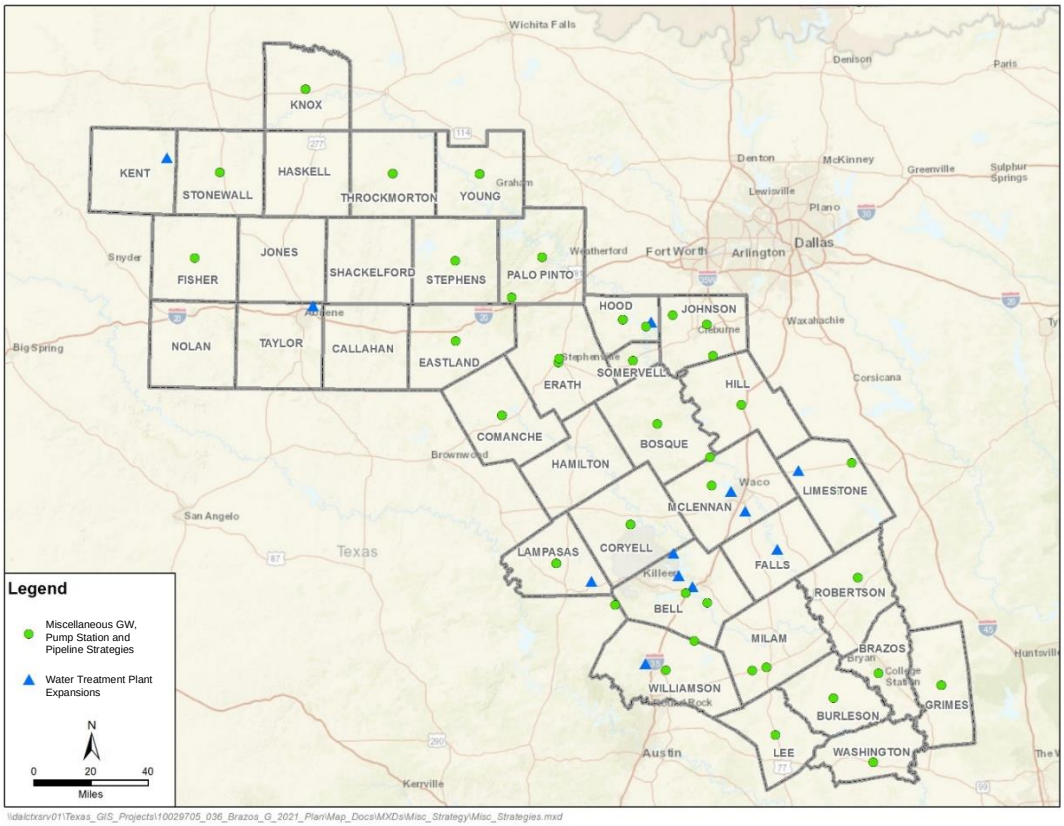
13 Miscellaneous Strategies

13.1 Strategy Overview

Miscellaneous Strategies represent 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 13.3 through Section 13.5. Figure 13-1 shows the locations of the miscellaneous strategies recommended in the 2021 Brazos G Plan. Locations for county-aggregated WUGs are shown at the center of each county.

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 2018 dollars. Debt service is calculated at 3.5% 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. Not all strategies presented in this section are recommended in the 2021 Brazos G Plan.

Figure 13-1. Miscellaneous Strategies and Water Treatment Plant Expansions



13.2 Evaluation of Miscellaneous Water Management Strategies

The miscellaneous strategies for each WUG were evaluated based on plan development criteria. Groundwater, surface water and reuse water supplies are adequate to implement these miscellaneous strategies. Environmental impacts will need to be mitigated to protect habitat, cultural resources, threatened and endangered species and wetlands. Generally, it is assumed that pipelines can be routed, well fields and water treatment plants can be located to avoid environmentally and culturally 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; and
    - 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; and
- Aquatic Resource Relocation Plan (ARRP) and a relocation permit may be required from TPWD if a dewatering event is required during construction.

Mitigation requirements would vary depending on impacts, but could include vegetation restoration, wetland creation or enhancement, or additional land acquisition.

13.3 Miscellaneous Pipelines, Pump Stations, and Groundwater Strategies by County

13.3.1 Bell County

WUG: Bell County Irrigation

Strategy: Edwards Aquifer Development

Source: Edwards Aquifer

Facilities: Well Field, collection pipes

Total Capital Cost: $657,000

Total Project Cost: $922,000

Total Annual Cost: $88,000

Available Project Yield: 585 acft/yr (2070)

Annual Cost of Water: $150 per acft/yr or $0.46 per 1,000 gal

This project will include two 365 gpm wells drilled to 500 ft with 200 ft of transmission pipeline per well.

Cost Estimate Summary September 2018 Prices	
Bell County Irrigation - Edwards BFZ Aquifer Development	
Item	***Estimated Costs for Facilities (for 1 well)***
Well Fields (Wells, Pumps, and Piping)	$657,000
TOTAL COST OF FACILITIES	**$657,000**
Engineering and Feasibility Studies, Legal Assistance, Financing, Bond Counsel, and Contingencies (30% for pipes & 35% for all other facilities)	$230,000
Environmental & Archaeology Studies and Mitigation	$5,000
Land Acquisition and Surveying (1 acres)	$5,000
Interest During Construction (3% for 1 years with a 0.5% ROI)	$25,000
TOTAL COST OF PROJECT	**$922,000**
ANNUAL COST	
Debt Service (3.5 percent, 20 years)	$65,000
Operation and Maintenance	
Pipeline, Wells, and Storage Tanks (1% of Cost of Facilities)	$7,000
Pumping Energy Costs (196,537 kW-hr @ 0.08 $/kW-hr)	$16,000

TOTAL ANNUAL COST	**$88,000**
Available Project Yield (acft/yr)	585
Annual Cost of Water ($ per acft), based on PF=1	$150
Annual Cost of Water After Debt Service ($ per acft), based on PF=1	$39
Annual Cost of Water ($ per 1,000 gallons), based on PF=1	$0.46
Annual Cost of Water After Debt Service ($ per 1,000 gallons), based on PF=1	$0.12

WUG: Bell County Mining

Strategy: Trinity Aquifer Development

Source: Trinity Aquifer

Facilities: Well Field, collection pipes

Total Capital Cost: $6,186,000

Total Project Cost: $8,771,000

Total Annual Cost: $2,101,000

Available Project Yield: 4,700 acft/yr

Annual Cost of Water: $447 per acft/yr or $1.37 per 1,000 gal

This project will include 17, 210 gpm wells drilled to around 800 ft with 1,000 ft of transmission pipeline per well.

Cost Estimate Summary September 2018 Prices	
Bell County Mining - Trinity for Bell County Mining	
Item	***Estimated Costs for Facilities (for 1 well)***
Well Fields (Wells, Pumps, and Piping)	$6,186,000
TOTAL COST OF FACILITIES	**$6,186,000**
Engineering and Feasibility Studies, Legal Assistance, Financing, Bond Counsel, and Contingencies (30% for pipes & 35% for all other facilities)	$2,165,000
Environmental & Archaeology Studies and Mitigation	$85,000
Land Acquisition and Surveying (9 acres)	$100,000
Interest During Construction (3% for 1 years with a 0.5% ROI)	$235,000
TOTAL COST OF PROJECT	**$8,771,000**

ANNUAL COST	
Debt Service (3.5 percent, 20 years)	$617,000
Operation and Maintenance	
Pipeline, Wells, and Storage Tanks (1% of Cost of Facilities)	$62,000
Pumping Energy Costs (17,777,753 kW-hr @ 0.08 $/kW-hr)	$1,422,000
TOTAL ANNUAL COST	**$2,101,000**
Available Project Yield (acft/yr)	4,700
Annual Cost of Water ($ per acft), based on PF=1	$447
Annual Cost of Water After Debt Service ($ per acft), based on PF=1	$316
Annual Cost of Water ($ per 1,000 gallons), based on PF=1	$1.37
Annual Cost of Water After Debt Service ($ per 1,000 gallons), based on PF=1	$0.97

WUG: Bell County Mining

Strategy: Edwards Aquifer Development

Source: Edwards Aquifer

Facilities: Well Field, collection pipes

Total Capital Cost: $1,003,000

Total Project Cost: $1,423,000

Total Annual Cost: $199,000

Available Project Yield: 615 acft/yr

Annual Cost of Water: $324 per acft/yr or $0.99 per 1,000 gal

This project will include three 365 gpm wells drilled to 500 ft as well as 200 ft of transmission pipeline per well.

Cost Estimate Summary September 2018 Prices	
Bell County Mining - Edwards BFZ Aquifer Development	
Item	***Estimated Costs for Facilities (for 1 well)***
Well Fields (Wells, Pumps, and Piping)	$1,003,000
TOTAL COST OF FACILITIES	**$1,003,000**
Engineering and Feasibility Studies, Legal Assistance, Financing, Bond Counsel, and Contingencies (30% for pipes & 35% for all other facilities)	$351,000

Environmental & Archaeology Studies and Mitigation	$15,000
Land Acquisition and Surveying (2 acres)	$15,000
Interest During Construction (3% for 1 years with a 0.5% ROI)	$39,000
TOTAL COST OF PROJECT	**$1,423,000**
ANNUAL COST	
Debt Service (3.5 percent, 20 years)	$100,000
Operation and Maintenance	
Pipeline, Wells, and Storage Tanks (1% of Cost of Facilities)	$10,000
Pumping Energy Costs (1,102,640 kW-hr @ 0.08 $/kW-hr)	$89,000
TOTAL ANNUAL COST	**$199,000**
Available Project Yield (acft/yr)	615
Annual Cost of Water ($ per acft), based on PF=1	$324
Annual Cost of Water After Debt Service ($ per acft), based on PF=1	$161
Annual Cost of Water ($ per 1,000 gallons), based on PF=1	$0.99
Annual Cost of Water After Debt Service ($ per 1,000 gallons), based on PF=1	$0.49

WUG: Bell County WCID 2

Strategy: Trinity Aquifer Development

Source: Trinity Aquifer

Facilities: Well Field, collection pipes, transmission and treatment

Total Capital Cost: $680,000

Total Project Cost: $979,000

Total Annual Cost: $92,000

Available Project Yield: 63 acft/yr

Annual Cost of Water: $1,460 per acft/yr or $4.48 per 1,000 gal (Maximum of Phased Costs)

This project will include two 80 gpm wells drilled to 800 ft as well as 200 ft of collection pipeline per well and disinfection treatment.

Cost Estimate Summary September 2018 Prices	
Bell County WCID 2 - Trinity Aquifer Development	
Item	***Estimated Costs for Facilities***
Well Fields (Wells, Pumps, and Piping)	$656,000
Water Treatment Plant (0.1 MGD)	$24,000
TOTAL COST OF FACILITIES	**$680,000**
Engineering and Feasibility Studies, Legal Assistance, Financing, Bond Counsel, and Contingencies (30% for pipes & 35% for all other facilities)	$238,000
Environmental & Archaeology Studies and Mitigation	$16,000
Land Acquisition and Surveying (2 acres)	$18,000
Interest During Construction (3% for 1 years with a 0.5% ROI)	$27,000
TOTAL COST OF PROJECT	**$979,000**
ANNUAL COST	
Debt Service (3.5 percent, 20 years)	$69,000
Operation and Maintenance	
Pipeline, Wells, and Storage Tanks (1% of Cost of Facilities)	$7,000
Water Treatment Plant	$14,000
Pumping Energy Costs (21,933 kW-hr @ 0.08 $/kW-hr)	$2,000
TOTAL ANNUAL COST	**$92,000**
Available Project Yield (acft/yr)	63
Annual Cost of Water ($ per acft), based on PF=2	$1,460
Annual Cost of Water After Debt Service ($ per acft), based on PF=2	$365
Annual Cost of Water ($ per 1,000 gallons), based on PF=2	$4.48
Annual Cost of Water After Debt Service ($ per 1,000 gallons), based on PF=2	$1.12

13.3.2 Bosque County

WUG: Bosque County Irrigation

Strategy: Trinity Aquifer Development

Source: Trinity Aquifer

Facilities: Well Field, collection pipes

Total Capital Cost: $1,746,000

Total Project Cost: $2,473,000

Total Annual Cost: $245,000

Available Project Yield: 1,259 acft/yr (2070)

Annual Cost of Water: $195 per acft/yr or $0.60 per 1,000 gal

This project will include four 280 gpm wells drilled to 930 ft with 1,000 ft of transmission pipeline per well.

Cost Estimate Summary, September 2018 Prices	
Bosque County Irrigation - Trinity for Bosque County Irrigation	
Item	***Estimated Costs for Facilities (for 1 well)***
Well Fields (Wells, Pumps, and Piping)	$1,746,000
TOTAL COST OF FACILITIES	**$1,746,000**
Engineering and Feasibility Studies, Legal Assistance, Financing, Bond Counsel, and Contingencies (30% for pipes & 35% for all other facilities)	$611,000
Environmental & Archaeology Studies and Mitigation	$24,000
Land Acquisition and Surveying (2 acres)	$25,000
Interest During Construction (3% for 1 years with a 0.5% ROI)	$67,000
TOTAL COST OF PROJECT	**$2,473,000**
ANNUAL COST	
Debt Service (3.5 percent, 20 years)	$174,000
Operation and Maintenance	
Pipeline, Wells, and Storage Tanks (1% of Cost of Facilities)	$17,000
Pumping Energy Costs (682,713 kW-hr @ 0.08 $/kW-hr)	$55,000
TOTAL ANNUAL COST	**$246,000**
Available Project Yield (acft/yr)	1,259
Annual Cost of Water ($ per acft), based on PF=3.75	$195
Annual Cost of Water After Debt Service ($ per acft), based on PF=3.75	$57
Annual Cost of Water ($ per 1,000 gallons), based on PF=3.75	$0.60
Annual Cost of Water After Debt Service ($ per 1,000 gallons), based on PF=3.75	$0.18

WUG: Highland Park WSC

Strategy: Trinity Aquifer Development

Source: Trinity Aquifer

Facilities: Well Field, collection pipes, transmission and treatment

Total Capital Cost: $1,245,000

Total Project Cost: $1,829,000

Total Annual Cost: $159,000

Available Project Yield: 82 acft/yr

Annual Cost of Water: $1,939 per acft/yr or $5.95 per 1,000 gal

This project will include two 110 gpm wells drilled to 1,280 ft as well as 1,000 ft of transmission pipeline per well and disinfection treatment.

Cost Estimate Summary September 2018 Prices	
Highland Park WSC - Trinity for Highland Park WSC	
Item	***Estimated Costs for Facilities***
Well Fields (Wells, Pumps, and Piping)	$1,222,000
Water Treatment Plant (0.1 MGD)	$23,000
TOTAL COST OF FACILITIES	**$1,245,000**
Engineering and Feasibility Studies, Legal Assistance, Financing, Bond Counsel, and Contingencies (30% for pipes & 35% for all other facilities)	$436,000
Environmental & Archaeology Studies and Mitigation	$34,000
Land Acquisition and Surveying (8 acres)	$65,000
Interest During Construction (3% for 1 years with a 0.5% ROI)	$49,000
TOTAL COST OF PROJECT	**$1,829,000**
ANNUAL COST	
Debt Service (3.5 percent, 20 years)	$129,000
Operation and Maintenance	
Pipeline, Wells, and Storage Tanks (1% of Cost of Facilities)	$12,000
Water Treatment Plant	$14,000
Pumping Energy Costs (45,180 kW-hr @ 0.08 $/kW-hr)	$4,000
TOTAL ANNUAL COST	**$159,000**
Available Project Yield (acft/yr)	82

Annual Cost of Water ($ per acft), based on PF=2	$1,939
Annual Cost of Water After Debt Service ($ per acft), based on PF=2	$366
Annual Cost of Water ($ per 1,000 gallons), based on PF=2	$5.95
Annual Cost of Water After Debt Service ($ per 1,000 gallons), based on PF=2	$1.12

13.3.3 Brazos County

WUG: Texas A&M University

Strategy: Sparta Aquifer Development

Source: Spara Aquifer

Facilities: Well Field, collection pipes, transmission and treatment

Total Capital Cost: $3,507,000

Total Project Cost: $4,931,000

Total Annual Cost: $490,000 (Maximum of Phased Costs)

Available Project Yield: 638 acft/yr

Annual Cost of Water: $768 per acft/yr or $2.36 per 1,000 gal (Maximum of Phased Costs)

This project will include two 500 gpm wells drilled to 2,500 ft as well as 1,000 ft of transmission pipeline per well and disinfection treatment.

Cost Estimate Summary September 2018 Prices	
Texas A&M University - Sparta Aquifer Development	
Item	***Estimated Costs for Facilities (for 1 well)***
Well Fields (Wells, Pumps, and Piping)	$3,411,000
Water Treatment Plant (1.1 MGD)	$96,000
TOTAL COST OF FACILITIES	**$3,507,000**
Engineering and Feasibility Studies, Legal Assistance, Financing, Bond Counsel, and Contingencies (30% for pipes & 35% for all other facilities)	$1,228,000
Environmental & Archaeology Studies and Mitigation	$14,000
Land Acquisition and Surveying (2 acres)	$50,000
Interest During Construction (3% for 1 years with a 0.5% ROI)	$132,000
TOTAL COST OF PROJECT	**$4,931,000**
ANNUAL COST	
Debt Service (3.5 percent, 20 years)	$347,000

Operation and Maintenance	
Pipeline, Wells, and Storage Tanks (1% of Cost of Facilities)	$34,000
Water Treatment Plant	$58,000
Pumping Energy Costs (637,085 kW-hr @ 0.08 $/kW-hr)	$51,000
TOTAL ANNUAL COST	**$490,000**
Available Project Yield (acft/yr)	638
Annual Cost of Water ($ per acft), based on PF=2	$768
Annual Cost of Water After Debt Service ($ per acft), based on PF=2	$224
Annual Cost of Water ($ per 1,000 gallons), based on PF=2	$2.36
Annual Cost of Water After Debt Service ($ per 1,000 gallons), based on PF=2	$0.69

13.3.4 Burleson County

WUG: Burleson County Manufacturing

Strategy: Sparta Aquifer Development

Source: Sparta Aquifer

Facilities: Well Field, collection pipes, treatment

Total Capital Cost: $166,000

Total Project Cost: $233,000

Total Annual Cost: $18,000 (Maximum of Phased Costs)

Available Project Yield: 25 acft/yr

Annual Cost of Water: $18,000 per acft/yr or $2.33 per 1,000 gal (Maximum of Phased Costs)

This project will include one 200 gpm well drilled to 1,500 ft as well as 400 ft of transmission pipeline.

Cost Estimate Summary September 2018 Prices	
Burleson County Manufacturing - Sparta for Burleson County Manufacturing	
Item	***Estimated Costs for Facilities (for 1 well)***
Well Fields (Wells, Pumps, and Piping)	$166,000
TOTAL COST OF FACILITIES	**$166,000**
Engineering and Feasibility Studies, Legal Assistance, Financing, Bond Counsel, and Contingencies (30% for pipes & 35% for all other facilities)	$58,000

Environmental & Archaeology Studies and Mitigation	$2,000
Interest During Construction (3% for 1 years with a 0.5% ROI)	$7,000
TOTAL COST OF PROJECT	**$233,000**
ANNUAL COST	
Debt Service (3.5 percent, 20 years)	$16,000
Operation and Maintenance	
Pipeline, Wells, and Storage Tanks (1% of Cost of Facilities)	$2,000
Pumping Energy Costs (6,610 kW-hr @ 0.08 $/kW-hr)	$1,000
TOTAL ANNUAL COST	**$19,000**
Available Project Yield (acft/yr)	25
Annual Cost of Water ($ per acft), based on PF=1	$760
Annual Cost of Water After Debt Service ($ per acft), based on PF=1	$120
Annual Cost of Water ($ per 1,000 gallons), based on PF=1	$2.33
Annual Cost of Water After Debt Service ($ per 1,000 gallons), based on PF=1	$0.37

13.3.5 Comanche County

WUG: Comanche County Other

Strategy: Trinity Aquifer Development

Source: Trinity Aquifer (Erath County)

Facilities: Well Field, collection pipes, transmission pipeline, and treatment

Total Capital Cost: $3,451,000

Total Project Cost: $5,359,000

Total Annual Cost: $492,000

Available Project Yield: 488 acft/yr

Annual Cost of Water: $1,008 per acft/yr or $3.09 per 1,000 gal

This project will include four 300 gpm wells drilled to 500 ft as well as 1,000 ft of collection pipeline and disinfection treatment per well and approximately 5 miles of transmission pipeline.

Cost Estimate Summary September 2018 Prices	
Comanche County-Other - Trinity Aquifer Development (Erath County)	
Item	***Estimated Costs for Facilities***
Transmission Pipeline (6 in dia., 5 miles)	$207,000
Well Fields (Wells, Pumps, and Piping)	$3,165,000
Water Treatment Plant (0.9 MGD)	$79,000
TOTAL COST OF FACILITIES	**$3,451,000**
Engineering and Feasibility Studies, Legal Assistance, Financing, Bond Counsel, and Contingencies (30% for pipes & 35% for all other facilities)	$1,198,000
Environmental & Archaeology Studies and Mitigation	$239,000
Land Acquisition and Surveying (31 acres)	$328,000
Interest During Construction (3% for 1 years with a 0.5% ROI)	$143,000
TOTAL COST OF PROJECT	**$5,359,000**
ANNUAL COST	
Debt Service (3.5 percent, 20 years)	$377,000
Operation and Maintenance	
Pipeline, Wells, and Storage Tanks (1% of Cost of Facilities)	$34,000
Water Treatment Plant	$48,000
Pumping Energy Costs (407,984 kW-hr @ 0.08 $/kW-hr)	$33,000
TOTAL ANNUAL COST	**$492,000**
Available Project Yield (acft/yr)	488
Annual Cost of Water ($ per acft), based on PF=2	$1,008
Annual Cost of Water After Debt Service ($ per acft), based on PF=2	$236
Annual Cost of Water ($ per 1,000 gallons), based on PF=2	$3.09
Annual Cost of Water After Debt Service ($ per 1,000 gallons), based on PF=2	$0.72

WUG: Comanche County Mining

Strategy: Trinity Aquifer Development (Erath County)

Source: Trinity Aquifer

Facilities: Well Field, collection pipes, and transmission pipeline

Total Capital Cost: $1,229,000

Total Project Cost: $2,223,000

Total Annual Cost: $184,000

Available Project Yield: 288 acft/yr

Annual Cost of Water: $639 per acft/yr or $1.96 per 1,000 gal

This project will include three 150 gpm wells drilled to 500 ft as well as 1,000 ft of collection pipeline per well and approximately 5 miles of transmission pipeline.

Cost Estimate Summary September 2018 Prices	
Comanche County-Mining - Trinity Aquifer Development (Erath County)	
Item	***Estimated Costs for Facilities***
Well Fields (Wells, Pumps, and Piping)	$1,229,000
TOTAL COST OF FACILITIES	**$1,229,000**
Engineering and Feasibility Studies, Legal Assistance, Financing, Bond Counsel, and Contingencies (30% for pipes & 35% for all other facilities)	$430,000
Environmental & Archaeology Studies and Mitigation	$207,000
Land Acquisition and Surveying (26 acres)	$298,000
Interest During Construction (3% for 1 years with a 0.5% ROI)	$59,000
TOTAL COST OF PROJECT	**$2,223,000**
ANNUAL COST	
Debt Service (3.5 percent, 20 years)	$156,000
Operation and Maintenance	
Pipeline, Wells, and Storage Tanks (1% of Cost of Facilities)	$12,000
Pumping Energy Costs (203,891 kW-hr @ 0.08 $/kW-hr)	$16,000
TOTAL ANNUAL COST	**$184,000**
Available Project Yield (acft/yr)	288
Annual Cost of Water ($ per acft), based on PF=1	$639
Annual Cost of Water After Debt Service ($ per acft), based on PF=1	$97
Annual Cost of Water ($ per 1,000 gallons), based on PF=1	$1.96
Annual Cost of Water After Debt Service ($ per 1,000 gallons), based on PF=1	$0.30

13.3.6 Coryell County

WUG: Coryell County Other

Strategy: Trinity Aquifer Development

Source: Trinity Aquifer

Facilities: Well Field, collection pipes, treatment.

Total Capital Cost: $3,227,327

Total Project Cost: $4,710,000

Total Annual Cost: $407,000 (Maximum of Phased Costs)

Available Project Yield: 1,107 acft/yr

Annual Cost of Water: $784 per acft/yr or $2.41 per 1,000 gal (Maximum of Phased Costs)

This project will include five 200 gpm wells drilled to 1,000 ft as well as 200 ft of collection pipiniing and disinfection treatment per well.

Cost Estimate Summary September 2018 Prices	
Coryell County Other - Trinity Aquifer Development	
Item	***Estimated Costs for Facilities***
Well Fields (Wells, Pumps, and Piping)	$609,000
Water Treatment Plant (0.3 MGD)	$37,000
TOTAL COST OF FACILITIES	**$646,000**
Engineering and Feasibility Studies, Legal Assistance, Financing, Bond Counsel, and Contingencies (30% for pipes & 35% for all other facilities)	$226,000
Environmental & Archaeology Studies and Mitigation	$10,000
Land Acquisition and Surveying (2 acres)	$11,000
Interest During Construction (3% for 2 years with a 0.5% ROI)	$49,000
TOTAL COST OF PROJECT	**$942,000**
ANNUAL COST	
Debt Service (3.5 percent, 20 years)	$66,000
Operation and Maintenance	
Pipeline, Wells, and Storage Tanks (1% of Cost of Facilities)	$6,000
Water Treatment Plant	$22,000
Pumping Energy Costs (453,153 kW-hr @ 0.08 $/kW-hr)	$36,000

TOTAL ANNUAL COST	**$130,000**
Available Project Yield (acft/yr)	1,107
Annual Cost of Water ($ per acft), based on PF=2	$117
Annual Cost of Water After Debt Service ($ per acft), based on PF=2	$58
Annual Cost of Water ($ per 1,000 gallons), based on PF=2	$0.36
Annual Cost of Water After Debt Service ($ per 1,000 gallons), based on PF=2	$0.18

WUG: Coryell County Mining

Strategy: Trinity Aquifer Development

Source: Trinity Aquifer

Facilities: Well Field, collection pipes

Total Capital Cost: $2,138,000

Total Project Cost: $3,145,000

Total Annual Cost: $282,000

Available Project Yield: 1,270 acft/yr

Annual Cost of Water: $ 222 per acft/yr or $0.68 per 1,000 gal

This project will include ten 100 gpm wells drilled to 1,000 ft as well as 200 ft of collection pipeline per well.

Cost Estimate Summary September 2018 Prices	
Coryell County Mining - Trinity Aquifer Development	
Item	***Estimated Costs for Facilities***
Well Fields (Wells, Pumps, and Piping)	$2,138,000
TOTAL COST OF FACILITIES	**$2,138,000**
Engineering and Feasibility Studies, Legal Assistance, Financing, Bond Counsel, and Contingencies (30% for pipes & 35% for all other facilities)	$748,000
Environmental & Archaeology Studies and Mitigation	$37,000
Land Acquisition and Surveying (7 acres)	$58,000
Interest During Construction (3% for 2 years with a 0.5% ROI)	$164,000
TOTAL COST OF PROJECT	**$3,145,000**
ANNUAL COST	

Debt Service (3.5 percent, 20 years)	$221,000
Operation and Maintenance	
Pipeline, Wells, and Storage Tanks (1% of Cost of Facilities)	$21,000
Pumping Energy Costs (494,854 kW-hr @ 0.08 $/kW-hr)	$40,000
TOTAL ANNUAL COST	**$282,000**
Available Project Yield (acft/yr)	1,270
Annual Cost of Water ($ per acft), based on PF=1	$222
Annual Cost of Water After Debt Service ($ per acft), based on PF=1	$48
Annual Cost of Water ($ per 1,000 gallons), based on PF=1	$0.68
Annual Cost of Water After Debt Service ($ per 1,000 gallons), based on PF=1	$0.15

13.3.7 Eastland County

WUG: Eastland County Mining

Strategy: Trinity Aquifer Development (Erath County)

Source: Trinity Aquifer

Facilities: Well Field, collection pipes, transmission pipeline

Total Capital Cost: $2,268,000

Total Project Cost: $3,669,000

Total Annual Cost: $329,000

Available Project Yield: 886 acft/yr

Annual Cost of Water: $371 per acft/yr or $1.14 per 1,000 gal

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

Cost Estimate Summary September 2018 Prices	
Eastland County Mining - Trinity Aquifer Development (Erath Co)	
Item	***Estimated Costs for Facilities***
Well Fields (Wells, Pumps, and Piping)	$1,992,000
TOTAL COST OF FACILITIES	**$2,268,000**
Engineering and Feasibility Studies, Legal Assistance, Financing, Bond Counsel, and Contingencies (30% for pipes & 35% for all other facilities)	$780,000
Environmental & Archaeology Studies and Mitigation	$213,000

Land Acquisition and Surveying (28 acres)	$310,000
Interest During Construction (3% for 1 years with a 0.5% ROI)	$98,000
TOTAL COST OF PROJECT	**$3,669,000**
ANNUAL COST	
Debt Service (3.5 percent, 20 years)	$258,000
Operation and Maintenance	
Pipeline, Wells, and Storage Tanks (1% of Cost of Facilities)	$23,000
Pumping Energy Costs (603,032 kW-hr @ 0.08 $/kW-hr)	$48,000
TOTAL ANNUAL COST	**$329,000**
Available Project Yield (acft/yr)	886
Annual Cost of Water ($ per acft), based on PF=1	$371
Annual Cost of Water After Debt Service ($ per acft), based on PF=1	$80
Annual Cost of Water ($ per 1,000 gallons), based on PF=1	$1.14
Annual Cost of Water After Debt Service ($ per 1,000 gallons), based on PF=1	$0.25

13.3.8 Erath County

WUG: Stephenville

Strategy: Trinity Aquifer Well Field Development

Source: Trinity Aquifer

Facilities: Well Field, collection pipes, roads, pads & electrical distribution

Total Capital Cost: $4,559,000

Total Project Cost: $7,344,000

Total Annual Cost: $655,000

Available Project Yield: 484 acft/yr

Annual Cost of Water: $1,353 per acft/yr or $4.15 per 1,000 gal

This project will include constructing five new Trinity Aquifer wells, collection and transmission pipelines, disinfection treatment, well access roads, and electrical power distribution. Project annual cost estimated based on capital and construction cost provided by the City of Stephenville.

Cost Estimate Summary September 2018 Prices	
City of Stephenville - Trinity Aquifer Development	
Item	***Estimated Costs for Facilities***
Transmission Pipeline (10 in dia., 4 miles)	$18,000
Well Fields (Wells, Pumps, and Piping)	$2,760,000
Water Treatment Plant (1.7 MGD)	$128,000
Integration, Relocations, & Other	$1,653,000
TOTAL COST OF FACILITIES	**$4,559,000**
Engineering and Feasibility Studies, Legal Assistance, Financing, Bond Counsel, and Contingencies (30% for pipes & 35% for all other facilities)	$2,276,000
Environmental & Archaeology Studies and Mitigation	$128,000
Land Acquisition and Surveying (21 acres)	$184,000
Interest During Construction (3% for 1 years with a 0.5% ROI)	$197,000
TOTAL COST OF PROJECT	**$7,344,000**
ANNUAL COST	
Debt Service (3.5 percent, 20 years)	$517,000
Operation and Maintenance	
Pipeline, Wells, and Storage Tanks (1% of Cost of Facilities)	$44,000
Water Treatment Plant	$77,000
Pumping Energy Costs (213,162 kW-hr @ 0.08 $/kW-hr)	$17,000
TOTAL ANNUAL COST	**$655,000**
Available Project Yield (acft/yr)	484
Annual Cost of Water ($ per acft), based on PF=2	$1,353
Annual Cost of Water After Debt Service ($ per acft), based on PF=2	$285
Annual Cost of Water ($ per 1,000 gallons), based on PF=2	$4.15
Annual Cost of Water After Debt Service ($ per 1,000 gallons), based on PF=2	$0.87

WUG: Erath County Other

Strategy: Trinity Aquifer Development

Source: Trinity Aquifer

Facilities: Well Field, collection pipes, and treatment

Total Capital Cost: $917,000

Total Project Cost: $1,350,000

Total Annual Cost: $152,000 (Maximum of Phased Costs)

Available Project Yield: 347 acft/yr

Annual Cost of Water: $438 per acft/yr or $1.34 per 1,000 gal

This project will include two 300 gpm wells drilled to 500 ft as well as 200 ft of collection pipe and disinfection treatment.

Cost Estimate Summary September 2018 Prices	
Erath County-Other - Trinity Aquifer Development	
Item	***Estimated Costs for Facilities***
Transmission Pipeline (8 in dia., 1 miles)	$55,000
Well Fields (Wells, Pumps, and Piping)	$801,000
Water Treatment Plant (0.6 MGD)	$61,000
TOTAL COST OF FACILITIES	**$917,000**
Engineering and Feasibility Studies, Legal Assistance, Financing, Bond Counsel, and Contingencies (30% for pipes & 35% for all other facilities)	$318,000
Environmental & Archaeology Studies and Mitigation	$34,000
Land Acquisition and Surveying (5 acres)	$45,000
Interest During Construction (3% for 1 years with a 0.5% ROI)	$36,000
TOTAL COST OF PROJECT	**$1,350,000**
ANNUAL COST	
Debt Service (3.5 percent, 20 years)	$95,000
Operation and Maintenance	
Pipeline, Wells, and Storage Tanks (1% of Cost of Facilities)	$9,000
Water Treatment Plant	$37,000
Pumping Energy Costs (139,153 kW-hr @ 0.08 $/kW-hr)	$11,000

TOTAL ANNUAL COST	**$152,000**
Available Project Yield (acft/yr)	347
Annual Cost of Water ($ per acft), based on PF=2	$438
Annual Cost of Water After Debt Service ($ per acft), based on PF=2	$164
Annual Cost of Water ($ per 1,000 gallons), based on PF=2	$1.34
Annual Cost of Water After Debt Service ($ per 1,000 gallons), based on PF=2	$0.50

13.3.9 Fisher County

WUG: Fisher County Mining

Strategy: Blaine Aquifer Development

Source: Blaine Aquifer

Facilities: Well Field, collection pipes

Total Capital Cost: $305,000

Total Project Cost: $511,000

Total Annual Cost: $55,311 (Maximum of Phased Costs)

Available Project Yield: 179 acft/yr

Annual Cost of Water: $309 per acft/yr (Maximum of Phased Costs)

This project will include two 76 gpm wells drilled to 55 ft,10,560 ft of transmission pipeline, and a water treatment with chlorine disinfection of 0.1 MGD.

Cost Estimate Summary September 2018 Prices	
Mining Fisher - Mining Blaine Fisher	
Item	***Estimated Costs for Facilities***
Well Fields (Wells, Pumps, and Piping)	$281,000
Water Treatment Plant (0.1 MGD)	$24,000
TOTAL COST OF FACILITIES	**$305,000**
Engineering and Feasibility Studies, Legal Assistance, Financing, Bond Counsel, and Contingencies (30% for pipes & 35% for all other facilities)	$107,000
Environmental & Archaeology Studies and Mitigation	$67,000
Land Acquisition and Surveying (11 acres)	$18,000

Interest During Construction (3% for 1 years with a 0.5% ROI)	$14,000
TOTAL COST OF PROJECT	**$511,000**
ANNUAL COST	
Debt Service (3.5 percent, 20 years)	$36,000
Operation and Maintenance	
Pipeline, Wells, and Storage Tanks (1% of Cost of Facilities)	$3,000
Water Treatment Plant	$14,000
Pumping Energy Costs (29,880 kW-hr @ 0.08 $/kW-hr)	$2,000
TOTAL ANNUAL COST	**$55,000**
Available Project Yield (acft/yr)	179
Annual Cost of Water ($ per acft), based on PF=1	$307
Annual Cost of Water After Debt Service ($ per acft), based on PF=1	$106
Annual Cost of Water ($ per 1,000 gallons), based on PF=1	$0.94
Annual Cost of Water After Debt Service ($ per 1,000 gallons), based on PF=1	$0.33

13.3.10 Grimes County

WUG: Grimes County Mining

Strategy: Gulf Coast Aquifer Development

Source: Gulf Coast Aquifer

Facilities: Well Field, collection pipes

Total Capital Cost: $513,000

Total Project Cost: $744,000

Total Annual Cost: $64,000 (Maximum of Phased Costs)

Available Project Yield: 382 acft/yr

Annual Cost of Water: $480 per acft/yr or $1.47 per 1,000 gal (Maximum of Phased Costs)

This project will include two 250 gpm wells drilled to 500 ft as well as 200 ft of collection pipe per well.

Cost Estimate Summary September 2018 Prices	
Grimes County-Mining - Gulf Coast Aquifer Development	
Item	***Estimated Costs for Facilities***
Well Fields (Wells, Pumps, and Piping)	$513,000
TOTAL COST OF FACILITIES	**$513,000**
Engineering and Feasibility Studies, Legal Assistance, Financing, Bond Counsel, and Contingencies (30% for pipes & 35% for all other facilities)	$180,000
Environmental & Archaeology Studies and Mitigation	$12,000
Land Acquisition and Surveying (1 acres)	$19,000
Interest During Construction (3% for 1 years with a 0.5% ROI)	$20,000
TOTAL COST OF PROJECT	**$744,000**
ANNUAL COST	
Debt Service (3.5 percent, 20 years)	$52,000
Operation and Maintenance	
Pipeline, Wells, and Storage Tanks (1% of Cost of Facilities)	$5,000
Intakes and Pump Stations (2.5% of Cost of Facilities)	$0
Dam and Reservoir (1.5% of Cost of Facilities)	$0
Water Treatment Plant	$0
Advanced Water Treatment Facility	$0
Pumping Energy Costs (84,694 kW-hr @ 0.08 $/kW-hr)	$7,000
Purchase of Water (acft/yr @ $/acft)	$0
TOTAL ANNUAL COST	**$64,000**
Available Project Yield (acft/yr)	382
Annual Cost of Water ($ per acft), based on PF=1	$168
Annual Cost of Water After Debt Service ($ per acft), based on PF=1	$31
Annual Cost of Water ($ per 1,000 gallons), based on PF=1	$0.51
Annual Cost of Water After Debt Service ($ per 1,000 gallons), based on PF=1	$0.10

WUG: Grimes County Irrigation

Strategy: Gulf Coast Development

Source: Gulf Coast Aquifer

Facilities: Well Field, collection pipes

Total Capital Cost: $441,000

Total Project Cost: $623,000

Total Annual Cost: $50,000

Available Project Yield: 131 acft/yr

Annual Cost of Water: $382 per acft/yr or $1.17 per 1,000 gal (Maximum of Phased Costs)

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

Cost Estimate Summary September 2018 Prices	
Grimes County-Irrigation - Gulf Coast Aquifer Development	
Item	***Estimated Costs for Facilities***
Well Fields (Wells, Pumps, and Piping)	$441,000
TOTAL COST OF FACILITIES	**$441,000**
Engineering and Feasibility Studies, Legal Assistance, Financing, Bond Counsel, and Contingencies (30% for pipes & 35% for all other facilities)	$154,000
Environmental & Archaeology Studies and Mitigation	$2,000
Land Acquisition and Surveying (1 acres)	$9,000
Interest During Construction (3% for 1 years with a 0.5% ROI)	$17,000
TOTAL COST OF PROJECT	**$623,000**
ANNUAL COST	
Debt Service (3.5 percent, 20 years)	$44,000
Operation and Maintenance	
Pipeline, Wells, and Storage Tanks (1% of Cost of Facilities)	$4,000
Pumping Energy Costs (28,855 kW-hr @ 0.08 $/kW-hr)	$2,000
TOTAL ANNUAL COST	**$50,000**

Available Project Yield (acft/yr)	131
Annual Cost of Water ($ per acft), based on PF=3.75	$382
Annual Cost of Water After Debt Service ($ per acft), based on PF=3.75	$46
Annual Cost of Water ($ per 1,000 gallons), based on PF=3.75	$1.17
Annual Cost of Water After Debt Service ($ per 1,000 gallons), based on PF=3.75	$0.14

13.3.11 Hamilton County

WUG: Hamilton County Mining

Strategy: Trinity Aquifer Development

Source: Trinity Aquifer

Facilities: Well Field, collection pipes

Total Capital Cost: $375,000

Total Project Cost: $548,000

Total Annual Cost: $46,000

Available Project Yield: 125 acft/yr

Annual Cost of Water: $368 per acft/yr or $1.13 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.

Cost Estimate Summary September 2018 Prices	
Hamilton County-Mining - Gulf Coast Aquifer Development	
Item	***Estimated Costs for Facilities***
Well Fields (Wells, Pumps, and Piping)	$375,000
TOTAL COST OF FACILITIES	**$375,000**
Engineering and Feasibility Studies, Legal Assistance, Financing, Bond Counsel, and Contingencies (30% for pipes & 35% for all other facilities)	$131,000
Environmental & Archaeology Studies and Mitigation	$12,000
Land Acquisition and Surveying (1 acres)	$15,000
Interest During Construction (3% for 1 years with a 0.5% ROI)	$15,000
TOTAL COST OF PROJECT	**$548,000**

ANNUAL COST	
Debt Service (3.5 percent, 20 years)	$39,000
Operation and Maintenance	
Pipeline, Wells, and Storage Tanks (1% of Cost of Facilities)	$4,000
Pumping Energy Costs (35,580 kW-hr @ 0.08 $/kW-hr)	$3,000
TOTAL ANNUAL COST	**$46,000**
Available Project Yield (acft/yr)	125
Annual Cost of Water ($ per acft), based on PF=1	$368
Annual Cost of Water After Debt Service ($ per acft), based on PF=1	$56
Annual Cost of Water ($ per 1,000 gallons), based on PF=1	$1.13
Annual Cost of Water After Debt Service ($ per 1,000 gallons), based on PF=1	$0.17

13.3.12 Hill County

WUG: Hill County Irrigation

Strategy: Woodbine Aquifer Development

Source: Woodbine Aquifer

Facilities: Well Field, collection pipes

Total Capital Cost: $617,000

Total Project Cost: $870,000

Total Annual Cost: $74,000

Available Project Yield: 158 acft/yr

Annual Cost of Water: $468 per acft/yr or $1.44 per 1,000 gal

This project will include two 200 gpm wells drilled to 895 ft as well as 200 ft of transmission pipeline per well.

Cost Estimate Summary September 2018 Prices	
Hill County Irrigation - Woodbine Aquifer Development	
Item	***Estimated Costs for Facilities (for 1 well)***
Well Fields (Wells, Pumps, and Piping)	$617,000
TOTAL COST OF FACILITIES	**$617,000**

Engineering and Feasibility Studies, Legal Assistance, Financing, Bond Counsel, and Contingencies (30% for pipes & 35% for all other facilities)	$216,000
Environmental & Archaeology Studies and Mitigation	$3,000
Land Acquisition and Surveying (1 acres)	$10,000
Interest During Construction (3% for 1 years with a 0.5% ROI)	$24,000
TOTAL COST OF PROJECT	**$870,000**
ANNUAL COST	
Debt Service (3.5 percent, 20 years)	$61,000
Operation and Maintenance	
Pipeline, Wells, and Storage Tanks (1% of Cost of Facilities)	$6,000
Pumping Energy Costs (79,082 kW-hr @ 0.08 $/kW-hr)	$7,000
TOTAL ANNUAL COST	**$74,000**
Available Project Yield (acft/yr)	158
Annual Cost of Water ($ per acft), based on PF=3.75	$468
Annual Cost of Water After Debt Service ($ per acft), based on PF=3.75	$82
Annual Cost of Water ($ per 1,000 gallons), based on PF=3.75	$1.44
Annual Cost of Water After Debt Service ($ per 1,000 gallons), based on PF=3.75	$0.25

13.3.13 Hood County

WUG: Acton MUD

Strategy: Trinity Aquifer Development

Source: Trinity Aquifer

Facilities: Well Field, collection pipes, treatment

Total Capital Cost: $679,000

Total Project Cost: $965,000

Total Annual Cost: $89,000

Available Project Yield: 51 acft/yr

Annual Cost of Water: $1,745 per acft/yr or $5.35 per 1,000 gal

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

Cost Estimate Summary September 2018 Prices	
Acton MUD - Trinity for Acton MUD	
Item	***Estimated Costs for Facilities (for 1 well)***
Well Fields (Wells, Pumps, and Piping)	$658,000
Water Treatment Plant (0.1 MGD)	$21,000
TOTAL COST OF FACILITIES	**$679,000**
Engineering and Feasibility Studies, Legal Assistance, Financing, Bond Counsel, and Contingencies (30% for pipes & 35% for all other facilities)	$237,000
Environmental & Archaeology Studies and Mitigation	$13,000
Land Acquisition and Surveying (1 acres)	$10,000
Interest During Construction (3% for 1 years with a 0.5% ROI)	$26,000
TOTAL COST OF PROJECT	**$965,000**
ANNUAL COST	
Debt Service (3.5 percent, 20 years)	$68,000
Operation and Maintenance	
Pipeline, Wells, and Storage Tanks (1% of Cost of Facilities)	$7,000
Water Treatment Plant	$12,000
Pumping Energy Costs (23,554 kW-hr @ 0.08 $/kW-hr)	$2,000
TOTAL ANNUAL COST	**$89,000**
Available Project Yield (acft/yr)	51
Annual Cost of Water ($ per acft), based on PF=2	$1,745
Annual Cost of Water After Debt Service ($ per acft), based on PF=2	$412
Annual Cost of Water ($ per 1,000 gallons), based on PF=2	$5.35
Annual Cost of Water After Debt Service ($ per 1,000 gallons), based on PF=2	$1.26

WUG: Hood County-Other

Strategy: Trinity Aquifer Development

Source: Trinity Aquifer

Facilities: Well Field, collection pipes, and treatment

Total Capital Cost: $3,818,000

Total Project Cost: $6,210,000

Total Annual Cost: $803,000

Available Project Yield: 1,845 acft/yr

Annual Cost of Water: $435 per acft/yr or $1.34 per 1,000 gal

This project will include ten 150 gpm wells drilled to 500 ft as well as 1,000 ft of transmission pipeline per well and disinfection treatment.

Cost Estimate Summary September 2018 Prices	
Hood County-Other - Trinity for Hood County-Other	
Item	***Estimated Costs for Facilities***
Well Fields (Wells, Pumps, and Piping)	$3,607,000
Water Treatment Plant (3.3 MGD)	$211,000
TOTAL COST OF FACILITIES	**$3,818,000**
Engineering and Feasibility Studies, Legal Assistance, Financing, Bond Counsel, and Contingencies (30% for pipes & 35% for all other facilities)	$1,909,000
Environmental & Archaeology Studies and Mitigation	$119,000
Land Acquisition and Surveying (14 acres)	$197,000
Interest During Construction (3% for 1 years with a 0.5% ROI)	$167,000
TOTAL COST OF PROJECT	**$6,210,000**
ANNUAL COST	
Debt Service (3.5 percent, 20 years)	$437,000
Operation and Maintenance	
Pipeline, Wells, and Storage Tanks (1% of Cost of Facilities)	$36,000
Water Treatment Plant	$126,000
Pumping Energy Costs (2,554,934 kW-hr @ 0.08 $/kW-hr)	$204,000
TOTAL ANNUAL COST	**$803,000**
Available Project Yield (acft/yr)	1,845
Annual Cost of Water ($ per acft), based on PF=2	$435
Annual Cost of Water After Debt Service ($ per acft), based on PF=2	$198

Annual Cost of Water ($ per 1,000 gallons), based on PF=2	$1.34
Annual Cost of Water After Debt Service ($ per 1,000 gallons), based on PF=2	$0.61

WUG: Hood County Mining

Strategy: Trinity Aquifer Development

Source: Trinity Aquifer

Facilities: Well Field, collection pipes, treatment

Total Capital Cost: $718,000

Total Project Cost: $1,027,000

Total Annual Cost: $102,000

Available Project Yield: 913 acft/yr

Annual Cost of Water: $112 per acft/yr or $0.34 per 1,000 gal

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

Cost Estimate Summary September 2018 Prices	
Hood County Mining - Trinity for Hood County Mining	
Item	***Estimated Costs for Facilities (for 1 well)***
Well Fields (Wells, Pumps, and Piping)	$718,000
TOTAL COST OF FACILITIES	**$718,000**
Engineering and Feasibility Studies, Legal Assistance, Financing, Bond Counsel, and Contingencies (30% for pipes & 35% for all other facilities)	$251,000
Environmental & Archaeology Studies and Mitigation	$10,000
Land Acquisition and Surveying (2 acres)	$20,000
Interest During Construction (3% for 1 years with a 0.5% ROI)	$28,000
TOTAL COST OF PROJECT	**$1,027,000**
ANNUAL COST	
Debt Service (3.5 percent, 20 years)	$72,000
Operation and Maintenance	
Pipeline, Wells, and Storage Tanks (1% of Cost of Facilities)	$7,000

Pumping Energy Costs (286,974 kW-hr @ 0.08 $/kW-hr)	$23,000
TOTAL ANNUAL COST	**$102,000**
Available Project Yield (acft/yr)	913
Annual Cost of Water ($ per acft), based on PF=1	$112
Annual Cost of Water After Debt Service ($ per acft), based on PF=1	$33
Annual Cost of Water ($ per 1,000 gallons), based on PF=1	$0.34
Annual Cost of Water After Debt Service ($ per 1,000 gallons), based on PF=1	$0.10

13.3.14 Johnson County

WUG: City of Godley

Strategy: Trinity Aquifer Development

Source: Trinity Aquifer

Facilities: Well Field, collection pipes, transmission

Total Capital Cost: $686,000

Total Project Cost: $1,101,000

Total Annual Cost: $15,015 (Maximum of Phased Costs)

Available Project Yield: 65 acft/yr (After Full Implementation)

Annual Cost of Water: $1,423per acft/yr

This project will include one 140 gpm well drilled to 1,170 ft as well as 5,280 ft of transmission pipeline per well, and chlorine disinfection water treatment.

Cost Estimate Summary September 2018 Prices	
City of Godley – Godley Trinity Johnson	
Item	***Estimated Costs for Facilities***
Well Fields (Wells, Pumps, and Piping)	$672,000
Water Treatment Plant (0.1 MGD)	$14,000
TOTAL COST OF FACILITIES	**$686,000**
Engineering and Feasibility Studies, Legal Assistance, Financing, Bond Counsel, and Contingencies (30% for pipes & 35% for all other facilities)	$240,000
Environmental & Archaeology Studies and Mitigation	$82,000
Land Acquisition and Surveying (5 acres)	$63,000
Interest During Construction (3% for 1 years with a 0.5% ROI)	$30,000

TOTAL COST OF PROJECT	**$1,101,000**
ANNUAL COST	
Debt Service (3.5 percent, 20 years)	$77,000
Operation and Maintenance	
Pipeline, Wells, and Storage Tanks (1% of Cost of Facilities)	$7,000
Water Treatment Plant	$8,000
TOTAL ANNUAL COST	**$92,000**
Available Project Yield (acft/yr)	65
Annual Cost of Water ($ per acft), based on PF=1	$1,415
Annual Cost of Water After Debt Service ($ per acft), based on PF=1	$231
Annual Cost of Water ($ per 1,000 gallons), based on PF=1	$4.34
Annual Cost of Water After Debt Service ($ per 1,000 gallons), based on PF=1	$0.71

WUG: Johnson County SUD

Strategy: Trinity Aquifer Development

Source: Trinity Aquifer

Facilities: Well Field, collection pipes, transmission

Total Capital Cost: $6,237,497

Total Project Cost: $9,305,940

Total Annual Cost: $735,155 (Maximum of Phased Costs)

Available Project Yield: 1,491 acft/yr (After Full Implementation)

Annual Cost of Water: $437 per acft/yr

This project will include eight 140 gpm wells drilled to 1,170 ft as well as 5,280 ft of transmission pipeline per well and disinfection treatment.

Cost Estimate Summary September 2018 Prices	
Johnson County SUD – Johnson Co SUD Trinity Johnson	
Item	***Estimated Costs for Facilities***
Well Fields (Wells, Pumps, and Piping)	$6,207,000
Water Treatment Plant (0.2 MGD)	$31,000
TOTAL COST OF FACILITIES	**$6,238,000**

Engineering and Feasibility Studies, Legal Assistance, Financing, Bond Counsel, and Contingencies (30% for pipes & 35% for all other facilities)	$2,183,000
Environmental & Archaeology Studies and Mitigation	$407,000
Land Acquisition and Surveying (43 acres)	$228,000
Interest During Construction (3% for 1 years with a 0.5% ROI)	$250,000
TOTAL COST OF PROJECT	**$9,306,000**
ANNUAL COST	
Debt Service (3.5 percent, 20 years)	$655,000
Operation and Maintenance	
Pipeline, Wells, and Storage Tanks (1% of Cost of Facilities)	$62,000
Water Treatment Plant	$18,000
TOTAL ANNUAL COST	**$735,000**
Available Project Yield (acft/yr)	1,491
Annual Cost of Water ($ per acft), based on PF=1	$437
Annual Cost of Water After Debt Service ($ per acft), based on PF=1	$48
Annual Cost of Water ($ per 1,000 gallons), based on PF=1	$1.34
Annual Cost of Water After Debt Service ($ per 1,000 gallons), based on PF=1	$0.15

WUG: Parker WSC

Strategy: Trinity Aquifer Development

Source: Trinity Aquifer

Facilities: Well Field, collection pipes, transmission

Total Capital Cost: $698,000

Total Project Cost: $1,045,000

Total Annual Cost: $95,845 (Maximum of Phased Costs)

Available Project Yield: 145 acft/yr (After Full Implementation)

Annual Cost of Water: $661 per acft/yr

This project will include one 140 gpm well drilled to 1,170 ft as well as 5,280 ft of transmission pipeline per well and disinfection treatment.

Cost Estimate Summary September 2018 Prices	
Parker WSC – Parker WSC Trinity Johnson	
Item	***Estimated Costs for Facilities***
Well Fields (Wells, Pumps, and Piping)	$672,000
Water Treatment Plant (0.1 MGD)	$26,000
TOTAL COST OF FACILITIES	**$698,000**
Engineering and Feasibility Studies, Legal Assistance, Financing, Bond Counsel, and Contingencies (30% for pipes & 35% for all other facilities)	$244,000
Environmental & Archaeology Studies and Mitigation	$49,000
Land Acquisition and Surveying (5 acres)	$26,000
Interest During Construction (3% for 1 years with a 0.5% ROI)	$28,000
TOTAL COST OF PROJECT	**$1,045,000**
ANNUAL COST	
Debt Service (3.5 percent, 20 years)	$74,000
Operation and Maintenance	
Pipeline, Wells, and Storage Tanks (1% of Cost of Facilities)	$7,000
Water Treatment Plant	$16,000
TOTAL ANNUAL COST	**$97,000**
Available Project Yield (acft/yr)	145
Annual Cost of Water ($ per acft), based on PF=1	$669
Annual Cost of Water After Debt Service ($ per acft), based on PF=1	$159
Annual Cost of Water ($ per 1,000 gallons), based on PF=1	$2.05
Annual Cost of Water After Debt Service ($ per 1,000 gallons), based on PF=1	$0.49

13.3.15 Knox County

WUG: Knox County Irrigation

Strategy: Blaine Aquifer Development

Source: Blaine Aquifer

Facilities: Well Field, collection pipes

Total Capital Cost: $452,000

Total Project Cost: $631,000

Total Annual Cost: $55,000

Available Project Yield: 405 acft/yr

Annual Cost of Water: $136 per acft/yr or $0.42 per 1,000 gal (Maximum of Phased Costs)

This project will include two 300 gpm wells drilled to 250 ft as well as 200 ft of transmission pipeline per well.

Cost Estimate Summary September 2018 Prices	
Knox County-Irrigation - Blaine Aquifer Development	
Item	***Estimated Costs for Facilities***
Well Fields (Wells, Pumps, and Piping)	$452,000
TOTAL COST OF FACILITIES	**$452,000**
Engineering and Feasibility Studies, Legal Assistance, Financing, Bond Counsel, and Contingencies (30% for pipes & 35% for all other facilities)	$158,000
Environmental & Archaeology Studies and Mitigation	$2,000
Land Acquisition and Surveying (1 acres)	$2,000
Interest During Construction (3% for 1 years with a 0.5% ROI)	$17,000
TOTAL COST OF PROJECT	**$631,000**
ANNUAL COST	
Debt Service (3.5 percent, 20 years)	$44,000
Operation and Maintenance	
Pipeline, Wells, and Storage Tanks (1% of Cost of Facilities)	$5,000
Intakes and Pump Stations (2.5% of Cost of Facilities)	$0
Pumping Energy Costs (77,116 kW-hr @ 0.08 $/kW-hr)	$6,000
TOTAL ANNUAL COST	**$55,000**
Available Project Yield (acft/yr)	405
Annual Cost of Water ($ per acft), based on PF=3.75	$136
Annual Cost of Water After Debt Service ($ per acft), based on PF=3.75	$27
Annual Cost of Water ($ per 1,000 gallons), based on PF=3.75	$0.42
Annual Cost of Water After Debt Service ($ per 1,000 gallons), based on PF=3.75	$0.08

WUG: Knox County Manufacturing

Strategy: Blaine Aquifer Development

Source: Blaine Aquifer

Facilities: Well Field, collection pipes, treatment

Total Capital Cost: $221,000

Total Project Cost: $331,000

Total Annual Cost: $28,000

Available Project Yield: 25 acft/yr

Annual Cost of Water: $1,120 per acft/yr or $3.44 per 1,000 gal (Maximum of Phased Costs)

This project will include two 25 gpm wells drilled to 250 ft as well as 200 ft of transmission pipeline and disinfection treatment per well.

Cost Estimate Summary September 2018 Prices	
Knox County-Manufacturing - Blaine Aquifer Development	
Item	***Estimated Costs for Facilities***
Well Fields (Wells, Pumps, and Piping)	$216,000
Water Treatment Plant (0.02 MGD)	$5,000
TOTAL COST OF FACILITIES	**$221,000**
Engineering and Feasibility Studies, Legal Assistance, Financing, Bond Counsel, and Contingencies (30% for pipes & 35% for all other facilities)	$77,000
Environmental & Archaeology Studies and Mitigation	$12,000
Land Acquisition and Surveying (1 acres)	$12,000
Interest During Construction (3% for 1 years with a 0.5% ROI)	$9,000
TOTAL COST OF PROJECT	**$331,000**
ANNUAL COST	
Debt Service (3.5 percent, 20 years)	$23,000
Operation and Maintenance	
Pipeline, Wells, and Storage Tanks (1% of Cost of Facilities)	$2,000
Water Treatment Plant	$3,000
TOTAL ANNUAL COST	**$28,000**
Available Project Yield (acft/yr)	25

Annual Cost of Water ($ per acft), based on PF=1	$1,120
Annual Cost of Water After Debt Service ($ per acft), based on PF=1	$200
Annual Cost of Water ($ per 1,000 gallons), based on PF=1	$3.44
Annual Cost of Water After Debt Service ($ per 1,000 gallons), based on PF=1	$0.61

WUG: Knox County Mining

Strategy: Blaine Aquifer Development

Source: Blaine Aquifer

Facilities: Well Field, collection pipes

Total Capital Cost: $110,000

Total Project Cost: $178,000

Total Annual Cost: $14,000

Available Project Yield: 25 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 two 20 gpm wells drilled to 250 ft as well as 200 ft of transmission pipeline per well.

Cost Estimate Summary September 2018 Prices	
Knox County-Mining - Blaine Aquifer Development	
Item	***Estimated Costs for Facilities***
Well Fields (Wells, Pumps, and Piping)	$110,000
TOTAL COST OF FACILITIES	**$110,000**
Engineering and Feasibility Studies, Legal Assistance, Financing, Bond Counsel, and Contingencies (30% for pipes & 35% for all other facilities)	$39,000
Environmental & Archaeology Studies and Mitigation	$12,000
Land Acquisition and Surveying (1 acres)	$12,000
Interest During Construction (3% for 1 years with a 0.5% ROI)	$5,000
TOTAL COST OF PROJECT	**$178,000**
ANNUAL COST	
Debt Service (3.5 percent, 20 years)	$13,000
Operation and Maintenance	

Pipeline, Wells, and Storage Tanks (1% of Cost of Facilities)	$1,000
TOTAL ANNUAL COST	**$14,000**
Available Project Yield (acft/yr)	25
Annual Cost of Water ($ per acft), based on PF=1	$560
Annual Cost of Water After Debt Service ($ per acft), based on PF=1	$40
Annual Cost of Water ($ per 1,000 gallons), based on PF=1	$1.72
Annual Cost of Water After Debt Service ($ per 1,000 gallons), based on PF=1	$0.12

13.3.16 Lampasas County

WUG: Lampasas County Irrigation

Strategy: Marble Falls Aquifer Development

Source: Marble Falls Aquifer

Facilities: Well Field, collection pipes

Total Capital Cost: $1,425,000

Total Project Cost: $2,054,000

Total Annual Cost: $175,974 (Maximum of Phased Costs)

Available Project Yield: 211 acft/yr

Annual Cost of Water: $834 per acft/yr (Maximum of Phased Costs)

This project will include one 1,000 gpm well drilled to 1,000 ft as well as 5,280 ft of transmission pipeline per well.

Cost Estimate Summary September 2018 Prices	
Irrigation – Irrigation Marble Falls Lampasas	
Item	***Estimated Costs for Facilities***
Well Fields (Wells, Pumps, and Piping)	$1,396,000
Water Treatment Plant (0.2 MGD)	$29,000
TOTAL COST OF FACILITIES	**$1,425,000**
Engineering and Feasibility Studies, Legal Assistance, Financing, Bond Counsel, and Contingencies (30% for pipes & 35% for all other facilities)	$499,000
Environmental & Archaeology Studies and Mitigation	$49,000
Land Acquisition and Surveying (5 acres)	$26,000
Interest During Construction (3% for 1 years with a 0.5% ROI)	$55,000

TOTAL COST OF PROJECT	**$2,054,000**
ANNUAL COST	
Debt Service (3.5 percent, 20 years)	$145,000
Operation and Maintenance	
Pipeline, Wells, and Storage Tanks (1% of Cost of Facilities)	$14,000
Water Treatment Plant	$17,000
TOTAL ANNUAL COST	**$176,000**
Available Project Yield (acft/yr)	211
Annual Cost of Water ($ per acft), based on PF=1	$834
Annual Cost of Water After Debt Service ($ per acft), based on PF=1	$147
Annual Cost of Water ($ per 1,000 gallons), based on PF=1	$2.56
Annual Cost of Water After Debt Service ($ per 1,000 gallons), based on PF=1	$0.45

WUG: Lampasas County Mining

Strategy: Ellenburger-San Saba Aquifer Development

Source: Ellenburger-San Saba Aquifer

Facilities: Well Field, collection pipes

Total Capital Cost: $1,423,000

Total Project Cost: $2,051,000

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

Available Project Yield: 187 acft/yr

Annual Cost of Water: $936 per acft/yr (Maximum of Phased Costs)

This project will include one 1,000 gpm wells drilled to 1,000 ft as well as 5,280 ft of transmission pipeline per well.

Cost Estimate Summary September 2018 Prices	
Mining – Mining Ellenburger-San Saba Lampasas	
Item	***Estimated Costs for Facilities***
Well Fields (Wells, Pumps, and Piping)	$1,396,000
Water Treatment Plant (0.2 MGD)	$27,000
TOTAL COST OF FACILITIES	**$1,423,000**

Engineering and Feasibility Studies, Legal Assistance, Financing, Bond Counsel, and Contingencies (30% for pipes & 35% for all other facilities)	$498,000
Environmental & Archaeology Studies and Mitigation	$49,000
Land Acquisition and Surveying (5 acres)	$26,000
Interest During Construction (3% for 1 years with a 0.5% ROI)	$55,000
TOTAL COST OF PROJECT	**$2,051,000**
ANNUAL COST	
Debt Service (3.5 percent, 20 years)	$144,000
Operation and Maintenance	
Pipeline, Wells, and Storage Tanks (1% of Cost of Facilities)	$14,000
Water Treatment Plant	$16,000
TOTAL ANNUAL COST	**$174,000**
Available Project Yield (acft/yr)	187
Annual Cost of Water ($ per acft), based on PF=1	$930
Annual Cost of Water After Debt Service ($ per acft), based on PF=1	$160
Annual Cost of Water ($ per 1,000 gallons), based on PF=1	$2.86
Annual Cost of Water After Debt Service ($ per 1,000 gallons), based on PF=1	$0.49

13.3.17 Lee County

WUG: Lee County Mining

Strategy: Carrizo-Wilcox Aquifer Development

Source: Carrizo-Wilcox Aquifer

Facilities: Well Field, collection pipes, transmission

Total Capital Cost: $2,162,000

Total Project Cost: $3,077,000

Total Annual Cost: $254,340 (Maximum of Phased Costs)

Available Project Yield: 180 acft/yr

Annual Cost of Water: $1,413 per acft/yr

This project will include one 1,800 gpm well drilled to 1,225 ft as well as 5,280 ft of transmission pipeline per well and disinfection treatment.

Cost Estimate Summary September 2018 Prices	
Mining Lee County – Mining Lee	
Item	***Estimated Costs for Facilities***
Well Fields (Wells, Pumps, and Piping)	$2,135,000
Water Treatment Plant (0.2 MGD)	$27,000
TOTAL COST OF FACILITIES	**$2,162,000**
Engineering and Feasibility Studies, Legal Assistance, Financing, Bond Counsel, and Contingencies (30% for pipes & 35% for all other facilities)	$757,000
Environmental & Archaeology Studies and Mitigation	$49,000
Land Acquisition and Surveying (5 acres)	$26,000
Interest During Construction (3% for 1 years with a 0.5% ROI)	$83,000
TOTAL COST OF PROJECT	**$3,077,000**
ANNUAL COST	
Debt Service (3.5 percent, 20 years)	$217,000
Operation and Maintenance	
Pipeline, Wells, and Storage Tanks (1% of Cost of Facilities)	$21,000
Water Treatment Plant	$16,000
TOTAL ANNUAL COST	**$254,000**
Available Project Yield (acft/yr)	180
Annual Cost of Water ($ per acft), based on PF=1	$1,411
Annual Cost of Water After Debt Service ($ per acft), based on PF=1	$206
Annual Cost of Water ($ per 1,000 gallons), based on PF=1	$4.33
Annual Cost of Water After Debt Service ($ per 1,000 gallons), based on PF=1	$0.63

13.3.18 Limestone County

WUG: Bistone Municipal Water Supply District

Strategy: Carrizo-Wilcox Aquifer Development

Source: Carrizo-Wilcox Aquifer (Brazos Basin)

Facilities: Well Field, treatment, collection pipes

Total Capital Cost: $1,257,000

Total Project Cost: $1,772,000

Total Annual Cost: $165,000

Available Project Yield: 460 acft/yr

Annual Cost of Water: $358.70 per acft/yr or $1.10 per 1,000 gal (Maximum of Phased Costs)

This project will include two 300 gpm wells drilled to 800 ft as well as 200 ft of transmission pipeline and disinfection treatment per well.

Cost Estimate Summary September 2018 Prices	
Bistone Municipal WSD - Carrizo-Wilcox Aquifer Development	
Item	***Estimated Costs for Facilities***
Well Fields (Wells, Pumps, and Piping)	$1,217,000
Water Treatment Plant (0.3 MGD)	$40,000
TOTAL COST OF FACILITIES	**$1,257,000**
Engineering and Feasibility Studies, Legal Assistance, Financing, Bond Counsel, and Contingencies (30% for pipes & 35% for all other facilities)	$440,000
Environmental & Archaeology Studies and Mitigation	$12,000
Land Acquisition and Surveying (2 acres)	$15,000
Interest During Construction (3% for 1 years with a 0.5% ROI)	$48,000
TOTAL COST OF PROJECT	**$1,772,000**
ANNUAL COST	
Debt Service (3.5 percent, 20 years)	$125,000
Operation and Maintenance	
Pipeline, Wells, and Storage Tanks (1% of Cost of Facilities)	$12,000
Water Treatment Plant	$24,000
Pumping Energy Costs (51791 kW-hr @ 0.08 $/kW-hr)	$4,000
TOTAL ANNUAL COST	**$165,000**
Available Project Yield (acft/yr)	460
Annual Cost of Water ($ per acft), based on PF=2	$359
Annual Cost of Water After Debt Service ($ per acft), based on PF=2	$87
Annual Cost of Water ($ per 1,000 gallons), based on PF=2	$1.10
Annual Cost of Water After Debt Service ($ per 1,000 gallons), based on PF=2	$0.27

WUG: Limestone County-Manufacturing

Strategy: Carrizo-Wilcox Aquifer Development

Source: Carrizo-Wilcox Aquifer

Facilities: Well Field, treatment, collection pipes, treatment

Total Capital Cost: $1,253,000

Total Project Cost: $1,767,000

Total Annual Cost: $165,000

Available Project Yield: 314 acft/yr

Annual Cost of Water: $525 per acft/yr or $1.61 per 1,000 gal

This project will include two 300 gpm wells drilled to 800 ft as well as 200 ft of transmission pipeline and disinfection treatment per well.

Cost Estimate Summary September 2018 Prices	
Limestone County -Manufacturing - Carrizo-Wilcox Aquifer Development	
Item	***Estimated Costs for Facilities***
Well Fields (Wells, Pumps, and Piping)	$1,217,000
Water Treatment Plant (0.3 MGD)	$36,000
TOTAL COST OF FACILITIES	**$1,253,000**
Engineering and Feasibility Studies, Legal Assistance, Financing, Bond Counsel, and Contingencies (30% for pipes & 35% for all other facilities)	$439,000
Environmental & Archaeology Studies and Mitigation	$12,000
Land Acquisition and Surveying (2 acres)	$15,000
Interest During Construction (3% for 1 years with a 0.5% ROI)	$48,000
TOTAL COST OF PROJECT	**$1,767,000**
ANNUAL COST	
Debt Service (3.5 percent, 20 years)	$124,000
Operation and Maintenance	
Pipeline, Wells, and Storage Tanks (1% of Cost of Facilities)	$12,000
Water Treatment Plant	$22,000
Pumping Energy Costs (89,354 kW-hr @ 0.08 $/kW-hr)	$7,000
TOTAL ANNUAL COST	**$165,000**

Available Project Yield (acft/yr)	315
Annual Cost of Water ($ per acft), based on PF=1	$525
Annual Cost of Water After Debt Service ($ per acft), based on PF=1	$131
Annual Cost of Water ($ per 1,000 gallons), based on PF=1	$1.61
Annual Cost of Water After Debt Service ($ per 1,000 gallons), based on PF=1	$0.40

WUG: Limestone County Steam-Electric

Strategy: Carrizo-Wilcox Aquifer Development

Source: Carrizo-Wilcox Aquifer

Facilities: Well Field, collection pipes

Total Capital Cost: $1,212,000

Total Project Cost: $1,709,000

Total Annual Cost: $141,000

Available Project Yield: 388 acft/yr

Annual Cost of Water: $363 per acft/yr or $1.12 per 1,000 gal (Maximum of Phased Costs)

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

Cost Estimate Summary September 2018 Prices	
Limestone County -Steam Electric - Carrizo-Wilcox Aquifer Development	
Item	***Estimated Costs for Facilities***
Well Fields (Wells, Pumps, and Piping)	$1,212,000
TOTAL COST OF FACILITIES	**$1,212,000**
Engineering and Feasibility Studies, Legal Assistance, Financing, Bond Counsel, and Contingencies (30% for pipes & 35% for all other facilities)	$424,000
Environmental & Archaeology Studies and Mitigation	$12,000
Land Acquisition and Surveying (1 acres)	$15,000
Interest During Construction (3% for 1 years with a 0.5% ROI)	$46,000
TOTAL COST OF PROJECT	**$1,709,000**

ANNUAL COST	
Debt Service (3.5 percent, 20 years)	$120,000
Operation and Maintenance	
Pipeline, Wells, and Storage Tanks (1% of Cost of Facilities)	$12,000
Pumping Energy Costs (111,104 kW-hr @ 0.08 $/kW-hr)	$9,000
TOTAL ANNUAL COST	**$141,000**
Available Project Yield (acft/yr)	388
Annual Cost of Water ($ per acft), based on PF=1	$363
Annual Cost of Water After Debt Service ($ per acft), based on PF=1	$54
Annual Cost of Water ($ per 1,000 gallons), based on PF=1	$1.12
Annual Cost of Water After Debt Service ($ per 1,000 gallons), based on PF=1	$0.17

13.3.19 McLennan County

WUG: North Bosque WSC

Strategy: Trinity Aquifer Development

Source: Trinity Aquifer

Facilities: Well Field, collection pipes, transmission and treatment

Total Capital Cost: $1,069,347

Total Project Cost: $1,558,911

Total Annual Cost: $148,322 (Maximum of Phased Costs)

Available Project Yield: 109 acft/yr (by 2070)

Annual Cost of Water: $1,358 per acft/yr or $4.17 per 1,000 gal (Maximum of Phased Costs)

This project will use supply from the McLennan County ASR project. This project will include one 300 gpm well drilled to 1,250 ft as well as 5,280 ft of transmission pipeline per well and disinfection treatment.

Cost Estimate Summary September 2018 Prices	
North Bosque WSC – North Bosque WSC Trinity McLennan	
Item	***Estimated Costs for Facilities***
Well Fields (Wells, Pumps, and Piping)	$1,022,000
Water Treatment Plant (0.4 MGD)	$47,000

TOTAL COST OF FACILITIES	**$1,069,000**
Engineering and Feasibility Studies, Legal Assistance, Financing, Bond Counsel, and Contingencies (30% for pipes & 35% for all other facilities)	$374,000
Environmental & Archaeology Studies and Mitigation	$48,000
Land Acquisition and Surveying (6 acres)	$25,000
Interest During Construction (3% for 1 years with a 0.5% ROI)	$42,000
TOTAL COST OF PROJECT	**$1,558,000**
ANNUAL COST	
Debt Service (3.5 percent, 20 years)	$110,000
Operation and Maintenance	
Pipeline, Wells, and Storage Tanks (1% of Cost of Facilities)	$10,000
Water Treatment Plant	$28,000
TOTAL ANNUAL COST	**$148,000**
Available Project Yield (acft/yr)	109
Annual Cost of Water ($ per acft), based on PF=1	$1,358
Annual Cost of Water After Debt Service ($ per acft), based on PF=1	$349
Annual Cost of Water ($ per 1,000 gallons), based on PF=1	$4.17
Annual Cost of Water After Debt Service ($ per 1,000 gallons), based on PF=1	$1.07

13.3.20 Palo Pinto County

WUG: City of Strawn

Strategy: Trinity Aquifer Development

Source: Trinity Aquifer

Facilities: Well Field, collection pipes, disinfection, and pipeline from Strawn to Erath County

Total Capital Cost: $1,436,000

Total Project Cost: $2,447,000

Total Annual Cost: $255,000

Available Project Yield: 182 acft/yr

Annual Cost of Water: $1,401 per acft/yr or $4.30 per 1,000 gal

This project will include one 180 gpm well drilled to 420 ft as well as 5,280 ft of transmission pipeline per well and disinfection and 8.2 miles of pipeline to transfer water from Erath County to City of Strawn.

Cost Estimate Summary September 2018 Prices	
City of Strawn – Strawn Trinity Erath	
Item	***Estimated Costs for Facilities***
Well Fields (Wells, Pumps, and Piping)	$465,000
Water Treatment Plant (0.3 MGD)	$39,000
TOTAL COST OF FACILITIES	**$1,436,000**
Engineering and Feasibility Studies, Legal Assistance, Financing, Bond Counsel, and Contingencies (30% for pipes & 35% for all other facilities)	$503,000
Environmental & Archaeology Studies and Mitigation	$252,000
Land Acquisition and Surveying (50 acres)	$190,000
Interest During Construction (3% for 1 years with a 0.5% ROI)	$66,000
TOTAL COST OF PROJECT	**$2,447,000**
ANNUAL COST	
Debt Service (3.5 percent, 20 years)	$172,000
Operation and Maintenance	
Pipeline, Wells, and Storage Tanks (1% of Cost of Facilities)	$5,000
Intakes and Pump Stations (2.5% of Cost of Facilities)	$23,000
Water Treatment Plant	$24,000
Pumping Energy Costs (385,582 kW-hr @ 0.08 $/kW-hr)	$31,000
TOTAL ANNUAL COST	**$255,000**
Available Project Yield (acft/yr)	182
Annual Cost of Water ($ per acft), based on PF=2	$1,401
Annual Cost of Water After Debt Service ($ per acft), based on PF=2	$456
Annual Cost of Water ($ per 1,000 gallons), based on PF=2	$4.30
Annual Cost of Water After Debt Service ($ per 1,000 gallons), based on PF=2	$1.40

WUG: Palo Pinto Mining

Strategy: Trinity Aquifer Development

Source: Trinity Aquifer

Facilities: Well Field, collection pipes, disinfection and pipeline from Palo Pinto Mining to Erath County

Total Capital Cost: $3,192,000

Total Project Cost: $4,885,000

Total Annual Cost: $590,000

Available Project Yield: 844 acft/yr

Annual Cost of Water: $699 per acft/yr or $2.14 per 1,000 gal

This project will include four 180 gpm wells drilled to 420 ft as well as 21,120 ft of transmission pipeline per well and disinfection and 3.51 miles of pipeline to transfer water from Erath County to City of Strawn.

Cost Estimate Summary September 2018 Prices	
Mining Palo Pinto - Mining Palo Pinto Trinity Erath	
Item	***Estimated Costs for Facilities***
Well Fields (Wells, Pumps, and Piping)	$2,160,000
Water Treatment Plant (0.8 MGD)	$74,000
TOTAL COST OF FACILITIES	**$3,192,000**
Engineering and Feasibility Studies, Legal Assistance, Financing, Bond Counsel, and Contingencies (30% for pipes & 35% for all other facilities)	$1,117,000
Environmental & Archaeology Studies and Mitigation	$276,000
Land Acquisition and Surveying (44 acres)	$169,000
Interest During Construction (3% for 1 years with a 0.5% ROI)	$131,000
TOTAL COST OF PROJECT	**$4,885,000**
ANNUAL COST	
Debt Service (3.5 percent, 20 years)	$344,000
Operation and Maintenance	
Pipeline, Wells, and Storage Tanks (1% of Cost of Facilities)	$22,000
Intakes and Pump Stations (2.5% of Cost of Facilities)	$24,000
Water Treatment Plant	$44,000
Pumping Energy Costs (1,950,700 kW-hr @ 0.08 $/kW-hr)	$156,000
TOTAL ANNUAL COST	**$590,000**
Available Project Yield (acft/yr)	844
Annual Cost of Water ($ per acft), based on PF=1	$699
Annual Cost of Water After Debt Service ($ per acft), based on PF=1	$291

Annual Cost of Water ($ per 1,000 gallons), based on PF=1	$2.14
Annual Cost of Water After Debt Service ($ per 1,000 gallons), based on PF=1	$0.89

WUG: Palo Pinto Irrigation

Strategy: Trinity Aquifer Development

Source: Trinity Aquifer

Facilities: Well Field, collection pipes, disinfection and pipeline from Palo Pinto Irrigation to Erath County

Total Capital Cost: $34,728,000

Total Project Cost: $49,832,000

Total Annual Cost: $4,986,000

Available Project Yield: 2,236 acft/yr

Annual Cost of Water: $2,230 per acft/yr or $6.84 per 1,000 gal

This project will include ten 180 gpm wells drilled to 420 ft as well as 52,800 ft of transmission pipeline per well and disinfection and 19.9 miles of pipeline to transfer water from Erath County to City of Strawn.

Cost Estimate Summary September 2018 Prices	
Irrigation Palo Pinto - Irrigation Palo Pinto Trinity Erath	
Cost based on ENR CCI 11170.28 for September 2018 and	
a PPI of 202.4 for September 2018	
Item	***Estimated Costs for Facilities***
Well Fields (Wells, Pumps, and Piping)	$6,306,000
Water Treatment Plant (7.5 MGD)	$434,000
TOTAL COST OF FACILITIES	**$34,728,000**
Engineering and Feasibility Studies, Legal Assistance, Financing, Bond Counsel, and Contingencies (30% for pipes & 35% for all other facilities)	$12,155,000
Environmental & Archaeology Studies and Mitigation	$969,000
Land Acquisition and Surveying (159 acres)	$646,000
Interest During Construction (3% for 1 years with a 0.5% ROI)	$1,334,000
TOTAL COST OF PROJECT	**$49,832,000**
ANNUAL COST	

Debt Service (3.5 percent, 20 years)	$3,506,000
Operation and Maintenance	
Pipeline, Wells, and Storage Tanks (1% of Cost of Facilities)	$122,000
Intakes and Pump Stations (2.5% of Cost of Facilities)	$551,000
Water Treatment Plant	$260,000
Pumping Energy Costs (6,834,630 kW-hr @ 0.08 $/kW-hr)	$547,000
TOTAL ANNUAL COST	**$4,986,000**
Available Project Yield (acft/yr)	2,236
Annual Cost of Water ($ per acft), based on PF=3.753	$2,230
Annual Cost of Water After Debt Service ($ per acft), based on PF=3.753	$662
Annual Cost of Water ($ per 1,000 gallons), based on PF=3.753	$6.84
Annual Cost of Water After Debt Service ($ per 1,000 gallons), based on PF=3.753	$2.03

13.3.21 Milam County

WUG: City of Cameron

Strategy: Little River Intake

Source: Little River water right

Facilities: Intake, pump station, pipeline

Total Capital Cost: $8,578,000

Total Project Cost: $13,006,000

Total Annual Cost: $1,137,000

Available Project Yield: 2,792 acft/yr

Annual Cost of Water: $407 per acft/yr

This project will include one 5 mgd intake and pump station and 2 miles of 18-inch diameter pipe.

Cost Estimate Summary September 2018 Prices	
City of Cameron - Little River Intake	
Item	***Estimated Costs for Facilities***
Intake and Primary Pump Station (5 MGD)	$7,213,000
Transmission Pipeline (18 in dia., 2 miles)	$1,365,000
TOTAL COST OF FACILITIES	**$8,578,000**

Engineering and Feasibility Studies, Legal Assistance, Financing, Bond Counsel, and Contingencies (30% for pipes & 35% for all other facilities)	$4,016,000
Environmental & Archaeology Studies and Mitigation	$53,000
Land Acquisition and Surveying (5 acres)	$10,000
Interest During Construction (3% for 1 years with a 0.5% ROI)	$349,000
TOTAL COST OF PROJECT	**$13,006,000**
ANNUAL COST	
Debt Service (3.5 percent, 20 years)	$915,000
Operation and Maintenance	
Pipeline, Wells, and Storage Tanks (1% of Cost of Facilities)	$14,000
Intakes and Pump Stations (2.5% of Cost of Facilities)	$180,000
Pumping Energy Costs (346,599 kW-hr @ 0.08 $/kW-hr)	$28,000
TOTAL ANNUAL COST	**$1,137,000**
Available Project Yield (acft/yr)	2,792
Annual Cost of Water ($ per acft), based on PF=2	$407
Annual Cost of Water After Debt Service ($ per acft), based on PF=2	$80
Annual Cost of Water ($ per 1,000 gallons), based on PF=2	$1.25
Annual Cost of Water After Debt Service ($ per 1,000 gallons), based on PF=2	$0.24

WUG: City of Rockdale

Strategy: Lee County: Carrizo-Wilcox Aquifer Development

Source: Lee County: Carrizo-Wilcox Aquifer

Facilities: Well Field, collection pipes, treatment

Total Capital Cost: $3,182,000

Total Project Cost: $5,086,000

Total Annual Cost: $447,000

Available Project Yield: 433 acft/yr (maximum need for Rockdale)

Annual Cost of Water: $1,034 per acft/yr

This project will include one 1,800 gpm well drilled to 1,225 ft as well as 5,280 ft of transmission pipeline per well and disinfection treatment.

Cost Estimate Summary September 2018 Prices	
Mining Lee County – Mining Carrizo Wilcox Lee	
Item	***Estimated Costs for Facilities***
Primary Pump Station (0.7 MGD)	$979,000
Well Fields (Wells, Pumps, and Piping)	$2,135,000
Water Treatment Plant (0.7 MGD)	$68,000
TOTAL COST OF FACILITIES	**$3,182,000**
Engineering and Feasibility Studies, Legal Assistance, Financing, Bond Counsel, and Contingencies (30% for pipes & 35% for all other facilities)	$1,113,000
Environmental & Archaeology Studies and Mitigation	$345,000
Land Acquisition and Surveying (64 acres)	$309,000
Interest During Construction (3% for 1 years with a 0.5% ROI)	$137,000
TOTAL COST OF PROJECT	**$5,086,000**
ANNUAL COST	
Debt Service (3.5 percent, 20 years)	$358,000
Operation and Maintenance	
Pipeline, Wells, and Storage Tanks (1% of Cost of Facilities)	$21,000
Intakes and Pump Stations (2.5% of Cost of Facilities)	$24,000
Water Treatment Plant	$41,000
Pumping Energy Costs (40,834 kW-hr @ 0.08 $/kW-hr)	$3,000
TOTAL ANNUAL COST	**$447,000**
Available Project Yield (acft/yr)	433
Annual Cost of Water ($ per acft), based on PF=2	$1,032
Annual Cost of Water After Debt Service ($ per acft), based on PF=2	$206
Annual Cost of Water ($ per 1,000 gallons), based on PF=2	$3.17
Annual Cost of Water After Debt Service ($ per 1,000 gallons), based on PF=2	$0.63

WUG: Southwest Milam WSC

Strategy: Lee County: Carrizo-Wilcox Aquifer Development

Source: Lee County: Carrizo Aquifer

Facilities: Well Field, collection pipes, treatment

Total Capital Cost: $3,177,000

Total Project Cost: $5,080,000

Total Annual Cost: $455,000

Available Project Yield: 534 acft/yr

Annual Cost of Water: $853 per acft/yr

This project will include one 1,800 gpm well drilled to 1,225 ft as well as 5,280 ft of transmission pipeline per well and disinfection treatment.

Cost Estimate Summary September 2018 Prices	
Mining Lee County – Southwest Milam WSC Carrizo Wilcox Lee	
Item	***Estimated Costs for Facilities***
Primary Pump Station (1 MGD)	$957,000
Well Fields (Wells, Pumps, and Piping)	$2,135,000
Water Treatment Plant (1 MGD)	$85,000
TOTAL COST OF FACILITIES	**$3,177,000**
Engineering and Feasibility Studies, Legal Assistance, Financing, Bond Counsel, and Contingencies (30% for pipes & 35% for all other facilities)	$1,112,000
Environmental & Archaeology Studies and Mitigation	$345,000
Land Acquisition and Surveying (64 acres)	$310,000
Interest During Construction (3% for 1 years with a 0.5% ROI)	$136,000
TOTAL COST OF PROJECT	**$5,080,000**
ANNUAL COST	
Debt Service (3.5 percent, 20 years)	$357,000
Operation and Maintenance	
Pipeline, Wells, and Storage Tanks (1% of Cost of Facilities)	$21,000
Intakes and Pump Stations (2.5% of Cost of Facilities)	$24,000
Water Treatment Plant	$51,000
Pumping Energy Costs (24,003 kW-hr @ 0.08 $/kW-hr)	$2,000
TOTAL ANNUAL COST	**$455,000**
Available Project Yield (acft/yr)	534
Annual Cost of Water ($ per acft), based on PF=2	$852

Annual Cost of Water After Debt Service ($ per acft), based on PF=2	$184
Annual Cost of Water ($ per 1,000 gallons), based on PF=2	$2.61
Annual Cost of Water After Debt Service ($ per 1,000 gallons), based on PF=2	$0.56

13.3.22 Robertson County

WUG: Robertson County WSC

Strategy: Carrizo Aquifer Development

Source: Carrizo Aquifer

Facilities: Well Field, collection pipes, treatment

Total Capital Cost: $2,351,000

Total Project Cost: $3,440,000

Total Annual Cost: $447,000

Available Project Yield: 550 acft/yr

Annual Cost of Water: $813 per acft/yr or $2.49 per 1,000 gal

This project will include four 150 gpm wells drilled to 1,080 ft as well as 1,000 ft of transmission pipeline per well and disinfection treatment.

Cost Estimate Summary September 2018 Prices	
Robertson County WSC - Carrizo-Wilcox for Robertson County WSC	
Item	***Estimated Costs for Facilities (for 1 well)***
Well Fields (Wells, Pumps, and Piping)	$2,263,000
Water Treatment Plant (1 MGD)	$88,000
TOTAL COST OF FACILITIES	**$2,351,000**
Engineering and Feasibility Studies, Legal Assistance, Financing, Bond Counsel, and Contingencies (30% for pipes & 35% for all other facilities)	$823,000
Environmental & Archaeology Studies and Mitigation	$68,000
Interest During Construction (3% for 1 years with a 0.5% ROI)	$93,000
TOTAL COST OF PROJECT	**$3,440,000**
ANNUAL COST	
Debt Service (3.5 percent, 20 years)	$242,000
Operation and Maintenance	

Pipeline, Wells, and Storage Tanks (1% of Cost of Facilities)	$23,000
Water Treatment Plant	$53,000
Pumping Energy Costs (1,612,774 kW-hr @ 0.08 $/kW-hr)	$129,000
TOTAL ANNUAL COST	**$447,000**
Available Project Yield (acft/yr)	550
Annual Cost of Water ($ per acft), based on PF=2	$813
Annual Cost of Water After Debt Service ($ per acft), based on PF=2	$373
Annual Cost of Water ($ per 1,000 gallons), based on PF=2	$2.49
Annual Cost of Water After Debt Service ($ per 1,000 gallons), based on PF=2	$1.14

13.3.23 Somervell County

WUG: Somervell County Mining

Strategy: Trinity Aquifer Development

Source: Trinity Aquifer

Facilities: Well Field and collection pipes

Total Capital Cost: $617,000

Total Project Cost: $876,000

Total Annual Cost: $85,000

Available Project Yield: 426 acft/yr

Annual Cost of Water: $200 per acft/yr or $0.61 per 1,000 gal (Maximum of Phased Costs)

This project will include three 150 gpm wells drilled to 400 ft as well as 1,000 ft of transmission pipeline per well.

Cost Estimate Summary September 2018 Prices	
Somervell County Mining - Trinity for Somervell County Mining	
Cost based on ENR CCI 11170.28 for September 2018 and	
a PPI of 202.4 for September 2018	
Item	***Estimated Costs for Facilities (for 1 well)***
Well Fields (Wells, Pumps, and Piping)	$617,000
TOTAL COST OF FACILITIES	**$617,000**

Engineering and Feasibility Studies, Legal Assistance, Financing, Bond Counsel, and Contingencies (30% for pipes & 35% for all other facilities)	$216,000
Environmental & Archaeology Studies and Mitigation	$19,000
Interest During Construction (3% for 1 years with a 0.5% ROI)	$24,000
TOTAL COST OF PROJECT	**$876,000**
ANNUAL COST	
Debt Service (3.5 percent, 20 years)	$62,000
Operation and Maintenance	
Pipeline, Wells, and Storage Tanks (1% of Cost of Facilities)	$6,000
Pumping Energy Costs (214,907 kW-hr @ 0.08 $/kW-hr)	$17,000
TOTAL ANNUAL COST	**$85,000**
Available Project Yield (acft/yr)	426
Annual Cost of Water ($ per acft), based on PF=1	$200
Annual Cost of Water After Debt Service ($ per acft), based on PF=1	$54
Annual Cost of Water ($ per 1,000 gallons), based on PF=1	$0.61
Annual Cost of Water After Debt Service ($ per 1,000 gallons), based on PF=1	$0.17

13.3.24 Stephens County

WUG: Stephens County Irrigation

Strategy: Other Aquifer Development

Source: Other Aquifer

Facilities: Well Field and collection pipes

Total Capital Cost: $101,000

Total Project Cost: $143,000

Total Annual Cost: $12,000

Available Project Yield: 30 acft/yr

Annual Cost of Water: $400 per acft/yr or $1.23 per 1,000 gal (Maximum of Phased Costs)

This project will include two 25 gpm wells drilled to 200 ft as well as 600 ft of transmission pipeline.

Cost Estimate Summary September 2018 Prices	
Stephens County Irrigation - Other Aquifer Development	
Item	***Estimated Costs for Facilities (for 1 well)***
Well Fields (Wells, Pumps, and Piping)	$101,000
TOTAL COST OF FACILITIES	**$101,000**
Engineering and Feasibility Studies, Legal Assistance, Financing, Bond Counsel, and Contingencies (30% for pipes & 35% for all other facilities)	$35,000
Environmental & Archaeology Studies and Mitigation	$3,000
Interest During Construction (3% for 1 years with a 0.5% ROI)	$4,000
TOTAL COST OF PROJECT	**$143,000**
ANNUAL COST	
Debt Service (3.5 percent, 20 years)	$10,000
Operation and Maintenance	
Pipeline, Wells, and Storage Tanks (1% of Cost of Facilities)	$1,000
Pumping Energy Costs (8,790 kW-hr @ 0.08 $/kW-hr)	$1,000
TOTAL ANNUAL COST	**$12,000**
Available Project Yield (acft/yr)	30
Annual Cost of Water ($ per acft), based on PF=1	$400
Annual Cost of Water After Debt Service ($ per acft), based on PF=1	$67
Annual Cost of Water ($ per 1,000 gallons), based on PF=1	$1.23
Annual Cost of Water After Debt Service ($ per 1,000 gallons), based on PF=1	$0.20

13.3.25 Stonewall County

WUG: Stonewall County Manufacturing

Strategy: Blaine Aquifer Development

Source: Blaine Aquifer

Facilities: Well Field and collection pipes

Total Capital Cost: $136,000

Total Project Cost: $192,000

Total Annual Cost: $15,000

Available Project Yield: 56 acft/yr

Annual Cost of Water: $268 per acft/yr or $0.82 per 1,000 gal (Maximum of Phased Costs)

This project will include one 50 gpm well drilled to 250 ft as well as 400 ft of transmission pipeline.

Cost Estimate Summary September 2018 Prices	
Stonewall County Manufacturing - Blaine for Stonewall County Manufacturing	
Item	***Estimated Costs for Facilities (for 1 well)***
Well Fields (Wells, Pumps, and Piping)	$136,000
TOTAL COST OF FACILITIES	**$136,000**
Engineering and Feasibility Studies, Legal Assistance, Financing, Bond Counsel, and Contingencies (30% for pipes & 35% for all other facilities)	$48,000
Environmental & Archaeology Studies and Mitigation	$2,000
Interest During Construction (3% for 1 years with a 0.5% ROI)	$6,000
TOTAL COST OF PROJECT	**$192,000**
ANNUAL COST	
Debt Service (3.5 percent, 20 years)	$13,000
Operation and Maintenance	
Pipeline, Wells, and Storage Tanks (1% of Cost of Facilities)	$1,000
Pumping Energy Costs (14,813 kW-hr @ 0.08 $/kW-hr)	$1,000
TOTAL ANNUAL COST	**$15,000**
Available Project Yield (acft/yr)	56
Annual Cost of Water ($ per acft), based on PF=1	$268
Annual Cost of Water After Debt Service ($ per acft), based on PF=1	$36
Annual Cost of Water ($ per 1,000 gallons), based on PF=1	$0.82
Annual Cost of Water After Debt Service ($ per 1,000 gallons), based on PF=1	$0.11

WUG: Stonewall County Mining

Strategy: Blaine Aquifer Development

Source: Blaine Aquifer

Facilities: Well Field and collection pipes

Total Capital Cost: $482,000

Total Project Cost: $687,000

Total Annual Cost: $81,000

Available Project Yield: 372 acft/yr

Annual Cost of Water: $218 per acft/yr or $0.67 per 1,000 gal (Maximum of Phased Costs)

This project will include six 50 gpm wells drilled to 250 ft as well as 500 ft of transmission pipeline per well.

Cost Estimate Summary September 2018 Prices	
Stonewall County Mining - Blaine for Stonewall County Mining	
Item	***Estimated Costs for Facilities (for 1 well)***
Well Fields (Wells, Pumps, and Piping)	$482,000
TOTAL COST OF FACILITIES	**$482,000**
Engineering and Feasibility Studies, Legal Assistance, Financing, Bond Counsel, and Contingencies (30% for pipes & 35% for all other facilities)	$169,000
Environmental & Archaeology Studies and Mitigation	$17,000
Interest During Construction (3% for 1 years with a 0.5% ROI)	$19,000
TOTAL COST OF PROJECT	**$687,000**
ANNUAL COST	
Debt Service (3.5 percent, 20 years)	$48,000
Operation and Maintenance	
Pipeline, Wells, and Storage Tanks (1% of Cost of Facilities)	$5,000
Pumping Energy Costs (349,924 kW-hr @ 0.08 $/kW-hr)	$28,000
TOTAL ANNUAL COST	**$81,000**
Available Project Yield (acft/yr)	372
Annual Cost of Water ($ per acft), based on PF=1	$218
Annual Cost of Water After Debt Service ($ per acft), based on PF=1	$89
Annual Cost of Water ($ per 1,000 gallons), based on PF=1	$0.67
Annual Cost of Water After Debt Service ($ per 1,000 gallons), based on PF=1	$0.27

13.3.26 Throckmorton County

WUG: Throckmorton County Mining

Strategy: Cross Timbers Aquifer Development

Source: Cross Timbers Aquifer

Facilities: Well Field, collection pipes

Total Capital Cost: $211,000

Total Project Cost: $344,000

Total Annual Cost: $27,000

Available Project Yield: 84 acft/yr

Annual Cost of Water: $321 per acft/yr or $0.99 per 1,000 gal

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

Cost Estimate Summary September 2018 Prices	
Throckmorton County-Mining - Cross Timbers Aquifer Development	
Item	***Estimated Costs for Facilities***
Well Fields (Wells, Pumps, and Piping)	$211,000
TOTAL COST OF FACILITIES	**$211,000**
Engineering and Feasibility Studies, Legal Assistance, Financing, Bond Counsel, and Contingencies (30% for pipes & 35% for all other facilities)	$74,000
Environmental & Archaeology Studies and Mitigation	$24,000
Land Acquisition and Surveying (3 acres)	$25,000
Interest During Construction (3% for 1 years with a 0.5% ROI)	$10,000
TOTAL COST OF PROJECT	**$344,000**
ANNUAL COST	
Debt Service (3.5 percent, 20 years)	$24,000
Operation and Maintenance	
Pipeline, Wells, and Storage Tanks (1% of Cost of Facilities)	$2,000
Pumping Energy Costs (10,425 kW-hr @ 0.08 $/kW-hr)	$1,000
TOTAL ANNUAL COST	**$27,000**
Available Project Yield (acft/yr)	84
Annual Cost of Water ($ per acft), based on PF=1	$321

Annual Cost of Water After Debt Service ($ per acft), based on PF=1	$36
Annual Cost of Water ($ per 1,000 gallons), based on PF=1	$0.99
Annual Cost of Water After Debt Service ($ per 1,000 gallons), based on PF=1	$0.11

WUG: Throckmorton County Irrigation

Strategy: Cross Timbers Aquifer Development

Source: Cross Timbers

Facilities: Well Field, collection pipes

Total Capital Cost: $287,000

Total Project Cost: $405,000

Total Annual Cost: $33,000

Available Project Yield: 152 acft/yr

Annual Cost of Water: $217 per acft/yr or $0.67 per 1,000 gal

This project will include three 94 gpm wells drilled to 200 ft as well as 200 ft of transmission pipeline per well.

Cost Estimate Summary September 2018 Prices	
Throckmorton County-Irrigation - Cross Timbers Aquifer Development	
Item	***Estimated Costs for Facilities***
Well Fields (Wells, Pumps, and Piping)	$287,000
TOTAL COST OF FACILITIES	**$287,000**
Engineering and Feasibility Studies, Legal Assistance, Financing, Bond Counsel, and Contingencies (30% for pipes & 35% for all other facilities)	$100,000
Environmental & Archaeology Studies and Mitigation	$3,000
Land Acquisition and Surveying (2 acres)	$4,000
Interest During Construction (3% for 1 years with a 0.5% ROI)	$11,000
TOTAL COST OF PROJECT	**$405,000**
ANNUAL COST	
Debt Service (3.5 percent, 20 years)	$28,000
Operation and Maintenance	
Pipeline, Wells, and Storage Tanks (1% of Cost of Facilities)	$3,000
Pumping Energy Costs (18,902 kW-hr @ 0.08 $/kW-hr)	$2,000
TOTAL ANNUAL COST	**$33,000**

Available Project Yield (acft/yr)	152
Annual Cost of Water ($ per acft), based on PF=3.75	$217
Annual Cost of Water After Debt Service ($ per acft), based on PF=3.75	$33
Annual Cost of Water ($ per 1,000 gallons), based on PF=3.75	$0.67
Annual Cost of Water After Debt Service ($ per 1,000 gallons), based on PF=3.75	$0.10

13.3.27 Washington County

WUG: Brenham

Strategy: Gulf Coast Aquifer Development

Source: Gulf Coast Aquifer

Facilities: Well Field, collection pipes, transmission and treatment

Total Capital Cost: $1,911,000

Total Project Cost: $2,958,000

Total Annual Cost: $331,000

Available Project Yield: 628 acft/yr

Annual Cost of Water: $527 per acft/yr or $1.62 per 1,000 gal

This project will include three 154 gpm wells drilled to 820 ft as well as 5,280 ft of transmission pipeline per well and disinfection treatment.

Cost Estimate Summary September 2018 Prices	
Brenham - Brenham Gulf Coast Washington	
Item	***Estimated Costs for Facilities***
Well Fields (Wells, Pumps, and Piping)	$1,852,000
Water Treatment Plant (0.6 MGD)	$59,000
TOTAL COST OF FACILITIES	**$1,911,000**
Engineering and Feasibility Studies, Legal Assistance, Financing, Bond Counsel, and Contingencies (30% for pipes & 35% for all other facilities)	$669,000
Environmental & Archaeology Studies and Mitigation	$181,000
Land Acquisition and Surveying (16 acres)	$117,000
Interest During Construction (3% for 1 years with a 0.5% ROI)	$80,000
TOTAL COST OF PROJECT	**$2,958,000**

ANNUAL COST	
Debt Service (3.5 percent, 20 years)	$208,000
Operation and Maintenance	
Pipeline, Wells, and Storage Tanks (1% of Cost of Facilities)	$19,000
Water Treatment Plant	$35,000
Pumping Energy Costs (865,482 kW-hr @ 0.08 $/kW-hr)	$69,000
TOTAL ANNUAL COST	**$331,000**
Available Project Yield (acft/yr)	628
Annual Cost of Water ($ per acft), based on PF=1	$527
Annual Cost of Water After Debt Service ($ per acft), based on PF=1	$196
Annual Cost of Water ($ per 1,000 gallons), based on PF=1	$1.62
Annual Cost of Water After Debt Service ($ per 1,000 gallons), based on PF=1	$0.60

WUG: Corix Utilities Texas Inc

Strategy: Gulf Coast Aquifer Development

Source: Gulf Coast Aquifer

Facilities: Well Field, collection pipes, transmission and treatment

Total Capital Cost: $1,913,000

Total Project Cost: $2,892,000

Total Annual Cost: $255,000 (Maximum of Annual Costs)

Available Project Yield: 281 acft/yr

Annual Cost of Water: $512 per acft/yr or $1.57 per 1,000 gal (Maximum of Phased Costs)

This project will include three 140 gpm wells drilled to 960 ft as well as 5,280 ft of transmission pipeline per well and disinfection treatment.

Cost Estimate Summary September 2018 Prices	
Corix Utilities Texas Inc – Corix Utilities Texas Inc Gulf Coast Washington	
Item	***Estimated Costs for Facilities***
Well Fields (Wells, Pumps, and Piping)	$1,863,000
Water Treatment Plant (0.5 MGD)	$50,000
TOTAL COST OF FACILITIES	**$1,913,000**

Engineering and Feasibility Studies, Legal Assistance, Financing, Bond Counsel, and Contingencies (30% for pipes & 35% for all other facilities)	$670,000
Environmental & Archaeology Studies and Mitigation	$149,000
Land Acquisition and Surveying (16 acres)	$82,000
Interest During Construction (3% for 1 years with a 0.5% ROI)	$78,000
TOTAL COST OF PROJECT	**$2,892,000**
ANNUAL COST	
Debt Service (3.5 percent, 20 years)	$203,000
Operation and Maintenance	
Pipeline, Wells, and Storage Tanks (1% of Cost of Facilities)	$19,000
Water Treatment Plant	$30,000
Pumping Energy Costs (37,373 kW-hr @ 0.08 $/kW-hr)	$3,000
TOTAL ANNUAL COST	**$255,000**
Available Project Yield (acft/yr)	498
Annual Cost of Water ($ per acft), based on PF=1	$512
Annual Cost of Water After Debt Service ($ per acft), based on PF=1	$104
Annual Cost of Water ($ per 1,000 gallons), based on PF=1	$1.57
Annual Cost of Water After Debt Service ($ per 1,000 gallons), based on PF=1	$0.32

WUG: Washington County Mining

Strategy: Gulf Coast Aquifer Development

Source: Gulf Coast Aquifer

Facilities: Well Field, collection pipes

Total Capital Cost: $2,129,000

Total Project Cost: $3,348,000

Total Annual Cost: $379,000

Available Project Yield: 745 acft/yr

Annual Cost of Water: $509 per acft/yr or $1.56 per 1,000 gal

This project will include three 154 gpm wells drilled to 820 ft as well as 21,120 ft of transmission pipeline per well and disinfection.

Cost Estimate Summary September 2018 Prices	
Mining Washington County - Mining Gulf Coast Washington	
Item	***Estimated Costs for Facilities***
Well Fields (Wells, Pumps, and Piping)	$2,062,000
Water Treatment Plant (0.7 MGD)	$67,000
TOTAL COST OF FACILITIES	**$2,129,000**
Engineering and Feasibility Studies, Legal Assistance, Financing, Bond Counsel, and Contingencies (30% for pipes & 35% for all other facilities)	$745,000
Environmental & Archaeology Studies and Mitigation	$235,000
Land Acquisition and Surveying (21 acres)	$149,000
Interest During Construction (3% for 1 years with a 0.5% ROI)	$90,000
TOTAL COST OF PROJECT	**$3,348,000**
ANNUAL COST	
Debt Service (3.5 percent, 20 years)	$236,000
Operation and Maintenance	
Pipeline, Wells, and Storage Tanks (1% of Cost of Facilities)	$21,000
Water Treatment Plant	$40,000
Pumping Energy Costs (1,026,726 kW-hr @ 0.08 $/kW-hr)	$82,000
TOTAL ANNUAL COST	**$379,000**
Available Project Yield (acft/yr)	745
Annual Cost of Water ($ per acft), based on PF=1	$509
Annual Cost of Water After Debt Service ($ per acft), based on PF=1	$192
Annual Cost of Water ($ per 1,000 gallons), based on PF=1	$1.56
Annual Cost of Water After Debt Service ($ per 1,000 gallons), based on PF=1	$0.59

13.3.28 Williamson County

WUG: City of Bartlett

Strategy: Trinity Aquifer Development (Bell County)

Source: Trinity Aquifer

Facilities: Well Field, collection pipes, transmission and treatment

Total Capital Cost: $1,317,000

Total Project Cost: $1,872,000

Total Annual Cost: $184,000

Available Project Yield: 275 acft/yr (After Full Implementation)

Annual Cost of Water: $669 per acft/yr or $2.05 per 1,000 gal (Maximum of Phased Costs)

This project will include two 300 gpm wells drilled to 800 ft as well as 1,000 ft of transmission pipeline per well and disinfection treatment.

Cost Estimate Summary September 2018 Prices	
City of Bartlett - Trinity Aquifer Development (Bell County)	
Item	***Estimated Costs for Facilities***
Well Fields (Wells, Pumps, and Piping)	$1,265,000
Water Treatment Plant (0.5 MGD)	$52,000
TOTAL COST OF FACILITIES	**$1,317,000**
Engineering and Feasibility Studies, Legal Assistance, Financing, Bond Counsel, and Contingencies (30% for pipes & 35% for all other facilities)	$461,000
Environmental & Archaeology Studies and Mitigation	$21,000
Land Acquisition and Surveying (3 acres)	$22,000
Interest During Construction (3% for 1 years with a 0.5% ROI)	$51,000
TOTAL COST OF PROJECT	**$1,872,000**
ANNUAL COST	
Debt Service (3.5 percent, 20 years)	$132,000
Operation and Maintenance	
Pipeline, Wells, and Storage Tanks (1% of Cost of Facilities)	$13,000
Water Treatment Plant	$31,000
Advanced Water Treatment Facility	$0
Pumping Energy Costs (98,939 kW-hr @ 0.08 $/kW-hr)	$8,000
TOTAL ANNUAL COST	**$184,000**
Available Project Yield (acft/yr)	275
Annual Cost of Water ($ per acft), based on PF=2	$669
Annual Cost of Water After Debt Service ($ per acft), based on PF=2	$189

Annual Cost of Water ($ per 1,000 gallons), based on PF=2	$2.05
Annual Cost of Water After Debt Service ($ per 1,000 gallons), based on PF=2	$0.58

WUG: Williamson County Irrigation

Strategy: Edwards Aquifer Development

Source: Edwards Aquifer

Facilities: Well Field, collection pipes

Total Capital Cost: $458,000

Total Project Cost: $675,000

Total Annual Cost: $57,000 (Maximum of Phased Costs)

Available Project Yield: 172 acft/yr

Annual Cost of Water: $331 per acft/yr or $1.02 per 1,000 gal (Maximum of Phased Costs)

This project will include three 188 gpm wells drilled to 300 ft as well as 200 ft of transmission pipeline per well.

Cost Estimate Summary September 2018 Prices	
Williamson County-Irrigation - Edwards Aquifer (BFZ) Development	
Item	***Estimated Costs for Facilities***
Well Fields (Wells, Pumps, and Piping)	$458,000
TOTAL COST OF FACILITIES	**$458,000**
Engineering and Feasibility Studies, Legal Assistance, Financing, Bond Counsel, and Contingencies (30% for pipes & 35% for all other facilities)	$160,000
Environmental & Archaeology Studies and Mitigation	$18,000
Land Acquisition and Surveying (2 acres)	$21,000
Interest During Construction (3% for 1 years with a 0.5% ROI)	$18,000
TOTAL COST OF PROJECT	**$675,000**
ANNUAL COST	
Debt Service (3.5 percent, 20 years)	$48,000
Operation and Maintenance	
Pipeline, Wells, and Storage Tanks (1% of Cost of Facilities)	$5,000
Pumping Energy Costs (49,017 kW-hr @ 0.08 $/kW-hr)	$4,000

TOTAL ANNUAL COST	**$57,000**
Available Project Yield (acft/yr)	172
Annual Cost of Water ($ per acft), based on PF=3.75	$331
Annual Cost of Water After Debt Service ($ per acft), based on PF=3.75	$52
Annual Cost of Water ($ per 1,000 gallons), based on PF=3.75	$1.02
Annual Cost of Water After Debt Service ($ per 1,000 gallons), based on PF=3.75	$0.16

13.3.29 Young County

WUG: Young County Mining

Strategy: Cross Timbers Aquifer Development

Source: Cross Timbers Aquifer

Facilities: Well Field, collection pipes

Total Capital Cost: $316,000

Total Project Cost: $514,000

Total Annual Cost: $41,000

Available Project Yield: 181 acft/yr

Annual Cost of Water: $227 per acft/yr or $0.70 per 1,000 gal

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

Cost Estimate Summary September 2018 Prices	
Young County-Mining - Cross Timbers Aquifer Development	
Item	***Estimated Costs for Facilities***
Well Fields (Wells, Pumps, and Piping)	$316,000
TOTAL COST OF FACILITIES	**$316,000**
Engineering and Feasibility Studies, Legal Assistance, Financing, Bond Counsel, and Contingencies (30% for pipes & 35% for all other facilities)	$111,000
Environmental & Archaeology Studies and Mitigation	$36,000
Land Acquisition and Surveying (4 acres)	$37,000
Interest During Construction (3% for 1 years with a 0.5% ROI)	$14,000
TOTAL COST OF PROJECT	**$514,000**

ANNUAL COST	
Debt Service (3.5 percent, 20 years)	$36,000
Operation and Maintenance	
Pipeline, Wells, and Storage Tanks (1% of Cost of Facilities)	$3,000
Pumping Energy Costs (22,463 kW-hr @ 0.08 $/kW-hr)	$2,000
TOTAL ANNUAL COST	**$41,000**
Available Project Yield (acft/yr)	181
Annual Cost of Water ($ per acft), based on PF=1	$227
Annual Cost of Water After Debt Service ($ per acft), based on PF=1	$28
Annual Cost of Water ($ per 1,000 gallons), based on PF=1	$0.70
Annual Cost of Water After Debt Service ($ per 1,000 gallons), based on PF=1	$0.08

WUG: Young County Irrigation

Strategy: Cross Timbers Aquifer Development

Source: Cross Timbers Aquifer

Facilities: Well Field, collection pipes

Total Capital Cost: $382,000

Total Project Cost: $540,000

Total Annual Cost: $46,000

Available Project Yield: 450 acft/yr

Annual Cost of Water: $102 per acft/yr or $0.31 per 1,000 gal

This project will include four 94 gpm wells drilled to 200 ft as well as 200 ft of transmission pipeline per well.

Cost Estimate Summary September 2018 Prices	
Young County-Irrigation - Cross Timbers Aquifer Development	
Item	***Estimated Costs for Facilities***
Well Fields (Wells, Pumps, and Piping)	$382,000
TOTAL COST OF FACILITIES	**$382,000**
Engineering and Feasibility Studies, Legal Assistance, Financing, Bond Counsel, and Contingencies (30% for pipes & 35% for all other facilities)	$134,000
Environmental & Archaeology Studies and Mitigation	$4,000

Land Acquisition and Surveying (3 acres)	$5,000
Interest During Construction (3% for 1 years with a 0.5% ROI)	$15,000
TOTAL COST OF PROJECT	**$540,000**
ANNUAL COST	
Debt Service (3.5 percent, 20 years)	$38,000
Operation and Maintenance	
Pipeline, Wells, and Storage Tanks (1% of Cost of Facilities)	$4,000
Pumping Energy Costs (55,962 kW-hr @ 0.08 $/kW-hr)	$4,000
Purchase of Water (acft/yr @ $/acft)	$0
TOTAL ANNUAL COST	**$46,000**
Available Project Yield (acft/yr)	450
Annual Cost of Water ($ per acft), based on PF=3.75	$102
Annual Cost of Water After Debt Service ($ per acft), based on PF=3.75	$18
Annual Cost of Water ($ per 1,000 gallons), based on PF=3.75	$0.31
Annual Cost of Water After Debt Service ($ per 1,000 gallons), based on PF=3.75	$0.05

WUG: Young County Livestock

Strategy: Cross Timbers Aquifer Development

Source: Cross Timbers Aquifer

Facilities: Well Field, collection pipes

Total Capital Cost: $105,000

Total Project Cost: $151,000

Total Annual Cost: $12,000

Available Project Yield: 11 acft/yr

Annual Cost of Water: $1,091 per acft/yr or $3.35 per 1,000 gal

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

Cost Estimate Summary September 2018 Prices	
Young County-Livestock - Cross Timbers Aquifer Development	
Item	***Estimated Costs for Facilities***
Well Fields (Wells, Pumps, and Piping)	$105,000
TOTAL COST OF FACILITIES	**$105,000**
Engineering and Feasibility Studies, Legal Assistance, Financing, Bond Counsel, and Contingencies (30% for pipes & 35% for all other facilities)	$37,000
Environmental & Archaeology Studies and Mitigation	$2,000
Land Acquisition and Surveying (1 acres)	$2,000
Interest During Construction (3% for 1 years with a 0.5% ROI)	$5,000
TOTAL COST OF PROJECT	**$151,000**
ANNUAL COST	
Debt Service (3.5 percent, 20 years)	$11,000
Operation and Maintenance	
Pipeline, Wells, and Storage Tanks (1% of Cost of Facilities)	$1,000
TOTAL ANNUAL COST	**$12,000**
Available Project Yield (acft/yr)	11
Annual Cost of Water ($ per acft), based on PF=1	$1,091
Annual Cost of Water After Debt Service ($ per acft), based on PF=1	$91
Annual Cost of Water ($ per 1,000 gallons), based on PF=1	$3.35
Annual Cost of Water After Debt Service ($ per 1,000 gallons), based on PF=1	$0.28

13.4 Miscellaneous Purchases, Interconnects & Reallocations

13.4.1 Bell County

WUG: 439 WSC

Strategy: Purchase Raw Water Supply from Fort Hood

Source: Fort Hood (Lake Belton)

Facilities: None; purchasing raw in place in Lake Belton

Total Capital Cost: N/A

Total Project Cost: N/A

Total Annual Cost: $62,600

Available Project Yield: 626 acft/yr

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

This project will include contracting with Fort Hood to purchase portions of Fort Hood's projected surplus of raw water supply in Lake Belton. Water purchased under this strategy will be diverted, treated, and delivered to 439 WSC by Bell County WCID No. 1 using existing infrastructure. Cost of raw water is assumed and is estimated based on an approximately 33 percent markup to typical raw water wholesale cost from the Brazos River Authority.

WUG: 439 WSC

Strategy: Purchase Diversion, Treatment, and Delivery Capacity from Bell County WCID No. 1

Source: 439 WSC (Lake Belton)

Facilities: None; existing infrastructure assumed sufficient.

Total Capital Cost: N/A

Total Project Cost: N/A

Total Annual Cost: $1,161,000

Available Project Yield: 1,161 acft/yr

Annual Cost of Water: $1,000 per acft/yr or $3.07 per 1,000 gal

This strategy includes contracting with the Bell County WCID No. 1 to increase allocated capacity to divert, treat, and deliver raw water from Lake Belton to 439 WSC by Bell County WCID No.1. Cost of water estimated based on unit cost of water associated with expansion of Bell County WCID No. 1 treatment facilities.

WUG: Elm Creek WSC

Strategy: Reallocation of Supply from Moffat WSC

Source: Moffat WSC

Facilities: None; existing infrastructure assumed sufficient.

Total Capital Cost: N/A

Total Project Cost: N/A

Total Annual Cost: $1,161,000

Available Project Yield: 154 acft/yr

Annual Cost of Water: $978 per acft/yr or $3.00 per 1,000 gal

This strategy involves reallocation/purchasing a portion of Moffat WSC's surplus supply from Bluebonnet WSC. Reimbursement/purchase cost of water assumed equal to Moffat WSC current contract with Bluebonnet WSC.

WUG: Harker Heights

Strategy: Purchase Raw Water Supply from Fort Hood

Source: Fort Hood (Lake Belton)

Facilities: None; purchasing raw in place in Lake Belton

Total Capital Cost: N/A

Total Project Cost: N/A

Total Annual Cost: $48,700

Available Project Yield: 487 acft/yr

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

This project will include contracting with Fort Hood to purchase portions of Fort Hood's projected surplus of raw water supply in Lake Belton. Water purchased under this strategy will be diverted, treated, and delivered to Harker Heights by Bell County WCID No. 1 using existing infrastructure. Cost of raw water is assumed and is estimated based on an approximately 33 percent markup to typical raw water wholesale cost from the Brazos River Authority.

WUG: Harker Heights

Strategy: Purchase Diversion, Treatment, and Delivery Capacity from Bell County WCID No. 1

Source: Harker Heights (Lake Belton)

Facilities: None; existing infrastructure assumed sufficient.

Total Capital Cost: N/A

Total Project Cost: N/A

Total Annual Cost: $1,232,000

Available Project Yield: 1,232 acft/yr

Annual Cost of Water: $1,000 per acft/yr or $3.07 per 1,000 gal

This strategy includes contracting with the Bell County WCID No. 1 to increase allocated capacity to divert, treat, and deliver raw water from Lake Belton to Harker Heights by Bell County WCID No.1. Cost of water estimated based on unit cost of water associated with expansion of Bell County WCID No. 1 treatment facilities.

WUG: Bell County-Other

Strategy: Purchase Additional Water Supply 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: $387,024

Available Project Yield: 264 acft/yr

Annual Cost of Water: $1,466 per acft/yr or $4.50 per 1,000 gal

This strategy includes increasing contracted supply from Central Texas WSC. Unit cost based on retail costs for Kempner WSC.

WUG: Bell County-Manufacturing

Strategy: Purchase Reuse Supplies from Bell County WCID No. 1 (North)

Source: Bell County WCID No. 1

Facilities: None; existing infrastructure assumed sufficient.

Total Capital Cost: N/A

Total Project Cost: N/A

Total Annual Cost: $139,612

Available Project Yield: 152 acft/yr

Annual Cost of Water: $919 per acft/yr or $2.82 per 1,000 gal

This strategy includes purchasing existing reuse supplies; unit cost of reuse water based on Bell County WCID No. 1's cost to develop reuse supply.

13.4.2 Callahan County

WUG: City of Baird

Strategy: Additional Purchase from Abilene

Source: City of Abilene

Facilities: None, existing infrastructure assumed sufficient

Total Capital Cost: N/A

Total Project Cost: N/A

Total Annual Cost: $277,816 (Maximum of Phased Costs)

Available Project Yield: 164 acft/yr

Annual Cost of Water: $1,694 per acft/yr

This project will include a contract increase of up to 164 acft/yr additional utilizing existing infrastructure from Abilene to the City of Baird.

WUG: Callahan County – Mining

Strategy: Additional Purchase from EULA WSC and City of Cross Plains

Source: EULA WSC and City of Cross Plains

Facilities: None, existing infrastructure assumed sufficient

Total Capital Cost: N/A

Total Project Cost: N/A

Total Annual Cost: $674,934 (Maximum of Phased Costs)

Available Project Yield: 141 acft/yr

Annual Cost of Water: $6,617 per acft/yr

This project will include a contract increase of up to 141 acft/yr additional utilizing existing infrastructure from EULA WSC and City of Cross Plains to the Callahan County – Mining.

13.4.3 Coryell County

WUG: Multi-County WSC

Strategy: Purchase Additional Treated Water Supply 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: maximum of $43,560

Available Project Yield: 174 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 174 additional acft/yr utilizing existing infrastructure from the City of Hamilton to Multi-County WSC.

WUG: Flat WSC

Strategy: Purchase Additional Treated Water Supply from the City of Gatesville

Source: City of Gatesville

Facilities: None, existing infrastructure assumed sufficient

Total Capital Cost: N/A

Total Project Cost: N/A

Total Annual Cost: maximum of $28,798

Available Project Yield: 22 acft/yr

Annual Cost of Water: $1,309 per acft/yr or $4.02 per 1,000 gal (City of Gatesville Wholesale Cost)

This project will include a contract increase of up to 22 additional acft/yr utilizing existing infrastructure from the City of Gatesville to Flat WSC.

WUG: City of Copperas Cove

Strategy: Purchase Raw Water Supply from Fort Hood

Source: Fort Hood (Lake Belton)

Facilities: None; purchasing raw in place in Lake Belton

Total Capital Cost: N/A

Total Project Cost: N/A

Total Annual Cost: maximum of $128,500

Available Project Yield: 1,285 acft/yr

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

This project will include contracting with Fort Hood to purchase portions of Fort Hood's projected surplus of raw water supply in Lake Belton. Water purchased under this strategy will be diverted, treated, and delivered to Copperas Cove by Bell County WCID No. 1 using existing infrastructure. Cost of raw water is assumed and is estimated based on an approximately 33 percent markup to typical raw water wholesale cost from the Brazos River Authority.

WUG: City of Copperas Cove

Strategy: Purchase Diversion, Treatment, and Delivery Capacity from Bell County WCID No. 1

Source: City of Copperas Cove (Lake Belton)

Facilities: None; existing infrastructure assumed sufficient.

Total Capital Cost: N/A

Total Project Cost: N/A

Total Annual Cost: maximum of $1,285,000

Available Project Yield: 1,285 acft/yr

Annual Cost of Water: $1,000 per acft/yr or $3.07 per 1,000 gal

This strategy includes contracting with the Bell County WCID No. 1 to increase allocated capacity to divert, treat, and deliver raw water from Lake Belton to City of Copperas Cove by Bell County WCID No.1. Cost of water estimated based on unit cost of water associated with expansion of Bell County WCID No. 1 treatment facilities.

WUG: Fort Gates WSC

Strategy: Purchase Diversion, Treatment, and Delivery Capacity from City of Gatesville

Source: Fort Gates WSC

Facilities: None; existing infrastructure assumed sufficient.

Total Capital Cost: N/A

Total Project Cost: N/A

Total Annual Cost: maximum of $234,400

Available Project Yield: 200 acft/yr

Annual Cost of Water: $1,172 per acft/yr or $3.60 per 1,000 gal

This strategy includes increasing existing contract with the City of Gatesville to divert, treat, and deliver additional raw water supply for Fort Gates WSC. Annual cost of water estimated based on unit cost of water associated with expansion of City of Gatesville treatment facilities.

WUG: Fort Gates WSC

Strategy: Purchase Treated Water Supply from City of Gatesville

Source: City of Gatesville

Facilities: None; existing infrastructure assumed sufficient

Total Capital Cost: N/A

Total Project Cost: N/A

Total Annual Cost: maximum of $248,710

Available Project Yield: 190 acft/yr

Annual Cost of Water: $1,309 per acft/yr or $4.02 per 1,000 gal (City of Gatesville Wholesale Cost)

This strategy includes contracting with the City of Gatesville for treated water supply beyond what contracted Fort Gates WSC's raw water supply will yield.

WUG: City of Gatesville

Strategy: Purchase Additional Raw Water Supply from the Brazos River Authority

Source: Coryell County OCR

Facilities: None; existing infrastructure assumed sufficient

Total Capital Cost: N/A

Total Project Cost: N/A

Total Annual Cost: maximum of $126,990

Available Project Yield: 1,660 acft/yr

Annual Cost of Water: $76.50/acft

This strategy includes increasing existing raw water purchase contracts with the Brazos River Authority; water supplied under this increase will be sourced from the new Coryell County OCR.

13.4.4 Erath County

WUG: Erath County-Manufacturing

Strategy: Purchase Additional Supply from the City of Stephenville

Source: City of Stephenville

Facilities: None, existing infrastructure assumed sufficient

Total Capital Cost: N/A

Total Project Cost: N/A

Total Annual Cost: $4,920 (Maximum of Phased Costs)

Available Project Yield: 2 acft/yr

Annual Cost of Water: $ 2,460.00 per acft/yr or $7.55 per 1,000 gal

This project will include a contract increase of up to 2 additional acft/yr utilizing existing infrastructure from the City of Stephenville to Erath County-Manufacturing. Annual cost of water is estimated based on City of Stephenville's retail service rate structure.

13.4.5 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: $86,829

Available Project Yield: 76 acft/yr

Annual Cost of Water: $ 1,142.49 per acft/yr or $3.51 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.

13.4.6 Hill County

WUG: Chatt WSC

Strategy: Purchase Additional Supply from Files Valley WSC

Source: Files Valley WSC via Aquilla Water Supply

Facilities: None, existing infrastructure assumed sufficient

Total Capital Cost: N/A

Total Project Cost: N/A

Total Annual Cost: $7,820

Available Project Yield: 12 acft/yr

Annual Cost of Water: $652 per acft/yr or $2.00 per 1,000 gal (White Bluff base rates)

This project will include a voluntary sale of 12 acft/yr from Files Valley WSC utilizing existing infrastructure from Aquilla Water Supply to Chatt WSC.

WUG: Post Oak SUD

Strategy: Purchase Additional Supply from Corsicana

Source: Corsicana

Facilities: None, existing infrastructure assumed sufficient

Total Capital Cost: N/A

Total Project Cost: N/A

Total Annual Cost: $281,274

Available Project Yield: 208 acft/yr

Annual Cost of Water: $1,352 per acft/yr

This project will include additional sale of 208 acft/yr utilizing existing infrastructure from Corsicana to Post Oak SUD.

WUG: Hill County-Other

Strategy: Purchase Additional Supply from Brandon-Irene WSC

Source: Brandon-Irene WSC

Facilities: None, existing infrastructure assumed sufficient

Total Capital Cost: N/A

Total Project Cost: N/A

Total Annual Cost: $114,048

Available Project Yield: 70 acft/yr

Annual Cost of Water: $1,629 per acft/yr or $5.00 per 1,000 gal (based on Brandon-Irene tier 1 rates)

This project will include additional sale of up to 70 acft/yr utilizing existing infrastructure from Brandon-Irene WSC to Hood County-Other.

13.4.7 Jones County

WUG: Jones County Other

Strategy: Purchase Additional Supplies from City of Abilene

Source: City of Abilene

Facilities: None, existing infrastructure assumed sufficient

Total Capital Cost: N/A

Total Project Cost: N/A

Total Annual Cost: $283,987

Available Project Yield: 121 acft/yr

Annual Cost of Water: $2,347 per acft/yr

WUG: Jones County Mining

Strategy: Purchase Additional Supplies from City of Abilene

Source: City of Abilene

Facilities: None, existing infrastructure assumed sufficient

Total Capital Cost: N/A

Total Project Cost: N/A

Total Annual Cost: $359,091

Available Project Yield: 153 acft/yr

Annual Cost of Water: $2,347 per acft/yr

WUG: Jones County Irrigation

Strategy: Purchase Additional Supplies from City of Abilene

Source: City of Abilene

Facilities: None, existing infrastructure assumed sufficient

Total Capital Cost: N/A

Total Project Cost: N/A

Total Annual Cost: $248,782

Available Project Yield: 106 acft/yr

Annual Cost of Water: $2,347 per acft/yr

13.4.8 Johnson County

WUG: Bethesda WSC

Strategy: Additional Purchase from the City of Fort Worth

Source: The City of Fort Worth

Facilities: None, existing infrastructure assumed sufficient

Total Capital Cost: N/A

Total Project Cost: N/A

Total Annual Cost: $22,833

Available Project Yield: 43 acft/yr

Annual Cost of Water: $531 per acft/yr

This project will include a contract increase of up to 43 additional acft/yr utilizing existing infrastructure from the City of Fort Worth to Bethesda WSC.

WUG: City of Burleson

Strategy: Additional Purchase from the City of Fort Worth

Source: The City of Fort Worth

Facilities: Transmission pipeline and primary pump station

Total Capital Cost: $13,593,000

Total Project Cost: $19,163,000

Total Annual Cost: $2,306,000

Available Project Yield: 4,075 acft/yr

Annual Cost of Water: $566 per acft/yr

This project will include a contract increase of up to 4,075 additional acft/yr updating infrastructure from the City of Fort Worth to City of Burleson.

Cost Estimate Summary September 2018 Prices	
Johnson County Mining - Johnson County Burleson to Fort Worth Pipeline	
Item	***Estimated Costs for Facilities***
Primary Pump Station (4.6 MGD)	$76,000
Transmission Pipeline (18 in dia., 16 miles)	$13,441,000
Transmission Pump Station(s) & Storage Tank(s)	$76,000
TOTAL COST OF FACILITIES	**$13,593,000**
Engineering and Feasibility Studies, Legal Assistance, Financing, Bond Counsel, and Contingencies (30% for pipes & 35% for all other facilities)	$4,086,000
Environmental & Archaeology Studies and Mitigation	$430,000
Land Acquisition and Surveying (83 acres)	$541,000
Interest During Construction (3% for 1 years with a 0.5% ROI)	$513,000
TOTAL COST OF PROJECT	**$19,163,000**
ANNUAL COST	
Debt Service (3.5 percent, 20 years)	$1,348,000
Operation and Maintenance	
Pipeline, Wells, and Storage Tanks (1% of Cost of Facilities)	$134,000
Intakes and Pump Stations (2.5% of Cost of Facilities)	$4,000
Pumping Energy Costs (1,993,822 kW-hr @ 0.08 $/kW-hr)	$160,000
Purchase of Water (4,075 acft/yr @ 162 $/acft)	$660,000
TOTAL ANNUAL COST	**$2,306,000**
Available Project Yield (acft/yr)	4,075
Annual Cost of Water ($ per acft), based on PF=2	$566
Annual Cost of Water After Debt Service ($ per acft), based on PF=2	$235
Annual Cost of Water ($ per 1,000 gallons), based on PF=2	$1.74
Annual Cost of Water After Debt Service ($ per 1,000 gallons), based on PF=2	$0.72

WUG: City of Crowley

Strategy: Additional Purchase from the City of Fort Worth

Source: The City of Fort Worth

Facilities: None, existing infrastructure assumed sufficient

Total Capital Cost: N/A

Total Project Cost: N/A

Total Annual Cost: $11,151

Available Project Yield: 21 acft/yr

Annual Cost of Water: $531 per acft/yr

This project will include a contract increase of up to 21 additional acft/yr utilizing existing infrastructure from the City of Fort Worth to City of Crowley.

WUG: City of Forth Worth

Strategy: Additional Purchase from the Tarrant Regional Water District

Source: The Tarrant Regional Water District

Facilities: None, existing infrastructure assumed sufficient

Total Capital Cost: N/A

Total Project Cost: N/A

Total Annual Cost: $822,498

Available Project Yield: 841 acft/yr

Annual Cost of Water: $978 per acft/yr

This project will include a contract increase of up to 841 additional acft/yr utilizing existing infrastructure from the Tarrant Regional Water District to City of Fort Worth.

WUG: City of Mansfield

Strategy: Additional Purchase from the Tarrant Regional Water District

Source: The Tarrant Regional Water District

Facilities: None, existing infrastructure assumed sufficient

Total Capital Cost: N/A

Total Project Cost: N/A

Total Annual Cost: $443,034

Available Project Yield: 453 acft/yr

Annual Cost of Water: $978 per acft/yr

This project will include a contract increase of up to 453 additional acft/yr utilizing existing infrastructure from the Tarrant Regional Water District to City of Mansfield.

WUG: Mountain Peak SUD

Strategy: Additional Purchase from Midlothian

Source: Midlothian

Facilities: None, existing infrastructure assumed sufficient

Total Capital Cost: N/A

Total Project Cost: N/A

Total Annual Cost: $53,790

Available Project Yield: 55 acft/yr

Annual Cost of Water: $978 per acft/yr

This project will include a contract increase of up to 55 additional acft/yr utilizing existing infrastructure from Midlothian to Mountain Peak SUD.

WUG: City of Venus

Strategy: Additional Purchase from Midlothian

Source: Midlothian

Facilities: None, existing infrastructure assumed sufficient

Total Capital Cost: N/A

Total Project Cost: N/A

Total Annual Cost: $642,546

Available Project Yield: 657 acft/yr

Annual Cost of Water: $978 per acft/yr

This project will include a contract increase of up to 657 additional acft/yr utilizing existing infrastructure from Midlothian to City of Venus.

WUG: Johnson County – Steam-Electric

Strategy: Additional Purchase from reuse water from City of Cleburne

Source: City of Cleburne

Facilities: Pump station, transmission pipeline, storage tanks, and water treatment plant

Total Capital Cost: $4,677,000

Total Project Cost: $6,649,000

Total Annual Cost: $674,000

Available Project Yield: 571 acft/yr

Annual Cost of Water: $1,180 per acft/yr

This project will include a contract increase of up to 571 additional acft/yr utilizing new infrastructure from Cleburne to Johnson County – Steam Electric.

Cost Estimate Summary September 2018 Prices	
Johnson County Steam-Electric - Johnson County Steam-Electric Pipeline	
Item	***Estimated Costs for Facilities***
Primary Pump Station (1 MGD)	$878,000
Transmission Pipeline (18 in dia., 5 miles)	$3,799,000
TOTAL COST OF FACILITIES	**$4,677,000**
Engineering and Feasibility Studies, Legal Assistance, Financing, Bond Counsel, and Contingencies (30% for pipes & 35% for all other facilities)	$1,447,000
Environmental & Archaeology Studies and Mitigation	$155,000
Land Acquisition and Surveying (29 acres)	$192,000
Interest During Construction (3% for 1 years with a 0.5% ROI)	$178,000
TOTAL COST OF PROJECT	**$6,649,000**
ANNUAL COST	
Debt Service (3.5 percent, 20 years)	$468,000
Operation and Maintenance	
Pipeline, Wells, and Storage Tanks (1% of Cost of Facilities)	$38,000
Intakes and Pump Stations (2.5% of Cost of Facilities)	$22,000
Pumping Energy Costs (53,697 kW-hr @ 0.08 $/kW-hr)	$4,000
Purchase of Water (2,555 acft/yr @ 55.55 $/acft)	$142,000
TOTAL ANNUAL COST	**$674,000**
Available Project Yield (acft/yr)	571
Annual Cost of Water ($ per acft), based on PF=2	$1,180
Annual Cost of Water After Debt Service ($ per acft), based on PF=2	$361
Annual Cost of Water ($ per 1,000 gallons), based on PF=2	$3.62
Annual Cost of Water After Debt Service ($ per 1,000 gallons), based on PF=2	$1.11

WUG: Johnson County – Mining

Strategy: Additional Purchase from reuse water from City of Cleburne

Source: City of Cleburne

Facilities: Pump station, transmission pipeline, storage tanks, and water treatment plant

Total Capital Cost: $5,055,000

Total Project Cost: $7,173,000

Total Annual Cost: $742,000

Available Project Yield: 2,555 acft/yr

Annual Cost of Water: $290 per acft/yr

This project will include a contract increase of up to 2,555 additional acft/yr utilizing new infrastructure from Cleburne to Johnson County – Mining.

Cost Estimate Summary September 2018 Prices	
Johnson County Mining - Johnson County Mining Pipeline	
Cost based on ENR CCI 11170.28 for September 2018 and	
a PPI of 202.4 for September 2018	
Item	***Estimated Costs for Facilities***
Primary Pump Station (4.6 MGD)	$1,256,000
Transmission Pipeline (18 in dia., 5 miles)	$3,799,000
TOTAL COST OF FACILITIES	**$5,055,000**
Engineering and Feasibility Studies, Legal Assistance, Financing, Bond Counsel, and Contingencies (30% for pipes & 35% for all other facilities)	$1,579,000
Environmental & Archaeology Studies and Mitigation	$155,000
Land Acquisition and Surveying (29 acres)	$192,000
Interest During Construction (3% for 1 years with a 0.5% ROI)	$192,000
TOTAL COST OF PROJECT	**$7,173,000**
ANNUAL COST	
Debt Service (3.5 percent, 20 years)	$505,000
Operation and Maintenance	
Pipeline, Wells, and Storage Tanks (1% of Cost of Facilities)	$38,000
Intakes and Pump Stations (2.5% of Cost of Facilities)	$31,000
Pumping Energy Costs (328,761 kW-hr @ 0.08 $/kW-hr)	$26,000

Purchase of Water (2,555 acft/yr @ 55.55 $/acft)	$142,000
TOTAL ANNUAL COST	**$742,000**
Available Project Yield (acft/yr)	2,555
Annual Cost of Water ($ per acft), based on PF=2	$290
Annual Cost of Water After Debt Service ($ per acft), based on PF=2	$93
Annual Cost of Water ($ per 1,000 gallons), based on PF=2	$0.89
Annual Cost of Water After Debt Service ($ per 1,000 gallons), based on PF=2	$0.28

13.4.9 Limestone County

WUG: City of Mexia

Strategy: Purchase Additional Supply from Bistone Municipal Water Supply District

Source: Bistone Municipal Water Supply District

Facilities: None, existing infrastructure assumed sufficient

Total Capital Cost: N/A

Total Project Cost: N/A

Total Annual Cost: $130,680

Available Project Yield: 363 acft/yr

Annual Cost of Water: $360 per acft/yr or $1.10 per 1,000 gal

This project will include a contract increase of up to 363 acft/yr of additional groundwater supply utilizing existing infrastructure from the Bistone Municipal Water Supply District to the City of Mexia, with some sales to the City of Wortham in Region C. Cost of water estimated based on Bistone Municipal Water Supply District's cost of developing additional supplies.

13.4.10 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: $300,000

Available Project Yield: 600 acft/yr

Annual Cost of Water: $585 per acft/yr (City of Lampasas Wholesale Costs)

This project will include a treated water contract increase of up to 600 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.

WUG: Lampasas County Manufacturing

Strategy: Increase treated water contract from City of Lampasas

Source: City of Lampasas

Facilities: None, existing infrastructure assumed sufficient

Total Capital Cost: N/A

Total Project Cost: N/A

Total Annual Cost: $8,000

Available Project Yield: 16 acft/yr

Annual Cost of Water: $500 per acft/yr (City of Lampasas Wholesale Costs)

This project will include a treated water contract increase of up to 16 additional acft/yr utilizing existing infrastructure from Lampasas Manufacturing to the City of Lampasas.

13.4.11 McLennan County

WUG: Axtell WSC

Strategy: Purchase water from City of Waco

Source: City of Waco

Facilities: None, existing infrastructure assumed sufficient

Total Capital Cost: N/A

Total Project Cost: N/A

Total Annual Cost: $340,392

Available Project Yield: 104 acft/yr

Annual Cost of Water: $3,273 per acft/yr

This project will include a treated water contract increase for additional 104 acft/yr utilizing existing infrastructure from City of Waco to the City of Bellmead.

WUG: East Crawford WSC

Strategy: Purchase water from City of Waco

Source: City of Waco

Facilities: None, existing infrastructure assumed sufficient

Total Capital Cost: N/A

Total Project Cost: N/A

Total Annual Cost: $369,849

Available Project Yield: 113 acft/yr

Annual Cost of Water: $3,273 per acft/yr

This project will include a treated water contract increase for additional 113 acft/yr utilizing existing infrastructure from City of Waco to the East Crawford WSC.

WUG: EOL WSC

Strategy: Purchase water from City of Waco

Source: City of Waco

Facilities: None, existing infrastructure assumed sufficient

Total Capital Cost: N/A

Total Project Cost: N/A

Total Annual Cost: $451,674

Available Project Yield: 138 acft/yr

Annual Cost of Water: $3,273 per acft/yr

This project will include a treated water contract increase for additional 138 acft/yr utilizing existing infrastructure from City of Waco to the EOL WSC.

WUG: City of Hewitt

Strategy: Purchase water from City of Waco

Source: City of Waco

Facilities: None, existing infrastructure assumed sufficient

Total Capital Cost: N/A

Total Project Cost: N/A

Total Annual Cost: $1,668,444

Available Project Yield: 771 acft/yr

Annual Cost of Water: $2,164 per acft/yr

This project will include additional 771 acft/yr utilizing existing infrastructure from City of Waco to the City of Hewitt.

WUG: Leroy Tours Gerald WSC

Strategy: Purchase water from Brazos River Authority

Source: BRA System Operations Supplies

Facilities: None, existing infrastructure assumed sufficient

Total Capital Cost: N/A

Total Project Cost: N/A

Total Annual Cost: $386,656

Available Project Yield: 86 acft/yr

Annual Cost of Water: $4,496 per acft/yr

This project will include additional 86 acft/yr utilizing infrastructure developed by FHLM WSC.

WUG: Leroy Tours Gerald WSC

Strategy: Alternative Purchase water from City of Waco

Source: City of Waco

Facilities: None, existing infrastructure assumed sufficient

Total Capital Cost: N/A

Total Project Cost: N/A

Total Annual Cost: $281,478

Available Project Yield: 86 acft/yr

Annual Cost of Water: $3,273 per acft/yr

This project will include additional 86 acft/yr utilizing existing infrastructure from City of Waco to the Leroy Tours Gerald WSC.

WUG: City of Mart

Strategy: Purchase water from City of Waco

Source: City of Waco

Facilities: None, existing infrastructure assumed sufficient

Total Capital Cost: N/A

Total Project Cost: N/A

Total Annual Cost: $528,016

Available Project Yield: 244 acft/yr

Annual Cost of Water: $2,164 per acft/yr

This project will include additional 244 acft/yr utilizing existing infrastructure from City of Waco to the City of Mart.

WUG: McLennan County Manufacturing

Strategy: Purchase water from City of Waco-WMARSS Flat Creek

Source: City of Waco-WMARSS Flat Creek

Facilities: None, existing infrastructure assumed sufficient

Total Capital Cost: N/A

Total Project Cost: N/A

Total Annual Cost: $875,000

Available Project Yield: 2,500 acft/yr

Annual Cost of Water: $350 per acft/yr

This project will include additional 2,500 acft/yr utilizing existing infrastructure from City of Waco to the McLennan County Manufacturing.

WUG: McLennan County Mining

Strategy: Purchase water from City of Waco-WMARSS Flat Creek

Source: City of Waco-WMARSS Flat Creek

Facilities: None, existing infrastructure assumed sufficient

Total Capital Cost: N/A

Total Project Cost: N/A

Total Annual Cost: $1,120,000

Available Project Yield: 3,200 acft/yr

Annual Cost of Water: $350 per acft/yr

This project will include additional 3,200 acft/yr utilizing existing infrastructure from City of Waco to the McLennan County Mining.

13.4.12 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: $27,013,000

Total Project Cost: $38,106,000

Total Annual Cost: $3,525,000

Available Project Yield: 1,839 acft/yr

Annual Cost of Water: $1,914 per acft/yr or $5.87 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 $116.94/acft. Project costs to be shared between the two entities.

Cost Estimate Summary September 2018 Prices	
City of Sweetwater – Sweetwater Nolan	
Item	***Estimated Costs for Facilities***
Primary Pump Station (1.7 MGD)	$5,047,000
Transmission Pipeline (12 in dia., 40 miles)	$14,669,000
Transmission Pump Station(s) & Storage Tank(s)	$6,147,000
Storage Tanks (Other Than at Booster Pump Stations)	$1,150,000
TOTAL COST OF FACILITIES	**$27,013,000**

Engineering and Feasibility Studies, Legal Assistance, Financing, Bond Counsel, and Contingencies (30% for pipes & 35% for all other facilities)	$8,721,000
Environmental & Archaeology Studies and Mitigation	$1,011,000
Land Acquisition and Surveying (201 acres)	$341,000
Interest During Construction (3% for 1 years with a 0.5% ROI)	$1,020,000
TOTAL COST OF PROJECT	**$38,106,000**
ANNUAL COST	
Debt Service (3.5 percent, 20 years)	$2,681,000
Operation and Maintenance	
Pipeline, Wells, and Storage Tanks (1% of Cost of Facilities)	$186,000
Intakes and Pump Stations (2.5% of Cost of Facilities)	$210,000
Pumping Energy Costs (3,303,353 kW-hr @ 0.08 $/kW-hr)	$264,000
Purchase of Water (1,839 acft/yr @ 100 $/acft)	$184,000
TOTAL ANNUAL COST	**$3,525,000**
Available Project Yield (acft/yr)	1,839
Annual Cost of Water ($ per acft), based on PF=1	$1,914
Annual Cost of Water After Debt Service ($ per acft), based on PF=1	$456
Annual Cost of Water ($ per 1,000 gallons), based on PF=1	$5.87
Annual Cost of Water After Debt Service ($ per 1,000 gallons), based on PF=1	$1.40

WUG: Bitter Creek WSC

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: $236,099

Available Project Yield: 1,874 acft/yr

Annual Cost of Water: $1,031per acft/yr

This project will include a contract increase of up to 1,874 additional acft/yr utilizing existing infrastructure from the City of Sweetwater to Bitter Creek WSC.

WUG: City of Roscoe

Strategy: Additional Purchase from the City of Sweetwater

Source: City of Sweetwater

Facilities: None, existing infrastructure assumed sufficient

Total Capital Cost: N/A

Total Project Cost: N/A

Total Annual Cost: $110,317

Available Project Yield: 107 acft/yr

Annual Cost of Water: $1,031per acft/yr

This project will include a contract increase of up to 107 additional acft/yr utilizing existing infrastructure from the City of Sweetwater to City of Roscoe.

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: $5,155

Available Project Yield: 5 acft/yr

Annual Cost of Water: $1,031 per acft/yr

This project will include a contract increase of up to 5 additional acft/yr utilizing existing infrastructure from the City of Sweetwater to Nolan County Manufacturing.

WUG: Nolan County Mining

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: $223,861

Available Project Yield: 218 acft/yr

Annual Cost of Water: $1,031per acft/yr

This project will include a contract increase of up to 218 additional acft/yr utilizing existing infrastructure from the City of Sweetwater to Nolan County Mining.

13.4.13 Palo Pinto County

WUG: City of Gordon

Strategy: Purchase water from City of Strawn

Source: City of Strawn

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

Total Capital Cost: N/A

Total Project Cost: N/A

Total Annual Cost: $318,549

Available Project Yield: 147 acft/yr

Annual Cost of Water: $2,167 per acft/yr or $6.65 per 1,000

This project will include a contract for the purchase of water up to 147 acft/yr. Infrastructure such as pipelines, pump stations, and storage tanks will be needed once the location(s) of use are determined.

WUG: Possum Kingdom WSC

Strategy: Voluntary Redistribution from Palo Pinto Manufacturing

Source: Palo Pinto Manufacturing

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

Total Capital Cost: N/A

Total Project Cost: N/A

Total Annual Cost: $9,027

Available Project Yield: 118 acft/yr

Annual Cost of Water: $76.50 per acft/yr

This project will include a contract for the purchase of water up to 118 acft/yr. Infrastructure such as pipelines, pump stations, and storage tanks will be needed once the location(s) of use are determined.

WUG: Santo SUD

Strategy: Purchase Additional Supply from the City of Mineral Wells

Source: City of Mineral Wells

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

Total Capital Cost: N/A

Total Project Cost: N/A

Total Annual Cost: $29,232

Available Project Yield: 14 acft/yr

Annual Cost of Water: $2,088 per acft/yr

This project will include a contract for the purchase of water up to 14 acft/yr. Infrastructure such as pipelines, pump stations, and storage tanks will be needed once the location(s) of use are determined.

WUG: Sportsmans World MUD

Strategy: Voluntary Redistribution from Palo Pinto Manufacturing

Source: Palo Pinto Manufacturing

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

Total Capital Cost: N/A

Total Project Cost: N/A

Total Annual Cost: $2,525

Available Project Yield: 33 acft/yr

Annual Cost of Water: $76.50 per acft/yr

This project will include a contract for the purchase of water up to 33 acft/yr. Infrastructure such as pipelines, pump stations, and storage tanks will be needed once the location(s) of use are determined.

WUG: Palo Pinto County Other

Strategy: Purchase Additional Supply from the City of Mineral Wells

Source: City of Mineral Wells

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

Total Capital Cost: N/A

Total Project Cost: N/A

Total Annual Cost: $398,808

Available Project Yield: 191 acft/yr

Annual Cost of Water: $2,088 per acft/yr

This project will include a contract for the purchase of water up to 191 acft/yr. Infrastructure such as pipelines, pump stations, and storage tanks will be needed once the location(s) of use are determined.

13.4.14 Stephens County

WUG: Fort Griffin SUD

Strategy: Purchase of Water from the City of Albany

Source: City of Albany

Facilities: None

Total Capital Cost: N/A

Total Project Cost: N/A

Total Annual Cost: $3,878

Available Project Yield: 2 acft/yr

Annual Cost of Water: $1,939 per acft/yr or $5.95 per 1,000 gallons

This project will include a contract for the purchase of water up to 2 acft/yr. Assumes existing infrastructure is sufficient. Purchase cost of water based on Fort Griffin SUD's lowest tier rate of $5.95 per 1,000 gal.

13.4.15 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: $69,454

Available Project Yield: 41 acft/yr

Annual Cost of Water: $1,694 acft/yr

This project will include a contract increase of up to additional 41 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: $992,684

Available Project Yield: 586 acft/yr

Annual Cost of Water: $1,694 acft/yr

This project will include a contract increase of up to additional 586 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: $289,674

Available Project Yield: 171 acft/yr

Annual Cost of Water: $1,694 acft/yr

This project will include a contract increase of up to additional 171 acft/yr utilizing existing infrastructure from the City of Abilene to Steamboat Mountain WSC.

WUG: 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: $22,022

Available Project Yield: 13 acft/yr

Annual Cost of Water: $1,694 acft/yr

This project will include a contract increase of up to additional 13 acft/yr utilizing existing infrastructure from the City of Abilene to The City of Tye.

WUG: View Caps 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: $25,410

Available Project Yield: 15 acft/yr

Annual Cost of Water: $1,694 acft/yr

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

WUG: Taylor County-Other

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: $228,690

Available Project Yield: 135 acft/yr

Annual Cost of Water: $1,694 acft/yr

This project will include a contract increase of up to additional 135 acft/yr utilizing existing infrastructure from the City of Abilene to Taylor County-Other.

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: $28,665

Available Project Yield: 245 acft/yr

Annual Cost of Water: $1,694 acft/yr

This project will include a contract for the purchase of water up to 245 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: $142,389

Available Project Yield: 1,217 acft/yr

Annual Cost of Water: $1,694 acft/yr

This project will include a contract for the purchase of water up to 1,217 acft/yr. Infrastructure such as pipelines, pump stations, and storage tanks will be needed once the location(s) of use are determined.

13.4.16 Williamson County

WUG: City of Bartlett

Strategy: Purchase Supply from Jarrell-Schwertner WSC

Source: Jarrell-Schwertner WSC

Facilities: assumed delivery through existing infrastructure

Total Capital Cost: N/A

Total Project Cost: N/A

Total Annual Cost: $672,375

Available Project Yield: 275 acft/yr

Annual Cost of Water: $2,445 per acft/yr or $7.50 per 1,000 gal

WUG: Brushy Creek MUD

Strategy: Purchase Supply from City of Round Rock

Source: City of Round Rock

Facilities: assumed delivery through existing infrastructure

Total Capital Cost: N/A

Total Project Cost: N/A

Total Annual Cost: $228,000

Available Project Yield: 250 acft/yr

Annual Cost of Water: $912 per acft/yr or $2.80 per 1,000 gal

WUG: City of Florence

Strategy: Purchase Supply from City of Georgetown

Source: City of Georgetown

Facilities: assumed delivery through existing infrastructure

Total Capital Cost: N/A

Total Project Cost: N/A

Total Annual Cost: maximum of $56,304

Available Project Yield: 72 acft/yr

Annual Cost of Water: maximum of $782 per acft/yr or $2.40 per 1,000 gal

WUG: City of Leander

Strategy: Contract Amendment with LCRA or Redistribution of Supplies through the BCRUA Project

Source: LCRA

Facilities: assumed delivery through existing infrastructure

Total Capital Cost: N/A

Total Project Cost: N/A

Total Annual Cost: maximum of $1,261,200

Available Project Yield: 1,441 acft/yr

Annual Cost of Water: $844 per acft/yr or $2.59 per 1,000 gal

WUG: Williamson County-Other

Strategy: Purchase Supply from Round Rock

Source: City of Round Rock

Facilities: assumed delivery through existing infrastructure

Total Capital Cost: N/A

Total Project Cost: N/A

Total Annual Cost: maximum of $2,443,248

Available Project Yield: 2,679 acft/yr

Annual Cost of Water: $912 per acft/yr or $2.80 per 1,000 gal

WUG: Williamson County-Other

Strategy: Purchase Supply from SAWS Vista Ridge Project (Region L)

Source: SAWS Vista Ridge

Facilities: assumed delivery through existing infrastructure

Total Capital Cost: N/A

Total Project Cost: N/A

Total Annual Cost: maximum of $13,771,200

Available Project Yield: 5,700 acft/yr

Annual Cost of Water: $2,416 per acft/yr or $7.40 per 1,000 gal

13.4.17 Young County

WUG: Fort Belknap WSC

Strategy: Purchase Additional Water 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: $83,600

Available Project Yield: 95 acft/yr

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

WUG: City of Graham

Strategy: Treated Water Purchase and Conveyance

Source: City of Throckmorton

Facilities: Pump station, transmission pipeline, storage tanks

Total Capital Cost: $109,663,000

Total Project Cost: $153,846,000

Total Annual Cost: $12,299,000

Available Project Yield: 1,500 acft/yr

Annual Cost of Water: $8,199 per acft/yr (Maximum of Phased Costs)

This project will include approximately thirty-six miles of 14 inch transmission pipeline and associated pump station to convey treated surface water from the City of Throckmorton (New Throckmorton Reservoir) to the City of Graham. Project cost includes cost of purchasing water from the City of Throckmorton.

Cost Estimate Summary September 2018 Prices	
Graham - Graham to Throckmorton	
Item	***Estimated Costs for Facilities***
Primary Pump Station (3 MGD)	$1,395,000
Transmission Pipeline (14 in dia., 36 miles)	$89,654,000
Transmission Pump Station(s) & Storage Tank(s)	$18,614,000
TOTAL COST OF FACILITIES	**$109,663,000**
Engineering and Feasibility Studies, Legal Assistance, Financing, Bond Counsel, and Contingencies (30% for pipes & 35% for all other facilities)	$33,899,000
Environmental & Archaeology Studies and Mitigation	$3,295,000
Land Acquisition and Surveying (640 acres)	$2,871,000
Interest During Construction (3% for 1 years with a 0.5% ROI)	$4,118,000
TOTAL COST OF PROJECT	**$153,846,000**
ANNUAL COST	
Debt Service (3.5 percent, 20 years)	$10,825,000
Operation and Maintenance	
Pipeline, Wells, and Storage Tanks (1% of Cost of Facilities)	$975,000
Intakes and Pump Stations (2.5% of Cost of Facilities)	$305,000
Pumping Energy Costs (1,384,350 kW-hr @ 0.08 $/kW-hr)	$111,000
Purchase of Water (1,500 acft/yr @ 55 $/acft)	$83,000
TOTAL ANNUAL COST	**$12,299,000**
Available Project Yield (acft/yr)	1,500
Annual Cost of Water ($ per acft), based on PF=2	$8,199
Annual Cost of Water After Debt Service ($ per acft), based on PF=2	$983
Annual Cost of Water ($ per 1,000 gallons), based on PF=2	$25.16
Annual Cost of Water After Debt Service ($ per 1,000 gallons), based on PF=2	$3.02

13.5 Miscellaneous WTP Upgrades and Facilities Expansions

There are a total of 13 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 13.5-1 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 13.5-1. 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	$44,426,812	$61,664,832	$7,448,681	$573	$1.76
Acton MUD and Johnson County SUD	Increase WTP Capacity (SWATS) by 10.8 MGD	6,031	$25,062,000	$34,765,000	$4,200,000	$696	$2.14
Bell County WCID No. 1	Water Treatment Plant Expansion (Lake Belton)	3,360	$20,300,000	$28,964,000	$2,731,000 (max of phased cost)	$1,116 (max of phase cost)	$3.43 (max of phased cost)
Bell County WCID No. 1	New Water Treatment Plant (Lake Stillhouse Hollow)	9,521	$65,527,000	$93,404,000	$11,159,000	$1,172	$3.60
City of Belton	Water Treatment Plant Expansion	1,167	$8,355,000	$11,925,000	$1,588,000	$1,361	$4.18
City of Gatesville	Water Treatment Plant Expansion	1,355	$6,721,000	$9,329,000	$1,308,000	$965	$2.96
City of Temple	Water Treatment Plant Expansion	4,704	$25,002,000	$35,666,000	$3,247,000 (max of phased cost)	$957 (max of phase cost)	$2.94 (max of phased cost)
Falls County-Other (Moore WSC)	Upgrade Treatment for Arsenic	53	$165,000	$255,000	$84,000	$1,585	$4.86
Georgetown	Expand WTP by 21 MGD	17,000	$31,873,000	$46,095,000	$5,566,000	$327	$1.00
Granbury North Water Treatment Plant	New Water Treatment Plant	2,800	$34,057,000	$45,500,000	$7,155,000	$2,555	$4.33
Jayton	New WTP (0.4 MGD)	249	$2,533,000	$3,555,000	$710,000	$2,851	$8.75
Kempner WSC	New WTP (1.8 MGD)	2,015	$7,799,000	$10,821,000	$1,477,000	$879	$2.70

WUG/WWP	Strategy	Project Yield (acft/yr)	Capital Cost	Total Project Cost	Annual Cost	Unit Cost	
						$/acft	$/kgal
McLennan County-Other (FHLM WSC)	Upgrade Treatment for Arsenic	917	$2,871,000	$4,425,000	$835,000	$911	$2.79
Prairie Hill WSC	Upgrade Treatment for Arsenic	268	$913,000	$1,408,000	$268,000	$1,000	$3.07
Robinson	Expand WTP by 4 MGD	4,481	$12,109,000	$16,813,000	$2,155,000	$481	$1.48

13.5.1 WTP Cost Summaries

13.5.1.1 Abilene

Cost Estimate Summary September 2018 Prices	
Abilene WTP Expansion	
Item	***Estimated Costs for Facilities***
Water Treatment Plant (23.2 MGD)	$44,427,000
TOTAL COST OF FACILITIES	**$44,427,000**
Engineering and Feasibility Studies, Legal Assistance, Financing, Bond Counsel, and Contingencies (30% for pipes & 35% for all other facilities)	$15,549,000
Environmental & Archaeology Studies and Mitigation	$18,000
Land Acquisition and Surveying (12 acres)	$20,000
Interest During Construction (3% for 1 years with a 0.5% ROI)	$1,651,000
TOTAL COST OF PROJECT	**$61,665,000**
ANNUAL COST	
Debt Service (3.5 percent, 20 years)	$4,339,000
Operation and Maintenance	
Water Treatment Plant	$3,110,000
TOTAL ANNUAL COST	**$7,449,000**
Available Project Yield (acft/yr)	26,005

Annual Cost of Water ($ per acft), based on PF=1	$286
Annual Cost of Water After Debt Service ($ per acft), based on PF=1	$120
Annual Cost of Water ($ per 1,000 gallons), based on PF=1	$0.88
Annual Cost of Water After Debt Service ($ per 1,000 gallons), based on PF=1	$0.37

13.5.1.2 Acton MUD, Granbury, and Johnson County SUD

Cost Estimate Summary September 2018 Prices	
Acton MUD and Johnson County SUD SWATS WTP Expansion	
Item	***Estimated Costs for Facilities***
Water Treatment Plant (10.8 MGD)	$25,062,000
TOTAL COST OF FACILITIES	**$25,062,000**
Engineering and Feasibility Studies, Legal Assistance, Financing, Bond Counsel, and Contingencies (30% for pipes & 35% for all other facilities)	$8,772,000
Interest During Construction (3% for 1 years with a 0.5% ROI)	$931,000
TOTAL COST OF PROJECT	**$34,765,000**
ANNUAL COST	
Debt Service (3.5 percent, 20 years)	$2,446,000
Operation and Maintenance	
Water Treatment Plant	$1,754,000
TOTAL ANNUAL COST	**$4,200,000**
Available Project Yield (acft/yr)	6,031
Annual Cost of Water ($ per acft), based on PF=2	$696
Annual Cost of Water After Debt Service ($ per acft), based on PF=2	$291
Annual Cost of Water ($ per 1,000 gallons), based on PF=2	$2.14
Annual Cost of Water After Debt Service ($ per 1,000 gallons), based on PF=2	$0.89

13.5.1.3 Bell County WCID No. 1 (Lake Belton)

Bell County WCID No. 1 WTP Expansion
Cost Estimate Summary (September 2018 Prices)

Item	2020	2030	2040	2050	2060	2070
CAPITAL COST						
Water Treatment Plant (3 MGD)	--	$10,150,000	0	0	0	$10,150,000
TOTAL COST OF FACILITIES	--	**$10,150,000**	**0**	**0**	**0**	**$10,150,000**
Engineering and Feasibility Studies, Legal Assistance, Financing, Bond Counsel, and Contingencies (30% for pipes & 35% for all other facilities)	--	$3,552,000	0	0	0	$3,552,000
Environmental & Archaeology Studies and Mitigation	--	$10,000	0	0	0	$10,000
Land Acquisition and Surveying (2 acres)	--	$15,000	0	0	0	$15,000
Interest During Construction (3% for 2 years with a 0.5% ROI)	--	$755,000	0	0	0	$755,000
TOTAL COST OF PROJECT	**--**	**$14,482,000**	**0**	**0**	**0**	**$14,482,000**
ANNUAL COST						
Debt Service (3.5 percent, 20 years)	--	$1,019,000	$1,019,000	0	0	$1,019,000
Operation and Maintenance						
Water Treatment Plant	--	$856,000	$856,000	$856,000	$856,000	$1,712,000
TOTAL ANNUAL COST	**--**	**$1,875,000**	**$1,875,000**	**$856,000**	**$856,000**	**$2,731,000**
Available Project Yield (acft/yr)	--	1,680	1,680	1,680	1,680	3,360
Annual Cost of Water ($ per acft), based on PF=1	--	$1,116.07	$1,116.07	$509.52	$509.52	$812.80
Annual Cost of Water After Debt Service ($ per acft), based on PF=1	--	$3.43	$3.43	$1.56	$1.56	$2.49

13.5.1.4 Bell County WCID No. 1 (Lake Stillhouse Hollow)

Cost Estimate Summary September 2018 Prices	
Bell County WCID No 1 Lake Still Hollow WTP	
Item	***Estimated Costs for Facilities***
Water Treatment Plant (17 MGD)	$65,527,000
TOTAL COST OF FACILITIES	**$65,527,000**
Engineering and Feasibility Studies, Legal Assistance, Financing, Bond Counsel, and Contingencies (30% for pipes & 35% for all other facilities)	$22,935,000
Environmental & Archaeology Studies and Mitigation	$31,000
Land Acquisition and Surveying (9 acres)	$41,000
Interest During Construction (3% for 2 years with a 0.5% ROI)	$4,870,000
TOTAL COST OF PROJECT	**$93,404,000**
ANNUAL COST	
Debt Service (3.5 percent, 20 years)	$6,572,000
Operation and Maintenance	
Water Treatment Plant	$4,587,000
TOTAL ANNUAL COST	**$11,159,000**
Available Project Yield (acft/yr)	9,521
Annual Cost of Water ($ per acft), based on PF=2	$1,172
Annual Cost of Water After Debt Service ($ per acft), based on PF=2	$482
Annual Cost of Water ($ per 1,000 gallons), based on PF=2	$3.60
Annual Cost of Water After Debt Service ($ per 1,000 gallons), based on PF=2	$1.48

13.5.1.5 City of Belton

Cost Estimate Summary September 2018 Prices	
City of Belton WTP Expansion	
Item	***Estimated Costs for Facilities***
Water Treatment Plant (2.1 MGD)	$8,355,000
TOTAL COST OF FACILITIES	**$8,355,000**
Engineering and Feasibility Studies, Legal Assistance, Financing, Bond Counsel, and Contingencies (30% for pipes & 35% for all other facilities)	$2,924,000
Environmental & Archaeology Studies and Mitigation	$10,000
Land Acquisition and Surveying (1 acres)	$14,000
Interest During Construction (3% for 2 years with a 0.5% ROI)	$622,000
TOTAL COST OF PROJECT	**$11,925,000**
ANNUAL COST	
Debt Service (3.5 percent, 20 years)	$839,000
Operation and Maintenance	
Water Treatment Plant	$749,000
TOTAL ANNUAL COST	**$1,588,000**
Available Project Yield (acft/yr)	1,167
Annual Cost of Water ($ per acft), based on PF=2	$1,361
Annual Cost of Water After Debt Service ($ per acft), based on PF=2	$642
Annual Cost of Water ($ per 1,000 gallons), based on PF=2	$4.18
Annual Cost of Water After Debt Service ($ per 1,000 gallons), based on PF=2	$1.97

13.5.1.6 City of Gatesville

Cost Estimate Summary September 2018 Prices	
Gatesville WTP Expansion	
Item	***Estimated Costs for Facilities***
Water Treatment Plant (1.3 MGD)	$6,721,000
TOTAL COST OF FACILITIES	**$6,721,000**
Engineering and Feasibility Studies, Legal Assistance, Financing, Bond Counsel, and Contingencies (30% for pipes & 35% for all other facilities)	$2,352,000
Environmental & Archaeology Studies and Mitigation	$3,000
Land Acquisition and Surveying (1 acres)	$3,000
Interest During Construction (3% for 1 years with a 0.5% ROI)	$250,000
TOTAL COST OF PROJECT	**$9,329,000**
ANNUAL COST	
Debt Service (3.5 percent, 20 years)	$656,000
Operation and Maintenance	
Water Treatment Plant	$652,000
TOTAL ANNUAL COST	**$1,308,000**
Available Project Yield (acft/yr)	1,355
Annual Cost of Water ($ per acft), based on PF=1	$965
Annual Cost of Water After Debt Service ($ per acft), based on PF=1	$481
Annual Cost of Water ($ per 1,000 gallons), based on PF=1	$2.96
Annual Cost of Water After Debt Service ($ per 1,000 gallons), based on PF=1	$1.48

13.5.1.7 City of Temple

Cost Estimate Summary September 2018 Prices	
City of Temple WTP Expansion	
Item	***Estimated Costs for Facilities***
Water Treatment Plant (4.2 MGD)	$12,501,000
TOTAL COST OF FACILITIES	**$12,501,000**
Engineering and Feasibility Studies, Legal Assistance, Financing, Bond Counsel, and Contingencies (30% for pipes & 35% for all other facilities)	$4,375,000
Environmental & Archaeology Studies and Mitigation	$10,000
Land Acquisition and Surveying (2 acres)	$17,000
Interest During Construction (3% for 2 years with a 0.5% ROI)	$930,000
TOTAL COST OF PROJECT	**$17,833,000**
ANNUAL COST	
Debt Service (3.5 percent, 20 years)	$1,255,000
Operation and Maintenance	
Water Treatment Plant	$996,000
TOTAL ANNUAL COST	**$2,251,000**
Available Project Yield (acft/yr)	4,704
Annual Cost of Water ($ per acft), based on PF=1	$479
Annual Cost of Water After Debt Service ($ per acft), based on PF=1	$212
Annual Cost of Water ($ per 1,000 gallons), based on PF=1	$1.47
Annual Cost of Water After Debt Service ($ per 1,000 gallons), based on PF=1	$0.65

13.5.1.8 Falls County-Other (Moore WSC)

Cost Estimate Summary September 2018 Prices	
Falls County-Other - Upgrade for Arsenic Treatment	
Item	***Estimated Costs for Facilities***
Water Treatment Plant (0.1 MGD)	$165,000
TOTAL COST OF FACILITIES	**$165,000**
Engineering and Feasibility Studies, Legal Assistance, Financing, Bond Counsel, and Contingencies (30% for pipes & 35% for all other facilities)	$83,000
Interest During Construction (3% for 1 years with a 0.5% ROI)	$7,000
TOTAL COST OF PROJECT	**$255,000**
ANNUAL COST	
Debt Service (3.5 percent, 20 years)	$18,000
Operation and Maintenance	
Water Treatment Plant	$66,000
TOTAL ANNUAL COST	**$84,000**
Available Project Yield (acft/yr)	53
Annual Cost of Water ($ per acft), based on PF=1	$1,585
Annual Cost of Water After Debt Service ($ per acft), based on PF=1	$1,245
Annual Cost of Water ($ per 1,000 gallons), based on PF=1	$4.86
Annual Cost of Water After Debt Service ($ per 1,000 gallons), based on PF=1	$3.82

13.5.1.9 Georgetown

Cost Estimate Summary September 2018 Prices	
Georgetown WTP Expansion	
Item	***Estimated Costs for Facilities***
Water Treatment Plant (16 MGD)	$33,180,000
TOTAL COST OF FACILITIES	**$33,180,000**
Engineering and Feasibility Studies, Legal Assistance, Financing, Bond Counsel, and Contingencies (30% for pipes & 35% for all other facilities)	$11,613,000
Environmental & Archaeology Studies and Mitigation	$32,000
Land Acquisition and Surveying (8 acres)	$36,000
Interest During Construction (3% for 1 years with a 0.5% ROI)	$1,234,000
TOTAL COST OF PROJECT	**$46,095,000**
ANNUAL COST	
Debt Service (3.5 percent, 20 years)	$3,243,000
Operation and Maintenance	
Water Treatment Plant	$2,323,000
TOTAL ANNUAL COST	**$5,566,000**
Available Project Yield (acft/yr)	17,000
Annual Cost of Water ($ per acft), based on PF=1	$327
Annual Cost of Water After Debt Service ($ per acft), based on PF=1	$137
Annual Cost of Water ($ per 1,000 gallons), based on PF=1	$1.00
Annual Cost of Water After Debt Service ($ per 1,000 gallons), based on PF=1	$0.42

13.5.1.10 Granbury North Water Treatment Plant

Cost Estimate Summary September 2018 Prices	
City of Granbury North Water Treatment Plant	
Item	***Estimated Costs for Facilities***
Primary Pump Station and Intake (5 MGD)	$4,370,000
Transmission Pipeline (18 in dia., 0.25 miles)	$191,000
Advanced Water Treamtent Facility (5 MGD)	$29,496,000
TOTAL COST OF FACILITIES	**$34,057,000**
Engineering and Feasibility Studies, Legal Assistance, Financing, Bond Counsel, and Contingencies (30% for pipes & 35% for all other facilities)	$10,217,000
Environmental & Archaeology Studies and Mitigation	$6,000
Interest During Construction (3% for 1 years with a 0.5% ROI)	$1,218,000
TOTAL COST OF PROJECT	**$45,500,000**
ANNUAL COST	
Debt Service (3.5 percent, 20 years)	$3,201,000
Operation and Maintenance	
Pipeline, Wells, and Storage Tanks (1% of Cost of Facilities)	$2,000
Intakes and Pump Stations (2.5% of Cost of Facilities)	$109,000
Advanced Water Treatment Facility	$3,818,000
Pumping Energy Costs (311751 kW-hr @ 0.08 $/kW-hr)	$25,000
TOTAL ANNUAL COST	**$7,155,000**
Available Project Yield (acft/yr)	2,800
Annual Cost of Water ($ per acft), based on PF=2	$2,555
Annual Cost of Water After Debt Service ($ per acft), based on PF=2	$1,412
Annual Cost of Water ($ per 1,000 gallons), based on PF=2	$7.84
Annual Cost of Water After Debt Service ($ per 1,000 gallons), based on PF=2	$4.33

13.5.1.11 Jayton

Cost Estimate Summary September 2018 Prices	
City of Jayton WTP	
Item	***Estimated Costs for Facilities***
Water Treatment Plant (0.4 MGD)	$2,533,000
TOTAL COST OF FACILITIES	**$2,533,000**
Engineering and Feasibility Studies, Legal Assistance, Financing, Bond Counsel, and Contingencies (30% for pipes & 35% for all other facilities)	$886,000
Environmental & Archaeology Studies and Mitigation	$15,000
Land Acquisition and Surveying (0 acres)	$25,000
Interest During Construction (3% for 1 years with a 0.5% ROI)	$96,000
TOTAL COST OF PROJECT	**$3,555,000**
ANNUAL COST	
Debt Service (3.5 percent, 20 years)	$250,000
Operation and Maintenance	
Water Treatment Plant	$460,000
TOTAL ANNUAL COST	**$710,000**
Available Project Yield (acft/yr)	249
Annual Cost of Water ($ per acft), based on PF=1	$2,851
Annual Cost of Water After Debt Service ($ per acft), based on PF=1	$1,847
Annual Cost of Water ($ per 1,000 gallons), based on PF=1	$8.75
Annual Cost of Water After Debt Service ($ per 1,000 gallons), based on PF=1	$5.67

13.5.1.12 Kempner WSC

Cost Estimate Summary September 2018 Prices	
Kempner WSC WTP Expansion	
Item	***Estimated Costs for Facilities***
Water Treatment Plant (1.8 MGD)	$7,799,000
TOTAL COST OF FACILITIES	**$7,799,000**
Engineering and Feasibility Studies, Legal Assistance, Financing, Bond Counsel, and Contingencies (30% for pipes & 35% for all other facilities)	$2,729,000
Environmental & Archaeology Studies and Mitigation	$1,000
Land Acquisition and Surveying (1 acres)	$2,000
Interest During Construction (3% for 1 years with a 0.5% ROI)	$290,000
TOTAL COST OF PROJECT	**$10,821,000**
ANNUAL COST	
Debt Service (3.5 percent, 20 years)	$761,000
Operation and Maintenance	
Water Treatment Plant	$716,000
TOTAL ANNUAL COST	**$1,477,000**
Available Project Yield (acft/yr)	1,681
Annual Cost of Water ($ per acft), based on PF=1	$879
Annual Cost of Water After Debt Service ($ per acft), based on PF=1	$426
Annual Cost of Water ($ per 1,000 gallons), based on PF=1	$2.70
Annual Cost of Water After Debt Service ($ per 1,000 gallons), based on PF=1	$1.31

13.5.1.13 McLennan County-Other (FHLM WSC)

Cost Estimate Summary September 2018 Prices	
McLennan County-Other - Individual Treatment Plants for Arsenic	
Item	***Estimated Costs for Facilities***
Water Treatment Plant (0.8 MGD)	$2,871,000
TOTAL COST OF FACILITIES	**$2,871,000**
Engineering and Feasibility Studies, Legal Assistance, Financing, Bond Counsel, and Contingencies (30% for pipes & 35% for all other facilities)	$1,435,000
Interest During Construction (3% for 1 years with a 0.5% ROI)	$119,000
TOTAL COST OF PROJECT	**$4,425,000**
ANNUAL COST	
Debt Service (3.5 percent, 20 years)	$311,000
Operation and Maintenance	
Water Treatment Plant	$524,000
TOTAL ANNUAL COST	**$835,000**
Available Project Yield (acft/yr)	917
Annual Cost of Water ($ per acft), based on PF=1	$911
Annual Cost of Water After Debt Service ($ per acft), based on PF=1	$571
Annual Cost of Water ($ per 1,000 gallons), based on PF=1	$2.79
Annual Cost of Water After Debt Service ($ per 1,000 gallons), based on PF=1	$1.75

13.5.1.14 Prairie Hill WSC

Cost Estimate Summary September 2018 Prices	
Prairie Hill WSC - Upgrade for Arsenic Treatment	
Item	***Estimated Costs for Facilities***
Water Treatment Plant (0.2 MGD)	$913,000
TOTAL COST OF FACILITIES	**$913,000**
Engineering and Feasibility Studies, Legal Assistance, Financing, Bond Counsel, and Contingencies (30% for pipes & 35% for all other facilities)	$457,000
Interest During Construction (3% for 1 years with a 0.5% ROI)	$38,000
TOTAL COST OF PROJECT	**$1,408,000**
ANNUAL COST	
Debt Service (3.5 percent, 20 years)	$99,000
Operation and Maintenance	
Water Treatment Plant	$169,000
TOTAL ANNUAL COST	**$268,000**
Available Project Yield (acft/yr)	268
Annual Cost of Water ($ per acft), based on PF=1	$1,000
Annual Cost of Water After Debt Service ($ per acft), based on PF=1	$631
Annual Cost of Water ($ per 1,000 gallons), based on PF=1	$3.07
Annual Cost of Water After Debt Service ($ per 1,000 gallons), based on PF=1	$1.93

13.5.1.15 Robinson

Cost Estimate Summary September 2018 Prices	
Robinson WTP Expansion	
Item	***Estimated Costs for Facilities***
Water Treatment Plant (4 MGD)	$12,109,000
TOTAL COST OF FACILITIES	**$12,109,000**
Engineering and Feasibility Studies, Legal Assistance, Financing, Bond Counsel, and Contingencies (30% for pipes & 35% for all other facilities)	$4,238,000
Environmental & Archaeology Studies and Mitigation	$8,000
Land Acquisition and Surveying (2 acres)	$8,000
Interest During Construction (3% for 1 years with a 0.5% ROI)	$450,000
TOTAL COST OF PROJECT	**$16,813,000**
ANNUAL COST	
Debt Service (3.5 percent, 20 years)	$1,183,000
Operation and Maintenance	
Water Treatment Plant	$972,000
TOTAL ANNUAL COST	**$2,155,000**
Available Project Yield (acft/yr)	4,481
Annual Cost of Water ($ per acft), based on PF=1	$481
Annual Cost of Water After Debt Service ($ per acft), based on PF=1	$217
Annual Cost of Water ($ per 1,000 gallons), based on PF=1	$1.48
Annual Cost of Water After Debt Service ($ per 1,000 gallons), based on PF=1	$0.67