12 Miscellaneous Strategies

12.1 Strategy Overview

Miscellaneous Strategies represent 117 remaining strategies such as transmission projects, well field development, interconnections between water user groups, and water treatment plant expansions which are not included in any of the other water management strategies. Strategies were developed to overcome the water shortages identified between 2020 and 2070 after other specific water management strategies including conservation were applied for all WUGs. The WUGs with Miscellaneous Strategies are organized by county and are detailed in Section 12.3 through Section 12.5

Strategies are summarized below by the name of the miscellaneous strategy, the source of water for the strategy, a list of the facilities necessary, costs, project yield and a short description of the strategy. Costs are consistent with the TWDB and Brazos G assumptions as described in Volume II, Chapter 1 and are priced in September 2013 dollars. Debt service is calculated at 5.5% for 20 years. Some strategies include estimates of wholesale water costs as verified through discussion with water providers or as base costs from other strategies.

12.2 Implementation Issues

The miscellaneous strategies for each WUG were evaluated and determined based on plan development criteria. Groundwater, surface water and reuse water supplies are projected to be adequate to implement these miscellaneous strategies. Environmental impacts will need to be mitigated to protect instream flow requirements, habitat, cultural resources, threatened and endangered species and wetlands. Generally, it is assumed that pipelines can be routed to avoid environmentally sensitive areas. Strategies were considered to meet municipal and industrial shortages in the planning area and will not have an apparent negative impact on other state water resources, or on agriculture and natural resources. The strategies do not require interbasin transfers.

Some of the miscellaneous strategies are feasible only if other recommended strategies are implemented. Other considerations for implementation of the miscellaneous strategies are summarized below:

- In general, any development of additional groundwater in the Brazos G Area must address several issues including:
- Competition with others for groundwater in the area.
- Purchase of groundwater rights.
- Impact on water levels in the aquifer which could trigger reduction in production permits from the regulating Groundwater Conservation District.
- Restricted availability under the MAG

The regulatory permits that are expected to be requirements specific to wells and pipelines include:

- Regulations and permits by the groundwater conservation districts.
- U.S. Army Corps of Engineers Sections 10 and 404 dredge and fill permits for the pipelines impacting wetlands or navigable waters of the United States.
- General Land Office easement for use of state-owned land.
- Texas Parks and Wildlife Department Sand, Gravel, and Marl permit for construction in state-owned streambeds.
- Mitigation requirements would vary depending on impacts, but could include vegetation restoration, wetland creation or enhancement, or additional land acquisition.

12.3 Miscellaneous Pipelines, Pump Stations, and Groundwater Options by County

12.3.1 Bell County

WUG: Bell County Irrigation

Strategy: Brackish Trinity Aquifer Development

Source: Trinity Aquifer

Facilities: Well Field, collection pipes

Total Capital Cost: $1,815,000

Total Project Cost: $2,541,000

Total Annual Cost: $231,894 (Maximum of Phased Costs)

Available Project Yield: 140 acft/yr (2070)

Annual Cost of Water: $ 1,656 per acft/yr or $ 5.08 per 1,000 gal (Maximum of Phased Costs)

This project will include 5 brackish 150 gpm wells drilled to 800ft with 200 ft of 4 inch diameter transmission pipeline per well.

WUG: Bell County Irrigation

Strategy: Edwards Aquifer Development

Source: Edwards Aquifer

Facilities: Well Field, collection pipes

Total Capital Cost: $9,562,000

Total Project Cost: $13,384,000

Total Annual Cost: $1,222,446

Available Project Yield: 1,091 acft/yr (After Full Implementation)

Annual Cost of Water: $1,120 per acft/yr or $3.44 per 1,000 gal

This project will include 29 200 gpm wells drilled to 500 ft as well as 200 ft of transmission pipeline per well.

WUG: Bell County Mining

Strategy: Brackish Trinity Aquifer Development

Source: Trinity Aquifer

Facilities: Well Field, collection pipes

Total Capital Cost: $3,993,000

Total Project Cost: $5,588,000

Total Annual Cost: $514,267

Available Project Yield: 582 acft/yr (After Full Implementation)

Annual Cost of Water: $ 884 per acft/yr or $ 2.71per 1,000 gal (Maximum of Phased Costs)

This project will include 11 brackish 150 gpm wells drilled to 800ft with 200 ft of 4 inch diameter transmission pipeline per well.

WUG: Bell County Mining

Strategy: Edwards Aquifer Development

Source: Edwards Aquifer

Facilities: Well Field, collection pipes

Total Capital Cost: $9,892,000

Total Project Cost: $13,846,000

Total Annual Cost: $1,281,486

Available Project Yield: 2,176 acft/yr (After Full Implementation)

Annual Cost of Water: $589 per acft/yr or $1.81 per 1,000 gal

This project will include 30 200 gpm wells drilled to 500 ft as well as 200 ft of transmission pipeline per well .

WUG: Bell County Other

Strategy: Brackish Trinity Aquifer Development

Source: Trinity Aquifer

Facilities: Well Field, transmission and treatment

Total Capital Cost: $15,824,000

Total Project Cost: $22,147,000

Total Annual Cost: $3,177,000 (Maximum of Phased Costs)

Available Project Yield: 806 acft/yr (After Full Implementation)

Annual Cost of Water: $ 4,858 per acft/yr or $ 14.91 per 1,000 gal (Maximum of Phased Costs)

This project will include 10 brackish 100 gpm wells drilled to 800ft, 2,000 ft of 4 inch diameter transmission pipeline, brackish desalination, and disposal of concentrate at a landfill.

WUG: Bell County Other

Strategy: Edwards Aquifer Development

Source: Edwards Aquifer

Facilities: Well Field, collection pipes, transmission and treatment

Total Capital Cost:	$2,672,000
Total Project Cost:	$3,736,000
Total Annual Cost:	$380,823
Available Project Yield:	2,081 acft/yr (After Full Implementation)
Annual Cost of Water:	$ 183 per acft/yr or $0.56 per 1,000 gal (Maximum of Phased Costs)

This project will include two 200 gpm wells drilled to 500 ft as well as 1,000 ft of transmission pipeline and, disinfection treatment.

12.3.2 Bosque County

WUG: Bosque County Irrigation

Strategy: Trinity Aquifer Development

Source: Trinity Aquifer

Facilities: Well Field, collection pipes

Total Capital Cost:	$7,898,000
Total Project Cost:	$11,048,000
Total Annual Cost:	$1,006,457 (Maximum of Phased Costs)
Available Project Yield:	475 acft/yr (2070)
Annual Cost of Water:	$ 2,119 per acft/yr or $ 6.50 per 1,000 gal (Maximum of Phased Costs)

This project will include 15 200gpm wells drilled to 1,100ft with 200 ft of 4 inch diameter transmission pipeline per well.

WUG: Childress Creek

Strategy: Trinity Well Rehab

Source: Trinity Aquifer

Facilities: Rehab Costs

Total Capital Cost:	$10,000
Total Project Cost:	$15,000
Total Annual Cost:	$1,000
Available Project Yield:	161 acft/yr
Annual Cost of Water:	$ 6 per acft/yr or $0.2 per 1,000 gal

This project will involve the rehab of one 100 gpm well.

12.3.3 Brazos County

WUG: Wellbourne SUD

Strategy: Trinity Aquifer Development

Source: Trinity Aquifer

Facilities: Well Field, collection pipes, transmission and treatment

Total Capital Cost: $11,423,000

Total Project Cost: $16,016,000

Total Annual Cost: $2,548,000 (Maximum of Phased Costs)

Available Project Yield: 3,226 acft/yr (After Full Implementation)

Annual Cost of Water: $ 790 per acft/yr or $2.42 per 1,000 gal (Maximum of Phased Costs)

This project will include four 1,000 gpm wells drilled to 2,000 ft as well as 800 ft of transmission pipeline and, disinfection treatment.

WUG: Brazos County Manufacturing

Strategy: Gulf Coast Aquifer Development

Source: Gulf Coast Aquifer

Facilities: Well Field, collection pipes, treatment

Total Capital Cost: $6,319,000

Total Project Cost: $8,932,000

Total Annual Cost: $961,727 (Maximum of Phased Costs)

Available Project Yield: 530 acft/yr (After Full Implementation)

Annual Cost of Water: $ 1,815 per acft/yr or $5.57 per 1,000 gal (Maximum of Phased Costs)

This project will include fifteen100 gpm wells drilled to 1,100 ft as well as 200 ft of transmission pipeline per well and disinfection treatment.

12.3.4 Burleson County

WUG: Burleson County Manufacturing

Strategy: Sparta Aquifer Development

Source: Sparta Aquifer

Facilities: Well Field, collection pipes, treatment

Total Capital Cost: $656,000

Total Project Cost: $932,000

Total Annual Cost: $107,534 (Maximum of Phased Costs)

Available Project Yield: 85 acft/yr (After 2030)

Annual Cost of Water: $ 1,265 per acft/yr or $3.88 per 1,000 gal (Maximum of Phased Costs)

This project will include two 150 gpm wells drilled to 500 ft as well as 200 ft of transmission pipeline per well and disinfection treatment.

WUG: Burleson County Mining

Strategy: Sparta Aquifer Development

Source: Sparta Aquifer

Facilities: Well Field, collection pipes

Total Capital Cost: $3,904,000

Total Project Cost: $5,466,000

Total Annual Cost: $501,602 (Maximum of Phased Costs)

Available Project Yield: 740 acft/yr (After 2030)

Annual Cost of Water: $ 678 per acft/yr or $2.08 per 1,000 gal (Maximum of Phased Costs)

This project will include fourteen 150 gpm wells drilled to 500 ft as well as 200 ft of transmission pipeline per well.

12.3.5 Callahan County

WUG: Callahan County Mining

Strategy: Trinity Aquifer Development

Source: Trinity Aquifer

Facilities: Well Field, collection pipes,

Total Capital Cost: $1,208,000

Total Project Cost: $1,695,000

Total Annual Cost: $155,732 (Maximum of Phased Costs)

Available Project Yield: 740 acft/yr

Annual Cost of Water: $ 692 per acft/yr or $2.12 per 1,000 gal (Maximum of Phased Costs)

This project will include seven 100 gpm wells drilled to 300 ft as well as 200 ft of transmission pipeline per well .

12.3.6 Comanche County

WUG: Comanche County Other

Strategy: Trinity Aquifer Development

Source: Trinity Aquifer

Facilities: Well Field, collection pipes, transmission and treatment

Total Capital Cost: $1,446,000

Total Project Cost: $2,033,000

Total Annual Cost: $149,000 (Maximum of Phased Costs)

Available Project Yield: 242 acft/yr (After Full Implementation)

Annual Cost of Water: $ 924 per acft/yr or $2.83 per 1,000 gal (Maximum of Phased Costs)

This project will include three 100 gpm wells drilled to 600 ft as well as 600 ft of transmission pipeline and, disinfection treatment.

WUG: Comanche County Mining

Strategy: Trinity Aquifer Development

Source: Trinity Aquifer

Facilities: Well Field, collection pipes

Total Capital Cost: $3,195,000

Total Project Cost: $4,475,000

Total Annual Cost: $411,796 (Maximum of Phased Costs)

Available Project Yield: 473 acft/yr

Annual Cost of Water: $ 871 per acft/yr or $2.67 per 1,000 gal (Maximum of Phased Costs)

This project will include thirteen 100 gpm wells drilled to 600 ft as well as 200 ft of transmission pipeline per well .

WUG: Comanche County Irrigation

Strategy: Trinity Aquifer Development

Source: Trinity Aquifer

Facilities: Well Field, collection pipes

Total Capital Cost: $7,865,000

Total Project Cost: $11,015,000

Total Annual Cost: $1,004,806 (Maximum of Phased Costs)

Available Project Yield: 603 acft/yr

Annual Cost of Water: $ 1,666 per acft/yr or $5.11 per 1,000 gal (Maximum of Phased Costs)

This project will include thirty-two 100 gpm wells drilled to 600 ft as well as 200 ft of transmission pipeline per well .

12.3.7 Coryell County

WUG: Coryell County Other

Strategy: Trinity Aquifer Development

Source: Trinity Aquifer

Facilities: Well Field, transmission and treatment

Total Capital Cost: $3,147,000

Total Project Cost: $4,428,000

Total Annual Cost: $488,806 (Maximum of Phased Costs)

Available Project Yield: 565 acft/yr (After Full Implementation)

Annual Cost of Water: $ 931 per acft/yr or $ 2.86 per 1,000 gal (Maximum of Phased Costs)

This project will include seven brackish 100 gpm wells drilled to 200 ft, as well as 200 ft of transmission pipeline per well and disinfection.

WUG: Coryell County Mining

Strategy: Trinity Aquifer Development

Source: Trinity Aquifer

Facilities: Well Field, collection pipes

Total Capital Cost: $14,447,000

Total Project Cost: $20,220,000

Total Annual Cost: $1,853,751 (Maximum of Phased Costs)

Available Project Yield: 1,500 acft/yr

Annual Cost of Water: $ 1,236 per acft/yr or $3.79 per 1,000 gal (Maximum of Phased Costs)

This project will include thirteen 100 gpm wells drilled to 200 ft as well as 200 ft of transmission pipeline per well .

12.3.8 Eastland County

WUG: Eastland County Irrigation

Strategy: Trinity Aquifer Development (Erath County)

Source: Trinity Aquifer

Facilities: Well Field, collection pipes

Total Capital Cost: $17,291,000

Total Project Cost: $24,210,000

Total Annual Cost: $2,213,162 Maximum of Phased Costs)

Available Project Yield: 2,033 acft/yr

Annual Cost of Water: $ 1,089 per acft/yr or $3.34 per 1,000 gal (Maximum of Phased Costs)

This project will include 62: 150 gpm wells drilled to 500 ft as well as 200 ft of transmission pipeline per well .

WUG: Eastland County Mining

Strategy: Trinity Aquifer Development (Erath County)

Source: Trinity Aquifer

Facilities: Well Field, collection pipes

Total Capital Cost: $5,857,000

Total Project Cost: $8,202,000

Total Annual Cost: $758,354 (Maximum of Phased Costs)

Available Project Yield: 1,150 acft/yr

Annual Cost of Water: $ 560 per acft/yr or $1.72 per 1,000 gal (Maximum of Phased Costs)

This project will include 21: 150 gpm wells drilled to 500 ft as well as 200 ft of transmission pipeline per well .

12.3.9 Erath County

WUG: Erath County Other

Strategy: Trinity Aquifer Development

Source: Trinity Aquifer

Facilities: Well Field, collection pipes, transmission and treatment

Total Capital Cost: $1,488,000

Total Project Cost: $2,195,000

Total Annual Cost: $247,000 (Maximum of Phased Costs)

Available Project Yield: 363 acft/yr (After Full Implementation)

Annual Cost of Water: $ 681 per acft/yr or $2.09 per 1,000 gal (Maximum of Phased Costs)

This project will include three 150 gpm wells drilled to 500 ft as well as 600 ft of transmission pipeline and, disinfection treatment.

12.3.10 Falls County

WUG: Tri-County SUD

Strategy: Carrizo Aquifer Development

Source: Carrizo Aquifer

Facilities: Well Field, transmission and treatment

Total Capital Cost: $ 1,030,000

Total Project Cost: $1,445,000

Total Annual Cost: $268,000

Available Project Yield: 202 acft/yr

Annual Cost of Water: $ 1,329 per acft/yr or $ 4.08 per 1,000

This project will include one 250 gpm wells drilled to 550ft, 200ft of 4 inch diameter transmission pipeline, and Chlorine disinfection.

WUG: West Brazos WSC

Strategy: Carrizo Aquifer Development

Source: Carrizo Aquifer

Facilities: Well Field, collection pipes, transmission and treatment

Total Capital Cost: $1,965,000

Total Project Cost: $2,752,000

Total Annual Cost: $292,010 (Maximum of Phased Costs)

Available Project Yield: 216 acft/yr (After Full Implementation)

Annual Cost of Water: $ 1,446 per acft/yr or $4.44 per 1,000 gal (Maximum of Phased Costs)

This project will include two 250 gpm wells drilled to 2,000 ft as well as 400 ft of transmission pipeline and, disinfection treatment.

12.3.11 Fisher County

WUG: Fisher County Mining

Strategy: Trinity Aquifer Development

Source: Trinity Aquifer (Brackish)

Facilities: Well Field, collection pipes

Total Capital Cost: $2,159,000

Total Project Cost: $3,035,000

Total Annual Cost: $278,431 (Maximum of Phased Costs)

Available Project Yield: 400 acft/yr

Annual Cost of Water: $ 696 per acft/yr or $2.14 per 1,000 gal (Maximum of Phased Costs)

This project will include twenty-one 50 gpm wells drilled to 200 ft as well as 200 ft of transmission pipeline per well .

WUG: Fisher County Manufacturing

Strategy: Trinity Aquifer Development

Source: Trinity Aquifer (Brackish)

Facilities: Well Field, collection pipes, treatment, disposal

Total Capital Cost: $7,207,000

Total Project Cost: $10,081,000

Total Annual Cost: $1,517,030 (Maximum of Phased Costs)

Available Project Yield: 400 acft/yr

Annual Cost of Water: $ 14,040 per acft/yr or $43.08 per 1,000 gal (Maximum of Phased Costs)

This project will include eight 50 gpm wells drilled to 200 ft as well as 200 ft of transmission pipeline per well and treatment/disposal.

12.3.12 Grimes County

WUG: Grimes County Mining

Strategy: Brackish Carrizo Aquifer Development

Source: Carrizo Aquifer

Facilities: Well Field, collection pipes

Total Capital Cost: $4,152,000

Total Project Cost: $5,805,000

Total Annual Cost: $881,856 (Maximum of Phased Costs)

Available Project Yield: 550 acft/yr (by 2030)

Annual Cost of Water: $ 1,764 per acft/yr or $5.41 per 1,000 gal (Maximum of Phased Costs)

This project will include five 300 gpm wells drilled to 3000 ft as well as 200 ft of transmission pipeline per well .

WUG: Grimes County Steam-Electric

Strategy: Gulf Coast Development

Source: Gulf Coast Aquifer

Facilities: Well Field, collection pipes, treatment

Total Capital Cost: $15,869,000

Total Project Cost: $22,459,000

Total Annual Cost: $2,639,903 (Maximum of Phased Costs)

Available Project Yield: 6,236 acft/yr

Annual Cost of Water: $ 423 per acft/yr or $1.30 per 1,000 gal (Maximum of Phased Costs)

This project will include thirty-six 250 gpm wells drilled to 500 ft as well as 200 ft of transmission pipeline per well and disinfection .

WUG: Grimes County Steam-Electric

Strategy: Brackish Carrizo Aquifer Development

Source: Carrizo Aquifer

Facilities: Well Field, collection pipes, treatment

Total Capital Cost: $5,831,000

Total Project Cost: $8,182,000

Total Annual Cost: $1,081,979 (Maximum of Phased Costs)

Available Project Yield: 343 acft/yr

Annual Cost of Water: $ 2,971 per acft/yr or $9.12 per 1,000 gal (Maximum of Phased Costs)

This project will include four 300 gpm wells drilled to 3000 ft as well as 200 ft of transmission pipeline per well .

12.3.13 Hamilton County

WUG: Hamilton County Mining

Strategy: Trinity Aquifer Development

Source: Trinity Aquifer

Facilities: Well Field, collection pipes

Total Capital Cost: $1,952,000

Total Project Cost: $2,734,000

Total Annual Cost: $251,735 (Maximum of Phased Costs)

Available Project Yield: 370 acft/yr (by 2030)

Annual Cost of Water: $ 680 per acft/yr or $2.09 per 1,000 gal (Maximum of Phased Costs)

This project will include seven 150 gpm wells drilled to 500 ft as well as 200 ft of transmission pipeline per well .

WUG: Hamilton County Irrigation

Strategy: Trinity Aquifer Development

Source: Trinity Aquifer

Facilities: Well Field, collection pipes

Total Capital Cost: $837,000

Total Project Cost: $1,173,000

Total Annual Cost: $106,733 (Maximum of Phased Costs)

Available Project Yield: $60 acft/yr (by 2030)

Annual Cost of Water: $1,779 per acft/yr or $5.46 per 1,000 gal (Maximum of Phased Costs)

This project will include three 150 gpm wells drilled to 500 ft as well as 200 ft of transmission pipeline per well .

12.3.14 Hill County

WUG: Hill County Mining

Strategy: Woodbine Aquifer Development

Source: Woodbine Aquifer

Facilities: Well Field, collection pipes

Total Capital Cost: $3,343,000

Total Project Cost: $4,684,000

Total Annual Cost: $429,460 (Maximum of Phased Costs)

Available Project Yield: 550 acft/yr

Annual Cost of Water: $ 767 per acft/yr or $2.35 per 1,000 gal (Maximum of Phased Costs)

This project will include fifteen 100 gpm wells drilled to 500 ft as well as 200 ft of transmission pipeline per well .

12.3.15 Hood County

WUG: City of Cresson

Strategy: Groundwater Development – Trinity Aquifer

Source: Trinity Aquifer

Facilities: Well Field, collection pipes, transmission and treatment

Total Capital Cost: $540,000

Total Project Cost: $771,000

Total Annual Cost: $93,379 (Maximum of Phased Costs)

Available Project Yield: 60 acft/yr

Annual Cost of Water: $1,556 per acft/yr or $4.78 per 1,000 gal

This project will include two 150 gpm wells drilled to 600ft, 1,400ft of 4 inch diameter transmission pipeline, and Chlorine disinfection.

WUG: City of Tolar

Strategy: Trinity Aquifer Well Rehab

Source: Trinity Aquifer

Facilities: Well Field, collection pipes, transmission and treatment

Total Capital Cost: $20,000

Total Project Cost: $30,000

Total Annual Cost: $1,100 (Maximum of Phased Costs)

Available Project Yield: 24 acft/yr (After Full Implementation)

Annual Cost of Water: $91 per acft/yr or $0.28 per 1,000 gal (Maximum of Phased Costs)

This project will include the rehab of two 100 gpm well.

WUG: Hood County Other

Strategy: Trinity Aquifer Development

Source: Trinity Aquifer

Facilities: Well Field, transmission and treatment

Total Capital Cost: $4,372,000

Total Project Cost: $6,164,000

Total Annual Cost: $680,000

Available Project Yield: 605 acft/yr

Annual Cost of Water: $ 703 per acft/yr or $ 2.16 per 1,000

This project will include eight 150 gpm wells drilled to 600ft, 1,400ft of 4 inch diameter transmission pipeline, and Chlorine disinfection.

WUG: Hood County Mining

Strategy: Trinity Aquifer Development

Source: Trinity Aquifer

Facilities: Well Field, collection pipes

Total Capital Cost:	$4,423,000
Total Project Cost:	$6,197,000
Total Annual Cost:	$569,308 (Maximum of Phased Costs)
Available Project Yield:	1,120 acft/yr
Annual Cost of Water:	$ 508 per acft/yr or $1.56 per 1,000 gal (Maximum of Phased Costs)

This project will include twenty 150 gpm wells drilled to 300 ft as well as 200 ft of transmission pipeline per well .

12.3.16 Johnson County

WUG: City of Godley

Strategy: Woodbine Aquifer Development

Source: Woodbine Aquifer

Facilities: Well Field, collection pipes, transmission and treatment

Total Capital Cost:	$263,000
Total Project Cost:	$375,000
Total Annual Cost:	$44,206 (Maximum of Phased Costs)
Available Project Yield:	216 acft/yr (After Full Implementation)
Annual Cost of Water:	$ 1,474 per acft/yr or $4.52 per 1,000 gal (Maximum of Phased Costs)

This project will include one 100 gpm wells drilled to 500 ft as well as 200 ft of transmission pipeline per well, and disinfection treatment.

WUG: Parker WSC

Strategy: Woodbine Aquifer Development

Source: Woodbine Aquifer

Facilities: Well Field, collection pipes, transmission and treatment

Total Capital Cost:	$791,000
Total Project Cost:	$1,128,000
Total Annual Cost:	$132,617 (Maximum of Phased Costs)
Available Project Yield:	180 acft/yr (After Full Implementation)
Annual Cost of Water:	$ 737 per acft/yr or $2.26 per 1,000 gal (Maximum of Phased Costs)

This project will include three 100 gpm wells drilled to 500 ft as well as 200 ft of transmission pipeline per well, and disinfection treatment

WUG: City of Rio Vista

Strategy: Woodbine Aquifer Development

Source: Woodbine Aquifer

Facilities: Well Field, collection pipes, transmission and treatment

Total Capital Cost: $528,000

Total Project Cost: $753,000

Total Annual Cost: $88,411 (Maximum of Phased Costs)

Available Project Yield: 75 acft/yr (After Full Implementation)

Annual Cost of Water: $ 1,179 per acft/yr or $3.62 per 1,000 gal (Maximum of Phased Costs)

This project will include two 100 gpm wells drilled to 500 ft as well as 200 ft of transmission pipeline per well, and disinfection treatment.

WUG: City of Venus

Strategy: Woodbine Aquifer Development

Source: Woodbine Aquifer

Facilities: Well Field, collection pipes, transmission and treatment

Total Capital Cost: $1,055,000

Total Project Cost: $1,503,000

Total Annual Cost: $207,234 (Maximum of Phased Costs)

Available Project Yield: 450 acft/yr (After Full Implementation)

Annual Cost of Water: $ 589 per acft/yr or $1.81 per 1,000 gal (Maximum of Phased Costs)

This project will include six 100 gpm wells drilled to 500 ft as well as 200 ft of transmission pipeline per well, and disinfection treatment.

WUG: Johnson County Mining

Strategy: Woodbine Aquifer Development

Source: Woodbine Aquifer

Facilities: Well Field, collection pipes, transmission

Total Capital Cost: $3,343,000

Total Project Cost: $4,684,000

Total Annual Cost: $437,051 (Maximum of Phased Costs)

Available Project Yield: 1,140 acft/yr (After Full Implementation)

Annual Cost of Water: $ 383 per acft/yr or $1.18 per 1,000 gal

This project will include six 100 gpm wells drilled to 500 ft as well as 200 ft of transmission pipeline per well.

12.3.17 Knox County

WUG: Knox County Irrigation

Strategy: Blaine Aquifer Development

Source: Blaine Aquifer

Facilities: Well Field, collection pipes

Total Capital Cost: $1,737,000

Total Project Cost: $2,436,000

Total Annual Cost: $222,054 (Maximum of Phased Costs)

Available Project Yield: 461 acft/yr

Annual Cost of Water: $482 per acft/yr or $1.48 per 1,000 gal (Maximum of Phased Costs)

This project will include elleven 100 gpm wells drilled to 250 ft as well as 200 ft of transmission pipeline per well .

WUG: Knox County Irrigation

Strategy: Seymour Aquifer Development

Source: Seymour Aquifer

Facilities: Well Field, collection pipes

Total Capital Cost: $7,005,000

Total Project Cost: $9,817,000

Total Annual Cost: $896,747 (Maximum of Phased Costs)

Available Project Yield: 1,571 acft/yr

Annual Cost of Water: $571 per acft/yr or $1.75 per 1,000 gal (Maximum of Phased Costs)

This project will include thirty-six 200 gpm wells drilled to 250 ft as well as 200 ft of transmission pipeline per well.

WUG: Knox County Mining

Strategy: Blaine Aquifer Development

Source: Blaine Aquifer

Facilities: Well Field, collection pipes

Total Capital Cost: $158,000

Total Project Cost: $223,000

Total Annual Cost: $20,815 (Maximum of Phased Costs)

Available Project Yield: 15 acft/yr

Annual Cost of Water: $1,388 per acft/yr or $4.26 per 1,000 gal (Maximum of Phased Costs)

This project will include one 100 gpm wells drilled to 250 ft as well as 200 ft of transmission pipeline per well .

12.3.18 Lampasas County

WUG: Lampasas County Irrigation

Strategy: Trinity Aquifer Development

Source: Trinity Aquifer

Facilities: Well Field, collection pipes

Total Capital Cost: $2,175,000

Total Project Cost: $3,049,000

Total Annual Cost: $278,636 (Maximum of Phased Costs)

Available Project Yield: 210 acft/yr

Annual Cost of Water: $1,327 per acft/yr or $4.07 per 1,000 gal (Maximum of Phased Costs)

This project will include eleven 100 gpm wells drilled to 400 ft as well as 200 ft of transmission pipeline per well.

WUG: Lampasas County Mining

Strategy: Trinity Aquifer Development

Source: Trinity Aquifer

Facilities: Well Field, collection pipes

Total Capital Cost: $1,582,000

Total Project Cost: $2,219,000

Total Annual Cost: $204,252 (Maximum of Phased Costs)

Available Project Yield: 275 acft/yr

Annual Cost of Water: $743 per acft/yr or $2.28 per 1,000 gal (Maximum of Phased Costs)

This project will include eight 100 gpm wells drilled to 400 ft as well as 200 ft of transmission pipeline per well.

12.3.19 Lee County

WUG: Heart of Texas

Strategy: Carrizo Aquifer Development

Source: Carrizo Aquifer

Facilities: Well Field, collection pipes, transmission and treatment

Total Capital Cost: $81,194,000

Total Project Cost: $127,086,000

Total Annual Cost: $9,054,000 (Maximum of Phased Costs)

Available Project Yield: 11,994 acft/yr (After Full Implementation)

Annual Cost of Water: $ 1,619 per acft/yr or $4.97 per 1,000 gal (Maximum of Phased Costs)

This project will include five 1000 gpm wells drilled to 2000 ft as well as 25 miles of transmission pipeline, two pump stations, and disinfection treatment.

12.3.20 Limestone County

WUG: Bistone Municipal WSD

Strategy: Carrizo Aquifer Development

Source: Carrizo Aquifer

Facilities: Well Field, collection pipes, transmission and treatment

Total Capital Cost: $16,148,000

Total Project Cost: $22,689,000

Total Annual Cost: $2,541,878 (Maximum of Phased Costs)

Available Project Yield: 3,112 acft/yr (After Full Implementation)

Annual Cost of Water: $ 817 per acft/yr or $2.51 per 1,000 gal (Maximum of Phased Costs)

This project will include two 100 gpm wells drilled to 500 ft as well as 200 ft of transmission pipeline per well, and disinfection treatment.

WUG: Limestone County Mining

Strategy: Carrizo Aquifer Development

Source: Carrizo Aquifer (Brazos Basin)

Facilities: Well Field, collection pipes

Total Capital Cost: $22,552,000

Total Project Cost: $31,546,000

Total Annual Cost: $2,898,125 (Maximum of Phased Costs)

Available Project Yield: 4,806 acft/yr

Annual Cost of Water: $603 per acft/yr or $1.85 per 1,000 gal (Maximum of Phased Costs)

This project will include forty-three 300 gpm wells drilled to 800 ft as well as 200 ft of transmission pipeline per well .

WUG: Limestone County Mining

Strategy: Carrizo Aquifer Development

Source: Carrizo Aquifer (Trinity Basin)

Facilities: Well Field, collection pipes

Total Capital Cost: $4,196,000

Total Project Cost: $5,871,000

Total Annual Cost: $538,837 (Maximum of Phased Costs)

Available Project Yield: 888 acft/yr

Annual Cost of Water: $607 per acft/yr or $1.86 per 1,000 gal (Maximum of Phased Costs)

This project will include eight 300 gpm wells drilled to 800 ft as well as 200 ft of transmission pipeline per well.

12.3.21 McLennan County

WUG: McLennan County Irrigation

Strategy: Brazos River Alluvium Development

Source: Brazos River Alluvium

Facilities: Well Field, collection pipes

Total Capital Cost: $11,953,000

Total Project Cost: $16,763,000

Total Annual Cost: $1,531,732 (Maximum of Phased Costs)

Available Project Yield: 2,200 acft/yr

Annual Cost of Water: $696 per acft/yr or $2.14 per 1,000 gal (Maximum of Phased Costs)

This project will include seventy-seven 150 gpm wells drilled to 100ft as well as 200 ft of transmission pipeline per well.

WUG: McLennan County Irrigation

Strategy: Trinity Aquifer Development

Source: Trinity Aquifer

Facilities: Well Field, collection pipes

Total Capital Cost: $8,201,000

Total Project Cost: $11,477,000

Total Annual Cost: $1,047,405 (Maximum of Phased Costs)

Available Project Yield: 1,000 acft/yr

Annual Cost of Water: $1,047 per acft/yr or $3.21 per 1,000 gal (Maximum of Phased Costs)

This project will include twenty-one 250 gpm wells drilled to 550ft as well as 200 ft of transmission pipeline per well.

WUG: McLennan County Mining

Strategy: Brazos River Alluvium Development

Source: Brazos River Alluvium

Facilities: Well Field, collection pipes

Total Capital Cost: $5,123,000

Total Project Cost: $7,185,000

Total Annual Cost: $708,732 (Maximum of Phased Costs)

Available Project Yield: 2,900 acft/yr (by 2070)

Annual Cost of Water: $364 per acft/yr or $1.12 per 1,000 gal (Maximum of Phased Costs)

This project will include seventy-seven 150 gpm wells drilled to 100ft as well as 200 ft of transmission pipeline per well.

12.3.22 Nolan County

WUG: Nolan County Mining

Strategy: Edwards-Trinity Development

Source: Edwards-Trinity Aquifer

Facilities: Well Field, collection pipes

Total Capital Cost: $1,745,000

Total Project Cost: $2,448,000

Total Annual Cost: $223,861 (Maximum of Phased Costs)

Available Project Yield: 220 acft/yr (by 2070)

Annual Cost of Water: $1,018 per acft/yr or $3.12 per 1,000 gal (Maximum of Phased Costs)

This project will include twelve 50 gpm wells drilled to 400ft as well as 200 ft of transmission pipeline per well.

12.3.23 Robertson County

WUG: Robertson County Other

Strategy: Carrizo Aquifer Development

Source: Carrizo Aquifer

Facilities: Well Field, transmission and treatment

Total Capital Cost: $588,000

Total Project Cost: $825,000

Total Annual Cost: $87,000

Available Project Yield: 81 acft/yr

Annual Cost of Water: $ 1,079 per acft/yr or $ 3.31 per 1,000

This project will include one 100 gpm wells drilled to 1000 ft, 200 ft of 4 inch diameter transmission pipeline, and Chlorine disinfection.

WUG: Robertson County Irrigation

Strategy: Carrizo Aquifer Development

Source: Carrizo Aquifer

Facilities: Well Field, collection pipes

Total Capital Cost: $91,556,000

Total Project Cost: $128,018,000

Total Annual Cost: $11,713,251 (Maximum of Phased Costs)

Available Project Yield: 16,143 acft/yr

Annual Cost of Water: $726 per acft/yr or $2.23 per 1,000 gal (Maximum of Phased Costs)

This project will include 113: 750 gpm wells drilled to 1,000 ft as well as 200 ft of transmission pipeline per well.

12.3.24 Shackelford County

WUG: Shackelford County Mining

Strategy: Other Aquifer Development

Source: Other Aquifer

Facilities: Well Field, collection pipes

Total Capital Cost: $5,750,000

Total Project Cost: $8,095,000

Total Annual Cost: $741,015 (Maximum of Phased Costs)

Available Project Yield: 710 acft/yr

Annual Cost of Water: $1,044 per acft/yr or $3.20 per 1,000 gal (Maximum of Phased Costs)

This project will include seventy-six 25 gpm wells drilled to 200 ft as well as 200 ft of transmission pipeline per well.

12.3.25 Somervell County

WUG: Somervell County Mining

Strategy: Trinity Aquifer Development

Source: Trinity Aquifer

Facilities: Well Field, collection pipes

Total Capital Cost: $2,500,000

Total Project Cost: $3,502,000

Total Annual Cost: $320,542 (Maximum of Phased Costs)

Available Project Yield: 550 acft/yr

Annual Cost of Water: $583 per acft/yr or $1.79 per 1,000 gal (Maximum of Phased Costs)

This project will include ten 150 gpm wells drilled to 400 ft as well as 200 ft of transmission pipeline per well.

WUG: Somervell County Steam-Electric

Strategy: BRA System Operations

Source: Brazos River

Facilities: Intakes, pump stations, and transmission lines for makeup and blowdown lines

Total Capital Cost:	$89,493,000
Total Project Cost:	$128,162,000
Total Annual Cost:	$22,866,000 (Maximum of Phased Costs)
Available Project Yield:	103,717 acft/yr
Annual Cost of Water:	$285 per acft/yr or $0.87 per 1,000 gal (Maximum of Phased Costs)

The project will include two 12-mile, 42-inch makeup lines for the Comanche Peak Cooling Tower from Lake Granbury and two 12-mile, 36-in blowdown lines. The 103,717 acft/yr of yield includes existing Luminant contract supplies from BRA of 27,447 acft/yr and 76,270 acft/yr of new supplies from Sys-Ops.

12.3.26 Stephens County

WUG: Stephens County Irrigation

Strategy: Other Aquifer Development

Source: Other Aquifer

Facilities: Well Field, collection pipes

Total Capital Cost:	$454,000
Total Project Cost:	$640,000
Total Annual Cost:	$58,592 (Maximum of Phased Costs)
Available Project Yield:	26 acft/yr
Annual Cost of Water:	$2,254 per acft/yr or $6.91 per 1,000 gal (Maximum of Phased Costs)

This project will include six 25 gpm wells drilled to 200 ft as well as 200 ft of transmission pipeline per well.

12.3.27 Stonewall County

WUG: Stonewall County Mining

Strategy: Blaine Aquifer Development

Source: Blaine Aquifer

Facilities: Well Field, collection pipes

Total Capital Cost:	$2,444,000
Total Project Cost:	$3,434,000
Total Annual Cost:	$316,023 (Maximum of Phased Costs)
Available Project Yield:	400 acft/yr
Annual Cost of Water:	$790 per acft/yr or $2.42 per 1,000 gal (Maximum of Phased Costs)

This project will include twenty-two 50 gpm wells drilled to 250 ft as well as 200 ft of transmission pipeline per well.

12.3.28 Throckmorton County

WUG: Throckmorton County Mining

Strategy: Other Aquifer Development

Source: Other Aquifer

Facilities: Well Field, collection pipes

Total Capital Cost: $1,664,000

Total Project Cost: $2,344,000

Total Annual Cost: $214,373 (Maximum of Phased Costs)

Available Project Yield: 200 acft/yr

Annual Cost of Water: $1,072 per acft/yr or $3.29 per 1,000 gal (Maximum of Phased Costs)

This project will include twenty-two 25 gpm wells drilled to 200 ft as well as 200 ft of transmission pipeline per well.

12.3.29 Washington County

WUG: Washington County Manufacturing

Strategy: Gulf Coast Aquifer Development

Source: Gulf Coast Aquifer

Facilities: Well Field, collection pipes, disinfection

Total Capital Cost: $2,374,000

Total Project Cost: $3,380,000

Total Annual Cost: $393,990 (Maximum of Phased Costs)

Available Project Yield: 326 acft/yr

Annual Cost of Water: $ 1,209 per acft/yr or $3.71 per 1,000 gal (Maximum of Phased Costs)

This project will include nine 100 gpm wells drilled to 500 ft as well as 200 ft of transmission pipeline per well and disinfection.

WUG: Washington County Mining

Strategy: Gulf Coast Aquifer Development

Source: Gulf Coast Aquifer

Facilities: Well Field, collection pipes

Total Capital Cost: $4,457,000

Total Project Cost: $6,245,000

Total Annual Cost: $571,931 (Maximum of Annual Costs)

Available Project Yield: 823 acft/yr

Annual Cost of Water: $ 695 per acft/yr or $2.13 per 1,000 gal (Maximum of Phased Costs)

This project will include twenty 100 gpm wells drilled to 500 ft as well as 200 ft of transmission pipeline per well

12.3.30 Williamson County

WUG: Bartlett

Strategy: Brackish Trinity Aquifer Development

Source: Bell County- Trinity Aquifer

Facilities: Well Field, transmission and treatment

Total Capital Cost: $7,454,000

Total Project Cost: $10,428,000

Total Annual Cost: $1,388,000 (Maximum of Phased Costs)

Available Project Yield: 645 acft/yr (After Full Implementation)

Annual Cost of Water: $ 2,827 per acft/yr or $ 8.68 per 1,000 gal (Maximum of Phased Costs)

This project will include two brackish 400 gpm wells drilled to 2,500 ft, 400ft of 4 inch diameter transmission pipeline, brackish desalination, and disposal of concentrate at a landfill.

WUG: Brushy Creek MUD

Strategy: Edwards BFZ Aquifer Development

Source: Edwards BFZ Aquifer

Facilities: Well Field, transmission and treatment

Total Capital Cost: $124,000

Total Project Cost: $182,000

Total Annual Cost: $23,028

Available Project Yield: 12 acft/yr (After Full Implementation)

Annual Cost of Water: $ 1,919 per acft/yr or $ 5.89 per 1,000

This project will include one 50 gpm wells drilled to 200ft, 200ft of 4 inch diameter transmission pipeline, and treatment.

WUG: Florence

Strategy: Edwards BFZ Aquifer Development

Source: Edwards BFZ Aquifer

Facilities: Well Field, transmission and treatment

Total Capital Cost: $150,000

Total Project Cost: $218,000

Total Annual Cost: $26,226

Available Project Yield: 24 acft/yr (After Full Implementation)

Annual Cost of Water: $ 1,093 per acft/yr or $ 3.35 per 1,000

This project will include one 50 gpm wells drilled to 300ft, 200ft of 4 inch diameter transmission pipeline, and treatment.

WUG: Florence

Strategy: Brackish Trinity Aquifer Development (Bell)

Source: Bell County- Trinity Aquifer

Facilities: Well Field, transmission and treatment

Total Capital Cost: $2,608,000

Total Project Cost: $3,778,000

Total Annual Cost: $701,000

Available Project Yield: 121 acft/yr (After Full Implementation)

Annual Cost of Water: $ 5,795 per acft/yr or $ 17.78 per 1,000

This project will include one brackish 400 gpm wells drilled to 2,500ft, 200ft of 4 inch diameter transmission pipeline per well, brackish desalination, and disposal of concentrate at a landfill.

WUG: Williamson County Irrigation

Strategy: Edwards Aquifer Development

Source: Edwards Aquifer

Facilities: Well Field, collection pipes

Total Capital Cost: $868,000

Total Project Cost: $1,220,000

Total Annual Cost: $110,802 (Maximum of Phased Costs)

Available Project Yield: 66 acft/yr

Annual Cost of Water: $1,679 per acft/yr or $5.15 per 1,000 gal (Maximum of Phased Costs)

This project will include seven 50 gpm wells drilled to 300ft as well as 200 ft of transmission pipeline per well.

12.3.31 Young County

WUG: Young County Mining

Strategy: Other Aquifer Development

Source: Other Aquifer

Facilities: Well Field, collection pipes

Total Capital Cost: $2,194,000

Total Project Cost: $3,089,000

Total Annual Cost: $282,900

Available Project Yield: 270 acft/yr

Annual Cost of Water: $1,048 per acft/yr or $3.22 per 1,000 gal (Maximum of Phased Costs)

This project will include twenty-nine 25 gpm wells drilled to 200 ft as well as 200 ft of transmission pipeline per well.

WUG: Young County Irrigation

Strategy: Other Aquifer Development

Source: Other Aquifer

Facilities: Well Field, collection pipes

Total Capital Cost: $832,000

Total Project Cost: $1,172,000

Total Annual Cost: $107,418 (Maximum of Phased Costs)

Available Project Yield: 50 acft/yr

Annual Cost of Water: $2,148 per acft/yr or $6.59 per 1,000 gal (Maximum of Phased Costs)

This project will include eleven 25 gpm wells drilled to 200 ft as well as 200 ft of transmission pipeline per well.

12.4 Miscellaneous Purchases, Interconnects & Reallocations

12.4.1 Bell County

WUG: City of Harker Heights

Strategy: Additional Purchase from BRA

Source: BRA

Facilities: None, existing infrastructure assumed sufficient

Total Capital Cost: N/A

Total Project Cost: N/A

Total Annual Cost: $109,701 (Maximum of Phased Costs)

Available Project Yield: 1,671 acft/yr

Annual Cost of Water: $ 65.65 per acft/yr or $ 0.20 per 1,000 gal (BRA Wholesale Costs)

This project will include a contract increase of up to 1,671 additional acft/yr utilizing existing infrastructure from BRA to the City of Harker Heights.

WUG: City of Harker Heights

Strategy: Purchase water from City of Killeen

Source: City of Killeen

Facilities: Pump Station, storage tank, transmission pipeline

Total Capital Cost: $1,670,000

Total Project Cost: $2,580,000

Total Annual Cost: $541,000 (Maximum of Phased Costs)

Available Project Yield: 302 acft/yr

Annual Cost of Water: $ 1,791 per acft/yr or $ 5.50 per 1,000 gal

This project will include an interconnection between the City of Killeen and the City of Harker Heights including six miles of 6 inch diameter transmission pipeline, a pump station and storage tank. Water will be purchased from the City of Killeen at an estimated wholesale rate of $977/acft. Project costs to be shared between the two entities.

WUG: City of Nolanville

Strategy: Voluntary Redistribution of Supplies from Bell WCID #1

Source: Bell WCID #1

Facilities: None, existing infrastructure assumed sufficient

Total Capital Cost: N/A

Total Project Cost: N/A

Total Annual Cost: $202,110 (Maximum of Phased Costs)

Available Project Yield: 1,088 acft/yr

Annual Cost of Water: $ 185.76 per acft/yr or $ 0.58 per 1,000 gal (Bell County WCID #1 Wholesale Costs)

This project will include a contract increase of up to 1,088 additional acft/yr utilizing existing infrastructure from Bell County WCID #1 to the City of Nolanville.

WUG: Little River Academy

Strategy: Voluntary Redistribution of Supplies from the City of Temple

Source: Temple

Facilities: None, existing infrastructure assumed sufficient

Total Capital Cost: N/A

Total Project Cost: N/A

Total Annual Cost: $175,860 (Maximum of Phased Costs)

Available Project Yield: 180 acft/yr

Annual Cost of Water: $ 977 per acft/yr or $ 3.03 per 1,000 gal (Assumed Temple Wholesale Costs)

This project will include a contract increase of up to 180 additional acft/yr utilizing existing infrastructure from the City of Temple to Little River Academy

WUG: Bell County-Other

Strategy: Voluntary Redistribution from Central Texas WSC

Source: Central Texas WSC

Facilities: None, existing infrastructure assumed sufficient

Total Capital Cost: N/A

Total Project Cost: N/A

Total Annual Cost: $125,000

Available Project Yield: 500 acft/yr

Annual Cost of Water: $ 250 per acft/yr or $ 0.78 per 1,000 gal (Assumed Redistribution Cost)

This project will include a contract increase of up to 500 additional acft/yr utilizing existing infrastructure from Central Texas WSC to Bell County-Other.

WUG: Bell County-Other

Strategy: Purchase Additional Supply from Bell County WCID #1

Source: Bell County WCID #1

Facilities: None, existing infrastructure assumed sufficient

Total Capital Cost: N/A

Total Project Cost: N/A

Total Annual Cost: $185,036

Available Project Yield: 995 acft/yr

Annual Cost of Water: $ 185.76 per acft/yr or $ 0.58 per 1,000 gal (Bell County WCID #1 Wholesale Costs)

This project will include a contract increase of up to 919 additional acft/yr in 2070 utilizing existing infrastructure from Bell County WCID #1 to Bell County-Other. For these supplies to be made available would require a reallocation of contract with Killeen.

12.4.2 Brazos County

WUG: City of College Station

Strategy: Purchase water from BRA

Source: BRA

Facilities: Pump Station, storage tank, transmission pipeline, WTP Upgrades

Total Capital Cost: $26,354,000

Total Project Cost: $37,109,000

Total Annual Cost: $6,388,000

Available Project Yield: 6,000 acft/yr

Annual Cost of Water: $ 1,065 per acft/yr or $ 3.27 per 1,000 gal

This project will include an interconnection between BRA and the City of College Station including four miles of 18 inch diameter transmission pipeline, a pump station storage tank, and WTP upgrades. Water will be purchased from the City of Killeen at an estimated wholesale rate of $56.65/acft. Project costs to be shared between the two entities.

WUG: Brazos County Irrigation

Strategy: Additional Purchase from BRA

Source: BRA

Facilities: None, existing infrastructure assumed sufficient

Total Capital Cost: N/A

Total Project Cost: N/A

Total Annual Cost: $669,630

Available Project Yield: 10,200 acft/yr

Annual Cost of Water: $ 185.76 per acft/yr or $ 0.58 per 1,000 gal (BRA Wholesale Costs)

This project will include a contract increase of up to 10,200 additional acft/yr utilizing existing infrastructure from BRA to Brazos County Irrigation.

WUG: Brazos County Manufacturing

Strategy: Purchase of water from Texas A&M

Source: Texas A&M

Facilities: Wholesale rate included only. Not enough information to cost delivery.

Total Capital Cost: N/A

Total Project Cost: N/A

Total Annual Cost: $1,367,800

Available Project Yield: 1,400 acft/yr

Annual Cost of Water: $ 977 per acft/yr or $ 3.03 per 1,000 gal

This project will include a contract for the purchase of water up to 1,400 acft/yr. Infrastructure such as pipelines, pump stations, and storage tanks will be needed once the location(s) of use are determined.

12.4.3 Burleson County

WUG: Burleson County Manufacturing

Strategy: Purchase of water from the City of Caldwell

Source: The City of Caldwell

Facilities: Wholesale rate included only. Not enough information to cost delivery.

Total Capital Cost: N/A

Total Project Cost: N/A

Total Annual Cost: $42,500

Available Project Yield: 85 acft/yr

Annual Cost of Water: $ 500 per acft/yr or $ 1.55 per 1,000

This project will include a contract for the purchase of water up to 85 acft/yr. Infrastructure such as pipelines, pump stations, and storage tanks will be needed once the location(s) of use are determined.

12.4.4 Coryell County

WUG: Coryell County-Other

Strategy: Additional Purchase from the City of Gatesville

Source: The City of Gatesville

Facilities: None, existing infrastructure assumed sufficient

Total Capital Cost: N/A

Total Project Cost: N/A

Total Annual Cost: $687,225

Available Project Yield: 525 acft/yr

Annual Cost of Water: $ 1,309 per acft/yr or $ 4.06 per 1,000 gal (City of Gatesville Wholesale Costs)

This project will include a contract increase of up to 525 additional acft/yr utilizing existing infrastructure from the City of Gatesville to Coryell County-Other.

WUG: Multi-County WSC

Strategy: Additional Purchase from the City of Hamilton

Source: The City of Hamilton

Facilities: None, existing infrastructure assumed sufficient

Total Capital Cost: N/A

Total Project Cost: N/A

Total Annual Cost: $25,000

Available Project Yield: 100 acft/yr

Annual Cost of Water: $ 250 per acft/yr or $ 0.78 per 1,000 gal (City of Hamilton Wholesale Costs)

This project will include a contract increase of up to 100 additional acft/yr utilizing existing infrastructure from the City of Hamilton to Multi-County WSC.

12.4.5 Falls County

WUG: Falls County Manufacturing

Strategy: Additional Purchase from the City of Marlin

Source: The City of Marlin

Facilities: None, existing infrastructure assumed sufficient

Total Capital Cost: N/A

Total Project Cost: N/A

Total Annual Cost: $1,522

Available Project Yield: 1 acft/yr

Annual Cost of Water: $ 1,522 per acft/yr or $ 4.72 per 1,000 gal (City of Marlin Wholesale Costs)

This project will include a contract increase of up to 1 additional acft/yr utilizing existing infrastructure from the City of Marlin to manufacturing entities.

12.4.6 Fisher County

WUG: City of Rotan

Strategy: Additional Purchase from the City of Snyder

Source: The City of Snyder

Facilities: None, existing infrastructure assumed sufficient

Total Capital Cost: N/A

Total Project Cost: N/A

Total Annual Cost: $74,252

Available Project Yield: 76 acft/yr

Annual Cost of Water: $ 977 per acft/yr or $ 3.03 per 1,000 gal (City of Snyder Wholesale Costs)

This project will include a contract increase of up to 76 additional acft/yr utilizing existing infrastructure from the City of Snyder to the City of Rotan.

12.4.7 Grimes County

WUG: Grimes County Steam-Electric

Strategy: Purchase of reuse supply from cities of College Station and Bryan

Source: Treated effluent from College Station and Bryan

Facilities: None

Total Capital Cost: N/A

Total Project Cost: N/A

Total Annual Cost: maximum of $3,336,100

Available Project Yield: varies by decade up to 11,056 acft/yr in 2070

Annual Cost of Water: $ 304 per acft/yr or $ 0.93 per 1,000 gal

This strategy provides available treated effluent to Grimes County Steam-Electric to meet future projected shortages. Supply will be made available at the WWTP. Infrastructure may be necessary to deliver these supplies.

12.4.8 Hood County

WUG: Hood County-Other

Strategy: Additional Purchase from Acton MUD

Source: Acton MUD

Facilities: None, existing infrastructure assumed sufficient

Total Capital Cost: N/A

Total Project Cost: N/A

Total Annual Cost: $946,000

Available Project Yield: 968 acft/yr

Annual Cost of Water: $ 977 per acft/yr or $ 3.03 per 1,000 gal (Acton MUD Wholesale Costs)

This project will include a contract increase of up to 968 additional acft/yr utilizing existing infrastructure from Acton MUD to entities in Hood County-Other.

12.4.9 Lampasas County

WUG: City of Lampasas

Strategy: Increase Treated Water Contract with Kempner WSC

Source: Kempner WSC

Facilities: None, existing infrastructure assumed sufficient

Total Capital Cost: N/A

Total Project Cost: N/A

Total Annual Cost: $252,500

Available Project Yield: 505 acft/yr

Annual Cost of Water: $ 500 per acft/yr or $ 1.55 per 1,000 gal (City of Lampasas Wholesale Costs)

This project will include a treated water contract increase of up to 505 additional acft/yr utilizing existing infrastructure from Kempner WSC to the City of Lampasas. The City already has a BRA contract for the raw water supply.

12.4.10 McLennan County

WUG: City of Bruceville-Eddy

Strategy: Additional Purchase from Bluebonnet WSC

Source: Bluebonnet WSC

Facilities: None, existing infrastructure assumed sufficient

Total Capital Cost: N/A

Total Project Cost: N/A

Total Annual Cost: $35,500

Available Project Yield: 71 acft/yr

Annual Cost of Water: $ 500 per acft/yr or $ 1.55 per 1,000 gal (Bluebonnet WSC Wholesale Costs)

This project will include a contract increase of up to 71 additional acft/yr utilizing existing infrastructure from Bluebonnet WSC to the City of Bruceville-Eddy.

WUG: Cross County WSC

Strategy: Purchase water from City of Waco

Source: City of Waco

Facilities: Pump Station, storage tank, transmission pipeline

Total Capital Cost: $1,672,000

Total Project Cost: $2,579,000

Total Annual Cost: $491,000

Available Project Yield: 150 acft/yr

Annual Cost of Water: $ 3,273 per acft/yr or $ 10.04 per 1,000 gal

This project will include an interconnection between the City of Waco and Cross County WSC including six miles of 6 inch diameter transmission pipeline, a pump station and storage tank. Water will be purchased from the City of Waco at an estimated wholesale rate of $979/acft.

WUG: Mart

Strategy: Purchase water from City of Waco

Source: City of Waco

Facilities: Pump Station, storage tank, transmission pipeline

Total Capital Cost: $3,601,000

Total Project Cost: $5,617,000

Total Annual Cost: $788,000

Available Project Yield: 250 acft/yr

Annual Cost of Water: $ 3,152 per acft/yr or $ 9.67 per 1,000 gal

This project will include an interconnection between the City of Waco and City of Mart including fifteen miles of 6 inch diameter transmission pipeline, a pump station, booster station and storage tank. Water will be purchased from the City of Waco at an estimated wholesale rate of $979/acft.

WUG: North Bosque WSC

Strategy: Purchase water from City of Waco

Source: City of Waco

Facilities: Pump Station, storage tank, transmission pipeline

Total Capital Cost: $1,462,000

Total Project Cost: $2,203,000

Total Annual Cost: $465,000

Available Project Yield: 200 acft/yr

Annual Cost of Water: $ 2,325 per acft/yr or $ 7.13 per 1,000 gal

This project will include an interconnection between the City of Waco and North Bosque WSC including four miles of 6 inch diameter transmission pipeline, a pump station and storage tank. Water will be purchased from the City of Waco at an estimated wholesale rate of $979/acft.

WUG: City of Riesel

Strategy: Additional Purchase from RMS WSC

Source: RMS WSC (Trinity Groundwater)

Facilities: None, existing infrastructure assumed sufficient

Total Capital Cost: N/A

Total Project Cost: N/A

Total Annual Cost: $19,540

Available Project Yield: 20 acft/yr

Annual Cost of Water: $ 977 per acft/yr or $ 3.03 per 1,000 gal (RMS-WSC Wholesale Costs)

This project will include a contract increase of up to 20 additional acft/yr utilizing existing infrastructure from RMS WSC to the City of Riesel.

WUG: City of Woodway

Strategy: Additional Purchase from Bluebonnet WSC

Source: Bluebonnet WSC

Facilities: None, existing infrastructure assumed sufficient

Total Capital Cost: N/A

Total Project Cost: N/A

Total Annual Cost: $51,500

Available Project Yield: 103 acft/yr

Annual Cost of Water: $ 500 per acft/yr or $ 1.55 per 1,000 gal (Bluebonnet WSC Wholesale Costs)

This project will include a contract increase of up to 103 additional acft/yr utilizing existing infrastructure from Bluebonnet WSC to the City of Woodway.

12.4.11 Nolan County

WUG: City of Sweetwater

Strategy: Purchase water from City of Abilene

Source: City of Abilene

Facilities: Pump Station, storage tank, transmission pipeline

Total Capital Cost: $8,311,000

Total Project Cost: $13,036,000

Total Annual Cost: $1,448,000

Available Project Yield: 1,777 acft/yr

Annual Cost of Water: $ 815 per acft/yr or $ 2.50 per 1,000 gal

This project will include an interconnection between the City of Abilene and the City of Sweetwater including 40 miles of 6 inch diameter transmission pipeline, a pump station and storage tank. Water will be purchased from the City of Abilene at an estimated wholesale rate of $100/acft. Project costs to be shared between the two entities.

WUG: Nolan County-Other

Strategy: Additional Purchase from the City of Sweetwater

Source: Oak Creek Reservoir

Facilities: None, existing infrastructure assumed sufficient

Total Capital Cost: N/A

Total Project Cost: N/A

Total Annual Cost: $173,208

Available Project Yield: firm up existing contract of 168 acft/yr

Annual Cost of Water: $ 1,031 per acft/yr or $ 3.20 per 1,000 gal (City of Sweetwater Wholesale Costs)

Sweetwater's Oak Creek Reservoir conjunctive use project with subordination will firm up the existing contract with City of Blackwell (Nolan County-Other entity). Delivery of supplies uses utilizing existing infrastructure from the City of Sweetwater.

WUG: Nolan County-Manufacturing

Strategy: Additional Purchase from the City of Sweetwater

Source: The City of Sweetwater

Facilities: None, existing infrastructure assumed sufficient

Total Capital Cost: N/A

Total Project Cost: N/A

Total Annual Cost: $1,657,848

Available Project Yield: 1,608 acft/yr

Annual Cost of Water: $ 1,031 per acft/yr or $ 3.20 per 1,000 gal (City of Sweetwater Wholesale Costs)

This project will include a contract increase of up to 1,608 additional acft/yr utilizing existing infrastructure from the City of Sweetwater to Nolan County-Manufacturing.

WUG: Nolan County Steam-Electric

Strategy: Purchase of water from Abilene

Source: The City of Abilene

Facilities: Wholesale rate included only. Not enough information to cost delivery.

Total Capital Cost: N/A

Total Project Cost: N/A

Total Annual Cost: $1,000,000

Available Project Yield: 10,000 acft/yr

Annual Cost of Water: $ 100 per acft/yr or $ 0.31 per 1,000 gal

This project will include a contract for the purchase of water up to 10,000 acft/yr. Infrastructure such as pipelines, pump stations, and storage tanks will be needed once the location(s) of use are determined.

12.4.12 Palo Pinto County

WUG: Palo Pinto County Irrigation

Strategy: Purchase of water from PPMWD #1

Source: PPMWD #1

Facilities: Wholesale rate included only. Not enough information to cost delivery.

Total Capital Cost: N/A

Total Project Cost: N/A

Total Annual Cost: $1,194,626

Available Project Yield: 2,492 acft/yr

Annual Cost of Water: $ 479 per acft/yr or $ 1.48 per 1,000

This project will include a contract for the purchase of water up to 2,492 acft/yr. Infrastructure such as pipelines, pump stations, and storage tanks will be needed once the location(s) of use are determined.

12.4.13 Robertson County

WUG: Robertson County Steam-Electric

Strategy: Purchase of water from Walnut Creek Mine

Source: Walnut Creek Mine

Facilities: Wholesale rate included only. Not enough information to cost delivery.

Total Capital Cost: N/A

Total Project Cost: N/A

Total Annual Cost: $4,500,000

Available Project Yield: 9,000 acft/yr

Annual Cost of Water: $ 500 per acft/yr or $ 1.55 per 1,000

This project will include a contract for the purchase of water up to 9,000 acft/yr. Infrastructure such as pipelines, pump stations, and storage tanks will be needed once the location(s) of use are determined.

12.4.14 Taylor County

WUG: City of Merkel

Strategy: Additional Purchase from the City of Abilene

Source: The City of Abilene

Facilities: None, existing infrastructure assumed sufficient

Total Capital Cost: N/A

Total Project Cost: N/A

Total Annual Cost: $900

Available Project Yield: 9 acft/yr

Annual Cost of Water: $ 100 per acft/yr or $ 0.31 per 1,000 gal (City of Abilene Wholesale Costs)

This project will include a contract increase of up to 9 additional acft/yr utilizing existing infrastructure from the City of Abilene to the City of Merkel.

WUG: Potosi WSC

Strategy: Additional Purchase from the City of Abilene

Source: The City of Abilene

Facilities: None, existing infrastructure assumed sufficient

Total Capital Cost: N/A

Total Project Cost: N/A

Total Annual Cost: $54,200

Available Project Yield: 542 acft/yr

Annual Cost of Water: $ 100 per acft/yr or $ 0.31 per 1,000 gal (City of Abilene Wholesale Costs)

This project will include a contract increase of up to 542 additional acft/yr utilizing existing infrastructure from the City of Abilene to Potosi WSC.

WUG: Steamboat Mountain WSC

Strategy: Additional Purchase from the City of Abilene

Source: The City of Abilene

Facilities: None, existing infrastructure assumed sufficient

Total Capital Cost: N/A

Total Project Cost: N/A

Total Annual Cost: $21,000

Available Project Yield: 210 acft/yr

Annual Cost of Water: $ 100 per acft/yr or $ 0.31 per 1,000 gal (City of Abilene Wholesale Costs)

This project will include a contract increase of up to 210 additional acft/yr utilizing existing infrastructure from the City of Abilene to Steamboat Mountain WSC.

WUG: The City of Tye

Strategy: Additional Purchase from the City of Abilene

Source: The City of Abilene

Facilities: None, existing infrastructure assumed sufficient

Total Capital Cost: N/A

Total Project Cost: N/A

Total Annual Cost: $1,500

Available Project Yield: 15 acft/yr

Annual Cost of Water: $ 100 per acft/yr or $ 0.31 per 1,000 gal (City of Abilene Wholesale Costs)

This project will include a contract increase of up to 15 additional acft/yr utilizing existing infrastructure from the City of Abilene to The City of Tye.

WUG: Taylor County Mining

Strategy: Purchase of water from Abilene

Source: The City of Abilene

Facilities: Wholesale rate included only. Not enough information to cost delivery.

Total Capital Cost: N/A

Total Project Cost: N/A

Total Annual Cost: $37,900

Available Project Yield: 379 acft/yr

Annual Cost of Water: $ 100 per acft/yr or $ 0.31 per 1,000 gal

This project will include a contract for the purchase of water up to 379 acft/yr. Infrastructure such as pipelines, pump stations, and storage tanks will be needed once the location(s) of use are determined.

WUG: Taylor County Irrigation

Strategy: Purchase of water from Abilene

Source: The City of Abilene

Facilities: Wholesale rate included only. Not enough information to cost delivery.

Total Capital Cost: N/A

Total Project Cost: N/A

Total Annual Cost: $101,000

Available Project Yield: 1,010 acft/yr

Annual Cost of Water: $ 100 per acft/yr or $ 0.31 per 1,000 gal

This project will include a contract for the purchase of water up to 1,010 acft/yr. Infrastructure such as pipelines, pump stations, and storage tanks will be needed once the location(s) of use are determined.

12.4.15 Williamson County

WUG: Chisholm Trail SUD

Strategy: Reallocation from Georgetown

Source: Brazos River Authority

Facilities: None, existing infrastructure assumed sufficient

Total Capital Cost: N/A

Total Project Cost: N/A

Total Annual Cost: $391,000

Available Project Yield: 400 acft/yr

Annual Cost of Water: $ 977 per acft/yr or $ 3.03 per 1,000 gal (Georgetown Wholesale Costs)

This project will include a contract increase of up to 400 additional acft/yr utilizing existing infrastructure from Georgetown to Chisholm Trail SUD.

WUG: The City of Hutto

Strategy: Additional Purchase from Heart of Texas

Source: Heart of Texas

Facilities: None, existing infrastructure assumed sufficient

Total Capital Cost: N/A

Total Project Cost: N/A

Total Annual Cost: $3,886,506

Available Project Yield: 3,978 acft/yr

Annual Cost of Water: $ 977 per acft/yr or $ 3.03 per 1,000 gal (Heart of Texas Wholesale Costs)

This project will include a contract increase of up to 3,978 additional acft/yr utilizing existing infrastructure from Heart of Texas to the City of Hutto.

WUG: Williamson County-Other

Strategy: Purchase from SAWS Vista Ridge Project

Source: Carrizo-Wilcox Aquifer, Burleson County

Facilities: assumed delivery through existing infrastructure

Total Capital Cost: None – SAWS will bear the cost

Total Project Cost: None – SAWS will bear the cost

Total Annual Cost: $12,408,900

Available Project Yield: 5,700 acft/yr

Annual Cost of Water: $2,177 per acft/yr or $6.68 per 1,000 gal

This project will be a contract to purchase 5,700 acft/yr from Vista Ridge Project sponsored by San Antonio Water Systems. Costs are based on costs in the Region L Plan.

12.4.16 Young County

WUG: Fort Belknapp WSC

Strategy: Additional Purchase from the City of Graham

Source: City of Graham

Facilities: None, existing infrastructure assumed sufficient

Total Capital Cost: N/A

Total Project Cost: N/A

Total Annual Cost: $74,800

Available Project Yield: 85 acft/yr

Annual Cost of Water: $ 880 per acft/yr or $ 2.70 per 1,000 gal (City of Graham Wholesale Costs)

This project will include a contract increase of up to 85 additional acft/yr utilizing existing infrastructure from the City of Graham to Fort Belknapp WSC.

12.5 Miscellaneous WTP Upgrades and Facilities Expansions

There are a total of eleven water user groups and or wholesale water providers that will require a water treatment plant expansion, treated water reallocation or a new water treatment plant to meet potable water demand during the planning period. New or expanded treatment plants are sized for peaking capacity. However the yield of these projects is assumed to be 50% of the expansion or plant size to be consistent with the methodology for the surface water constraints. Table 12.5-1 summarizes water treatment plant strategies. This table includes only the water treatment plant strategies that are not included in any of the other Volume II water management strategy evaluations.

Table 12.5-1. Miscellaneous Strategies: Water Treatment Plant Strategies for WUGs/WWPs

WUG/WWP	Strategy	Project Yield (acft/yr)	Capital Cost	Total Project Cost	Annual Cost	Unit Cost	
						$/acft	$/kgal
Abilene	Expand WTP by 23.2	12,992	$34,537,000	$48,257,000	$7,492,000	$577	$1.77
Acton MUD	Reallocate SWATS Capacity	200	N/A	N/A	$110,400	$552	$1.69
Chisholm Trail SUD	Expand WTP by 13.4 MGD	7,500	$22,675,000	$31,675,000	$4,918,000	$656	$2.01
Georgetown	Expand WTP by 21 MGD	11,626	$31,873,000	$44,534,000	$6,917,000	$595	$1.82
Jayton	New WTP (0.4 MGD)	224	$2,531,000	$3,537,000	$549,000	$2,451	$7.52
Robinson	Expand WTP by 4 MGD	2,240	$9,413,000	$13,153,000	$2,042,000	$912	$2.80
Wellborn SUD	Expand WTP by 4 MGD	2,240	$9,413,000	$13,153,000	$2,042,000	$912	$2.80
McLennan County-Other	Upgrade Treatment for Arsenic	917	$2,455,000	$3,811,000	$936,000	$1,021	$3.13
Falls County-Other	Upgrade Treatment for Arsenic	53	$141,000	$220,000	$115,000	$2,177	$6.68
Hill County-Other	Upgrade Treatment for Arsenic	250	$671,000	$1,042,000	$364,000	$1,453	$4.46
Limestone County-Other	Upgrade Treatment for Arsenic	268	$718,000	$1,115,000	$379,000	$1,414	$4.34