | \$2,434,529,000 | \$1,127 | 0 | 200,000 | 200,000 | 200,000 | 200,000 | 200,000 | \$243 |
| Toledo Bend Project | \$1,433,774,000 | \$813 | 0 | 0 | 0 | 0 | 200,000 | 200,000 | \$813 |
| Water treatment plant - expansion | \$14,548,000 | na | 0 | 0 | 0 | 0 | 0 | 0 | na |
| Water treatment plant - new | \$17,000,000 | \$259 | 0 | 8,960 | 8,960 | 8,960 | 8,960 | 8,960 | \$121 |
| Water treatment plant - new (alternative strategies) | \$48,972,000 | \$1,204 | 0 | 0 | 6,726 | 6,726 | 6,726 | 6,726 | \$675 |
| Wright Patman - reallocation of flood pool NTMWD | \$1,433,524,000 | \$797 | 0 | 0 | 230,000 | 230,000 | 230,000 | 230,000 | \$227 |
| Wright Patman - reallocation of flood pool TRWD (180K) | \$1,694,140,000 | \$954 | 0 | 0 | 180,000 | 180,000 | 180,000 | 180,000 | \$270 |
| Wright Patman - Texarkana sale to NTMWD | \$1,192,489,000 | \$1,090 | 0 | 0 | 150,000 | 150,000 | 150,000 | 150,000 | \$390 |
| Wright Patman - Texarkana sale to TRWD | \$1,081,475,000 | \$1,167 | 0 | 0 | 100,000 | 100,000 | 100,000 | 100,000 | \$382 |
| Wright Patman system operation | \$2,954,940,000 | \$1,057 | 0 | 0 | 298,000 | 298,000 | 298,000 | 298,000 | \$337 |
| Marvin Nichols Reservoir with DWU ¹ | \$634,154,000 | \$661 | 0 | 0 | 95,931 | 95,931 | 95,931 | 95,931 | \$181 |
| Wright Patman system operation ¹ | \$403,387,000 | \$2,023 | 0 | 0 | 50,000 | 50,000 | 50,000 | 50,000 | \$582 |
| Region D | | | | | | | | | |
| Alternative Grand Saline Reservoir | \$54,613,652 | \$225,204 | 0 | 0 | 29 | 57 | 104 | 161 | \$11,402 |
| Alternative reuse City of Canton | \$3,761,806 | \$18,397 | 0 | 0 | 29 | 57 | 104 | 161 | \$1,617 |
| Region F | | | | | | | | | |
| Advanced treatment | \$78,000 | \$664 | 113 | 113 | 113 | 113 | 113 | 113 | \$566 |
| Steam-electric alternative generation technology | \$626,502,088 | \$1,032 - \$1,660 | 4,077 | 5,524 | 8,533 | 12,210 | 17,468 | 24,306 | \$1,962 |
| Aquifer storage recovery | \$1,752,000 | \$1,271 | 240 | 240 | 240 | 240 | 240 | 240 | \$633 |
| Bottled water program | \$176,000 | \$24,522 | 1 | 1 | 1 | 1 | 1 | 1 | \$24,522 |
| Desalination | \$14,494,000 | \$1,740 - \$1,879 | 500 | 850 | 850 | 850 | 850 | 850 | \$314 - \$349 |
| Develop Edwards Trinity Aquifer supplies | \$57,062,000 | \$660 - \$1,080 | 1,000 | 1,000 | 1,000 | 13,000 | 13,000 | 13,000 | \$288 - \$311 |
| Develop other aquifer supplies | \$287,925,000 | \$2,060 - \$2,643 | 150 | 650 | 650 | 12,650 | 12,650 | 12,650 | \$173 - \$626 |
| New/renew water supply - new infrastructure | \$6,795,000 | \$3,361 | 220 | 220 | 220 | 220 | 220 | 220 | \$670 |
| Off-channel reservoir | \$25,273,000 | \$4,430 | 500 | 500 | 500 | 500 | 500 | 500 | \$758 |
| Reuse | \$2,567,000 | \$1,473 | 0 | 220 | 220 | 220 | 220 | 220 | \$455 |

APPENDIX A.3. ALTERNATIVE WATER MANAGEMENT STRATEGIES AND COST ESTIMATES - CONTINUED

| Alternative Water Management Strategy | Total Capital Costs | First Decade Estimated Annual Average Unit Cost (\$/acre-foot/year) | Water Supply Volume (acre-feet/year) | | | | | Year 2060 Estimated Annual Average Unit Cost (\$/acre-foot/year) | |
|--|---------------------|---|--------------------------------------|--------|---------|---------|---------|--|---------|
| | | | 2010 | 2020 | 2030 | 2040 | 2050 | | 2060 |
| Region G | | | | | | | | | |
| Additional Carrizo Aquifer development (includes overdrafting) | \$212,042,000 | \$842 | 0 | 35,000 | 35,000 | 35,000 | 35,000 | 35,000 | \$314 |
| BRA system operations permit | \$14,086,000 | \$943 | 0 | 1,530 | 1,530 | 1,530 | 1,530 | 1,530 | \$140 |
| Interconnection from Abilene to Sweetwater | \$46,964,000 | \$2,365 | 4,000 | 4,000 | 4,000 | 4,000 | 4,000 | 4,000 | \$1,342 |
| Lake Aquilla Augmentation | \$64,749,000 | \$552 | 0 | 5,000 | 5,000 | 5,000 | 5,000 | 5,000 | \$232 |
| Lake Palo Pinto off-channel reservoir | \$25,399,000 | \$804 | 0 | 3,110 | 3,110 | 3,110 | 3,110 | 3,110 | \$92 |
| Possum Kingdom supply ¹ | \$189,947,000 | \$2,077 | 0 | 12,400 | 12,400 | 12,400 | 12,400 | 12,400 | \$741 |
| Region H | | | | | | | | | |
| Little River Reservoir, off-channel | \$137,356,000 | \$436 | 0 | 0 | 27,225 | 27,225 | 27,225 | 27,225 | \$317 |
| Montgomery MUD 8 and 9 brackish desalination | \$12,000,000 | \$1,171 | 2,240 | 2,240 | 2,240 | 2,240 | 2,240 | 2,240 | \$1,171 |
| Sabine to Region H transfer | \$760,813,320 | \$203 | 0 | 0 | 486,500 | 486,500 | 486,500 | 486,500 | \$67 |
| Region I | | | | | | | | | |
| New wells - Carrizo-Wilcox Aquifer | \$299,452 | \$285 | 0 | 0 | 0 | 212 | 212 | 212 | \$162 |
| Purchase water from provider (1) | \$1,021,000 | \$1,482 | 100 | 100 | 100 | 100 | 100 | 100 | \$592 |
| Purchase water from provider (2) | \$1,389,500 | \$285 | 700 | 700 | 700 | 700 | 700 | 700 | \$112 |
| Purchase water from provider (3) | \$114,418,981 | \$2,049 | 0 | 0 | 0 | 0 | 5,175 | 5,175 | \$2,049 |
| Purchase water from provider (1) ¹ | \$0 | \$1,140 | 0 | 688 | 688 | 688 | 688 | 688 | \$1,140 |
| Region K | | | | | | | | | |
| Alternative conjunctive use of groundwater - includes overdrafts | \$19,483,200 | \$964 | 0 | 0 | 0 | 0 | 15,000 | 15,000 | \$964 |
| Alternative irrigation division delivery system improvements | \$4,944,000 | \$39 | 0 | 20,000 | 25,000 | 40,000 | 48,000 | 48,000 | \$39 |
| Alternative on-farm conservation | \$5,425,000 | \$51 | 0 | 20,000 | 20,000 | 35,000 | 35,000 | 35,000 | \$51 |
| Desalination of Ellenburger-San Saba Aquifer | \$6,285,000 | \$3,168 | 0 | 0 | 384 | 384 | 384 | 384 | \$3,168 |
| Desalination of Brackish Gulf Coast Aquifer | \$177,600,000 | \$1,260 | 0 | 0 | 0 | 22,400 | 22,400 | 22,400 | \$1,260 |
| Enhanced recharge of groundwater (Gulf Coast Aquifer) | \$56,296,000 | \$354 | 0 | 0 | 0 | 0 | 17,200 | 17,200 | \$354 |
| Expansion of Gulf Coast Aquifer | \$0 | \$80 | 0 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | \$80 |
| Groundwater importation | \$395,900,000 | \$1,330 | 0 | 0 | 0 | 35,000 | 35,000 | 35,000 | \$1,330 |
| Off-channel storage in additional reservoirs | \$53,388,000 | \$345 | 0 | 0 | 30,000 | 40,000 | 40,000 | 40,000 | \$345 |

APPENDIX A.3. ALTERNATIVE WATER MANAGEMENT STRATEGIES AND COST ESTIMATES - CONTINUED

| Alternative Water Management Strategy | Total Capital Costs | First Decade Estimated Annual Average Unit Cost (\$/acre-foot/year) | Water Supply Volume (acre-feet/year) | | | | | Year 2060 Estimated Annual Average Unit Cost (\$/acre-foot/year) | |
|--|---------------------|---|--------------------------------------|--------|--------|--------|--------|--|---------|
| | | | 2010 | 2020 | 2030 | 2040 | 2050 | 2060 | |
| Region L | | | | | | | | | |
| Calhoun County brackish groundwater project | \$24,887,000 | \$2,679 | 0 | 1,344 | 1,344 | 1,344 | 1,344 | 1,344 | \$1,063 |
| GBRA Lower Basin storage (500 acre site) | \$77,876,000 | \$109 | 0 | 0 | 59,569 | 59,569 | 59,569 | 59,569 | \$73 |
| GBRA Mid-Basin project (conjunctive use) | \$282,072,000 | \$1,779 | 0 | 25,000 | 25,000 | 25,000 | 25,000 | 25,000 | \$425 |
| LGWSP for upstream GBRA needs | \$1,003,219,000 | \$1,921 | 0 | 60,000 | 60,000 | 60,000 | 60,000 | 60,000 | \$476 |
| LGWSP for upstream GBRA needs at reduced capacity | \$750,352,000 | \$2,565 | 0 | 35,000 | 35,000 | 35,000 | 35,000 | 35,000 | \$726 |
| Local groundwater Carrizo-Wilcox Aquifer (includes overdrafts) | \$5,813,000 | \$517 | 1,210 | 1,210 | 1,210 | 1,210 | 1,210 | 1,210 | \$99 |
| Local groundwater supply (Barton Springs Edwards) | \$4,321,000 | \$203 | 0 | 0 | 0 | 1,358 | 1,358 | 1,358 | \$84 |
| Medina Lake firm-up (off-channel reservoir) | \$121,751,000 | \$1,197 | 9,078 | 9,078 | 9,078 | 9,078 | 9,078 | 9,078 | \$199 |
| Regional Carrizo for Guadalupe Basin (GBRA) | \$239,245,000 | \$1,280 | 0 | 25,000 | 25,000 | 25,000 | 25,000 | 25,000 | \$454 |
| Region N | | | | | | | | | |
| Brackish groundwater desalination | \$108,331,000 | \$977 | 0 | 0 | 0 | 18,000 | 18,000 | 18,000 | \$977 |
| Desalination | \$260,914,000 | \$1,696 | 0 | 0 | 0 | 28,000 | 28,000 | 28,000 | \$1,696 |
| Pipeline from Choke Canyon Reservoir to Lake Corpus Christi | \$48,324,000 | \$588 | 0 | 0 | 0 | 21,905 | 21,905 | 21,905 | \$588 |
| Stage II of Lake Texana/construction of Palmetto Bend | | | | | | | | | |
| Phase II on the Lavaca River | \$232,828,000 | \$1,213 | 0 | 0 | 0 | 0 | 0 | 12,963 | \$1,213 |

¹ Denotes strategies with supply volumes included in other strategies
na = Not available/not applicable

APPENDIX B. PROJECTED POPULATION OF TEXAS COUNTIES

| County | 2010 | 2020 | 2030 | 2040 | 2050 | 2060 |
|---------------|-----------|-----------|-----------|-----------|-----------|-----------|
| ANDERSON | 59,390 | 62,720 | 65,230 | 67,838 | 69,873 | 71,619 |
| ANDREWS | 14,131 | 15,078 | 15,737 | 16,358 | 16,645 | 16,968 |
| ANGELINA | 91,399 | 104,853 | 120,936 | 140,497 | 165,783 | 197,878 |
| ARANSAS | 26,863 | 30,604 | 32,560 | 32,201 | 30,422 | 28,791 |
| ARCHER | 9,689 | 10,542 | 11,237 | 11,449 | 11,054 | 10,649 |
| ARMSTRONG | 2,171 | 2,240 | 2,163 | 2,074 | 2,053 | 1,994 |
| ATASCOSA | 45,504 | 52,945 | 59,598 | 64,844 | 69,320 | 72,578 |
| AUSTIN | 27,173 | 30,574 | 32,946 | 34,355 | 35,031 | 35,958 |
| BAILEY | 7,060 | 7,558 | 7,875 | 8,207 | 8,238 | 8,086 |
| BANDERA | 26,373 | 37,265 | 48,577 | 54,829 | 56,642 | 60,346 |
| BASTROP | 84,449 | 120,740 | 151,364 | 199,548 | 239,588 | 288,683 |
| BAYLOR | 3,865 | 3,735 | 3,534 | 3,353 | 3,230 | 3,066 |
| BEE | 34,298 | 36,099 | 37,198 | 37,591 | 37,598 | 36,686 |
| BELL | 289,672 | 327,610 | 364,632 | 396,478 | 424,255 | 449,460 |
| BEXAR | 1,631,935 | 1,857,745 | 2,059,112 | 2,222,887 | 2,369,950 | 2,500,731 |
| BLANCO | 9,946 | 11,756 | 13,487 | 15,002 | 16,641 | 18,544 |
| BORDEN | 792 | 820 | 782 | 693 | 644 | 582 |
| BOSQUE | 19,831 | 22,646 | 24,622 | 25,364 | 25,667 | 26,032 |
| BOWIE | 96,953 | 103,397 | 108,397 | 113,397 | 113,397 | 113,397 |
| BRAZORIA | 305,649 | 354,708 | 401,684 | 444,981 | 490,875 | 538,795 |
| BRAZOS | 178,187 | 205,099 | 229,850 | 248,962 | 271,608 | 279,182 |
| BREWSTER | 9,468 | 9,944 | 10,155 | 10,297 | 10,684 | 10,770 |
| BRISCOE | 1,862 | 1,899 | 1,865 | 1,779 | 1,747 | 1,700 |
| BROOKS | 8,607 | 9,303 | 9,909 | 10,288 | 10,399 | 10,349 |
| BROWN | 39,324 | 40,602 | 40,959 | 40,959 | 40,959 | 40,959 |
| BURLESON | 18,477 | 20,663 | 22,249 | 23,465 | 24,358 | 25,146 |
| BURNET | 47,160 | 61,191 | 78,133 | 94,716 | 105,095 | 115,056 |
| CALDWELL | 45,958 | 59,722 | 71,459 | 83,250 | 95,103 | 106,575 |
| CALHOUN | 23,556 | 26,610 | 29,964 | 33,046 | 34,642 | 36,049 |
| CALLAHAN | 12,829 | 12,980 | 12,750 | 12,492 | 12,206 | 11,968 |
| CAMERON | 424,762 | 510,697 | 599,672 | 688,532 | 777,607 | 862,511 |
| CAMP | 12,586 | 13,735 | 14,798 | 15,639 | 16,291 | 17,006 |
| CARSON | 6,541 | 6,610 | 6,557 | 6,345 | 5,767 | 5,237 |
| CASS | 30,990 | 32,240 | 33,490 | 34,740 | 34,740 | 34,740 |
| CASTRO | 9,070 | 9,762 | 10,224 | 10,587 | 10,567 | 10,381 |
| CHAMBERS | 34,282 | 40,786 | 46,838 | 52,083 | 57,402 | 62,850 |
| CHEROKEE | 50,093 | 54,024 | 57,393 | 60,492 | 63,563 | 67,191 |
| CHILDRESS | 7,847 | 7,977 | 8,090 | 8,129 | 8,133 | 7,925 |
| CLAY | 11,376 | 11,699 | 11,628 | 11,147 | 10,462 | 9,778 |
| COCHRAN | 4,086 | 4,338 | 4,449 | 4,375 | 4,193 | 3,989 |
| COKE | 3,748 | 3,750 | 3,750 | 3,750 | 3,750 | 3,750 |
| COLEMAN | 9,141 | 9,149 | 9,149 | 9,149 | 9,149 | 9,149 |
| COLLIN | 790,648 | 1,046,601 | 1,265,373 | 1,526,407 | 1,761,082 | 1,938,067 |
| COLLINGSWORTH | 3,134 | 3,139 | 3,029 | 2,880 | 2,767 | 2,578 |
| COLORADO | 21,239 | 22,591 | 23,311 | 23,424 | 23,900 | 24,324 |
| COMAL | 108,219 | 146,868 | 190,873 | 233,964 | 278,626 | 326,655 |
| COMANCHE | 14,273 | 14,721 | 14,860 | 14,816 | 14,503 | 14,045 |
| CONCHO | 4,467 | 4,628 | 4,628 | 4,628 | 4,628 | 4,628 |
| COOKE | 40,674 | 46,141 | 51,749 | 56,973 | 65,099 | 71,328 |
| CORYELL | 87,707 | 102,414 | 116,741 | 126,878 | 135,749 | 142,886 |

APPENDIX B. PROJECTED POPULATION OF TEXAS COUNTIES - CONTINUED

| County | 2010 | 2020 | 2030 | 2040 | 2050 | 2060 |
|------------|-----------|-----------|-----------|-----------|-----------|-----------|
| COTTLE | 1,857 | 1,853 | 1,769 | 1,674 | 1,590 | 1,543 |
| CRANE | 4,469 | 4,990 | 5,272 | 5,487 | 5,718 | 5,961 |
| CROCKETT | 4,482 | 4,840 | 4,966 | 5,022 | 5,139 | 5,244 |
| CROSBY | 7,678 | 8,174 | 8,514 | 8,856 | 8,873 | 8,731 |
| CULBERSON | 3,351 | 3,596 | 3,703 | 3,738 | 3,738 | 3,738 |
| DALLAM | 6,851 | 7,387 | 7,724 | 7,808 | 7,645 | 7,291 |
| DALLAS | 2,512,352 | 2,756,079 | 2,950,635 | 3,128,628 | 3,365,780 | 3,695,125 |
| DAWSON | 15,523 | 16,010 | 16,421 | 16,665 | 16,268 | 15,652 |
| DEAF SMITH | 20,533 | 22,685 | 24,568 | 26,152 | 26,716 | 26,911 |
| DELTA | 5,728 | 6,244 | 6,744 | 7,244 | 7,244 | 7,244 |
| DENTON | 674,322 | 889,705 | 1,118,010 | 1,347,185 | 1,573,994 | 1,839,507 |
| DEWITT | 20,460 | 20,964 | 21,251 | 21,341 | 21,021 | 20,648 |
| DICKENS | 2,712 | 2,661 | 2,547 | 2,375 | 2,304 | 2,221 |
| DIMITT | 10,996 | 11,733 | 12,187 | 12,234 | 11,966 | 11,378 |
| DONLEY | 3,764 | 3,694 | 3,536 | 3,375 | 3,238 | 3,026 |
| DUVAL | 13,881 | 14,528 | 14,882 | 14,976 | 14,567 | 13,819 |
| EASTLAND | 18,336 | 18,382 | 18,061 | 17,566 | 16,989 | 16,226 |
| ECTOR | 132,759 | 144,073 | 154,160 | 163,141 | 170,307 | 177,026 |
| EDWARDS | 2,322 | 2,421 | 2,364 | 2,291 | 2,264 | 2,170 |
| EL PASO | 833,640 | 1,000,651 | 1,141,414 | 1,262,817 | 1,384,220 | 1,505,623 |
| ELLIS | 169,514 | 233,654 | 293,665 | 351,919 | 411,721 | 471,317 |
| ERATH | 36,666 | 40,609 | 44,160 | 47,734 | 57,200 | 63,155 |
| FALLS | 19,600 | 20,884 | 22,196 | 23,350 | 24,267 | 25,346 |
| FANNIN | 38,129 | 42,648 | 49,775 | 60,659 | 74,490 | 86,970 |
| FAYETTE | 24,826 | 28,808 | 32,363 | 35,259 | 38,933 | 44,120 |
| FISHER | 4,264 | 4,259 | 4,097 | 3,972 | 3,910 | 3,717 |
| FLOYD | 8,173 | 8,580 | 8,723 | 8,793 | 8,491 | 8,053 |
| FOARD | 1,614 | 1,630 | 1,584 | 1,507 | 1,457 | 1,384 |
| FORT BEND | 550,121 | 719,737 | 893,875 | 1,090,710 | 1,348,851 | 1,643,825 |
| FRANKLIN | 11,533 | 13,363 | 14,613 | 15,863 | 15,863 | 15,863 |
| FREESTONE | 19,701 | 21,826 | 23,704 | 25,504 | 27,148 | 28,593 |
| FRIO | 18,160 | 20,034 | 21,628 | 22,962 | 23,913 | 24,412 |
| GAINES | 16,130 | 17,663 | 18,774 | 19,560 | 19,434 | 19,169 |
| GALVESTON | 268,714 | 284,731 | 294,218 | 298,057 | 300,915 | 302,774 |
| GARZA | 5,072 | 5,265 | 5,158 | 4,961 | 4,733 | 4,416 |
| GILLESPIE | 25,258 | 29,117 | 30,861 | 30,861 | 30,861 | 30,861 |
| GLASSCOCK | 1,582 | 1,783 | 1,891 | 1,921 | 1,915 | 1,954 |
| GOLIAD | 8,087 | 9,508 | 10,648 | 11,395 | 11,964 | 12,324 |
| GONZALES | 19,872 | 21,227 | 22,260 | 23,003 | 23,219 | 23,151 |
| GRAY | 22,163 | 21,988 | 21,371 | 20,542 | 19,286 | 18,064 |
| GRAYSON | 126,099 | 152,028 | 179,725 | 203,822 | 227,563 | 253,568 |
| GREGG | 118,770 | 126,421 | 134,330 | 143,481 | 155,871 | 173,587 |
| GRIMES | 26,635 | 30,073 | 32,785 | 34,670 | 36,176 | 37,657 |
| GUADALUPE | 114,878 | 146,511 | 180,725 | 214,912 | 252,857 | 293,736 |
| HALE | 39,456 | 42,103 | 44,034 | 45,204 | 44,940 | 44,069 |
| HALL | 3,750 | 3,832 | 3,884 | 3,841 | 3,859 | 3,783 |
| HAMILTON | 7,790 | 7,681 | 7,596 | 7,624 | 7,512 | 7,504 |
| HANSFORD | 5,699 | 6,148 | 6,532 | 6,948 | 7,191 | 7,406 |
| HARDEMAN | 4,665 | 4,626 | 4,496 | 4,329 | 4,144 | 3,792 |
| HARDIN | 54,504 | 59,115 | 61,211 | 63,381 | 65,627 | 67,954 |
| HARRIS | 4,078,231 | 4,629,335 | 5,180,439 | 5,731,543 | 6,282,647 | 6,833,751 |

APPENDIX B. PROJECTED POPULATION OF TEXAS COUNTIES - CONTINUED

| County | 2010 | 2020 | 2030 | 2040 | 2050 | 2060 |
|------------|---------|---------|-----------|-----------|-----------|-----------|
| HARRISON | 67,547 | 72,930 | 76,824 | 79,759 | 83,191 | 88,241 |
| HARTLEY | 5,697 | 5,889 | 5,989 | 6,026 | 5,950 | 5,646 |
| HASKELL | 5,860 | 5,741 | 5,580 | 5,496 | 5,345 | 5,089 |
| HAYS | 166,342 | 242,051 | 302,795 | 363,678 | 436,388 | 493,320 |
| HEMPHILL | 3,496 | 3,511 | 3,394 | 3,269 | 3,181 | 3,024 |
| HENDERSON | 80,019 | 91,456 | 104,323 | 116,918 | 131,949 | 150,317 |
| HIDALGO | 775,857 | 987,920 | 1,225,227 | 1,481,812 | 1,761,810 | 2,048,911 |
| HILL | 33,416 | 34,947 | 36,679 | 38,407 | 40,252 | 42,300 |
| HOCKLEY | 24,432 | 25,495 | 26,114 | 26,141 | 25,129 | 23,896 |
| HOOD | 49,207 | 58,364 | 66,888 | 75,814 | 87,058 | 100,045 |
| HOPKINS | 35,934 | 39,882 | 42,951 | 45,528 | 45,528 | 45,528 |
| HOUSTON | 23,947 | 24,555 | 25,539 | 26,559 | 27,622 | 28,727 |
| HOWARD | 34,574 | 35,438 | 35,719 | 35,719 | 35,719 | 35,719 |
| HUDSPETH | 3,815 | 4,146 | 4,314 | 4,314 | 4,314 | 4,314 |
| HUNT | 82,948 | 94,401 | 110,672 | 137,371 | 196,757 | 289,645 |
| HUTCHINSON | 24,320 | 24,655 | 24,311 | 23,513 | 22,209 | 21,087 |
| IRION | 1,888 | 1,938 | 1,892 | 1,774 | 1,680 | 1,606 |
| JACK | 9,567 | 10,275 | 10,915 | 11,415 | 11,915 | 12,415 |
| JACKSON | 15,441 | 16,515 | 17,183 | 17,567 | 17,713 | 17,716 |
| JASPER | 38,445 | 40,897 | 42,344 | 42,712 | 42,712 | 42,712 |
| JEFF DAVIS | 2,935 | 3,249 | 3,449 | 3,649 | 3,849 | 4,049 |
| JEFFERSON | 259,700 | 270,686 | 280,590 | 288,225 | 295,924 | 310,478 |
| JIM HOGG | 5,593 | 5,985 | 6,286 | 6,538 | 6,468 | 6,225 |
| JIM WELLS | 42,434 | 45,303 | 47,149 | 47,955 | 47,615 | 46,596 |
| JOHNSON | 159,451 | 200,381 | 238,590 | 268,082 | 304,454 | 346,999 |
| JONES | 21,211 | 21,729 | 21,695 | 21,366 | 20,738 | 19,933 |
| KARNES | 17,001 | 18,830 | 20,759 | 22,305 | 23,256 | 23,774 |
| KAUFMAN | 103,249 | 162,664 | 208,009 | 254,609 | 297,391 | 349,385 |
| KENDALL | 35,720 | 50,283 | 65,752 | 78,690 | 89,312 | 99,698 |
| KENEDY | 467 | 495 | 523 | 527 | 529 | 537 |
| KENT | 840 | 821 | 733 | 602 | 535 | 472 |
| KERR | 49,250 | 54,886 | 57,565 | 58,662 | 61,204 | 62,252 |
| KIMBLE | 4,660 | 4,702 | 4,702 | 4,702 | 4,702 | 4,702 |
| KING | 385 | 424 | 424 | 389 | 369 | 332 |
| KINNEY | 3,403 | 3,462 | 3,529 | 3,601 | 3,653 | 3,662 |
| KLEBERG | 36,959 | 40,849 | 43,370 | 44,989 | 47,118 | 47,212 |
| KNOX | 4,197 | 4,305 | 4,310 | 4,321 | 4,316 | 4,272 |
| LA SALLE | 6,599 | 7,278 | 7,930 | 8,578 | 9,048 | 9,407 |
| LAMAR | 52,525 | 56,536 | 60,286 | 64,036 | 64,036 | 64,036 |
| LAMB | 15,515 | 16,500 | 17,355 | 17,995 | 17,900 | 17,668 |
| LAMPASAS | 20,114 | 22,596 | 24,396 | 25,731 | 26,606 | 27,160 |
| LAVACA | 18,750 | 18,731 | 18,219 | 17,314 | 16,264 | 15,061 |
| LEE | 17,789 | 20,362 | 22,483 | 24,194 | 25,685 | 26,946 |
| LEON | 18,231 | 21,137 | 22,863 | 22,971 | 22,809 | 23,028 |
| LIBERTY | 81,930 | 94,898 | 107,335 | 119,519 | 132,875 | 147,845 |
| LIMESTONE | 23,322 | 24,944 | 25,828 | 26,505 | 27,177 | 28,050 |
| LIPSCOMB | 3,084 | 3,149 | 3,054 | 2,966 | 2,925 | 2,784 |
| LIVE OAK | 13,735 | 14,929 | 15,386 | 15,018 | 13,808 | 12,424 |
| LLANO | 21,284 | 23,007 | 23,471 | 23,932 | 24,393 | 24,855 |
| LOVING | 67 | 67 | 67 | 67 | 67 | 67 |
| LUBBOCK | 265,547 | 280,449 | 289,694 | 294,476 | 299,218 | 303,857 |

APPENDIX B. PROJECTED POPULATION OF TEXAS COUNTIES - CONTINUED

| County | 2010 | 2020 | 2030 | 2040 | 2050 | 2060 |
|---------------|---------|---------|---------|---------|-----------|-----------|
| LYNN | 6,969 | 7,280 | 7,243 | 7,216 | 6,891 | 6,413 |
| MADISON | 13,905 | 14,873 | 15,644 | 16,364 | 17,002 | 17,560 |
| MARION | 11,295 | 11,420 | 11,420 | 11,420 | 11,420 | 11,420 |
| MARTIN | 5,203 | 5,696 | 5,935 | 6,082 | 5,934 | 5,633 |
| MASON | 3,817 | 3,856 | 3,876 | 3,886 | 3,891 | 3,896 |
| MATAGORDA | 40,506 | 43,295 | 44,991 | 45,925 | 45,925 | 45,925 |
| MAVERICK | 58,252 | 67,929 | 77,165 | 85,292 | 92,831 | 99,091 |
| MCCULLOCH | 8,235 | 8,377 | 8,377 | 8,377 | 8,377 | 8,377 |
| MCLENNAN | 231,882 | 250,398 | 266,002 | 282,177 | 292,449 | 307,378 |
| MCMULLEN | 920 | 957 | 918 | 866 | 837 | 793 |
| MEDINA | 46,675 | 54,815 | 62,416 | 68,987 | 75,370 | 81,104 |
| MENARD | 2,493 | 2,528 | 2,528 | 2,528 | 2,528 | 2,528 |
| MIDLAND | 124,710 | 134,022 | 140,659 | 145,595 | 148,720 | 151,664 |
| MILAM | 26,053 | 28,086 | 29,396 | 30,201 | 30,405 | 30,496 |
| MILLS | 5,466 | 5,815 | 6,107 | 5,930 | 6,329 | 6,497 |
| MITCHELL | 9,736 | 9,714 | 9,545 | 9,332 | 9,069 | 8,521 |
| MONTAGUE | 19,863 | 20,596 | 20,892 | 21,009 | 21,040 | 21,119 |
| MONTGOMERY | 453,369 | 588,351 | 751,702 | 931,732 | 1,169,199 | 1,444,999 |
| MOORE | 23,049 | 26,241 | 29,057 | 31,293 | 32,655 | 33,474 |
| MORRIS | 13,039 | 13,039 | 13,039 | 13,039 | 13,039 | 13,039 |
| MOTLEY | 1,409 | 1,359 | 1,262 | 1,143 | 1,060 | 1,008 |
| NACOGDOCHES | 67,357 | 75,914 | 84,183 | 92,628 | 108,753 | 124,453 |
| NAVARRO | 52,752 | 58,919 | 65,331 | 72,374 | 80,168 | 89,638 |
| NEWTON | 16,008 | 16,731 | 16,825 | 17,329 | 17,849 | 18,385 |
| NOLAN | 16,550 | 17,177 | 17,464 | 17,412 | 16,747 | 15,954 |
| NUECES | 358,278 | 405,492 | 447,014 | 483,692 | 516,265 | 542,327 |
| OCHILTREE | 9,685 | 10,440 | 11,001 | 11,380 | 11,566 | 11,803 |
| OLDHAM | 2,322 | 2,373 | 2,204 | 1,942 | 1,689 | 1,364 |
| ORANGE | 90,503 | 94,274 | 95,818 | 96,473 | 97,843 | 98,836 |
| PALO PINTO | 28,895 | 31,147 | 33,048 | 34,897 | 37,074 | 39,589 |
| PANOLA | 23,903 | 24,402 | 24,800 | 25,141 | 25,419 | 25,600 |
| PARKER | 121,653 | 193,559 | 262,053 | 301,760 | 324,546 | 342,887 |
| PARMER | 10,641 | 11,302 | 11,585 | 11,666 | 11,301 | 10,674 |
| PECOS | 17,850 | 18,780 | 19,300 | 19,580 | 19,630 | 19,246 |
| POLK | 48,072 | 54,897 | 60,401 | 64,478 | 68,247 | 71,928 |
| POTTER | 127,580 | 142,703 | 156,846 | 172,950 | 190,526 | 204,933 |
| PRESIDIO | 8,825 | 10,184 | 11,508 | 12,421 | 12,872 | 13,130 |
| RAINS | 11,173 | 13,221 | 14,687 | 15,400 | 15,755 | 15,991 |
| RANDALL | 117,420 | 131,546 | 144,757 | 159,800 | 176,218 | 189,811 |
| REAGAN | 3,791 | 4,182 | 4,381 | 4,367 | 4,213 | 4,010 |
| REAL | 3,063 | 3,111 | 3,042 | 2,993 | 3,070 | 3,132 |
| RED RIVER | 14,251 | 14,251 | 14,251 | 14,251 | 14,251 | 14,251 |
| REEVES | 14,281 | 15,451 | 16,417 | 17,219 | 17,949 | 18,527 |
| REFUGIO | 8,217 | 8,505 | 8,609 | 8,799 | 8,915 | 8,877 |
| ROBERTS | 930 | 955 | 857 | 719 | 622 | 561 |
| ROBERTSON | 17,164 | 18,704 | 19,674 | 20,335 | 20,419 | 20,353 |
| ROCKWALL | 89,144 | 141,386 | 171,373 | 199,044 | 215,312 | 232,186 |
| RUNNELS | 11,610 | 12,025 | 12,339 | 12,686 | 12,956 | 13,298 |
| RUSK | 49,874 | 52,241 | 53,585 | 54,255 | 56,120 | 60,705 |
| SABINE | 11,280 | 11,743 | 12,095 | 12,457 | 12,832 | 13,216 |
| SAN AUGUSTINE | 9,715 | 9,911 | 10,164 | 10,470 | 10,785 | 10,999 |

APPENDIX B. PROJECTED POPULATION OF TEXAS COUNTIES - CONTINUED

| County | 2010 | 2020 | 2030 | 2040 | 2050 | 2060 |
|--------------|------------|------------|------------|------------|------------|------------|
| SAN JACINTO | 27,443 | 32,541 | 36,617 | 39,159 | 40,630 | 41,299 |
| SAN PATRICIO | 80,701 | 95,381 | 109,518 | 122,547 | 134,806 | 146,131 |
| SAN SABA | 6,387 | 6,746 | 7,059 | 7,332 | 7,365 | 7,409 |
| SCHLEICHER | 3,159 | 3,387 | 3,491 | 3,533 | 3,594 | 3,658 |
| SCURRY | 16,998 | 17,602 | 17,923 | 18,092 | 18,203 | 18,203 |
| SHACKELFORD | 3,456 | 3,638 | 3,603 | 3,406 | 2,997 | 2,516 |
| SHELBY | 26,531 | 28,248 | 29,597 | 30,602 | 31,467 | 32,414 |
| SHERMAN | 3,469 | 3,770 | 3,886 | 4,005 | 4,110 | 4,164 |
| SMITH | 194,223 | 208,737 | 223,251 | 237,766 | 262,454 | 295,252 |
| SOMERVELL | 7,542 | 8,393 | 9,094 | 9,554 | 9,740 | 9,804 |
| STARR | 69,379 | 83,583 | 98,262 | 113,102 | 127,802 | 141,961 |
| STEPHENS | 9,873 | 10,030 | 10,102 | 10,005 | 9,624 | 9,321 |
| STERLING | 1,529 | 1,680 | 1,744 | 1,766 | 1,717 | 1,739 |
| STONEWALL | 1,687 | 1,634 | 1,555 | 1,455 | 1,365 | 1,279 |
| SUTTON | 4,479 | 4,737 | 4,780 | 4,762 | 4,773 | 4,725 |
| SWISHER | 8,772 | 9,103 | 9,329 | 9,423 | 9,250 | 8,849 |
| TARRANT | 1,800,069 | 2,061,887 | 2,337,390 | 2,646,559 | 2,964,622 | 3,353,509 |
| TAYLOR | 136,370 | 142,645 | 145,634 | 146,529 | 143,772 | 139,309 |
| TERRELL | 1,156 | 1,200 | 1,200 | 1,200 | 1,200 | 1,200 |
| TERRY | 13,804 | 14,778 | 15,704 | 16,608 | 16,700 | 16,607 |
| THROCKMORTON | 1,851 | 1,793 | 1,713 | 1,584 | 1,483 | 1,407 |
| TITUS | 31,158 | 34,430 | 37,593 | 40,462 | 43,064 | 45,497 |
| TOM GREEN | 112,138 | 118,851 | 123,109 | 125,466 | 127,333 | 127,752 |
| TRAVIS | 1,003,253 | 1,201,256 | 1,402,153 | 1,583,068 | 1,770,347 | 1,918,135 |
| TRINITY | 15,361 | 16,572 | 16,972 | 16,951 | 16,581 | 16,243 |
| TYLER | 24,744 | 28,513 | 30,937 | 31,866 | 31,866 | 31,866 |
| UPSHUR | 38,372 | 41,496 | 43,619 | 44,953 | 46,003 | 47,385 |
| UPTON | 3,757 | 4,068 | 4,185 | 4,278 | 4,400 | 4,518 |
| UVALDE | 28,616 | 31,443 | 33,802 | 35,650 | 36,876 | 37,810 |
| VAL VERDE | 51,312 | 57,500 | 63,265 | 68,175 | 71,761 | 74,348 |
| VAN ZANDT | 55,423 | 63,079 | 69,539 | 74,392 | 80,547 | 87,414 |
| VICTORIA | 93,073 | 102,487 | 110,221 | 116,368 | 121,416 | 125,865 |
| WALKER | 70,672 | 77,915 | 81,402 | 80,547 | 80,737 | 80,737 |
| WALLER | 41,137 | 51,175 | 62,352 | 74,789 | 89,598 | 106,608 |
| WARD | 11,416 | 11,710 | 11,846 | 11,846 | 11,846 | 11,846 |
| WASHINGTON | 32,559 | 35,253 | 36,973 | 37,908 | 38,747 | 39,426 |
| WEBB | 257,647 | 333,451 | 418,332 | 511,710 | 613,774 | 721,586 |
| WHARTON | 43,560 | 46,045 | 47,648 | 48,567 | 48,590 | 48,074 |
| WHEELER | 5,132 | 5,133 | 5,112 | 5,149 | 5,139 | 5,080 |
| WICHITA | 138,058 | 143,805 | 147,606 | 149,595 | 150,981 | 152,102 |
| WILBARGER | 15,279 | 15,928 | 15,993 | 15,672 | 14,908 | 14,027 |
| WILLACY | 22,763 | 25,212 | 27,455 | 29,276 | 30,542 | 31,205 |
| WILLIAMSON | 408,743 | 553,412 | 701,334 | 880,370 | 1,056,891 | 1,240,276 |
| WILSON | 44,078 | 58,621 | 74,641 | 90,187 | 106,373 | 123,135 |
| WINKLER | 7,603 | 7,956 | 8,023 | 8,041 | 7,890 | 7,638 |
| WISE | 66,366 | 89,347 | 108,711 | 127,068 | 148,020 | 170,071 |
| WOOD | 42,727 | 48,200 | 51,236 | 51,565 | 51,565 | 51,565 |
| YOAKUM | 8,183 | 8,966 | 9,470 | 10,006 | 9,738 | 9,408 |
| YOUNG | 18,116 | 18,513 | 18,541 | 18,328 | 18,059 | 17,889 |
| ZAPATA | 14,025 | 16,217 | 18,415 | 20,486 | 22,354 | 23,733 |
| ZAVALA | 12,796 | 14,130 | 15,227 | 16,086 | 16,774 | 17,133 |
| Grand Total | 25,388,403 | 29,650,388 | 33,712,020 | 37,734,422 | 41,924,167 | 46,323,725 |

APPENDIX C. MAJOR RESERVOIRS OF TEXAS

| Reservoir Name | River Basin | Year of Completion | Year 2010 Firm Yield (acre-feet) from 2011 Regional Water Plans | Original Conservation Pool Capacity (acre-feet) |
|--|---------------------|--------------------|---|---|
| Abilene, Lake | Brazos | 1921 | 1,141 | 7,900 |
| Alan Henry Reservoir | Brazos | 1994 | 22,500 | 115,937 |
| Alcoa Lake | Brazos | 1952 | 14,000 | 15,650 |
| Amistad Reservoir, International | Rio Grande | 1969 | 1,011,976 | 3,505,400 |
| Amon G. Carter, Lake | Trinity | 1956 | 2,107 | 20,050 |
| Anahuac, Lake | Trinity | 1954 | 17,700 | 29,500 |
| Anzalduas Channel Dam | Rio Grande | 1960 | 0 | 13,910 |
| Aquilla Lake | Brazos | 1983 | 13,746 | 52,400 |
| Arlington, Lake | Trinity | 1957 | 9,850 | 45,710 |
| Arrowhead, Lake | Red | 1966 | 26,000 | 262,100 |
| Athens, Lake | Neches | 1963 | 6,064 | 32,790 |
| Austin, Lake | Colorado | 1939 | System Operation | 21,000 |
| B. A. Steinhagen Lake | Neches | 1951 | System Operation | 100,595 |
| Ballinger, Lake / Moonen, Lake | Colorado | 1984 | 30 | 6,850 |
| Balmorhea, Lake | Rio Grande | 1917 | 21,844 | 7,707 |
| Bardwell Lake | Trinity | 1965 | 9,600 | 54,877 |
| Bastrop, Lake | Colorado | 1964 | System Operation | 16,590 |
| Baylor Lake | Red | 1950 | 0 | 9,220 |
| Belton Lake | Brazos | 1954 | 112,257 | 456,884 |
| Benbrook Lake | Trinity | 1950 | 6,833 | 88,250 |
| Bob Sandlin, Lake | Cypress | 1978 | 60,430 | 213,350 |
| Bonham, Lake | Red | 1969 | 5,340 | 11,976 |
| Brady Creek Reservoir | Colorado | 1963 | 0 | 30,430 |
| Brandy Branch Cooling Pond | Sabine | 1983 | 0 | 29,513 |
| Brazoria Reservoir | Brazos | 1954 | Pass-through | 21,970 |
| Bridgeport, Lake | Trinity | 1931 | System Operation | 386,420 |
| Brownwood, Lake | Colorado | 1933 | 47,200 | 149,925 |
| Bryan Utilities Lake | Brazos | 1974 | 85 | 15,227 |
| Buchanan, Lake | Colorado | 1938 | 402,172 | 992,000 |
| Caddo Lake | Cypress | 1968 | 10,000 | 129,000 |
| Calaveras Lake | San Antonio | 1969 | 36,900 | 63,200 |
| Canyon Lake | Guadalupe | 1964 | 87,629 | 386,200 |
| Casa Blanca Lake | Rio Grande | 1951 | 0 | 20,000 |
| Cedar Bayou Generating Pond | Trinity-San Jacinto | 1972 | Cooling | 19,250 |
| Cedar Creek Reservoir Colorado | Colorado | 1977 | System Operation | 74,080 |
| Cedar Creek Reservoir Trinity | Trinity | 1966 | 175,000 | 679,200 |
| Champion Creek Reservoir | Colorado | 1959 | 10 | 42,500 |
| Cherokee, Lake | Sabine | 1948 | 28,885 | 49,295 |
| Choke Canyon Reservoir | Nueces | 1982 | 165,000 | 691,130 |
| Cisco, Lake | Brazos | 1923 | 1,138 | 26,000 |
| Clyde, Lake | Colorado | 1970 | 500 | 5,748 |
| Coleman, Lake | Colorado | 1966 | 5 | 40,000 |
| Coletto Creek Reservoir | Guadalupe | 1980 | 12,500 | 31,040 |
| Colorado City, Lake | Colorado | 1949 | 0 | 31,805 |
| Conroe, Lake | San Jacinto | 1973 | 79,800 | 430,260 |
| Corpus Christi Reservoir, Lake | Nueces | 1958 | System Operation | 308,700 |
| Cox Lake / Raw Water Lake / Recycle Lake | Colorado-Lavaca | 1956 | 0 | 5,034 |
| Crook, Lake | Red | 1923 | 7,290 | 11,487 |

APPENDIX C. MAJOR RESERVOIRS OF TEXAS - CONTINUED

| Reservoir Name | River Basin | Year of Completion | Year 2010 Firm Yield (acre-feet) from 2011 Regional Water Plans | Original Conservation Pool Capacity (acre-feet) |
|--------------------------------------|--------------------|--------------------|---|---|
| Cypress Springs, Lake | Cypress | 1971 | 10,737 | 72,800 |
| Daniel, Lake | Brazos | 1948 | 230 | 9,515 |
| Davis, Lake | Brazos | 1959 | 220 | 5,454 |
| Delta Lake | Nueces-Rio Grande | 1939 | 0 | 25,000 |
| Diversion, Lake | Red | 1924 | System Operation | 40,000 |
| Dunlap, Lake | Guadalupe | 1928 | Hydropower | 5,900 |
| E. V. Spence Reservoir | Colorado | 1969 | 6,170 | 488,760 |
| Eagle Lake | Colorado | 1900 | System Operation | 9,600 |
| Eagle Mountain Lake | Trinity | 1932 | 109,833 | 189,523 |
| Eagle Nest Lake / Manor Lake | Brazos | 1949 | 1,800 | 18,000 |
| Electra, Lake | Red | 1950 | 462 | 8,730 |
| Ellison Creek Reservoir | Cypress | 1943 | 13,857 | 24,700 |
| Fairfield Lake | Trinity | 1969 | 870 | 50,600 |
| Falcon Reservoir, International | Rio Grande | 1954 | System Operation | 2,830,000 |
| Farmers Creek Reservoir | Red | 1960 | 1,260 | 26,000 |
| Forest Grove Reservoir | Trinity | 1980 | 8,767 | 20,038 |
| Fork Reservoir, Lake | Sabine | 1980 | 173,035 | 675,819 |
| Georgetown, Lake | Brazos | 1982 | 11,803 | 37,080 |
| Gibbons Creek Reservoir | Brazos | 1981 | 9,740 | 28,363 |
| Gilmer, Lake | Cypress | 1999 | 6,180 | 12,720 |
| Gladewater, Lake | Sabine | 1952 | 2,125 | 6,950 |
| Gonzales (H-4), Lake | Guadalupe | 1931 | Hydropower | 6,500 |
| Graham, Lake | Brazos | 1958 | 5,335 | 53,680 |
| Granbury, Lake | Brazos | 1969 | 64,712 | 155,000 |
| Granger Lake | Brazos | 1979 | 18,007 | 56,961 |
| Grapevine Lake | Trinity | 1952 | 19,067 | 188,553 |
| Greenbelt Lake | Red | 1968 | 8,297 | 60,400 |
| Gulf Coast Water Authority Reservoir | San Jacinto-Brazos | 1948 | 0 | 7,308 |
| Halbert, Lake | Trinity | 1921 | 0 | 7,420 |
| Hords Creek Lake | Colorado | 1948 | 0 | 8,640 |
| Houston County Lake | Trinity | 1966 | 3,500 | 19,500 |
| Houston, Lake | San Jacinto | 1954 | 187,000 | 146,769 |
| Hubbard Creek Reservoir | Brazos | 1962 | 27,708 | 317,750 |
| Hubert H. Moss Lake | Red | 1966 | 7,410 | 23,210 |
| Imperial Reservoir | Rio Grande | 1915 | 0 | 6,000 |
| Inks Lake | Colorado | 1938 | System Operation | 17,545 |
| J. B. Thomas, Lake | Colorado | 1952 | 20 | 203,600 |
| Jacksonville, Lake | Neches | 1957 | 6,200 | 30,500 |
| Jim Chapman Lake | Sulphur | 1991 | 127,983 | 310,312 |
| Joe Pool Lake | Trinity | 1991 | 15,192 | 176,900 |
| Johnson Creek Reservoir | Cypress | 1961 | 0 | 10,100 |
| Kemp, Lake | Red | 1923 | 100,983 | 319,600 |
| Kickapoo, Lake | Red | 1945 | 19,800 | 106,000 |
| Kirby, Lake | Brazos | 1928 | 533 | 7,620 |
| Kurth, Lake | Neches | 1961 | 18,421 | 16,200 |
| Lavon Lake | Trinity | 1953 | 112,033 | 456,526 |
| Lake Creek Lake | Brazos | 1952 | 10,000 | 8,400 |
| Lake Fort Phantom Hill | Brazos | 1938 | 11,816 | 74,310 |

APPENDIX C. MAJOR RESERVOIRS OF TEXAS - CONTINUED

| Reservoir Name | River Basin | Year of Completion | Year 2010 Firm Yield (acre-feet) from 2011 Regional Water Plans | Original Conservation Pool Capacity (acre-feet) |
|-------------------------------------|--------------------|--------------------|---|---|
| Leon, Lake | Brazos | 1954 | 5,938 | 27,290 |
| Lewis Creek Reservoir | San Jacinto | 1969 | 0 | 16,400 |
| Lewisville Lake | Trinity | 1955 | 7,918 | 640,986 |
| Limestone, Lake | Brazos | 1978 | 65,074 | 225,400 |
| Livingston, Lake | Trinity | 1969 | 1,344,000 | 1,750,000 |
| Loma Alta Lake | Nueces-Rio Grande | 1963 | Storage | 26,500 |
| Lost Creek Reservoir | Trinity | 1991 | 1,597 | 11,961 |
| Lyndon B. Johnson, Lake | Colorado | 1951 | System Operation | 138,500 |
| Mackenzie Reservoir | Red | 1974 | 0 | 46,545 |
| Marble Falls, Lake | Colorado | 1951 | System Operation | 8,760 |
| Martin Lake | Sabine | 1974 | 25,000 | 77,619 |
| McQueeney, Lake | Guadalupe | 1928 | Hydropower | 5,000 |
| Medina Lake | San Antonio | 1913 | 0 | 254,000 |
| Meredith, Lake | Canadian | 1965 | 69,750 | 864,400 |
| Mexia, Lake | Brazos | 1961 | 1,320 | 10,000 |
| Millers Creek Reservoir | Brazos | 1974 | 50 | 33,000 |
| Mineral Wells, Lake | Brazos | 1920 | 2,508 | 6,760 |
| Mitchell County Reservoir | Colorado | 1991 | System Operation | 27,266 |
| Monticello Reservoir | Cypress | 1973 | 2,439 | 40,100 |
| Mountain Creek Lake | Trinity | 1936 | 6,400 | 22,840 |
| Mud Lake No. 4 | Colorado-Lavaca | 1974 | 0 | 11,048 |
| Murvaul, Lake | Sabine | 1958 | 21,792 | 45,815 |
| Mustang Lake East/Mustang Lake West | San Jacinto-Brazos | 1969 | 0 | 6,451 |
| Nacogdoches, Lake | Neches | 1977 | 17,067 | 41,140 |
| Nasworthy, Lake | Colorado | 1930 | 0 | 12,390 |
| Navarro Mills Lake | Trinity | 1963 | 19,342 | 63,000 |
| New Terrell City Lake | Trinity | 1955 | 2,283 | 8,712 |
| North Fork Buffalo Creek Reservoir | Red | 1964 | 840 | 15,400 |
| North Lake | Trinity | 1957 | 0 | 17,000 |
| O. C. Fisher Lake | Colorado | 1951 | 0 | 119,200 |
| O. H. Ivie Reservoir | Colorado | 1989 | 85,150 | 554,340 |
| O' the Pines, Lake | Cypress | 1958 | 174,960 | 274,443 |
| Oak Creek Reservoir | Colorado | 1952 | 5 | 39,360 |
| Olney, Lake / Cooper, Lake | Red | 1935 | 960 | 6,650 |
| Palestine, Lake | Neches | 1971 | 207,458 | 411,840 |
| Palo Duro Reservoir | Canadian | 1991 | 3,958 | 61,239 |
| Palo Pinto, Lake | Brazos | 1964 | 9,658 | 44,100 |
| Pat Cleburne, Lake | Brazos | 1964 | 5,075 | 25,560 |
| Pat Mayse Lake | Red | 1967 | 59,670 | 124,500 |
| Pauline, Lake | Red | 1905 | 1,200 | 7,000 |
| Peacock Site 1A Tailings Reservoir | Cypress | 1983 | System Operation | 11,248 |
| Pinkston Reservoir | Neches | 1977 | 3,800 | 7,380 |
| Possum Kingdom Lake | Brazos | 1941 | 230,750 | 724,739 |
| Proctor Lake | Brazos | 1963 | 19,467 | 59,400 |
| Randell Lake | Red | 1909 | 1,400 | 5,400 |
| Ray Hubbard, Lake | Trinity | 1969 | 57,427 | 490,000 |
| Ray Roberts, Lake | Trinity | 1987 | 211,364 | 796,875 |
| Red Bluff Reservoir | Rio Grande | 1936 | 41,725 | 310,000 |

APPENDIX C. MAJOR RESERVOIRS OF TEXAS - CONTINUED

| Reservoir Name | River Basin | Year of Completion | Year 2010 Firm Yield (acre-feet) from 2011 Regional Water Plans | Original Conservation Pool Capacity (acre-feet) |
|--|-------------------|--------------------|---|---|
| Red Draw Reservoir | Colorado | 1985 | System Operation | 8,538 |
| Richland-Chambers Reservoir | Trinity | 1987 | 223,872 | 1,181,866 |
| River Crest Lake | Sulphur | 1953 | 8,624 | 7,000 |
| Sam Rayburn Reservoir | Neches | 1965 | 820,000 | 2,898,500 |
| Santa Rosa Lake | Red | 1929 | 3,075 | 11,570 |
| Sheldon Reservoir | San Jacinto | 1943 | 0 | 5,420 |
| Smithers Lake | Brazos | 1957 | 34,300 | 18,700 |
| Somerville Lake | Brazos | 1967 | 42,120 | 160,100 |
| South Texas Project Reservoir | Colorado | 1981 | 0 | 202,600 |
| Squaw Creek Reservoir | Brazos | 1977 | 9,238 | 151,008 |
| Stamford, Lake | Brazos | 1953 | 5,667 | 57,632 |
| Stillhouse Hollow Lake | Brazos | 1968 | 66,205 | 235,700 |
| Striker, Lake | Neches | 1957 | 20,183 | 29,000 |
| Sulphur Springs Draw Storage Reservoir | Colorado | 1993 | 0 | 7,997 |
| Sulphur Springs, Lake | Sulphur | 1973 | 9,800 | 14,160 |
| Sweetwater, Lake | Brazos | 1930 | 1,051 | 11,900 |
| Tawakoni, Lake | Sabine | 1960 | 229,807 | 936,200 |
| Texana, Lake | Lavaca | 1981 | 74,500 | 165,918 |
| Texoma, Lake | Red | 1944 | 314,850 | 3,132,000 |
| Toledo Bend Reservoir | Sabine | 1969 | 750,000 | 4,477,000 |
| Tradinghouse Creek Reservoir | Brazos | 1968 | 4,958 | 37,800 |
| Travis, Lake | Colorado | 1942 | System Operation | 1,170,752 |
| Trinidad Lake | Trinity | 1925 | 3,050 | 7,450 |
| Twin Buttes Reservoir | Colorado | 1963 | 0 | 186,200 |
| Twin Oak Reservoir | Brazos | 1982 | 2,892 | 30,319 |
| Tyler, Lake | Neches | 1967 | 30,925 | 80,900 |
| Upper Nueces Lake | Nueces | 1948 | 0 | 7,590 |
| Valley Acres Reservoir | Nueces-Rio Grande | 1947 | 0 | 7,840 |
| Valley Lake | Red | 1961 | 0 | 16,400 |
| Victor Braunig Lake | San Antonio | 1962 | 12,000 | 26,500 |
| Waco, Lake | Brazos | 1965 | 79,098 | 152,500 |
| Wallisville Lake | Trinity | 1999 | System Operation | 58,000 |
| Walter E Long, Lake | Colorado | 1967 | 0 | 33,940 |
| Waxahachie, Lake | Trinity | 1956 | 2,905 | 13,500 |
| Weatherford, Lake | Trinity | 1957 | 2,967 | 21,233 |
| Welsh Reservoir | Cypress | 1975 | 4,476 | 23,587 |
| White River Lake | Brazos | 1963 | 2,431 | 38,650 |
| White Rock Lake | Trinity | 1911 | 3,500 | 10,740 |
| Whitney, Lake | Brazos | 1951 | 18,336 | 627,100 |
| Wichita, Lake | Red | 1901 | System Operation | 14,000 |
| William Harris Reservoir | Brazos | 1947 | 0 | 10,200 |
| Winters, Lake / New Winters, Lake | Colorado | 1983 | 0 | 8,374 |
| Worth, Lake | Trinity | 1914 | System Operation | 37,066 |
| Wright Patman Lake | Sulphur | 1954 | 363,000 | 145,300 |

APPENDIX C. MAJOR RESERVOIRS OF TEXAS - CONTINUED

| Reservoir Name | River Basin | Year of Completion | Year 2010 Firm Yield (acre-feet) from 2011 Regional Water Plans | Original Conservation Pool Capacity (acre-feet) |
|---|--------------------|--------------------|---|---|
| Major Reservoirs with no water supply function | | | | |
| Addicks Reservoir | San Jacinto | 1948 | No water supply function | 200,840 |
| Alders Reservoir | Trinity | 1950s | No water supply function | 7,064 |
| Barker Reservoir | San Jacinto | 1945 | No water supply function | 207,000 |
| Barney M. Davis Reservoir | Nueces-Rio Grande | 1973 | No water supply function | 6,600 |
| Bivins Lake | Red | 1927 | No water supply function | 5,122 |
| Buffalo Lake | Red | 1938 | No water supply function | 18,150 |
| Camp Creek Lake | Brazos | 1949 | No water supply function | 8,550 |
| Coffee Mill Lake | Red | 1938 | No water supply function | 8,000 |
| Hawkins, Lake | Sabine | 1962 | No water supply function | 11,890 |
| Holbrook, Lake | Sabine | 1962 | No water supply function | 7,990 |
| J. D. Murphree Wildlife Impoundment | Neches-Trinity | 1964 | No water supply function | 13,500 |
| Kiowa, Lake | Trinity | 1970 | No water supply function | 7,000 |
| Lower Running Water Draw WS SCS Site 2 Dam | Brazos | 1977 | No water supply function | 5,429 |
| Lower Running Water Draw WS SCS Site 3 Dam | Brazos | 1982 | No water supply function | 8,213 |
| Nacouche, Lake | Neches | 2005 | No water supply function | 15,031 |
| Natural Dam Lake | Colorado | 1989 | No water supply function | 54,560 |
| Quitman, Lake | Sabine | 1962 | No water supply function | 7,440 |
| Rita Blanca, Lake | Canadian | 1939 | No water supply function | 12,100 |
| San Esteban Lake | Rio Grande | 1911 | No water supply function | 18,770 |
| Tailing Ponds | San Antonio-Nueces | 1971 | No water supply function | 6,400 |
| Tailing Ponds No. 2 | San Antonio-Nueces | 1971 | No water supply function | 6,400 |
| Truscott Brine Lake | Red | 1983 | No water supply function | 111,147 |
| Winnsboro, Lake | Sabine | 1962 | No water supply function | 8,100 |
| | | | 9,367,813 | 42,900,519 |

Hydropower: Used to generate hydropower.

Cooling: Used as cooling pond for power plants.

Storage: Used as a water storage facility only.

Pass-through: Temporary storage facility only.

System Operation: Reservoir operated in system operation mode with several reservoirs contributing to one yield number.

(Note: When quantified separately, the sum of individual yields will not equal a system yield.)

Note: The capacity numbers for Amistad, Falcon, Toledo Bend, and Texoma are for total capacity, not Texas' share; yields are firm as reported by the regional water planning groups and are for the Texas share only.

APPENDIX D: REGIONAL WATER PLANNING GROUP POLICY RECOMMENDATIONS

AGRICULTURE

(EIGHT REGIONS: A, B, E, H, J, K, L, AND P)

WATER DATA - FIVE REGIONS: A, B, E, J, AND L

- Develop irrigation demand numbers on a regional basis - A
- Provide funding for agricultural water use data collection - B
- Improve accuracy of TWDB historical irrigation pumpage reports - E
- Develop more accurate means of estimating actual irrigation use - J
- Continue supporting evaluations of exotic animal water use to improve demand estimates - J
- Improve accuracy of water use and demand information for irrigation and livestock - L

CONSERVATION - FIVE REGIONS: A, H, K, L, AND P

- Create a water conservation reserve program to convert irrigated acreage to dry land - A
- Encourage the federal government to continue to support Conservation Reserve Program participation - A
- Provide funding to expand the High Plains Potential Evapotranspiration network into a statewide network - A
- Fund grants or subsidies to stimulate irrigation conservation practices - H
- Increase funding for TWDB agricultural water conservation programs - H, L
- Collaborate with the Natural Resources Conservation Service state conservationist in identifying projects to fund - K
- Support adequate funding of the Environmental Quality Incentives Program and its water conservation efforts - K
- Support funding of the Natural Resources Conservation Service - K, P
- Leverage federal agricultural conservation grants by providing local matching share - P

- Continue supporting state and federal programs that improve irrigation efficiency and agricultural water conservation - P
- Support adequate funding of State Soil and Water Conservation Board and local soil and conservation districts - P

OTHER - THREE REGIONS: K, L, AND P

- Develop water polices that enable agriculture and rural Texas to achieve parity with other users - K
- Provide additional funding to the Irrigation Technology Center at Texas A&M University - L
- Protect groundwater sources for agricultural production - P

CONJUNCTIVE USE

FOUR REGIONS: F, G, L, AND N

- Expand definition of conjunctive use - F
- Encourage conceptual modeling for conjunctive use projects - G
- Include conjunctive use projects as management strategies - G
- Develop incentives for conjunctive use projects - L
- Develop policy to manage all water resources on conjunctive use basis - N

CONSERVATION

FIFTEEN REGIONS: A, B, C, D, F, G, H, I, J, K, L, M, N, O, AND P

REUSE - NINE REGIONS: A, C, F, G, H, I, K, L, AND N

- Encourage Texas Commission on Environmental Quality to evaluate rules governing reuse of wastewater and quantify incentives for its use - A
- Recommend reducing legal obstacles to indirect reuse of treated wastewater - C
- Recommend Texas Commission on Environmental Quality clearly define permitting process for large-scale reuse projects - C

APPENDIX D: REGIONAL WATER PLANNING GROUP POLICY RECOMMENDATIONS

- Encourage legislation for safe and economical water reuse - F
- Work with federal agencies/representatives to develop safe procedures for disposing of reject water - F
- Encourage municipalities to manage return flows through direct and indirect reuse - G
- Encourage river authorities to manage return flows not under others' jurisdictions - G
- Clarify Texas Pollutant Discharge Elimination System after Elimination rules for wastewater permitting to eliminate double-counting of waste loads - H
- Advocate statewide reuse - H
- Resolve permitting issues for indirect reuse, including clarifying Texas Water Code Sections 11.042 and 11.046 - H, I
- Encourage Texas Commission on Environmental Quality to continue thorough review of indirect reuse applications, including environmental and water rights concerns - K
- Fund reuse technologies - L
- Promote water reuse and return flows wherever practical, after evaluating environmental needs - N

CONSERVATION FUNDING - FOUR REGIONS: F, H, K, AND O

- Fund grants or low-interest loans as incentives to use conservation technologies - F
- Leverage federal conservation grants by providing matching funds - H
- Continue and expand TWDB funding for retail utility water loss projects - K
- Fund conservation incentives for all user groups - O

WATER CONSERVATION ADVISORY COUNCIL - FOUR REGIONS: A, C, K, AND L

- Adopt definitions and methodology for gallons per capita per day proposed by Water Conservation Advisory Council - A, K
- Maintain the functionality and viability of the Water Conservation Advisory Council - A

- Fund activities of the Water Conservation Advisory Council and a statewide awareness campaign - C, L

WATER CONSERVATION IMPLEMENTATION TASK FORCE - FOUR REGIONS: C, F, L, AND O

- Follow the Water Conservation Implementation Task Force recommendation to institute voluntary, rather than mandatory, per capita water use goals - C, F
- Fund and implement programs recommended by the Water Conservation Implementation Task Force - L
- Update the 2004 Best Management Practices Guide - O

VOLUNTARY CONSERVATION - FOUR REGIONS: B, D, F, AND O

- Allow regions to establish voluntary water conservation goals - B, D
- Encourage conservation through technical assistance rather than mandatory goals - F
- Support landowner's voluntary protection of springs and seeps - O

WATER PROVIDERS - FIVE REGIONS: D, F, G, K, AND M

- Train water utilities to reduce water losses and improve their accountability - D, M
- Encourage retail water providers to use inclining block rate structure - F, G
- Support required use of conservation coordinator by all public water suppliers - K
- Encourage Texas Commission on Environmental Quality to amend 30 Texas Administrative Code Chapter 288 to require designated water conservation coordinators - K

CONSERVATION MANAGEMENT - FIVE REGIONS: J, K, L, M, AND N

- Develop conservation-oriented management plans for areas particularly susceptible to drought - J

APPENDIX D: REGIONAL WATER PLANNING GROUP POLICY RECOMMENDATIONS

- Encourage legislation to allow water providers to have dedicated funding for longer term water conservation - K
- Encourage legislation to allow property owners' associations to adopt restrictive covenants consistent with their water providers drought and conservation recommendations - K
- Encourage water users to develop and implement conservation plans that meet or exceed legal requirements - L, M
- Encourage municipal providers to develop and implement drought contingency plans that meet or exceed legal requirements - L, M
- Encourage legislation to support conservation strategies that manage water supplies more efficiently - N

OTHER - TEN REGIONS: A, B, D, F, H, J, K, L, M, AND O

- Evaluate policy barriers to using playa lakes for conservation purposes - A
- Base calculation of gallons per capita per day on residential water use only - B
- Recommend the legislature standardize the measurement of gallons per capita per day - D
- Systems with use greater than 140 gallons per capita per day should perform water audits - D
- Recommends legislature continue to address and improve water conservation in the state - H
- Require conservation on all state-owned lands - J
- Encourage conservation partnerships between water groups - K
- Recommend consideration of drought management as an interim strategy to meet near-term needs - L
- Recommend the state more actively monitor compliance with conservation and drought plans - M
- Recommend conservation and drought plans be consistent with the regional water plan - M
- Regional water planning groups should have a more active role in evaluating conservation and drought plans - M

- Develop a tiered recognition program for conservation achievements - O
- Control aquatic vegetation as water conservation practice - O

DATA COLLECTION AND RESEARCH FOURTEEN REGIONS: A, B, D, E, F, H, I, J, K, L, M, N, O, AND P

GROUNDWATER AND SURFACE WATER AVAILABILITY MODELING - NINE REGIONS: A, D, E, F, H, J, K, M, AND N

- Fund updates of water availability models - A, M, N
- Continue funding ground-water availability models - D, E, H, J, K, M, N
- Continue water availability modeling for minor Panhandle aquifers - A
- Recommend agencies coordinate with one another and planning groups in developing water availability and groundwater availability models - A
- Fund improvements to groundwater modeling and research in West Texas - E
- Request data from water agencies in Mexico to extend the Presidio Bolson groundwater availability model - E
- Allow more flexibility in the use of water availability models in the planning process - F
- Revise Hill Country Trinity Aquifer ground-water availability model - J
- Fund feasibility study linking groundwater and surface water in next generation of groundwater and water availability models - J, K
- Encourage public and private sector technical review of groundwater and water availability models - K
- Update the Central Gulf Coast Aquifer groundwater availability model - N

APPENDIX D: REGIONAL WATER PLANNING GROUP POLICY RECOMMENDATIONS

GROUNDWATER STUDIES - EIGHT REGIONS: E, F, J, K, L, N, O, AND P

- Finish study of Presidio Bolson Aquifer - E
- Study and characterize limestone formation in southern Brewster County - E
- Collect groundwater data to carry out Senate Bill 1 and Joint Planning for Groundwater - F
- Continue funding monitoring studies - J
- Study and characterize the Edwards-Trinity (Plateau) Aquifer and associated aquifers - J
- Provide groundwater conservation districts with technical assistance in gathering aquifer data - J
- Study the Frio River alluvium - J
- Study surface water/groundwater interaction in the upper Guadalupe River for springflow analysis - J
- Complete study of Trinity Aquifer use in Hays County and use results in next regional water plan - K
- Encourage legislation requiring economic and environmental studies for any groundwater project - L
- Encourage Railroad Commission of Texas to provide better information for identifying aquifer characteristics - N
- Provide additional funds to expand groundwater data program - N
- Encourage TWDB, Texas Commission on Environmental Quality, and Railroad Commission of Texas to expand and intensify ground-water data gathering and disseminating - N
- Fund computer models that quantify groundwater resources in each aquifer and project future availability based on historical net changes - O
- Continue monitoring static water levels and groundwater pumpage - P

ENVIRONMENTAL STUDIES - FOUR REGIONS: D, F, H, AND L

- Study mitigation effects as early as possible in reservoir planning - D
- Fund studies to identify and quantify environmental values to be protected and stream flows necessary to maintain priority environmental values - F
- Involve local groups in studies that evaluate streamflow issues - F
- Increase funding for research to determine freshwater inflow needs - H
- Complete the Texas Instream Flow Program - L
- Fund and improve freshwater inflow studies for bays and estuaries - L
- Examine applicability of report by Study Commission on Water for Environmental Flows - L
- Perform studies to evaluate effects of water management strategies on basin ecosystems - L

AQUIFER RECHARGE - FIVE REGIONS: A, B, J, L, AND O

- Consider the minimal recharge rate in assessments of the Ogallala Aquifer - A
- Study means to improve groundwater recharge - A
- Study the applicability of aquifer recharge programs and their impact to surface water rights - B
- Study quantity of increased groundwater from enhanced recharge structures - B
- Study aquifer recharge with harvested rainwater - J
- Fund research on Edwards (Balcones Fault Zone) Aquifer recharge and recirculation systems water management strategy - L
- Identify and quantify recharge mechanisms for Ogallala Aquifer - O
- Study and describe impact of playas on recharge - O

APPENDIX D: REGIONAL WATER PLANNING GROUP POLICY RECOMMENDATIONS

AGRICULTURE/RURAL - FIVE REGIONS: E, H, J, L, AND O

- Establish an integrated Rio Grande data management system to better manage irrigation releases and flood control - E
- Provide real time monitoring on the Rio Grande Project delivery system via information systems analysis and hydrologic operations modeling - E
- Fund research on more efficient irrigation practices - H
- Increase funding to research drought-resistant crop species - H, O
- Encourage riparian landowners to implement land stewardship practices - J
- Study impact of transient populations on rural water demand - J
- Undertake economic studies of water management strategies that meet irrigation needs - L

CONSERVATION - FOUR REGIONS: F, H, K, AND O

- Continue participating in conservation research and demonstration projects - F
- Fund research for advanced conservation technologies - H
- Fund research on developing and implementing conservation goals and successful water management strategies to update the 2004 Best Management Practices Guide - K
- Update the 2004 Best Management Practices Guide - O

BRUSH CONTROL - THREE REGIONS: D, J, AND K

- Monitor water pollution from Giant Salvinia and research and develop best management practices for its control - D
- Fund multidisciplinary research for defining watersheds with greatest potential for increasing water yields through brush management; quantify costs - J
- Fund voluntary brush control studies - K

RIVERS - ONE REGION: E

- Study effects of possible rechannelization of Rio Grande below Fort Quitman - E

GENERAL - ELEVEN REGIONS: A, B, E, F, I, J, K, L, M, N, AND O

- Improve monitoring and quantifying of small communities, manufacturers, livestock operators, and county-other categories - A
- Analyze economic effects of implementing water management strategies - A
- Remove provisions from Open Records Act restricting access to water data on private property - E
- Recommend TWDB meet with regions and consultants to discuss data collection and quality control - F
- Fund study on oral ingestion of radium before enforcing maximum containment load - F
- Fund improved data for next planning cycle - I
- Conduct studies on specific water resource issues - J
- Fund all levels of data collection and analysis - K, L, O
- Fund roles of TWDB and Texas Commission on Environmental Quality in providing data for regional planning - L
- Review the Texas Water Code regarding transfers of water out of groundwater conservation districts and provide sufficient revenue for technical studies - L
- Evaluate the effect of groundwater withdrawals on surface water availability - M
- Evaluate true impact and treaty compliance factors of aqueduct construction from Falcon Reservoir to Matamoros, Mexico - M
- Fund and establish regional research centers at local universities to focus on Coastal Bend water issues - N
- Provide funds to establish and maintain a regional water resources information management system - N

APPENDIX D: REGIONAL WATER PLANNING GROUP POLICY RECOMMENDATIONS

- Recommend TWDB consider local projects when developing mining water demand projections, specifically the Eagle Ford shale - N
- Fund a basic data network that maintains current inventory of surface water and groundwater resources - O
- Develop standardized, comprehensive methodologies for characterizing and computing per capita water use - O

EDUCATION

NINE REGIONS: D, F, G, J, K, L, M, N, AND O

CONSERVATION EDUCATION - EIGHT REGIONS: D, F, G, J, K, L, M, AND O

- Fund and implement conservation education programs for the public - D, F, J, M
- Create and fund a water conservation awareness program through TWDB - G, O
- Fund the Water IQ public education program - K, L
- Supports regional coordination and resource pooling for uniform conservation messaging - K
- Encourage TWDB to assist communities to coordinate on conservation education efforts - K

GENERAL EDUCATION - FOUR REGIONS: J, K, L, AND O

- Fund education on conservation and about water supplies programs for public sector - J, O
- Fund education on water management and rainwater harvesting programs for private sector - J
- Address sustainability through education - K
- Fund statewide education program and coordinate with Texas Cooperative Extension - L

AQUATIC WEED CONTROL - ONE REGION: D

- Develop awareness campaign and provide extension and education services to urban and industry stakeholders on giant salvinia threat and mitigation - D

REGIONAL GROUPS - ONE REGION: N

- Make funds available to planning groups and groundwater conservation districts to educate public on water issues - N

ENVIRONMENT

TWELVE REGIONS: A, B, C, D, E, F, G, H, K, L, O, AND P

UNIQUE STREAM SEGMENTS - FIVE REGIONS: A, B, C, D, AND L

- Clarify intent and uncertainties of unique stream segment designation - A, B, C, D, L
- Examine ancillary issues regarding unique stream segments - C
- Establish a working group on unique stream segments to review legislative intent, agency rules, and impacts of designations - C

INSTREAM FLOWS - THREE REGIONS: F, G, AND K

- Protect existing water rights when considering instream flows - F
- Oppose adaptive management requirements concerning instream flows - F
- Evaluate return flows to determine impact on instream flows - G
- Provide direction to protect instream/freshwater inflows - K
- Monitor and provide adequate funding for environmental flows - K
- Encourage Colorado and Lavaca Stakeholder Group to develop recommendations protective of long-term ecological productivity - K
- Recommend state evaluate ways to convert existing water rights to environmental uses - K

RESERVOIRS - TWO REGIONS: D AND P

- Consider environmental and economic impacts of reservoir development - D
- Recommend entities proposing new reservoirs through the planning process include a map of proposed mitigation acreage - D

APPENDIX D: REGIONAL WATER PLANNING GROUP POLICY RECOMMENDATIONS

- Support efforts to mitigate environmental impacts of Palmetto Bend Stage II - P

OTHER - SEVEN REGIONS: E, F, G, H, K, L, AND O

- Establish policy to protect aquifers and springs to preserve “the rural way of life” - E
- Support recognition of the importance of springs and spring-fed stream - F
- Encourage responsible land management practices to protect water sources - G, L
- Clarify agency rules on quantitative environmental analysis - H
- Support planning process structure that evaluates environmental needs to determine available water supply - K
- Evaluate land use and ecosystem health in light of sustaining future quality of life - L
- Encourage collaboration of scientists, policy makers, and agricultural representatives in managing threatened species - O

GROUNDWATER

FIFTEEN REGIONS: A, C, D, E, F, G, H, I, J, K, L, M, N, O, AND P

GROUNDWATER CONSERVATION DISTRICTS - TWELVE REGIONS: A, C, F, G, H, I, J, K, L, M, O, AND P

- Manage groundwater resources through local groundwater conservation districts - A, F, G, H, J, K, M, P
- Create or expand groundwater conservation districts in areas not currently served - A, F, I, J, K, M
- Encourage cooperation between groundwater conservation districts - C, F
- Recommend TWDB or Texas Commission on Environmental Quality oversee groundwater districts to standardize regulations - C, F
- Support groundwater conservation districts as local authority on groundwater issues - G, K
- Respect property rights and right to capture when adopting rules and regulations - F

- Base groundwater supply availability on management goals and rules - F
- Restrict export from a district until there is a plan to ensure adequate supplies are available for the district or region - F
- Ensure all state lands are subject to groundwater district rules and limits - F
- Train groundwater conservation districts in use of groundwater availability modeling - J
- Form groundwater conservation districts to administer sound, scientifically based groundwater management objectives - J
- Advocate that groundwater conservation districts consider developing management rules for Edwards (Balcones Fault Zone) Aquifer to sustain spring flows of upper Guadalupe River - J
- Strengthen groundwater conservation districts’ abilities to protect groundwater supplies - K
- Encourage TWDB to continue assisting groundwater districts - K
- Support referral of any groundwater district reorganization to the local election process - K
- Recommends groundwater districts manage groundwater as necessary to meet desired future conditions rather than use the Managed Available Groundwater as a permitting cap - K
- Review Texas Water Code to ensure groundwater conservation districts are funded and equipped for comprehensive analysis tasks - L
- Create and operate groundwater conservation districts under Texas Water Code, Chapter 36 - O

GROUNDWATER MANAGEMENT AREAS - SIX REGIONS: D, E, F, J, K, AND L

- Recommend voting representation for areas without groundwater districts be based upon the areas population, groundwater use, or number of aquifers - D

APPENDIX D: REGIONAL WATER PLANNING GROUP POLICY RECOMMENDATIONS

- Reschedule due dates in the Joint Planning process so Managed Available Groundwater data can be better integrated into the water plans - E, F
- Examine interaction of regional water planning and groundwater management areas processes to improve the resulting economic impacts - J
- Support use of groundwater management area-wide average desired future conditions to expedite establishment of managed available groundwater values - K
- Revise Texas Water Code Chapter 36 to allow groundwater districts to either manage groundwater to achieve the desired future condition or use TWDB-provided managed available groundwater to restrict permitting - K
- Support determinations of Managed Available Groundwater based on Desired Future Conditions Joint Planning process - L

REGIONAL COLLABORATION - SIX REGIONS: E, F, G, J, K, AND L

- Encourage groundwater conservation districts to collaborate in planning process - E, F, G, K
- Recommend groundwater management councils coordinate efforts with planning groups - E
- Require state lands to abide by ground-water district regulations and submit water withdrawal plans to relevant planning group - F
- Notify planning groups when significant amounts of groundwater are being exported - F
- Assess groundwater availability for regional plans based on groundwater conservation district's goals and requirements - F
- Recommend planning groups J, K, and L collaborate on Trinity Aquifer evaluation - J
- Recommend TWDB-sponsored workshops for regions sharing aquifers - J
- Encourage collaboration between regions sharing aquifers - L

RULE OF CAPTURE - FIVE REGIONS: F, H, K, O, AND P

- Support rule of capture - F, P
- Maintain rule of capture in areas not subject to defined subsidence or groundwater conservation districts - H, K
- Support rule of capture as modified by rules and regulations of existing ground-water conservation districts - K, O
- Oppose legal recognition of groundwater ownership in place as vested right of surface property owner - K

OIL AND GAS - FOUR REGIONS: D, F, M, AND N

- Recommend Railroad Commission of Texas review and enforce regulations protecting aquifers from oil well contamination - D, F
- Levy fines for oil and gas producers who violate rules governing aquifer contamination - F
- Support the industry-funded program to plug abandoned wells - F
- Encourage adequate funding for the Railroad Commission of Texas to protect water supplies - F
- Encourage restoring funding to well-plugging account - F
- Appropriate sufficient funds to Railroad Commission of Texas for capping abandoned wells - M, N

SUSTAINABILITY - THREE REGIONS: G, L, AND P

- Advocate adoption of water management strategies that do not substantially deplete aquifers - G
- Suggest the state continue developing policy that protects historical use and future sustainability - G
- Support management strategies that achieve groundwater sustainability - L
- Support sustainable yield of the Gulf Coast Aquifer as the limit for water development - P
- Recommend sustainable yield as upper limit for all groundwater conservation districts in region - P

APPENDIX D: REGIONAL WATER PLANNING GROUP POLICY RECOMMENDATIONS

STATE AGENCIES - TWO REGIONS: K AND N

- Encourage funding of TWDB groundwater programs - K
- Expand efforts of TWDB, Texas Commission on Environmental Quality, and Railroad Commission of Texas in managing groundwater - N

OTHER - THREE REGIONS: F, J, AND L

- Encourage groundwater legislation that is fair to all users - F
- Oppose historical use limits in granting water rights permits - F
- Oppose groundwater fees for wells used exclusively for dewatering - F
- Encourage state to review groundwater resources on state-owned land and determine appropriate management - F
- Standardize groundwater evaluations statewide - J
- Advocate groundwater management based on science, equity, and rationality - L
- Determine water management strategies for Edwards (Balcones Fault Zone) Aquifer during drought of record - L

INNOVATIVE STRATEGIES

TWELVE REGIONS: A, B, C, D, E, F, J, K, L, M, N, AND O

BRUSH CONTROL - NINE REGIONS: A, B, D, F, J, K, L, M, AND O

- Provide funding to implement brush control and land stewardship - B, O
- Encourage funding for new technical resources to combat giant salvinia, saltcedar, and aquatic weeds - D, M
- Request TWDB guidance on including brush control projects as source of new surface water - A
- Support brush control as funding priority - F
- Recommend completing final phase of North Concho River brush control program - F

- Continue funding Twin Buttes brush control project until completed - F
- Fund brush control for region's reservoirs - F
- Give priority funding to land conservation and management practices, including brush and burn management and follow-up grazing - F
- Continue cooperating with federal agencies to secure brush control funds - F
- Fund programs to eradicate nuisance vegetation - J
- Fund a long-term, cost-sharing program for landowners participating in brush management similar to the Natural Resources Conservation Service's Great Plains Conservation Program - J
- Encourage funding for saltcedar eradication and long-term brush management strategies in Rio Grande watershed - J, M
- Fund programs to eradicate saltcedar - J, O
- Provide pro rata funds to landowners for brush control assistance - K
- Fund brush management technologies - L

DESALINATION - SIX REGIONS: A, C, F, L, M, AND N

- Continue funding salinity control projects in Canadian and Red River basins - A
- Support research to advance desalination and reuse - C
- Provide funding to small communities for desalination projects - C
- Provide funds for desalination - F, L
- Continue funding brackish groundwater projects and seawater desalination demonstration projects - M
- Encourage Texas Commission on Environmental Quality, TWDB, and Texas Parks and Wildlife Department to investigate environmental impacts of seawater desalination discharge and allow it where no damage will occur - N
- Recommend changing regulations governing desalination brine to coincide with those governing petroleum brine - N

APPENDIX D: REGIONAL WATER PLANNING GROUP POLICY RECOMMENDATIONS

STORMWATER - ONE REGION: E

- Future planning should include stormwater, including aquifer recharge and optimization of surface water resources - E

WEATHER MODIFICATION - TWO REGIONS: F AND L

- Support funding for researching, evaluating, creating, and operating weather modification programs - F
- Fund weather modification technologies - L

AQUIFER RECHARGE - TWO REGIONS: J AND L

- Fund recharge structures and provide technical assistance - J
- Fund small aquifer recharge dams - L

PLAYAS - ONE REGION: O

- Create and preserve native grass buffers to protect playa basins - O

OTHER - THREE REGIONS: F, J, AND L

- Support state/federal funding for demineralization, reclamation, and aquifer storage and recovery - F
- Encourage and fund rainwater harvesting - J, L
- Increase funds for projects demonstrating alternative water supply strategies - L

INTERBASIN TRANSFERS

EIGHT REGIONS: C, D, F, G, H, I, K, AND N

JUNIOR RIGHTS - THREE REGIONS: F, I, AND N

- Oppose modifying the junior rights provision until basin of origin needs are ensured by reviewing water availability models to determine there are no detrimental impacts - F
- Support legislation to allow junior water rights exemptions from contracts reserving sufficient supply to meet 125 percent of demand in basin of origin - I

- Repeal junior rights provision and additional application requirements for interbasin transfers - N

BASIN OF ORIGIN - TWO REGIONS: D AND K

- Review the definition of “need” in basin of origin to ensure that needs are met before transfers are permitted - D
- Evaluate compensation to basin of origin - D
- Protect basins of origin in interbasin transfers - K

OTHER - FOUR REGIONS: C, F, H, AND K

- Recommend that unnecessary, counterproductive barriers to interbasin transfers be removed from Texas Water Code - C, H
- Support interbasin transfers as most efficient method for meeting state water needs - F
- Protect current water rights holders in interbasin transfers - F
- Verify that interbasin transfers are consistent with regional water plans - K
- Complete the Lower Colorado River Authority/ San Antonio Water System study to verify that water transport meets regional water plan guidelines - K

FUNDING FOR PLAN IMPLEMENTATION

NINE REGIONS: A, C, E, F, G, H, L, M, AND O

- Fund region-specific water supply strategies - A, E
- Change TWDB regulations to allow Water Infrastructure Funds to be used for acquisition of reservoir sites prior to permitting process - C
- Increase appropriations to the Water Infrastructure Fund - F
- Create statewide mechanism for funding state water plan projects - G, L
- Increase funding of State Participation Program to develop water supply projects meeting long-term demands - H

APPENDIX D: REGIONAL WATER PLANNING GROUP POLICY RECOMMENDATIONS

- Establish financing mechanisms to develop new water supply projects in adopted regional plans - H
- Provide sufficient funding to TWDB and Texas Commission on Environmental Quality for administering state water plan programs - L
- Fund water management strategies identified in regional water plans - M, O

PROVIDING AND FINANCING WATER AND WASTEWATER SYSTEMS SEVEN REGIONS: A, F, H, K, L, M, AND O

FEDERAL MONIES - THREE REGIONS: E, H, AND L

- Continue federal and state financial programs for substandard water and wastewater systems (colonia areas) - E
- Investigate opportunities for increased U.S. Army Corps of Engineers funding - H
- Encourage more active state solicitation of federal monies - L

STATE FUNDING PROGRAMS - FOUR REGIONS: C, H, I, AND K

- Establish more flexible deferred financing programs for large projects which allow repayment as portions of projects are brought online - C
- Increase funding of the State Loan Program for near-term infrastructure cost projections - H
- Continue state and federal support of Texas Community Development Program - H
- Increase funds for Small Towns Environment Program - H
- Increase funding of Regional Water Supply and Wastewater Facilities Planning Program; expand to include engineering design and cost estimates - H
- Increase future funding of State Revolving Fund to cover system capacity increases - H

- Make State Participation Program available to public/private partnerships and nonprofit water supply corporations - H
- Allow Water Infrastructure Funds to be used for replacement of water supply infrastructure - I
- Increase flexibility in determining categorical exclusions for Environmental Information Documents - I
- Revise Economically Disadvantaged Areas Program requirements to reduce difficult eligibility requirements, including model subdivision planning - I
- Provide low-interest loans and grants to reduce system water loss - K

OTHER - SEVEN REGIONS: A, F, H, I, K, M, AND N

- Develop or improve grant and loan programs to replace and repair aging infrastructure - A, I
- Provide grants to small and rural drinking water treatment systems to meet federal drinking water standards - F
- Increase funds for the Galveston Bay and Estuary program - H
- Provide funds for water treatment and radioactive waste disposal threatening rural water supplies - K
- Encourage regionalization of water and wastewater utility service - M
- Fund and support efforts of Groundwater Management Areas - N

REGIONAL WATER PLANNING ALL SIXTEEN REGIONS

FUNDING/SUPPORT - ELEVEN REGIONS: B, E, H, I, J, K, L, M, N, O, AND P

- Continue adequate funding of regional water planning process - B, E, H, K, L, M, N, O
- Provide additional state funding for regional planning administrative costs - B, E, J, K,
- Fund technical studies necessary to support the work of the planning groups - H

APPENDIX D: REGIONAL WATER PLANNING GROUP POLICY RECOMMENDATIONS

- Advocate that regions fund administrative costs of planning process - I
- Reimburse planning group members for reasonable expenses - J
- Consider factors other than population in funding the planning process - M
- Request public entities provide their share of funding for regional planning activities - N
- Establish funding for planning groups through TWDB - P

STATE AGENCIES - SIX REGIONS: C, F, G, J, K, AND M

- Recommend that TWDB and Texas Commission on Environmental Quality collaborate on determining which water availability modeling data to use in regional planning - C, F
- Recommend all state agencies adhere to state water plan - G
- Recommend nonvoting state agencies attend regional planning meetings or relinquish authority to alter adopted plan - J
- Encourage Texas Commission on Environmental Quality to provide technical reviews and draft permits to planning groups to ensure consistency with regional plans - K
- Suggest Texas Commission on Environmental Quality assist Rio Grande area in converting water rights from one use to another - M

ALTERNATIVE STRATEGIES - FOUR REGIONS: A, D, F, AND I

- Allow small systems to develop alternative near-term scenarios - A
- Allow alternative scenarios in population growth and economic development in determining future water demands - D
- Allow alternative water management strategies in regional plan - F, I

CONSISTENCY - SIX REGIONS: B, D, E, F, H, AND I

- Recommend waivers for surface water projects that will not significantly impact regional supplies and do not involve new water sources - B
- Recommend TWDB consider entire regional plan when determining consistency - D
- Apply consistent economic principles to water project and strategy evaluation - E
- Allow maximum flexibility in determining consistency with regional plans - F, I
- Recommend Texas Commission on Environmental Quality and TWDB collaborate on consistency determinations and waivers to allow for maximum flexibility - F, I
- Recommend TWDB publish clear criteria for consistency determinations before adopting regional water plans - F
- Recommend waivers for consistency issues for small projects - F
- Clarify rules to address consistency within regional plans - H
- Allow entities smaller than planning criteria that do not have specific needs identified in water plans to be eligible for state funds - I
- Remove willing buyer/seller transactions from consistency requirements - I
- Advocate removing consistency requirements from Senate Bill 1 - I

WATER DEMAND FIGURES - FIVE REGIONS: D, E, H, J, AND L

- Revise procedure for water demand reductions to recognize areas with low per capita consumption - D
- Allow more time for final demand figures - E
- Recommend more real life analysis of demand figures during drought conditions - E
- Recommend State Demographer explore potential changes in population distribution due to information technology advancements - H
- Develop better methodologies for estimating population and water demand - J

APPENDIX D: REGIONAL WATER PLANNING GROUP POLICY RECOMMENDATIONS

- Modify planning process so that water demand projections allow for regional input - L
- Modify regional planning process to allow for more flexibility in developing growth and water demand methodologies - L

PLANNING GROUP AUTHORITY - ONE REGION: O

- Oppose legislature empowering planning groups with any regulatory authority - O

TRAINING - ONE REGION: J

- Provide training for new planning group members - J

OTHER - TEN REGIONS: A, C, E, F, H, K, L, M, O, AND P

- Clarify relationship between drought contingency planning and regional water supply planning - A
- Include project for future groundwater quality in the region - A
- Ensure eligibility for small cities and entities included as county-other - A
- Allow flexibility in applying water availability models for planning - C, F
- Avoid constraining planning process with technical requirements - E
- Set deadlines for regional plans that avoid legislative sessions - E
- Consider all water resources available to a region including those outside of the state - E
- Recommend rule simplification before next round of planning - F
- Allow planning groups to adopt an existing water plan if there are no significant changes to the recommended water management strategies - F
- Clarify rules on quantitative environmental analysis - H
- Review the administrative provisions of SB1 and subsequent policies to determine if appropriate organizational structure exists - H
- Coordinate regional planning process with Texas Clean Rivers Program - K

- Improve representation of women and minorities on planning groups - K
- Oppose development of new water management strategies to accommodate export of supplies to another county and planning region of state - K
- Oppose use of water availability model Run 3 in regional water planning as being unreasonably restrictive - K
- Include in plan water supplies over and above those required to meet the projected need - L
- Establish contract requirements before grant proposals are submitted - L
- Oppose changes to planning process except through formal rulemaking procedure - L
- Urge prompt and full implementation of these plans - L
- Include wildlife and environmental needs as a category of water use - M
- Recommend shifting to a utility-centric method of planning rather than city-centric - M
- State should consider impacts of climate change on regional water planning and future water supplies - M
- Allow for additional region-specific planning options and forecast scenarios - O
- Review the planning process with a group of stakeholders and identify any revisions to the planning process by the end of 2010 - O
- Support a greater role for inter-regional coordination in future planning - P

RURAL WATER

THREE REGIONS: G, H, AND L

- Encourage regionalization, education, and proactive planning of small water systems - G
- Support increased funding of federal Rural Utilities Service programs and funding of the state Rural Water Assistance Fund - H
- Study implications of water export, considering its implications on rural environment and economy - L

APPENDIX D: REGIONAL WATER PLANNING GROUP POLICY RECOMMENDATIONS

SURFACE WATER

TEN REGIONS: A, B, C, D, F, G, H, L, M, AND P

RESERVOIRS - SIX REGIONS: A, B, D, H, I, AND P

- Recommend TWDB submit reservoir feasibility study plans and results to Compact Commissions - A
- Change definition of water availability in reservoirs to match owner's operational criteria - A
- Include possible reservoir sites and flood control/aquifer recharge structures in future water plans - A
- Extend designations for unique reservoir sites beyond 2015 - B, I
- Designate Toledo Bend Reservoir as a supply strategy for upper Sabine Basin in Region D and supply option for Region C - D
- Consider potential economic and environmental impacts to reservoir development - D
- Consider raising the level for Lake Wright Patman prior to development of new reservoirs in Region D - D
- Consider development of reservoirs in the Sulphur Basin in Region D as violation of the quantitative evaluations of water management strategies under 31 Texas Administrative Code 357.7(a)(8)(A) and a conflict with the Region D plan - D
- Oppose development of reservoirs in the Sulphur Basin in Region D prior to development of environmental flow standards through Senate Bill 3 process - D
- Establish flood damage liability limits for reservoirs - H
- Develop Lake Texana Stage II as supply strategy - P

WATER PERMITS - FOUR REGIONS: C, F, L, AND N

- Encourage TWDB and Texas Commission on Environmental Quality work with U.S. Environmental Protection Agency to revise Section 361(b) regulations on power plant cooling water - C

- Notify all basin water rights holders when a request to amend a water right increases quantity or changes purpose or place of use - F
- Fund Texas Commission on Environmental Quality adequately to ensure appropriate use of permitted surface water rights - L
- Urge Texas Commission on Environmental Quality to enforce existing rules and regulations regarding impoundments - N

U.S. ARMY CORPS OF ENGINEERS - FOUR REGIONS: B, D, H, AND I

- Recommend U.S. Army Corps of Engineers transfer flood storage to conservation storage - B
- Recommend the Wetlands Compensatory Mitigation Rule of "avoid, minimize, and compensate" be closely followed - D
- Allow U.S. Army Corps of Engineers to increase water supply storage in new reservoirs - H
- Include TWDB and regional water planning agencies on mitigation bank review teams - I

SEDIMENT CONTROL - THREE REGIONS: B, C, AND D

- Support efforts, including land management, to rehabilitate existing sediment control structures and construct new ones - B
- Seek additional federal funding to improve and maintain Natural Resources Conservation Service sediment and flood control structures - C, D

UNCOMMITTED WATER - TWO REGIONS: C AND F

- Recommend changing Texas Water Code to exempt from cancellation nonuse associated with developing and managing reservoirs - C
- Oppose canceling uncommitted water contracts/rights - F

WATERMASTER PROGRAM - ONE REGION: M

- Authorize Watermaster Program to manage the Rio Grande water availability model - M
- Direct all appropriate Rio Grande water rights fees to Watermaster operations - M

APPENDIX D: REGIONAL WATER PLANNING GROUP POLICY RECOMMENDATIONS

OTHER - SIX REGIONS: B, C, F, G, K, AND M

- Recommend all surface water uses, regardless of size, be consistent with regional plan - B
- Continued and increased state support of efforts to develop water supplies in Oklahoma - C
- Review state surface water policy to ensure its appropriateness for next 50 years - F
- Amend state water law to incorporate river basin subordinations in regional water plans - F
- Support long-term contracts for future projects and droughts - F
- Support long-term contracts for reliable water supply planning and shorter-term "interruptible" contracts to meet needs before long-term water rights are fully used - F
- Support coordinated operation of two or more water supply sources - G
- Give priority to water policies that increase surface water availability - K
- Encourage development of an operating plan for Mexican tributary reservoirs that ensures full compliance with 1944 Water Treaty while optimizing supply available to Mexico - M
- Continue considering allocation of Rio Grande Flows upstream of Ft. Quitman for treaty compliance - M

WATER MARKETING

FOUR REGIONS: A, F, L, AND P

- Assess potential of transporting water into or out of the Panhandle - A
- Assess potential for transferring groundwater to counties within region - A
- Oppose additional regulations in willing buyer/willing seller water transactions - F
- Require all water export plans to be submitted to regional planning groups - F
- Recommend legislative review of Water Code to consider changes in light of increasing number of water export proposals - F

- Oppose export of surface water outside of region, except for existing contracts until a comprehensive plan is in place - F
- Allow property owners to capture and market water - F
- Fund development of a standard method for evaluating water export proposals - L
- Clarify that water planning regions are not intended to be barriers to water transport - L
- Consider export fee to offset negative impacts of transferring water out of basin - P
- Allow water transfer out of basin that does not interfere with exempt, existing, or previously permitted wells - P

WATER QUALITY

SEVEN REGIONS: A, B, D, F, G, K, AND N

STANDARDS - THREE REGIONS: B, D, AND F

- Allow flexibility in drinking water standards for small systems, such as use of bottled water programs - B, F
- Recommend TWDB and Texas Commission on Environmental Quality standardize rules for minimum water supply requirements - D
- Recommend that Texas Commission on Environmental Quality revise its policy requiring use of secondary water standards, particularly total dissolved solids, when granting permits - F

WATER PLANNING - TWO REGIONS: A AND K

- Require Texas Commission on Environmental Quality to attend regional planning meetings and assist with water quality issues - A
- Support integrating water quality into water supply planning - K

APPENDIX D: REGIONAL WATER PLANNING GROUP POLICY RECOMMENDATIONS

RADIOACTIVE WASTES - TWO REGIONS: F AND K

- Recommend Texas Commission on Environmental Quality develop disposal procedures for the safe handling of radioactive wastes in water treatment process - F, K
- Develop disposal procedures for radioactive wastes threatening water supplies - K

MINING - ONE REGION: N

- Amend rules to require routine, nonpartisan water quality monitoring of mining operations - N
- Oppose in-situ mining (a process that circulates acidic water through injection and recovery wells to remove minerals) where drinking water will be contaminated - N
- Monitor water quality from mining activities - N

OTHER - THREE REGIONS: B, D, AND G

- Recognize chloride control project as regional priority - B
- Recommend Texas Commission on Environmental Quality expedite effort to replace methyl tertiary butyl ether in gasoline - D
- Encourage policies and business practices that give priority to water quality - G

OTHER

SIX REGIONS: A, J, K, L, M, AND N

- Establish guidelines differentiating between groundwater and surface rights - A
- Recommend basing drought management plans on peak use rather than annual production - J
- New electric generation facilities should utilize the most efficient technologies and conservation practices and assure water is available or can be obtained during the planning and permitting process - K
- Give counties additional authority for regulating land development to protect water resources - L
- Supports providers obtaining land for project through willing buyer-willing seller and using limited condemnation as a last resort - L
- Renew efforts to ensure Mexico's compliance with 1944 Treaty to eliminate water delivery deficits - M
- Amend state laws governing procurement of professional services to allow more flexibility in public works projects - N



Photo Citations

COVER

Water tower (Wikimedia Commons)

EXECUTIVE SUMMARY

Cover: Stream near San Angelo (TWDB)

CHAPTER 1

Cover: Windmill in Big Bend National Park (TWDB)

CHAPTER 3

Cover: Corn irrigation near Vick (TWDB)

Last page: Robert Lee Dam morning glory structure,
E.V. Spence Reservoir (TWDB)

CHAPTER 4

Cover: Dry stream near Uvalde (TWDB)

CHAPTER 5

Cover: Llano dam (TWDB)

CHAPTER 6

Cover: Sugarcane in the Lower Rio Grande Valley
(TWDB)

CHAPTER 7

Cover: George W. Shannon Wetlands Water Reuse
Project (Tarrant Regional Water District)

Last page: Frio River (TWDB)

CHAPTER 8

Cover: Guadalupe River in Kerrville (TWDB)

CHAPTER 9

Cover: Trinity Bay area wastewater treatment plant
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CHAPTER 11

Cover: Texas Capitol ceiling dome (Istockphoto.com/
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GLOSSARY

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APPENDICES

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WATER FOR TEXAS 2012 STATE WATER PLAN



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