



5

County and WWP Plans



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5 County and WWP Plans

5.1 Bell County Water Supply Plan

Table 5.1-1 lists each water user group in Bell County and their corresponding surplus or shortage in years 2040 and 2070. A brief summary of the water user groups and the plan for the selected water user are presented in the following subsections.

Table 5.1-1. Bell County Surplus/(Shortage)

Water User Group	Surplus/(Shortage)		Comment
	2040 (acft/yr)	2070 (acft/yr)	
439 WSC	(293)	(1,161)	Projected shortage - see plan below.
Armstrong WSC	448	369	Projected surplus
City of Bartlett			See Williamson County
Bell County WCID 2	44	(63)	Projected shortage - see plan below.
Bell County WCID 3	0	0	No projected surplus or shortage
Bell-Milam-Falls WSC	1,832	1,695	Projected surplus
City of Belton	2,448	(1,072)	Projected shortage - see plan below.
Central Texas College District			See Coryell County
Dog Ridge WSC	714	370	Projected surplus
East Bell WSC	675	466	Projected surplus
Elm Creek WSC	23	(196)	Projected shortage - see plan below.
Fort Hood	5,086	5,107	Projected surplus
City of Georgetown			See Williamson County
City of Harker Heights	122	(3,000)	Projected shortage - see plan below.
City of Holland	228	226	Projected surplus
Jarrell-Schwertner WSC			See Williamson County
Kempner WSC			See Lampasas County
City of Killeen	0	0	No projected surplus or shortage
Little Elm Valley WSC	265	124	Projected surplus
Moffat WSC	907	843	Projected surplus
Morgan's Point Resort	1,148	814	Projected surplus
Pendleton WSC	301	254	Projected surplus
City of Rogers	294	263	Projected surplus
Salado WSC	(29)	(586)	Projected shortage - see plan below.
City of Temple	(6,969)	(17,103)	Projected shortage - see plan below.
The Grove WSC	0	0	No projected surplus or shortage

Table 5.1-1. Bell County Surplus/(Shortage)

Water User Group	Surplus/(Shortage)		Comment
	2040 (acft/yr)	2070 (acft/yr)	
City of Troy	836	776	Projected surplus
West Bell County WSC	876	880	Projected surplus
County-Other	955	(307)	Projected shortage - see plan below.
Manufacturing	(186)	(186)	Projected shortage - see plan below.
Steam-Electric	5,366	5,366	Projected surplus
Mining	(3,434)	(5,803)	Projected shortage - see plan below.
Irrigation	(690)	(719)	Projected shortage - see plan below.
Livestock	0	0	No projected surplus or shortage

5.1.1 439 WSC

Description of Supply

439 WSC has contracted for 1,409 acft/yr of surface water supplies from the Brazos River Authority, which can supply 1,171 acft/yr in 2020 and 1,132 acft/yr in 2070, based on water availability analyses prescribed under water planning guidelines. 439 WSC also obtains water supply through purchases of treated water under contract with the Bell County WCID No. 1 and through purchases of raw water under contract with the Brazos River Authority which is sourced from Lake Belton. Additionally, 439 WSC contracts with Bell County WCID No. 1 to divert, treat, and deliver the raw water purchased under contract with the Brazos River Authority. 439 WSC’s available treated water supply is limited based on proportioned capacity of the Bell County WCID No. 1 water treatment plant.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended for 439 WSC. Conservation was also considered; however, the entity’s usage is below the selected goal of 140 gpcd.

- a. Firm Up BRA Little River Supplies
 - Cost Source: BRA to firm up water supply
 - Date to be Implemented: before 2030
 - Project Cost: Costs borne by BRA
- a. Unit Cost: Costs borne by BRA
- b. Purchase Additional Diversion, Treatment, and Delivery of Supply from Bell County WCID No. 1.
 - Cost Source: Volume II
 - Date to be Implemented: by 2030



- Annual Cost: \$1,161,000
 - Unit Cost: \$1,000/acft
- c. Purchase Raw Water Supply from Fort Hood
- Cost Source: Volume II
 - Date to be Implemented: before 2050
 - Annual Cost: maximum of \$642,276
 - Unit Cost: \$100/acft

Table 5.1-2. Recommended Plan Costs by Decade for 439 WSC

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	217	(32)	(293)	(567)	(859)	(1,161)
Conservation						
Supply From Plan Element (acft/yr)	—	—	—	—	—	—
Annual Cost (\$/yr)	—	—	—	—	—	—
<i>Projected Surplus/(Shortage) after Conservation (acft/yr)</i>	217	(32)	(293)	(567)	(859)	(1,161)
Firm Up BRA Little River Supplies						
Supply From Plan Element (acft/yr)	—	246	253	261	269	277
Annual Cost (\$/yr)	—	—	—	—	—	—
Unit Cost (\$/acft)	—	—	—	—	—	—
Purchase Additional Diversion, Treatment, and Delivery from Bell County WCID No. 1						
Supply From Plan Element (acft/yr)	—	1,161	1,161	1,161	1,161	1,161
Annual Cost (\$/yr)	—	\$1,161,000	\$1,161,000	\$1,161,000	\$1,161,000	\$1,161,000
Unit Cost (\$/acft)	—	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000
Purchase Raw Water Supply from Fort Hood						
Supply From Plan Element (acft/yr)	—	—	—	32	324	626
Annual Cost (\$/yr)	—	—	—	\$3,200	\$32,400	\$62,600
Unit Cost (\$/acft)	—	—	—	\$100	\$100	\$100
Reuse from Bell County WCID No. 1 – South						
Supply From Plan Element (acft/yr)	—	32	185	185	—	20
Annual Cost (\$/yr)	—	\$43,650	\$252,340	\$50,690	—	\$5,480
Unit Cost (\$/acft)	—	\$1,364	\$1,364	\$274	—	\$274

5.1.2 Armstrong WSC

Description of Supply

Armstrong WSC obtains its water supply from the Trinity Aquifer and surface water from Central Texas WSC. No shortages are projected and no change in water supply is recommended.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended for Armstrong WSC. Conservation is recommended to reduce usage to a goal of 140 gpcd.

- a. Conservation
 - Cost Source: Volume II
 - Date to be Implemented: 2030
 - Annual Cost: maximum of \$20,720
 - Unit Cost: \$560/acft

Table 5.1-3. Recommended Plan Costs by Decade for Armstrong WSC

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	491	469	448	425	397	369
Conservation						
Supply From Plan Element (acft/yr)	0	35	37	33	35	36
Annual Cost (\$/yr)	\$0	\$19,600	\$20,720	\$18,480	\$19,600	\$20,160
<i>Projected Surplus/(Shortage) after Conservation (acft/yr)</i>	491	504	485	458	432	405

5.1.3 Bell County WCID No. 2

Description of Supply

Bell County WCID No. 2 obtains its water supply from the Trinity Aquifer and treated surface water from the City of Temple. Shortages are projected for Bell County WCID No. 2 beginning in 2060.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended for Armstrong WSC. Conservation was also considered; however, the entity's usage is below the selected goal of 140 gpcd.

- a. Groundwater Development – Trinity Aquifer
 - Cost Source: Volume II



- Date to be Implemented: before 2060
- Project Cost: \$979,000
- Unit Cost: maximum of \$1,460/acft

Table 5.1-4. Recommended Plan Costs by Decade for Bell County WCID No. 2

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	106	76	44	9	(27)	(63)
Conservation						
Supply From Plan Element (acft/yr)	—	—	—	—	—	—
Annual Cost (\$/yr)	—	—	—	—	—	—
<i>Projected Surplus/(Shortage) after Conservation (acft/yr)</i>	106	76	44	9	(27)	(63)
Groundwater Development – Trinity Aquifer						
Supply From Plan Element (acft/yr)	—	—	—	—	63	63
Annual Cost (\$/yr)	—	—	—	—	\$92,000	\$92,000
Unit Cost (\$/acft)	—	—	—	—	\$1,460	\$1,460

5.1.4 Bell County WCID No. 3

Description of Supply

Bell County WCID No. 3 purchases its water supply from Bell County WCID No. 1. Supply is projected to meet demand and no change in water supply is recommended.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended for Bell County WCID No. 3. Conservation is recommended to reduce usage to a goal of 140 gpcd.

a. Conservation

- Cost Source: Volume II
- Date to be Implemented: 2030
- Annual Cost: \$12,320
- Unit Cost: \$560/acft

Table 5.1-5. Recommended Plan Costs by Decade for Bell County WCID No. 3

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	0	0	0	0	0	0
Conservation						
Supply From Plan Element (acft/yr)	0	22	—	—	—	—
Annual Cost (\$/yr)	—	\$12,320	—	—	—	—
<i>Projected Surplus/(Shortage) after Conservation (acft/yr)</i>	0	22	0	0	0	0

5.1.5 Bell-Milam-Falls WSC

Description of Supply

Bell-Milam Falls WSC is located in multiple counties (Bell, Falls, Milam and Williamson) and obtains its water supply from the Trinity Aquifer through a contract for surface water from Lake Stillhouse Hollow from Central Texas WSC. Totals shown in Table 5.1-6 represent cumulative totals for Bell-Milam Falls WSC. No shortages are projected and no changes to water supply are recommended for Bell-Milam Falls WSC.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended. Conservation is recommended to reduce usage to a goal of 140 gpcd.

- a. Conservation
 - Cost Source: Volume II
 - Date to be Implemented: 2030
 - Annual Cost: maximum of \$2,800
 - Unit Cost: \$560/acft

Table 5.1-6. Recommended Plan Costs by Decade for Bell-Milam-Falls WSC

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	1,902	1,864	1,832	1,798	1,747	1,695
Conservation						
Supply From Plan Element (acft/yr)	0	4	4	4	4	5
Annual Cost (\$/yr)	\$0	\$2,240	\$2,240	\$2,240	\$2,240	\$2,800
<i>Projected Surplus/(Shortage) after Conservation (acft/yr)</i>	1,902	1,868	1,836	1,802	1,751	1,700

5.1.6 City of Belton

Description of Supply

The City of Belton has a contract to purchase water from the Brazos River Authority from Lake Belton. City of Belton has contracted for 2,500 acft/yr of surface water supplies from the Brazos River Authority, which can supply 2,078 acft/yr in 2020 and 2,009 acft/yr in 2070, based on water availability analyses prescribed under water planning guidelines. Belton contracts with Bell County WCID No. 1 to divert, treat, and deliver water from Lake Belton to the City. The City also has a contract with Central Texas WSC. A shortage is projected for the City of Belton in 2070.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended for the City of Belton. Conservation is recommended to reduce usage to a goal of 140 gpcd.

- a. Conservation
 - Cost Source: Volume II
 - Date to be Implemented: 2020
 - Annual Cost: maximum of \$215,040 in 2070
 - Unit Cost: \$560/acft
- b. Firm Up BRA Little River Supplies
 - Cost Source: Volume II
 - Date to be Implemented: before 2070
 - Project Cost: Costs borne by BRA
 - Unit Cost: Costs borne by BRA
- c. Water Treatment Plant Expansion
 - Cost Source: Volume II
 - Date to be Implemented: before 2070
 - Project Cost: \$11,925,000
 - Unit Cost: maximum of \$1,361/acft

Table 5.1-7. Recommended Plan Costs by Decade for City of Belton

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	3,608	3,046	2,448	1,831	1,201	(1,072)
Conservation						
Supply From Plan Element (acft/yr)	—	323	323	325	352	384
Annual Cost (\$/yr)	—	\$180,880	\$180,880	\$182,000	\$197,120	\$215,040

Table 5.1-7. Recommended Plan Costs by Decade for City of Belton

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) after Conservation (acft/yr)</i>	3,608	3,046	2,448	1,831	1,201	(1,072)
Firm Up BRA Little River Supplies						
Supply From Plan Element (acft/yr) ^A	—	436	450	463	477	491
Annual Cost (\$/yr)	—	—	—	—	—	—
Unit Cost (\$/acft)	—	—	—	—	—	—
Water Treatment Plant Expansion						
Supply From Plan Element (acft/yr)	—	—	—	—	—	676
Annual Cost (\$/yr)	—	—	—	—	—	\$740,900
Unit Cost (\$/acft)	—	—	—	—	—	\$1,096

1. Quantity represents increase in treatment capacity required to develop existing supplies currently constrained by treatment capacity.

5.1.7 Dog Ridge WSC

Description of Supply

Dog Ridge WSC has surface water contracts with BRA and Central Texas WSC. No shortages are projected for Dog Ridge WSC and no changes in water supply are recommended. Dog Ridge WSC has contracted for 1,500 acft/yr of surface water supplies from the Brazos River Authority, which can supply 1,247 acft/yr in 2020 and 1,206 acft/yr in 2070, based on water availability analyses prescribed under water planning guidelines.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended for Dog Ridge WSC. Conservation was considered; however the entity's usage is below the selected goal of 140 gpcd.

- a. Firm Up BRA Little River Supplies
 - Cost Source: Volume II
 - Date to be Implemented: before 2070
 - Annual Cost: Costs from by BRA
 - Unit Cost: Costs from by BRA



Table 5.1-8. Recommended Plan Costs by Decade for Dog Ridge WSC

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	914	817	714	602	486	370
Conservation						
Supply From Plan Element (acft/yr)	—	—	—	—	—	—
Annual Cost (\$/yr)	—	—	—	—	—	—
<i>Projected Surplus/ (Shortage) after Conservation</i>	914	817	714	602	486	370
Firm Up BRA Little River Supplies						
Supply From Plan Element (acft/yr)	—	261	270	278	286	294
Annual Cost (\$/yr)	—	—	—	—	—	—
Unit Cost (\$/acft)	—	—	—	—	—	—

5.1.8 East Bell WSC

East Bell WSC is split between Bell and Falls counties, yet the majority of demand lies within Bell County. The WSC obtains its water supply from the Trinity Aquifer and treated surface water from Central Texas WSC. Supplies are projected to be adequate to meet future demands across the entire service area, and no change in water supply is recommended. Conservation was considered; however, the usage is below the selected goal of 140 gpcd.

5.1.9 Elm Creek WSC

Description of Supply

Elm Creek WSC service area includes portions of Bell, Coryell, and McLennan counties, yet the majority of demand lies within Bell County. Elm Creek WSC has a contract to purchase water from Bluebonnet WSC from Lake Belton. The surpluses and shortages shown in Table 5.1-9 represent the cumulative totals for Elm Creek WSC across all counties it serves.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended for Elm Creek WSC. Conservation was considered; however, the entity’s usage is below the selected goal of 140 gpcd.

a. Bluebonnet WSC to Firm Up Contracted Supply

Bluebonnet WSC provides this supply under contract to entity. Bluebonnet WSC to develop any combinations of strategies as described in Section 5.38 to firm up this amount.

- Cost Source: Volume II

- Date to be Implemented: before 2050
 - Project Cost: associated project costs to be borne by Bluebonnet WSC
 - Unit Cost: supply already under contract.
- b. Reallocation of Supply from Moffat WSC
- Cost Source: Volume II
 - Date to be Implemented: before 2050
 - Annual Cost: maximum of \$150,612
 - Unit Cost: \$978/acft (reimbursement of cost under Moffat's take-or-pay contract with Bluebonnet WSC)

Table 5.1-9. Recommended Plan Costs by Decade for Elm Creek WSC

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	157	92	23	(47)	(121)	(196)
Conservation						
Supply From Plan Element (acft/yr)	—	—	—	—	—	—
Annual Cost (\$/yr)	—	—	—	—	—	—
<i>Projected Surplus/(Shortage) after Conservation (acft/yr)</i>	157	92	23	(47)	(121)	(196)
Bluebonnet WSC to Firm Up Contracted Supply						
Supply From Plan Element (acft/yr)	—	—	—	33	37	42
Annual Cost (\$/yr)	—	—	—	\$2,550	\$2,850	\$3,240
Unit Cost (\$/acft)	—	—	—	\$77	\$77	\$77
Reallocation of Supply from Moffat WSC						
Supply From Plan Element (acft/yr)	—	—	—	14	84	154
Annual Cost (\$/yr)	—	—	—	\$13,692	\$82,152	\$150,612
Unit Cost (\$/acft)	—	—	—	\$978	\$978	\$978

5.1.10 Fort Hood

Description of Supply

The U.S. Department of the Army (Fort Hood) has a water right to store and divert 12,000 acft/yr in Lake Belton. The Fort Hood service area includes portions of Bell and Coryell Counties. Bell County WCID No. 1 and City of Gatesville divert, treat and deliver its Lake Belton supply to the Army base. No shortages are projected for Fort Hood and no changes in water supply are recommended. The surplus shown in Table 5.1-10 represents the cumulative totals for Fort Hood in the counties it serves.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended for Fort Hood. Conservation is recommended to reduce usage to a goal of 140 gpcd.

a. Conservation

- Cost Source: Volume II
- Date to be Implemented: 2030
- Unit Cost: \$560/acft
- Annual Cost: maximum of \$1,109,448 in 2060

Table 5.1-10. Recommended Plan Costs by Decade for Fort Hood

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	4,915	5,007	5,086	5,097	5,106	5,107
Conservation						
Supply From Plan Element (acft/yr)	0	531	1,053	1,602	1,981	1,980
Annual Cost (\$/yr)	\$0	\$297,000	\$590,000	\$897,000	\$1,109,000	\$1,109,000
<i>Projected Surplus/(Shortage) after Conservation (acft/yr)</i>	4,915	5,007	5,086	5,097	5,106	5,107
Additional Demands from Recommended Strategies from Others						
Provide raw supply to 439 WSC (acft/yr)	—	—	—	(32)	(324)	(626)
Provide raw supply to Harker Heights (acft/yr)	—	—	—	—	—	(487)
Provide raw supply to Copperas Cove (acft/yr)	—	—	—	—	(125)	(1,285)
<i>Total Surplus/(Shortage) Including Recommended Strategies (acft/yr)</i>	4,915	5,007	5,086	5,065	4,657	2,709

5.1.11 City of Harker Heights

Description of Supply

The City of Harker Heights has a contract to purchase water from the Brazos River Authority Little River System from Lake Stillhouse Hollow and Lake Belton. City of Harker Heights has contracted for 3,535 acft/yr of surface water supplies from the Brazos River Authority, which can supply 2,938 acft/yr in 2020 and 2,841 acft/yr in 2070, based on water availability analyses prescribed under water planning guidelines. Harker Heights also contracts with Bell County WCID No. 1 to divert, treat, and deliver water from Lake Belton to the City.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to meet water needs for the City of Harker Heights. Associated costs are included for each strategy. Conservation is recommended to reduce usage to a goal of 140 gpcd.

- a. Conservation
 - Cost Source: Volume II
 - Date to be Implemented: before 2030
 - Annual Cost: maximum of \$1,018,640
 - Unit Cost: \$560/acft
- b. Firm Up BRA Little River Supplies
 - Cost Source: Volume II
 - Date to be Implemented: before 2030
 - Annual Cost: Costs borne by BRA
 - Unit Cost: Costs borne by BRA
- c. Purchase Raw Water Supply from Fort Hood
 - Cost Source: Volume II
 - Date to be Implemented: before 2030
 - Annual Cost: maximum of \$48,700
 - Unit Cost: \$100/acft
- d. Purchase Additional Diversion, Treatment, and Delivery from Bell County WCID No. 1.
 - Cost Source: Volume II
 - Date to be Implemented: before 2060
 - Annual Cost: \$1,232,000
 - Unit Cost: \$1,000/acft

Table 5.1-11. Recommended Plan Costs by Decade for City of Harker Heights

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	2,104	1,141	122	(915)	(1,962)	(3,000)
Conservation						
Supply From Plan Element (acft/yr)	—	559	1,274	1,498	1,656	1,819
Annual Cost (\$/yr)	—	\$313,040	\$713,440	\$838,880	\$927,360	\$1,018,640
<i>Projected Surplus/(Shortage) after Conservation</i>	2,104	1,141	122	583	(306)	(1,181)
Firm Up BRA Little River Supplies						
Supply From Plan Element (acft/yr)	—	616	636	655	674	694



Table 5.1-11. Recommended Plan Costs by Decade for City of Harker Heights

Plan Element	2020	2030	2040	2050	2060	2070
Annual Cost (\$/yr)	—	—	—	—	—	—
Unit Cost (\$/acft)	—	—	—	—	—	—
Purchase Raw Water Supply from Fort Hood						
Supply From Plan Element (acft/yr)	—	—	—	—	—	487
Annual Cost (\$/yr)	—	—	—	—	—	\$48,700
Unit Cost (\$/acft)	—	—	—	—	—	\$100
Purchase Additional Diversion, Treatment, and Delivery from Bell County WCID No. 1						
Supply From Plan Element (acft/yr)	—	—	—	—	185	185
Annual Cost (\$/yr)	—	—	—	—	\$252,340	\$252,340
Unit Cost (\$/acft)	—	—	—	—	\$1,364	\$1,364
Killeen Reduction to Harker Heights						
Supply From Plan Element (acft/yr)	—	—	—	—	—	302
Annual Cost (\$/yr)	—	—	—	—	—	\$541,000
Unit Cost (\$/acft)	—	—	—	—	—	\$1,791

5.1.12 City of Holland

The City of Holland has Trinity supplies and a contract to purchase water from the Central Texas WSC from Lake Stillhouse Hollow. No shortages are projected for the City of Holland and no changes in water supply are recommended. Conservation was considered; however, the entity’s usage is below the selected goal of 140 gpcd.

5.1.13 City of Killeen

The City of Killeen has a contract to purchase water from Bell County WCID No. 1 to divert, treat, and deliver water from Lake Belton to the City. Killeen provides supply for Bell County manufacturing entities.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to meet water needs for the City of Killeen. Associated costs are included for each strategy. Conservation is recommended to reduce usage to a goal of 140 gpcd.

- a. Bell County WCID No. 1 North Reuse
 - Cost Source: Volume II
 - Date to be Implemented: before 2030
 - Annual Cost: maximum of \$1,018,640
 - Unit Cost: \$835/acft

- b. Bell County WCID No. 1 South Reuse
- Cost Source: Volume II
 - Date to be Implemented: before 2030
 - Annual Cost: maximum of \$1,018,640
 - Unit Cost: \$1,364/acft

Table 5.1-12. Recommended Plan Costs by Decade for the City of Killeen

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	0	0	0	0	0	0
Conservation						
Supply From Plan Element (acft/yr)	—	—	—	—	—	—
Annual Cost (\$/yr)	—	—	—	—	—	—
<i>Projected Surplus/(Shortage) after Conservation</i>	0	0	0	0	0	0
Reuse from Bell County WCID No. 1 – North						
Supply From Plan Element (acft/yr)	—	1,773	1,773	1,773	1,773	1,773
Annual Cost (\$/yr)	—	\$3,899,000	\$3,899,000	\$984,000	\$984,000	\$984,000
Unit Cost (\$/acft)	—	\$2,199	\$2,199	\$555	\$555	\$555
Reuse from Bell County WCID No. 1 – South						
Supply From Plan Element (acft/yr)	—	716	563	563	563	543
Annual Cost (\$/yr)	—	\$1,574,000	\$1,238,000	\$312,000	\$312,000	\$301,000
Unit Cost (\$/acft)	—	\$2,199	\$2,199	\$555	\$555	\$555
<i>Projected Surplus/(Shortage) after Reuse</i>	—	2,489	2,336	2,336	2,336	2,316

5.1.14 Little Elm Valley WSC

Description of Supply

Little Elm Valley WSC obtains its water supply from the Trinity Aquifer and a contract for treated supplies from Central Texas WSC. Little River Academy is projected to have sufficient supply through 2070.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended for Little Elm Valley WSC. Conservation is recommended to reduce usage to a goal of 140 gpcd.

- a. Conservation
- Cost Source: Volume II
 - Date to be Implemented: before 2030



- Annual Cost: maximum of \$26,320 in 2070
- Unit Cost: \$560/acft

Table 5.1-13. Recommended Plan Costs by Decade for Little Elm Valley WSC

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/ (Shortage) (acft/yr)</i>	353	310	265	219	171	124
Conservation						
Supply From Plan Element (acft/yr)	0	25	37	39	43	47
Annual Cost (\$/yr)	0	\$14,000	\$20,720	\$21,840	\$24,080	\$26,320
<i>Projected Surplus/(Shortage) after Conservation</i>	353	335	302	258	214	171

5.1.15 Moffat WSC

Description of Supply

Moffat WSC has a contract to purchase water from the Brazos River Authority and Bluebonnet WSC from Lake Belton, as well as supplemental wells in the Trinity Aquifer. Moffat WSC has contracted for 500 acft/yr of surface water supplies from the Brazos River Authority, which can supply 416 acft/yr in 2020 and 402 acft/yr in 2070, based on water availability analyses prescribed under water planning guidelines. No shortages are projected for Moffat WSC and no changes in water supply are recommended. Moffat WSC is slated to voluntarily redistribute 14, 84, and 154 acft/yr to Elm Creek WSC in 2050, 2060, and 2070.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended for Moffat WSC, Conservation was considered; however, the entity’s usage is below the selected goal of 140 gpcd.

- a. Firm Up BRA Little River Supplies
 - Cost Source: Volume II
 - Date to be Implemented: before 2070
 - Annual Cost: Costs borne by BRA.
 - Unit Cost: Costs borne by BRA

Table 5.1-14. Recommended Plan Costs by Decade for Moffat WSC

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	936	922	907	890	867	843
Conservation						
Supply From Plan Element (acft/yr)	—	—	—	—	—	—
Annual Cost (\$/yr)	—	—	—	—	—	—
<i>Projected Surplus/ (Shortage) after Conservation</i>	936	922	907	890	867	843
Firm Up BRA Little River Supplies						
Supply From Plan Element (acft/yr)	—	87	90	93	95	98
Annual Cost (\$/yr)	—	—	—	—	—	—
Unit Cost (\$/acft)	—	—	—	—	—	—

5.1.16 Morgan’s Point Resort

Morgan’s Point Resort contracts with the City of Temple for all of its water supply. No shortages are projected for Morgan’s Point Resort and no changes in water supply are recommended. Conservation was considered; however, the entity’s usage is below the selected goal of 140 gpcd.

5.1.17 Pendleton WSC

Pendleton WSC has wells in the Trinity Aquifer and a contract to purchase water from Bluebonnet WSC from Lake Belton. No shortages are projected for Pendleton WSC and no changes in water supply are recommended. Conservation was considered; however, the entity’s usage is below the selected goal of 140 gpcd.

5.1.18 City of Rogers

The City of Rogers has wells in the Trinity Aquifer and purchases treated surface water from Central Texas WSC. No shortages are projected for the City of Rogers and no changes in water supply are recommended. Conservation was considered; however, the entity’s usage is below the selected goal of 140 gpcd.

5.1.19 Salado WSC

Description of Supply

Salado WSC currently obtains water from the Edwards Aquifer and through purchases of treated supply from Kempner WSC. The entity also has a contract with the BRA. Salado WSC has contracted for 1,600 acft/yr of surface water supplies from the Brazos River Authority, which can supply 1,330 acft/yr in 2020 and 1,286 acft/yr in 2070, based on water



availability analyses prescribed under water planning guidelines. A shortage is projected beginning in 2040 for Salado WSC.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended for Salado WSC. Conservation is recommended to reduce usage to a goal of 140 gpcd.

- a. Conservation
 - Cost Source: Volume II
 - Date to be Implemented: 2030
 - Annual Cost: maximum \$601,440 in 2070
 - Unit Cost: \$560/acft
- b. Firm Up BRA Little River Supplies
 - Cost Source: Volume II
 - Date to be Implemented: before 2070
 - Annual Cost: Costs borne by BRA.
 - Unit Cost: Costs borne by BRA

Table 5.1-15. Recommended Plan Costs by Decade for Salado WSC

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	337	155	(29)	(213)	(400)	(586)
Conservation						
Supply From Plan Element (acft/yr)	0	178	379	597	831	1,074
Annual Cost (\$/yr)	\$0	\$99,680	\$212,240	\$334,320	\$465,360	\$601,440
<i>Projected Surplus/ (Shortage) after Conservation</i>	337	333	350	384	431	488
Firm Up BRA Little River Supplies						
Supply From Plan Element (acft/yr)	—	279	288	296	305	314
Annual Cost (\$/yr)	—	—	—	—	—	—
Unit Cost (\$/acft)	—	—	—	—	—	—

5.1.20 City of Temple

Description of Supply

The City of Temple obtains its water supply from surface water from Lake Belton through the BRA and run-of-the river water rights. City of Temple has contracted for 30,453 acft/yr of surface water supplies from the Brazos River Authority, which can supply 25,311 acft/yr in 2020 and 24,476 acft/yr in 2070, based on water availability analyses prescribed under water planning guidelines. The City supplies several neighboring communities with treated water. The City is projected to have a shortage of supplies through the planning period.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended for the City of Temple. Conservation is recommended to reduce usage to a goal of 140 gpcd.

- a. Conservation
 - Cost Source: Volume II
 - Date to be Implemented: before 2030
 - Annual Cost: maximum \$6,982,640 in 2070
 - Unit Cost: \$560/acft
- b. Firm up BRA Little River Supplies
 - Cost Source: Volume II
 - Date to be Implemented: by 2030
 - Project Cost: Costs borne by BRA
 - Unit Cost: Costs borne by BRA
- c. Expand Water Treatment Plant Capacity. Strategy includes two identical expansions. First treatment plant expansion will increase available supply to cover shortage for 2030.
 - Cost Source: Volume II
 - Date to be implemented: first expansion before 2030; second expansion before 2040.
 - Project Cost: \$35,666,000
 - Unit Cost: maximum of \$957



Table 5.1-16. Recommended Plan Costs by Decade for the City of Temple

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	(532)	(3,668)	(6,969)	(10,340)	(13,738)	(17,103)
Conservation						
Supply From Plan Element (acft/yr)	0	1,868	4,232	7,057	10,263	12,469
Annual Cost (\$/yr)	\$0	\$1,046,080	\$2,369,920	\$3,951,920	\$5,747,280	\$6,982,640
<i>Projected Surplus/ (Shortage) after Conservation</i>	(532)	(1,800)	(2,737)	(3,283)	(3,475)	(4,634)
Firm up BRA Little River Supplies						
Supply From Plan Element (acft/yr)	—	5,309	5,476	5,643	5,810	5,977
Annual Cost (\$/yr)	—	—	—	—	—	—
Unit Cost (\$/acft)	—	—	—	—	—	—
Water Treatment Plant Expansion^A						
Supply From Plan Element (acft/yr) ^B	2,352	2,352	3,610	3,138	2,707	2,256
Annual Cost (\$/yr)	\$2,251,000	\$2,251,000	\$2,491,000	\$2,166,000	\$1,146,000	\$955,000
Unit Cost (\$/acft)	\$957	\$957	\$690	\$690	\$423	\$423

A – Two separate expansions at 2.1 MGD each with the first completed by 2030 and the second completed before 2040.

B - Quantity represents increase in treatment capacity required to develop additional supplies and does not include the supply itself.

5.1.21 The Grove WSC

Description of Supply

The Grove WSC services entities in Bell and Coryell counties, with the majority of demand lying within Bell County. The WSC purchases treated surface water from the City of Gatesville and raw surface water from the Brazos River authority Little River System. The Grove WSC has contracted for 400 acft/yr of surface water supplies from the Brazos River Authority, which can supply 332 acft/yr in 2020 and 321 acft/yr in 2070, based on water availability analyses prescribed under water planning guidelines. The Grove WSC is projected to have sufficient water supply through the planning period and no changes to water supply are recommended.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended for The Grove WSC. Conservation was considered; however, the entity’s usage is below the selected goal of 140 gpcd.

- a. Firm Up BRA Little River Supplies
 - Cost Source: Volume II
 - Date to be Implemented: before 2070
 - Annual Cost: Costs borne by BRA.
 - Unit Cost: Costs borne by BRA

Table 5.1-17. Recommended Plan Costs by Decade for The Grove WSC

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	0	0	0	0	0	0
Conservation						
Supply From Plan Element (acft/yr)	—	—	—	—	—	—
Annual Cost (\$/yr)	—	—	—	—	—	—
<i>Projected Surplus/ (Shortage) after Conservation</i>	0	0	0	0	0	0
Firm Up BRA Little River Supplies						
Supply From Plan Element (acft/yr)	—	70	72	74	76	79
Annual Cost (\$/yr)	—	—	—	—	—	—
Unit Cost (\$/acft)	—	—	—	—	—	—

5.1.22 City of Troy

The City of Troy obtains its water from a contract with the City of Temple and wells located in the Trinity Aquifer. No shortages are projected for the City of Troy and no changes in water supply are recommended. Conservation was considered; however, the entity's usage is below the selected goal of 140 gpcd.

5.1.23 West Bell County WSC

West Bell County WSC obtains its water through a contract with the Central Texas WSC. No shortages are projected for West Bell County WSC and no changes in water supply are recommended. Conservation was considered; however, the usage is below the selected goal of 140 gpcd.

5.1.24 Bell County-Other

Description of Supply

Bell County-Other entities obtain water supply from groundwater from the Trinity Aquifer and treated surface water from Bell County WCID No. 1, Central Texas WSC, and City of Temple. Shortages are projected for County Other by 2040.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended for Bell County-Other. Conservation is recommended to reduce usage to a goal of 140 gpcd.

a. Conservation

- Cost Source: Volume II
- Date to be Implemented: 2030
- Annual Cost: maximum \$24,191 in 2070
- Unit Cost: \$560/acft

b. Purchase Additional Treated Surface Water Supply from Central Texas WSC

- Cost Source: Volume II
- Date to be Implemented: before 2070
- Annual Cost: \$387,024
- Unit Cost: \$1,460

Table 5.1-18. Recommended Plan Costs by Decade for Bell County – Other

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	1,025	995	955	911	287	(307)
Conservation						
Supply From Plan Element (acft/yr)	0	17	14	14	30	43
Annual Cost (\$/yr)	\$0	\$9,520	\$7,840	\$7,840	\$16,800	\$24,080
<i>Projected Surplus/(Shortage) after Conservation</i>	1,025	995	955	911	287	(264)
Purchase Additional Treated Surface Water Supply from Central Texas WSC						
Supply From Plan Element (acft/yr)	—	—	—	—	—	264
Annual Cost (\$/yr)	—	—	—	—	—	\$387,024
Unit Cost (\$/acft)	—	—	—	—	—	\$1,466

5.1.25 Manufacturing

Description of Supply

Water supply for manufacturing in Bell County is obtained by purchase from the cities of Killeen, Temple, and Troy, and from wells within the Trinity Aquifer. Bell County Manufacturing is projected to have shortages beginning in 2020.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to meet water needs for Bell County Manufacturing. Conservation is recommended.

- a. Conservation
 - Cost Source: Volume II
 - Date to be Implemented: before 2020
 - Annual Cost: Not determined
- b. Reuse Supplies from Bell County WCID No. 1 (North)
 - Cost Source: Volume II
 - Date to be Implemented: by 2030
 - Annual Cost: Costs to be borne by Bell County WCID No. 1
 - Unit Cost: \$919/acft

Table 5.1-19. Recommended Plan Costs by Decade for Bell County – Manufacturing

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	(142)	(186)	(186)	(186)	(186)	(186)
Conservation						
Supply From Plan Element (acft/yr)	19	34	48	48	48	48
Annual Cost (\$/yr)	ND	ND	ND	ND	ND	ND
<i>Projected Surplus/ (Shortage) after Conservation</i>	(123)	(152)	(138)	(138)	(138)	(138)
Purchase Reuse Supplies from Bell County WCID No. 1 (North)						
Supply From Plan Element (acft/yr)	—	152	152	152	152	152
Annual Cost (\$/yr)	—	\$126,920	\$126,920	\$42,720	\$42,720	\$42,720
Unit Cost (\$/acft)	—	\$835	\$835	\$281	\$281	\$281

ND – Not Determined. Costs to implement industrial conservation technologies will vary based on each location.

5.1.26 Steam-Electric

Steam-Electric operations in Bell County obtain reuse water supply from the City of Temple. Steam-Electric has a projected surplus throughout the planning period and no changes in water supply are recommended.

5.1.27 Mining

Description of Supply

Mining in Bell County obtains water supply from wells within the Trinity Aquifer. A shortage is projected for mining operations throughout the planning period.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to meet water needs for Bell County-Mining. Conservation is recommended.

- a. Conservation
 - Cost Source: Volume II
 - Date to be Implemented: by 2030
 - Annual Cost: Not determined
- b. Groundwater Development – Trinity Aquifer
 - Cost Source: Volume II
 - Date to be Implemented: before 2030
 - Project Cost: \$8,771,000
 - Unit Cost: \$447/acft
- c. Groundwater Development – Edwards BFZ Aquifer
 - Cost Source: Volume II
 - Date to be Implemented: before 2070
 - Project Cost: \$1,423,000
 - Unit Cost: \$324/acft

Table 5.1-20. Recommended Plan Costs by Decade for Bell County – Mining

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	(2,077)	(2,815)	(3,434)	(4,184)	(4,940)	(5,803)
Conservation						
Supply From Plan Element (acft/yr)	97	199	322	374	427	488
Annual Cost (\$/yr)	ND	ND	ND	ND	ND	ND
<i>Projected Surplus/(Shortage) after Conservation (acft/yr)</i>	(1,980)	(2,616)	(3,112)	(3,810)	(4,513)	(5,315)
Groundwater Development – Trinity Aquifer						
Supply From Plan Element (acft/yr)	4,700	4,700	4,700	4,700	4,700	4,700
Annual Cost (\$/yr)	\$2,101,000	\$2,101,000	\$1,484,000	\$1,484,000	\$1,484,000	\$1,484,000
Unit Cost (\$/acft)	\$447	\$447	\$316	\$316	\$316	\$316
Groundwater Development – Edwards BFZ Aquifer						
Supply From Plan Element (acft/yr)	—	—	—	—	—	615
Annual Cost (\$/yr)	—	—	—	—	—	\$199,000
Unit Cost (\$/acft)	—	—	—	—	—	\$324

ND – Not determined. Costs to implement industrial conservation technologies will vary based on each location

5.1.28 Irrigation

Description of Supply

Bell County Irrigation is supplied by groundwater from the Trinity and the Edwards (BFZ) Aquifers, and surface water from the Brazos River Authority Little River System. Bell County Irrigation has contracted for 308 acft/yr of surface water supplies from the Brazos River Authority, which can supply 256 acft/yr in 2020 and 248 acft/yr in 2070, based on water availability analyses prescribed under water planning guidelines. Irrigation is projected to have shortages beginning in 2020.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to meet water needs for Bell County-Irrigation. Conservation is recommended.

a. Conservation

- Cost Source: Volume II
- Date to be Implemented: before 2030
- Annual Cost: maximum of \$263,326



- Unit Cost: \$1,323/acft
- b. Firm Up BRA Little River Supplies
 - Cost Source: Volume II
 - Date to be Implemented: before 2030
 - Project Cost: Costs borne by BRA
 - Unit Cost: Costs borne by BRA
- c. Groundwater Development – Edwards BFZ Aquifer
 - Cost Source: Volume II
 - Date to be Implemented: before 2030
 - Project Cost: \$922,000
 - Unit Cost: \$185/acft

Table 5.1-21. Recommended Plan Costs by Decade for Bell County – Irrigation

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	(670)	(680)	(690)	(700)	(710)	(719)
Conservation						
Supply From Plan Element (acft/yr)	85	142	199	199	199	199
Annual Cost (\$/yr)	\$112,455	\$187,870	\$263,280	\$263,280	\$263,280	\$263,280
<i>Projected Surplus/(Shortage) after Conservation (acft/yr)</i>	(585)	(538)	(491)	(501)	(511)	(520)
Firm Up BRA Little River Supplies						
Supply From Plan Element (acft/yr)	—	54	55	57	59	60
Annual Cost (\$/yr)	—	—	—	—	—	—
Unit Cost (\$/acft)	—	—	—	—	—	—
Groundwater Development – Edwards BFZ Aquifer						
Supply From Plan Element (acft/yr)	585	585	585	585	585	585
Annual Cost (\$/yr)	\$88,000	\$88,000	\$23,000	\$23,000	\$23,000	\$23,000
Unit Cost (\$/acft)	\$150	\$150	\$39	\$39	\$39	\$39

5.1.29 Livestock

Livestock water supply is projected to meet demands through 2070 and no changes in water supply are recommended.

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5.2 Bosque County Water Supply Plan

Table 5.2-1 lists each water user group in Bosque County and their corresponding surplus or shortage in years 2040 and 2070. A brief summary of the water user groups and the plan for the selected water user are presented in the following subsections.

Table 5.2-1. Bosque County Surplus/(Shortage)

Water User Group	Surplus/(Shortage)		Comment
	2040 (acft/yr)	2070 (acft/yr)	
Childress Creek WSC	139	124	Projected surplus
City of Clifton	59	(70)	Projected shortage - see plan below.
Cross Country WSC			See McLennan County
Highland Park WSC	(102)	(116)	Projected shortage - see plan below.
HILCO United Services			See Hill County
City of Meridian	228	167	Projected surplus
Mustang Valley WSC	(30)	(52)	Projected shortage - see plan below.
Smith Bend WSC	108	130	Projected surplus
City of Valley Mills	28	11	Projected surplus
County-Other	39	0	No projected surplus or shortage
Manufacturing	235	235	Projected surplus
Steam-Electric	3,621	3,621	Projected surplus
Mining	(726)	(655)	Projected shortage - see plan below.
Irrigation	(1,366)	(1,366)	Projected shortage - see plan below.
Livestock	0	0	No projected surplus or shortage

5.2.1 Childress Creek WSC

Description of Supply

Childress Creek WSC obtains its water supply from groundwater from the Trinity Aquifer. No shortages are projected for the Childress Creek WSC.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended to meet additional regional needs. Associated Childress Creek WSC costs are included for the Bosque County Regional Project. Conservation was considered; however, the entity's usage is below the selected goal of 140 gpcd.

a. Bosque County Regional Project

- Cost Source: Volume II

- Date to be Implemented: before 2030
- Project Cost: \$8,030,000 for Childress Creek WSC portion
- Unit Cost: \$3,488/acft

Table 5.2-2. Recommended Plan Costs by Decade for Childress Creek WSC

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	169	147	139	133	128	124
Conservation						
Supply From Plan Element (acft/yr)	—	—	—	—	—	—
Annual Cost (\$/yr)	—	—	—	—	—	—
<i>Projected Surplus/(Shortage) after Conservation (acft/yr)</i>	169	147	139	133	128	124
Bosque County Regional Project						
Supply From Plan Element (acft/yr)		203	203	203	203	203
Annual Cost (\$/yr)		\$708,000	\$708,000	\$333,000	\$207,000	\$207,000
Unit Cost (\$/acft)		\$3,488	\$3,488	\$1,640	\$1,020	\$1,020

5.2.2 City of Clifton

Description of Supply

The City of Clifton obtains its water supply from groundwater from the Trinity Aquifer and from surface water from the North Bosque River. The City of Clifton owns water rights on the North Bosque River and diverts water into a 500 acft off-channel reservoir. Based on the estimated availability of groundwater and surface water to the City, shortages are projected for the City beginning in 2060.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to meet water needs for County-Other entities. Associated costs are included for each strategy. Conservation is recommended to reduce usage to a goal of 140 gpcd.

- Conservation
 - Cost Source: Volume II
 - Date to be Implemented: before 2030
 - Annual Cost: maximum of \$42,731 in 2040; Unit cost of \$560/acft
- Bosque County Regional Project – includes expansion of the Clifton OCR and WTP
 - Cost Source: Volume II



- Date to be Implemented: 2030
- Project Cost: \$10,852,000 for the City's portion
- Unit Cost: \$2,567/acft

Table 5.2-3. Recommended Plan Costs by Decade for City of Clifton

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	214	120	59	13	(30)	(70)
Conservation						
Supply From Plan Element (acft/yr)	0	53	76	71	71	71
Annual Cost (\$/yr)	\$0	\$30,000	\$43,000	\$40,000	\$40,000	\$40,000
<i>Projected Surplus/(Shortage) after Conservation</i>	214	120	59	13	41	1
Bosque County Regional Project						
Supply From Plan Element (acft/yr)		397	397	397	397	397
Annual Cost (\$/yr)		\$1,019,000	\$1,019,000	\$512,000	\$341,000	\$341,000
Unit Cost (\$/acft)		\$2,567	\$2,567	\$1,290	\$859	\$859

5.2.3 Highland Park WSC

Description of Supply

Highland Park WSC obtains its water supply from groundwater from the Trinity Aquifer, and has a projected shortage from 2020 through 2070.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to meet projected water supply shortages. Associated costs are included for each strategy. Conservation is recommended to reduce usage to a goal of 140 gpcd.

- Conservation
 - Cost Source: Volume II
 - Date to be Implemented: before 2030
 - Annual Cost: \$42,011 in 2070; Unit Cost of \$560/acft
- Groundwater Development – Trinity Aquifer
 - Cost Source: Volume II
 - Date to be Implemented: before 2030
 - Project Cost: \$1,245,000
 - Unit Cost: \$1,939/acft

Table 5.2-4. Recommended Plan Costs by Decade for Highland Park WSC

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	(82)	(95)	(102)	(108)	(112)	(116)
Conservation						
Supply From Plan Element (acft/yr)	0	16	31	47	61	75
Annual Cost (\$/yr)	\$0	\$9,000	\$17,000	\$26,000	\$34,000	\$42,000
<i>Projected Surplus/(Shortage) after Conservation</i>	(82)	(80)	(71)	(61)	(51)	(41)
Groundwater Development – Trinity Aquifer						
Supply From Plan Element (acft/yr)	82	82	82	82	82	82
Annual Cost (\$/yr)	\$159,000	\$159,000	\$30,000	\$30,000	\$30,000	\$30,000
Unit Cost (\$/acft)	\$1,939	\$1,939	\$366	\$366	\$366	\$366

5.2.4 City of Meridian

Description of Supply

The City of Meridian obtains its water supply from groundwater from the Trinity Aquifer and has a contract to purchase treated water from the City of Clifton. No shortages are projected for the City of Meridian.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to meet any unforeseen water needs that may arise. Associated costs are included for each strategy. Conservation was considered; however, the entity’s usage is below the selected goal of 140 gpcd.

- a. Bosque County Regional Project – includes expansion of the Clifton OCR and WTP
 - Cost Source: Volume II
 - Date to be Implemented: before 2030
 - Project Cost: \$6,407,000 for the City’s portion
 - Unit Cost: \$2,665/acft



Table 5.2-5. Recommended Plan Costs by Decade for City of Meridian

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/ (Shortage) (acft/yr)</i>	252	240	228	208	187	167
Conservation						
Supply From Plan Element (acft/yr)	—	—	—	—	—	—
Annual Cost (\$/yr)	—	—	—	—	—	—
<i>Projected Surplus/ (Shortage) after Conservation</i>	252	240	228	208	187	167
Bosque County Regional Project						
Supply From Plan Element (acft/yr)	—	224	224	224	224	224
Annual Cost (\$/yr)	—	\$597,000	\$597,000	\$298,000	\$197,000	\$197,000
Unit Cost (\$/acft)	—	\$2,665	\$2,665	\$1,221	\$879	\$879

5.2.5 Mustang Valley WSC

Description of Supply

The Mustang Valley WSC service area is primarily in Bosque County but also serves a small portion of Coryell County. The WSC obtains all of its water supply from Trinity Aquifer groundwater. Based on the groundwater supply available, the City of Valley Mills is projected to have a shortage beginning in year 2030 and increasing throughout the planning period. The surplus/shortages shown in Table 5.2-6 represent the cumulative totals for Mustang Valley WSC.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, conservation is the recommended water management strategy to meet water needs for Mustang Valley WSC. Associated costs are included below. Conservation is recommended to reduce usage to a goal of 140 gpcd.

a. Conservation

- Cost Source: Volume II
- Date to be Implemented: before 2030
- Annual Cost: maximum of \$78,318 in 2070; Unit Cost of \$560/acft

Table 5.2-6. Recommended Plan Costs by Decade for Mustang Valley WSC

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	19	(14)	(30)	(39)	(47)	(52)
Conservation						
Supply From Plan Element (acft/yr)	0	38	79	120	137	138
Annual Cost (\$/yr)	\$0	\$21,280	\$44,240	\$67,200	\$76,720	\$77,280
<i>Projected Surplus/(Shortage) after Conservation</i>	19	24	49	81	90	86

5.2.6 Smith Bend WSC

Description of Supply

Smith Bend WSC obtains all of its water supply from Trinity Aquifer groundwater. No shortages are projected for the WSC throughout the planning period and no changes in water supply are recommended. Conservation was considered; however, the entity's usage is below the selected goal of 140 gpcd.

5.2.7 City of Valley Mills

Description of Supply

The City of Valley Mills service area is primarily in Bosque County but also serves a small portion of McLennan County. The City obtains all of its water supply from groundwater from the Trinity Aquifer. No shortages are projected for the City of Valley Mills throughout the planning period. The surpluses shown in Table 5.2-7 represent the cumulative totals for the City of Valley Mills (including Bosque and McLennan Counties).

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to improve the City's water system reliability. Associated costs are included for each strategy. Conservation is recommended to reduce usage to a goal of 140 gpcd.

- a. Conservation
 - Cost Source: Volume II
 - Date to be Implemented: before 2030
 - Annual Cost: maximum of \$27,173 in 2070; Unit Cost of \$560/acft
- b. Bosque County Regional Project
 - Cost Source: Volume II
 - Date to be Implemented: before 2030
 - Project Cost: \$7,923,000 for the City's portion
 - Unit Cost: \$3,753/acft

Table 5.2-7. Recommended Plan Costs by Decade for City of Valley Mills

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	57	37	28	21	16	11
Conservation						
Supply From Plan Element (acft/yr)	0	21	43	46	46	47
Annual Cost (\$/yr)	\$0	\$12,000	\$24,000	\$26,000	\$26,000	\$26,000
<i>Projected Surplus/(Shortage) after Conservation</i>	57	58	71	67	62	58
Bosque County Regional Project						
Supply From Plan Element (acft/yr)		182	182	182	182	182
Annual Cost (\$/yr)		\$683,000	\$683,000	\$313,000	\$188,000	\$188,000
Unit Cost (\$/acft)		\$3,753	\$3,753	\$1,720	\$1,033	\$1,033

5.2.8 County-Other

Description of Supply

Bosque County-Other entities obtain water supply from groundwater from the Trinity Aquifer. No shortages are projected for County-Other throughout the planning period.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the Bosque County Regional Project is the recommended water management strategy to improve County-Other water system reliability. Associated costs are included below. Conservation was considered; however, the entity’s usage is below the selected goal of 140 gpcd.

- a. Bosque County Regional Project
 - Cost Source: Volume II
 - Date to be Implemented: before 2030
 - Project Cost: \$5,573,000 for the County-Other portion
 - Unit Cost: \$6,984/acft

Table 5.2-8. Recommended Plan Costs by Decade for County-Other

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	117	61	39	30	26	0
Conservation						
Supply From Plan Element (acft/yr)	—	—	—	—	—	—
Annual Cost (\$/yr)	—	—	—	—	—	—
<i>Projected Surplus/(Shortage) after Conservation</i>	117	61	39	30	26	0
Bosque County Regional Project						
Supply From Plan Element (acft/yr)		64	64	64	64	64
Annual Cost (\$/yr)		\$447,000	\$447,000	\$187,000	\$99,000	\$99,000
Unit Cost (\$/acft)		\$6,984	\$6,984	\$2,922	\$1,547	\$1,547

5.2.9 Manufacturing

Water supply for manufacturing in Bosque County is obtained by purchase from a city or water supply corporation, from private wells operated by the manufacturing entity, or by limited surface water supplies. Childress Creek WSC, the City of Clifton, and the City of Hamilton sell groundwater to Bosque County manufacturing entities. No shortages are projected for manufacturing in Bosque County and no changes in water supply are recommended.

5.2.10 Steam-Electric

The water supply for Steam-Electric use in Bosque County consists of surface water contracts with the Brazos River Authority. No shortages are projected for Steam-Electric from the year 2020 through 2070 and no changes in water supply are recommended.

5.2.11 Mining

Description of Supply

Mining operations in Bosque County are supplied by Trinity Groundwater. Shortages are projected for Bosque County-Mining beginning in 2020 through 2070.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to meet water needs for Bosque County-Mining. Associated costs are included for each strategy. Conservation is recommended.

- a. Conservation
 - Cost Source: Volume II
 - Date to be Implemented: before 2030



- Annual Cost: not determined
- b. Leave Needs Unmet
- Cost Source: Cost of not meeting needs – see Appendix G
 - Date to be Implemented: before 2030

Table 5.2-9. Recommended Plan Costs by Decade for Bosque County – Mining

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	(806)	(905)	(726)	(706)	(667)	(655)
Conservation						
Supply From Plan Element (acft/yr)	59	104	132	131	128	127
Annual Cost (\$/yr)	ND	ND	ND	ND	ND	ND
<i>Projected Surplus/(Shortage) after Conservation (acft/yr)</i>	(747)	(801)	(594)	(575)	(539)	(528)
Purchase Supply from BRA						
Supply From Plan Element (acft/yr)	387	387	387	387	387	387
Annual Cost (\$/yr)	\$29,000	\$29,000	\$29,000	\$29,000	\$29,000	\$29,000
Unit Cost (\$/acft)	\$76	\$76	\$76	\$76	\$76	\$76
Leave Needs Unmet (acft/yr)	(360)	(414)	(207)	(188)	(152)	(141)

ND – Not determined. Costs to implement industrial conservation technologies will vary based on each location

5.2.12 Irrigation

Description of Supply

Bosque County Irrigation is supplied by Trinity Groundwater and run of the river water rights. Irrigation is projected to have shortages beginning in 2020.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to meet water needs for Bosque County-Irrigation. Associated costs are included for each strategy. Conservation is recommended.

- a. Conservation
- Cost Source: Volume II
 - Date to be Implemented: before 2030
 - Annual Cost: maximum of \$242,829; Unit Cost: \$970/acft
- b. Groundwater Development – Trinity Aquifer
- Cost Source: Volume II
 - Date to be Implemented: before 2030

- Project Cost: \$2,473,000
- Unit Cost: \$195

Table 5.2-10. Recommended Plan Costs by Decade for Bosque County – Irrigation

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	(1,366)	(1,366)	(1,366)	(1,366)	(1,366)	(1,366)
Conservation						
Supply From Plan Element (acft/yr)	107	179	250	250	250	250
Annual Cost (\$/yr)	\$104,000	\$174,000	\$243,000	\$243,000	\$243,000	\$243,000
<i>Projected Surplus/(Shortage) after Conservation (acft/yr)</i>	(1,259)	(1,187)	(1,116)	(1,116)	(1,116)	(1,116)
Groundwater Development – Trinity Aquifer						
Supply From Plan Element (acft/yr)	1,259	1,259	1,259	1,259	1,259	1,259
Annual Cost (\$/yr)	\$245,000	\$245,000	\$55,000	\$55,000	\$55,000	\$55,000
Unit Cost (\$/acft)	\$195	\$195	\$57	\$57	\$57	\$57

5.2.13 Livestock

Livestock demand is met by local water supply and is projected to meet needs through 2070. No changes in Bosque County Livestock water supply are recommended.

5.3 Brazos County Water Supply Plan

Table 5.3-1 lists each water user group in Brazos County and their corresponding surplus or shortage in years 2040 and 2070. A brief summary of the water user groups and the plan for the selected water user are presented in the following subsections.

Table 5.3-1. Brazos County Surplus/(Shortage)

Water User Group	Surplus/(Shortage)		Comment
	2040 (acft/yr)	2070 (acft/yr)	
City of Bryan	(4,578)	(19,650)	Projected shortage - see plan below.
City of College Station	(8,874)	(13,360)	Projected shortage - see plan below.
Texas A&M University	104	124	Projected shortage - see plan below.
Wellborn SUD	1,785	(434)	Projected shortage - see plan below.
Wickson Creek SUD	1,201	64	Projected surplus
County-Other	40	46	Projected surplus
Manufacturing	1,078	1,078	Projected surplus
Steam-Electric	20	20	Projected shortage in 2020 – see plan below.
Mining	207	826	Projected surplus
Irrigation	6,336	6,336	Projected surplus
Livestock	0	0	No projected surplus or shortage

5.3.1 City of Bryan

Description of Supply

The City of Bryan obtains its water supply from groundwater from the Carrizo-Wilcox and Sparta Aquifers. The city also provides water supply for Brazos County Manufacturing, Brazos County Steam-Electric, Wellborn SUD, and Wickson Creek SUD. Shortages are projected beginning in year 2030 for the City of Bryan.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to meet the projected water shortage for the City of Bryan. Associated costs are included for each strategy. Conservation is recommended to reduce usage to a goal of 140 gpcd.

- a. Conservation
 - Cost Source: Volume II
 - Date to be Implemented: by 2030

- Annual Cost: maximum of \$1,393,972 in 2070
 - Unit Cost: \$560/acft
- b. Wellfield Expansion in Brazos County – Carrizo-Wilcox Aquifer
- Cost Source: Volume II
 - Date to be Implemented: by 2030
 - Project Cost: \$34,718,000
 - Unit Cost: \$471/acft
- c. Bryan ASR – Carrizo-Wilcox Aquifer
- Cost Source: Volume II
 - Date to be Implemented: 2030
 - Project Cost: \$72,404,000
 - Unit Cost: \$445/acft
- d. Direct Non-Potable Reuse – Option 1
- Cost Source: Volume II
 - Date to be Implemented: 2030
 - Project Cost: \$11,092,000
 - Unit Cost: \$2,450/acft
- e. Alternative: Indirect Potable Reuse – Option 2
- Cost Source: Volume II
 - Date to be Implemented: 2030
 - Project Cost: \$41,105,000
 - Unit Cost: \$2,439/acft
- f. Alternative: Wellfield Expansion in Robertson County – Carrizo-Wilcox Aquifer
- Cost Source: Volume II
 - Date to be Implemented: by 2030
 - Project Cost: \$51,281,000
 - Unit Cost: \$523/acft



Table 5.3-2. Recommended Plan Costs by Decade for City of Bryan

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	215	(1,896)	(4,578)	(8,034)	(12,323)	(19,650)
Conservation						
Supply From Plan Element (acft/yr)	0	1,311	1,606	1,719	1,988	2,489
Annual Cost (\$/yr)	\$0	\$734,000	\$899,000	\$963,000	\$1,113,000	\$1,394,000
<i>Projected Surplus/(Shortage) after Conservation (acft/yr)</i>	215	(585)	(2,972)	(6,315)	(10,335)	(17,161)
Wellfield Expansion in Brazos County – Carrizo-Wilcox Aquifer						
Supply From Plan Element (acft/yr)	–	7,501	7,501	7,501	7,501	7,501
Annual Cost (\$/yr)	–	\$3,536,000	\$3,536,000	\$1,093,000	\$1,093,000	\$1,093,000
Unit Cost (\$/acft)	–	\$471	\$471	\$146	\$146	\$146
Bryan ASR – Carrizo-Wilcox Aquifer						
Supply From Plan Element (acft/yr)	–	6,000	6,000	6,000	8,500	10,500
Annual Cost (\$/yr)	–	\$6,515,000	\$6,515,000	\$1,421,000	\$1,421,000	\$1,421,000
Unit Cost (\$/acft)	–	\$445	\$445	\$97	\$97	\$97
Indirect Potable Reuse – Option 2						
Supply From Plan Element (acft/yr)	–	2,419	2,419	2,419	2,419	2,419
Annual Cost (\$/yr)	–	\$5,899,000	\$5,899,000	\$3,007,000	\$3,007,000	\$3,007,000
Unit Cost (\$/acft)	–	\$2,439	\$2,439	\$1,243	\$1,243	\$1,243
Alternative: Wellfield Expansion in Robertson County – Carrizo-Wilcox Aquifer						
Supply From Plan Element (acft/yr)	–	9,973	9,973	9,973	9,973	9,973
Annual Cost (\$/yr)	–	\$5,217,000	\$5,217,000	\$1,609,000	\$1,609,000	\$1,609,000
Unit Cost (\$/acft)	–	\$523	\$523	\$161	\$161	\$161

5.3.2 City of College Station

Description of Supply

The City of College Station obtains its water supply from groundwater from the Carrizo-Wilcox and Sparta Aquifers. The city provides water supply for Brazos County Manufacturing. Shortages are projected beginning in year 2030 for the City of College Station.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to meet the projected water shortage for the City of College Station. Associated costs are included for each strategy. Conservation is recommended to reduce usage to a goal of 140 gpcd. This goal is reached after 2030.

- a. Conservation
 - Cost Source: Volume II
 - Date to be Implemented: by 2030
 - Annual Cost: \$131,155
 - Unit Cost: \$560/acft
- b. College Station ASR
 - Cost Source: Volume II
 - Date to be Implemented: by 2030
 - Project Cost: \$86,514,000
 - Unit Cost: \$3,216/acft
- c. Groundwater Development – Carrizo-Wilcox Aquifer
 - Cost Source: Volume II
 - Date to be Implemented: by 2040
 - Project Cost: \$43,914,000
 - Unit Cost: \$513/acft
- d. Direct Potable Reuse
 - Cost Source: Volume II
 - Date to be Implemented: by 2030
 - Project Cost: \$84,177,000
 - Unit Cost: \$1,325

Table 5.3-3. Recommended Plan Costs by Decade for City of College Station

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	413	(3,492)	(8,874)	(13,436)	(13,379)	(13,360)
Conservation						
Supply From Plan Element (acft/yr)	–	234	–	–	–	–
Annual Cost (\$/yr)	–	\$131,000	–	–	–	–

Table 5.3-3. Recommended Plan Costs by Decade for City of College Station

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) after Conservation (acft/yr)</i>	413	(3,258)	(8,874)	(13,436)	(13,379)	(13,360)
College Station ASR						
Supply From Plan Element (acft/yr)	–	3,640	3,640	3,640	3,640	3,640
Annual Cost (\$/yr)	–	\$11,705,000	\$11,705,000	\$5,618,000	\$5,618,000	\$4,222,000
Unit Cost (\$/acft)	–	\$3,216	\$3,216	\$1,543	\$1,543	\$1,160
Groundwater Development: Carrizo-Wilcox						
Supply From Plan Element (acft/yr)	–	–	5,234	9,695	9,796	9,796
Annual Cost (\$/yr)	–	–	\$5,030,000	\$4,974,000	\$1,940,000	\$1,940,000
Unit Cost (\$/acft)	–	–	\$961	\$513	\$198	\$198
Direct Potable Reuse						
Supply From Plan Element (acft/yr)	–	8,232	8,232	8,232	8,232	8,232
Annual Cost (\$/yr)	–	\$10,909,000	\$10,909,000	\$4,986,000	\$4,986,000	\$4,986,000
Unit Cost (\$/acft)	–	\$1,325	\$1,325	\$606	\$606	\$606

5.3.3 Texas A&M University

Description of Supply

Texas A&M University obtains its water supply from groundwater from the Sparta and Carrizo-Wilcox Aquifers. A shortage is projected only for 2020. This need will remain unmet in the plan. Needs remain unmet in 2020. While not a strategy recommended by the Brazos G RWPG, the impacts of the unmet needs can be mitigated through demand management in the event of a supply shortage prior to the recommended water management strategies coming online.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended for Texas A&M University. Associated costs are included. Conservation is recommended to reduce usage to a goal of 140 gpcd.

a. Conservation

- Cost Source: Volume II
- Date to be Implemented: by 2030
- Annual Cost: maximum of \$1,352,435 in 2070
- Unit Cost: \$560/acft

b. Groundwater Development - Sparta Aquifer

- Cost Source: Volume II
- Date to be Implemented: by 2040
- Project Cost: \$4,931,000
- Unit Cost: \$768/acft

Table 5.3-4. Recommended Plan Costs by Decade for Texas A&M University

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	(99)	43	104	120	124	124
Conservation						
Supply From Plan Element (acft/yr)	0	560	1,072	1,557	2,006	2,415
Annual Cost (\$/yr)	\$0	\$314,000	\$600,000	\$872,000	\$1,123,000	\$1,352,000
<i>Projected Surplus/(Shortage) after Conservation (acft/yr)</i>	(99)	603	1,176	1,677	2,130	2,539
Groundwater Development – Sparta Aquifer						
Supply From Plan Element (acft/yr)	–	–	638	638	638	638
Annual Cost (\$/yr)	–	–	\$490,000	\$490,000	\$143,000	\$143,000
Unit Cost (\$/acft)	–	–	\$768	\$768	\$224	\$224

5.3.4 Wellborn SUD

Description of Supply

Wellborn SUD is located in Brazos and Robertson counties and currently obtains water from the Carrizo-Wilcox Aquifer and through contracts with BRA and the City of Bryan. Wellborn SUD has sufficient supplies but is constrained by its treatment plant capacity resulting in a shortage beginning in 2070. With advanced conservation, however, the projected shortage can be met.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended to meet the projected water shortage for Wellborn SUD. Associated costs are included. Conservation is recommended to reduce usage to a goal of 140 gpcd.

a. Conservation

- Cost Source: Volume II
- Date to be Implemented: by 2030
- Annual Cost: \$420,440 in 2070
- Unit Cost: \$560/acft

Table 5.3-5. Recommended Plan Costs by Decade for Wellborn SUD

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	3,883	2,351	1,785	1,121	358	(434)
Conservation						
Supply From Plan Element (acft/yr)	0	424	591	622	683	751
Annual Cost (\$/yr)	—	\$237,000	\$331,000	\$348,000	\$382,000	\$421,000
<i>Projected Surplus/ (Shortage) after Conservation (acft/yr)</i>	3,883	2,351	1,785	1,121	358	317

5.3.5 Wickson Creek SUD

Wickson Creek SUD is located in multiple counties (Grimes, Robertson, and Brazos). The balances shown in Table 5.3-1 represent the cumulative totals for Wickson Creek SUD. Supplies are obtained from the Sparta, Carrizo, and Yegua-Jackson Aquifers and is purchased from the City of Bryan. The entity also provides supply to Brazos and Grimes County Manufacturing. No shortages are projected for Wickson Creek SUD and no change in water supply is recommended. Conservation was considered; however, the entity’s usage is below the selected goal of 140 gpcd.

5.3.6 County-Other

Brazos County-Other entities obtain water supply from groundwater from the Carrizo and Queen City Aquifers. This supply is projected to be sufficient through the planning period and no change in water supply is recommended. Conservation was considered; however, the entity’s usage is below the selected goal of 140 gpcd.

5.3.7 Manufacturing

Water supply for manufacturing in Brazos County is obtained from nearby WUGs and wells within the Carrizo and Sparta Aquifers. Manufacturing is projected to have a surplus in water supply through the planning period.

5.3.8 Steam-Electric

Description of Supply

Supplies for Steam-Electric demand in Brazos County are obtained through groundwater from the Sparta and the Carrizo Aquifers and from Bryan Utilities Lake. Brazos County Steam-Electric is projected to have a shortage in year 2020.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to meet water needs for Brazos County Steam-Electric.

Leave Needs Unmet:

- Cost Source: Cost of not meeting needs – see Appendix G
- Date to be Implemented: 2020

Table 5.3-6. Recommended Plan Costs by Decade for Brazos County – Steam-Electric

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	(1)	18	20	20	20	20
Conservation						
Supply From Plan Element (acft/yr)	—	—	—	—	—	—
Annual Cost (\$/yr)	—	—	—	—	—	—
<i>Projected Surplus/(Shortage) after Conservation (acft/yr)</i>	(1)	18	20	20	20	20
Leave Needs Unmet (acft/yr)	(1)	—	—	—	—	—

5.3.9 Mining

Description of Supply

Brazos County Mining operations obtain supply from the Yergua-Jackson Aquifer and are projected to have a surplus throughout the planning period.

5.3.10 Irrigation

Description of Supply

Brazos County Irrigation is supplied by Sparta, Carrizo, Yegua-Jackson, and Brazos River Alluvium groundwater and from run-of-river diversion rights from the Brazos River and contracts with BRA. Surpluses of over 6,000 acft/yr are projected for irrigation beginning in year 2020.

Table 5.3-7. Recommended Plan Costs by Decade for Irrigation

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	6,258	6,328	6,336	6,336	6,336	6,336
BRA System Operation Surplus						
Supply From Plan Element (acft/yr)	348	348	348	348	348	348
Annual Cost (\$/yr)	\$26,448	\$26,448	\$26,448	\$26,448	\$26,448	\$26,448
Unit Cost (\$/acft)	\$76	\$76	\$76	\$76	\$76	\$76



5.3.11 Livestock

Livestock water supply is projected to meet demands through 2070 and no changes in water supply are recommended.

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5.4 Burleson County Water Supply Plan

Table 5.4-1 lists each water user group in Burleson County and their corresponding surplus or shortage in years 2040 and 2070. A brief summary of the water user groups and the plan for the water users are presented in the following subsections.

Table 5.4-1. Burleson County Surplus/(Shortage)

Water User Group	Surplus/(Shortage)		Comment
	2040 (acft/yr)	2070 (acft/yr)	
City of Caldwell	1,204	1,168	Projected surplus
Deanville WSC	226	218	Projected surplus
Milano WSC			See Milam County
City of Snook	180	149	Projected surplus
City of Somerville	576	479	Projected surplus
Southwest Milam WSC			See Milam County
County-Other	95	2	Projected surplus
Manufacturing	(6)	(6)	Projected shortage - see plan below.
Steam-Electric	0	0	No projected demand
Mining	506	1,590	Projected surplus
Irrigation	(347)	(347)	Projected shortage - see plan below.
Livestock	0	0	No projected surplus or shortage

5.4.1 City of Caldwell

Description of Supply

The City of Caldwell obtains its water supply from groundwater from the Carrizo-Wilcox Aquifer. The supply is projected to be sufficient through the planning period.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management plan is recommended for the City of Caldwell. Associated costs are included. Conservation is recommended to reduce usage to a goal of 140 gpcc.

a. Conservation

- Cost Source: Volume II
- Date to be Implemented: by 2030
- Annual Cost: maximum of \$137,650 in 2070
- Unit Cost: \$560/acft

Table 5.4-2. Recommended Plan Costs by Decade for City of Caldwell

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	1,249	1,233	1,204	1,204	1,185	1,168
Conservation						
Supply From Plan Element (acft/yr)	0	83	167	239	242	246
Annual Cost (\$/yr)	\$0	\$46,000	\$94,000	\$134,000	\$136,000	\$138,000
<i>Projected Surplus/(Shortage) after Conservation (acft/yr)</i>	1,249	1,233	1,204	1,204	1,185	1,168

5.4.2 Deanville WSC

The Deanville WSC obtains its water supply from groundwater from the Carrizo-Wilcox Aquifer. Water supply is projected to be sufficient through the planning period and no changes in water supply are recommended. Conservation was considered; however, the entity’s usage is below the selected goal of 140 gpcd.

5.4.3 City of Snook

Description of Supply

The City of Snook obtains its water supply from groundwater from the Sparta Aquifer. No shortages are projected through the planning period.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management plan is recommended for the City of Snook. Associated costs are included. Conservation is recommended to reduce usage to a goal of 140 gpcd.

a. Conservation

- Cost Source: Volume II
- Date to be Implemented: by 2030
- Annual Cost: maximum of \$72,274 in 2070
- Unit Cost: \$560/acft



Table 5.4-3. Recommended Plan Costs by Decade for City of Snook

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	206	189	180	167	157	149
Conservation						
Supply From Plan Element (acft/yr)	0	25	50	78	104	129
Annual Cost (\$/yr)	\$0	\$14,000	\$28,000	\$44,000	\$58,000	\$72,000
<i>Projected Surplus/(Shortage) after Conservation (acft/yr)</i>	206	189	180	167	157	149

5.4.4 City of Somerville

Description of Supply

The City of Somerville obtains its water supply from groundwater from the Sparta Aquifer. Water supply is projected to be sufficient through the planning period.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management plan is recommended for the City of Somerville. Associated costs are included. Conservation is recommended to reduce usage to a goal of 140 gpcd.

a. Conservation

- Cost Source: Volume II
- Date to be Implemented: by 2030
- Annual Cost: \$17,144 in 2070
- Unit Cost: \$560/acft

Table 5.4-4. Recommended Plan Costs by Decade for City of Somerville

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	618	599	576	545	513	479
Conservation						
Supply From Plan Element (acft/yr)	0	20	25	27	29	31
Annual Cost (\$/yr)	\$0	\$11,000	\$14,000	\$15,000	\$16,000	\$17,000
<i>Projected Surplus/(Shortage) after Conservation (acft/yr)</i>	618	599	576	545	513	479

5.4.5 County-Other

Burleson County-Other entities obtain water supply from groundwater from the Queen City and Carrizo-Wilcox Aquifers. The supply is projected to be sufficient through the planning period and no change in water supply is recommended. Conservation was considered; however, the entity’s usage is below the selected goal of 140 gpcd.

5.4.6 Manufacturing

Description of Supply

Water supply for manufacturing in Burleson County is obtained from Sparta wells operated by the various manufacturing entities. Manufacturing is projected to have a shortage of water beginning in the year 2020 and continuing through 2070.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management plan is recommended to meet the entity’s water needs. Associated costs are included. Conservation is recommended.

- a. Conservation
 - Cost Source: Volume II
 - Date to be Implemented: before 2030
 - Annual Cost: not determined
- b. Groundwater Development – Sparta Aquifer
 - Cost Source: Volume II
 - Date to be Implemented: before 2030
 - Project Cost: \$233,000
 - Unit Cost: \$760/acft
- c. Alternative: Leave Needs Unmet in 2020
 - Cost Source: Cost of not meeting needs – see Appendix G
 - Date to be Implemented: 2020

Table 5.4-5. Recommended Plan Costs by Decade for Burleson County – Manufacturing

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	(6)	(6)	(6)	(6)	(6)	(6)
Conservation						
Supply From Plan Element (acft/yr)	4	6	8	8	8	8
Annual Cost (\$/yr)	ND	ND	ND	ND	ND	ND

Table 5.4-5. Recommended Plan Costs by Decade for Burleson County – Manufacturing

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) after Conservation (acft/yr)</i>	(2)	—	2	2	2	2
Groundwater Development – Sparta Aquifer						
Supply From Plan Element (acft/yr)	25	25	25	25	25	25
Annual Cost (\$/yr)	\$18,000	\$18,000	\$2,000	\$5,000	\$5,000	\$5,000
Unit Cost (\$/acft)	\$760	\$760	\$120	\$120	\$120	\$120
Alternative: Leave Needs Unmet (acft/yr)	(2)					

ND – Not determined. Costs to implement industrial conservation technologies will vary based on each location

5.4.7 Steam-Electric

No Steam-Electric demand exists or is projected for the county.

5.4.8 Mining

Burleson County Mining is supplied by Yegua-Jackson groundwater. No shortages are projected for Mining and no changes in water supply are recommended.

5.4.9 Irrigation

Description of Supply

Water supply for irrigation in Burleson County is obtained from the Carrizo-Wilcox, Yegua-Jackson, and Brazos River Alluvium Aquifers. Irrigation is projected to have a shortage of water beginning in the year 2020 and continuing through 2070.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended to meet water needs for Irrigation. Associated costs are included. Conservation is recommended.

a. Conservation

- Cost Source: Volume II
- Date to be Implemented: before 2030
- Annual Cost: maximum of \$2,957,804
- Unit Cost: \$1,576

Table 5.4-6. Recommended Plan Costs by Decade for Burleson County – Irrigation

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	(347)	(347)	(347)	(347)	(347)	(347)
Conservation						
Supply From Plan Element (acft/yr)	804	1,340	1,876	1,876	1,876	1,876
Annual Cost (\$/yr)	\$1,267,000	\$2,112,000	\$2,957,000	\$2,957,000	\$2,957,000	\$2,957,000
<i>Projected Surplus/(Shortage) after Conservation (acft/yr)</i>	457	993	1,529	1,529	1,529	1,529

5.4.10 Livestock

Livestock water supply is projected to meet demands through 2070 and no changes in water supply are recommended.

5.5 Callahan County Water Supply Plan

Table 5.5-1 lists each water user group in Callahan County and their corresponding surplus or shortage in years 2040 and 2070. For each water user group with a projected shortage, a water supply plan has been developed and is presented in the following subsections.

Table 5.5-1. Callahan County Surplus/(Shortage)

Water User Group	Surplus/(Shortage)		Comment
	2040 (acft/yr)	2070 (acft/yr)	
City of Baird	(150)	(164)	Projected shortage - see plan below.
Callahan County WSC	0	0	No projected surplus or shortage
City of Clyde	91	85	Projected surplus - see plan below.
Coleman County SUD	(15)	(15)	Projected shortage - see plan below.
City of Cross Plains	107	101	Projected surplus - see plan below.
Eula WSC	96	88	Projected surplus - see plan below.
Hamby WSC			See Jones County
Potosi WSC			See Taylor County
County-Other	24	17	Projected surplus
Steam-Electric	-	-	No demand projected
Manufacturing	-	-	No demand projected
Mining	(134)	(100)	Projected shortage - see plan below.
Irrigation	291	287	Projected surplus
Livestock	0	0	No projected surplus or shortage

5.5.1 City of Baird

Description of Supply

The City of Baird obtains its water supply from surface water supplied from Lake Baird and from the City of Abilene. From 2020 through 2070, the City's contractual purchase from the City of Abilene is 77 acft/yr and the total amount of surface water availability from Lake Baird ranges from 25 to 0 in 2020 to 2070, respectively. Supplies are not sufficient to meet demands through 2070.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water supply plan is recommended for the City of Baird. Associated costs are included for each strategy. Conservation was also considered; however, the entity's usage is below the selected goal of 140 gpcd.

- a. Purchase Additional Supplies from City of Abilene
 - Cost Source: Abilene Water Rates 2019

- Date to be Implemented: 2020
- Project Cost: none
- Unit Cost: \$1,694/acft (\$5.20/1,000 gal)

Table 5.5-2. Recommended Plan Costs by Decade for the City of Baird

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	(155)	(152)	(150)	(154)	(159)	(164)
Conservation						
Supply from Plan Element (acft/yr)	–	–	–	–	–	–
Annual Cost (\$/yr)	–	–	–	–	–	–
<i>Projected Surplus/(Shortage) after Conservation (acft/yr)</i>	(155)	(152)	(150)	(154)	(159)	(164)
Purchase Additional Supplies from City of Abilene						
Supply from Plan Element (acft/yr)	155	152	150	154	159	164
Annual Cost (\$/yr)	\$262,570	\$257,488	\$254,100	\$260,876	\$269,346	\$277,816
Unit Cost (\$/acft)	\$1,694	\$1,694	\$1,694	\$1,694	\$1,694	\$1,694

5.5.2 Callahan County WSC

Callahan County WSC obtains its water supply from a contract with Clyde. Supplies are sufficient to meet demands through 2070. Conservation was also considered; however, the entity’s current per capita use rate is below the selected target rate of 140 gpcd.

5.5.3 City of Clyde

The City of Clyde uses surface water from Clyde Lake which is projected to supply 500 acft/yr from 2020 through 2070. Clyde also has a contractual purchase plan of 307 acft/yr from the City of Abilene that can cover the city’s projected demands. No current or future shortages are projected. Clyde also has contractual sales to Eula WSC of 221 acft/yr through 2070 and Callahan County WSC from 184 to 188 acft/yr from 2020 to 2070, respectively. Clyde has recently acquired a 2,500 acft/yr water right for supplies from Fort Phantom Hill Reservoir; however, the full amount of the water right is not firm and supply will be less than 2,500 acft/yr. In addition, this supply cannot be applied until infrastructure is in place to deliver and treat the water.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water supply plan is recommended for the City of Clyde. Associated costs are included for each strategy. Conservation was also considered; however, the entity’s usage is below the selected goal of 140 gpcd.

- a. Purchase Additional Supply from Abilene
- Cost Source: Abilene Water Rates 2019
 - Date to be Implemented: 2020
 - Project Cost: none
 - Unit Cost: \$1,694/acft (\$5.20/1,000 gal)

Table 5.5-3. Recommended Plan Costs by Decade for the City of Clyde

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	(214)	(220)	91	93	88	85
Conservation						
Supply from Plan Element (acft/yr)	–	–	–	–	–	–
Annual Cost (\$/yr)	–	–	–	–	–	–
<i>Projected Surplus/(Shortage) after Conservation (acft/yr)</i>	(214)	(220)	91	93	88	85
BRA System Operations						
Supply from Plan Element (acft/yr)	214	220	–	–	–	–
Annual Cost (\$/yr)	\$363,000	\$373,000	–	–	–	–
Unit Cost (\$/acft)	\$1,694	\$1,694	–	–	–	–

5.5.4 Coleman County SUD

Description of Supply

Coleman County SUD obtains its water supply from the Lake Brownwood (sales from Brookesmith SUD from BCWID #1) and Lake Coleman and Hords Creek Lake (which have no supply under WAM Run 3) in Region F. These supplies become available under the subordination WMS for each lake and Coleman County SUD has no remaining needs. These supplies and WMS volumes are also in the database. Shortages are projected beginning in 2020. This WUG is located in multiple counties (Callahan and Taylor and others outside of Region G (Brown, Coleman, and Runnels)). The values shown in the table below represent the cumulative totals for Coleman County WSC in these two counties.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, and in coordination with Region F, the following water supply plan is recommended for Coleman County SUD. Conservation was considered; however, the entity’s current per capita use rate is below the selected target rate of 140 gpcd.

- a. Subordination Lake Coleman (Region F):
- Cost Source: 2020 Region F Water Plan
 - Date to be Implemented: 2030
 - Total Project Cost: no cost
 - Unit Cost: none

Table 5.5-4. Recommended Plan Costs by Decade for the Coleman County SUD

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	(15)	(15)	(15)	(15)	(15)	(15)
Conservation						
Supply from Plan Element (acft/yr)	–	–	–	–	–	–
Annual Cost (\$/yr)	–	–	–	–	–	–
<i>Projected Surplus/(Shortage) after Conservation (acft/yr)</i>	(15)	(15)	(15)	(15)	(15)	(15)
Subordination Lake Coleman (Region F)						
Supply from Plan Element (acft/yr)	15	15	15	15	15	15
Annual Cost (\$/yr)	–	–	–	–	–	–
Unit Cost (\$/acft)	–	–	–	–	–	–
Subordination Hords Creek Lake (Region F)						
Supply from Plan Element (acft/yr)	3	3	3	3	3	3
Annual Cost (\$/yr)	–	–	–	–	–	–
Unit Cost (\$/acft)	–	–	–	–	–	–

5.5.5 City of Cross Plains

Description of Supply

The City of Cross Plains uses locally available groundwater from the Trinity Aquifer at 310 acft/yr. The city is projected to have sufficient supplies through the planning period.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water supply plan is recommended for the City of Cross Plains. Associated costs are included for each strategy. Conservation is recommended to reduce usage to a goal of 140 gpcd.



- a. Conservation:
- Cost Source: Volume II
 - Date to be Implemented: before 2030
 - Annual Cost: maximum of \$5,387 in 2020
 - Unit Cost: \$560/acft

Table 5.5-5. Recommended Plan Costs by Decade for the City of Cross Plains

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	117	110	107	105	102	101
Conservation						
Supply from Plan Element (acft/yr)	0	10	6	4	5	4
Annual Cost (\$/yr)	\$0	\$6,000	\$3,000	\$2,000	\$3,000	\$2,000
<i>Projected Surplus/(Shortage) after Conservation (acft/yr)</i>	117	120	113	109	107	105
Additional Demands from Recommended Strategies from Others						
Increase Contract Amount to Mining-Callahan (acft/yr)	27	34	23	15	7	0
<i>Total Needs Including Recommended Strategies</i>	90	86	90	94	100	105

5.5.6 EULA WSC

Description of Supply

The City of Cross Plains has a contract with Abilene for 61 acft/yr and Clyde for 221 acft/yr and a surplus is projected.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water supply plan is recommended for EULA WSC. Associated costs are included for each strategy. Conservation was considered; however, the entity’s current per capita use rate is below the selected target rate of 140 gpcd.

Table 5.5-6. Recommended Plan Costs by Decade for EULA WSC

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	114	102	96	92	90	88
Conservation						
Supply from Plan Element (acft/yr)	–	–	–	–	–	–
Annual Cost (\$/yr)	–	–	–	–	–	–
<i>Projected Surplus/(Shortage) after Conservation (acft/yr)</i>	114	102	96	92	90	88
Additional Demands from Recommended Strategies from Others						
Increase Contract Amount to Mining-Callahan (acft/yr)	114	102	96	92	90	87
<i>Total Needs Including Recommended Strategies</i>	0	0	0	0	0	1

5.5.7 County-Other

The water supply entities comprising County-Other mostly rely on groundwater systems in the Trinity Aquifer show a projected surplus through the planning period. No changes in water supply are recommended for Callahan County-Other. Conservation was considered; however, the entity’s current per capita use rate is below the selected target rate of 140 gpcd.

5.5.8 Manufacturing

No Manufacturing demand exists or is projected for the county.

5.5.9 Steam-Electric

No Steam-Electric demand exists or is projected for the county.

5.5.10 Mining

Description of Supply

Mining activities are projected to increase in Callahan County requiring local water management strategies to meet the projected water demand and shortages. Available Trinity Aquifer supplies at 80 acft/yr in Callahan County will also be used to meet the projected demands.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water supply plan is recommended for Mining in Callahan County. Associated costs are included for each strategy. Conservation is recommended.



- a. Conservation:
 - Cost Source: Volume II
 - Date to be Implemented: before 2030
 - Annual Cost: not determined
- b. Purchase Water from EULA WSC:
 - Cost Source: Volume II
 - Date to be Implemented: before 2020
 - Project Cost: \$11,058,000
 - Unit Cost: \$6,617 acft/yr (with debit service)
- c. Purchase Water from City of Cross Plains:
 - Cost Source: Volume II
 - Date to be Implemented: before 2020
 - Project Cost: \$11,058,000
 - Unit Cost: \$6,617 acft/yr (with debit service)

Table 5.5-7. Recommended Plan Costs by Decade for the Callahan County – Mining

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	(148)	(147)	(134)	(121)	(110)	(100)
Conservation						
Supply from Plan Element (acft/yr)	7	11	15	14	13	13
Annual Cost (\$/yr)	ND	ND	ND	ND	ND	ND
<i>Projected Surplus/(Shortage) after Conservation (acft/yr)</i>	(141)	(136)	(119)	(107)	(97)	(87)
Purchase Water from EULA WSC						
Supply from Plan Element (acft/yr)	114	102	96	92	90	87
Annual Cost (\$/yr)	\$754,338	\$674,934	\$105,504	\$101,108	\$98,910	\$95,613
Unit Cost (\$/acft)	\$6,617	\$6,617	\$1,099	\$1,099	\$1,099	\$1,099
Purchase Water from City of Cross Plains						
Supply from Plan Element (acft/yr)	27	34	23	15	7	0
Annual Cost (\$/yr)	\$178,659	\$224,978	\$25,277	\$16,485	\$7,693	\$0
Unit Cost (\$/acft)	\$6,617	\$6,617	\$1,099	\$1,099	\$1,099	\$1,099

ND – Not determined. Costs to implement industrial conservation technologies will vary based on each location

5.5.11 Irrigation

Description of Supply

Irrigation activities are supplied from the local Trinity Aquifer. Conservation is not needed as there are projected surplus supplies to meet the demands.

5.5.12 Livestock

No Livestock shortage exists or is projected for the county.

5.6 Comanche County Water Supply Plan

Table 5.6-1 lists each water user group in Comanche County and their corresponding surplus or shortage in years 2040 and 2070. A brief summary of the water user groups and the plan for the selected water user are presented in the following subsections.

Table 5.6-1. Comanche County Surplus/(Shortage)

Water User Group	Surplus/(Shortage)		Comment
	2040 (acft/yr)	2070 (acft/yr)	
City of Comanche	173	140	Projected surplus
City of De Leon	94	81	Projected surplus
County-Other	(440)	(488)	Projected shortage - see plan below.
Manufacturing	4	4	Projected surplus
Steam-Electric	0	0	No demand projected
Mining	(151)	83	Projected shortage - see plan below.
Irrigation	(15,151)	(15,292)	Projected shortage - see plan below.
Livestock	0	0	No projected surplus or shortage

5.6.1 City of Comanche

The City of Comanche obtains its water supply through purchases of treated surface water under contract from the Upper Leon River Municipal Water District. The water supplied by the Upper Leon River Municipal Water District is diverted from Lake Proctor under contracts with the Brazos River Authority. The City of Comanche is projected to obtain up to 706 acft/yr of treated surface water supply from the Upper Leon River Municipal Water District through the planning period. The City of Comanche is also contracted to sell 20 acft/yr of treated surface water to Manufacturing entities in Comanche County. No shortage is projected for the City of Comanche and no changes in water supply are recommended. Conservation was also considered; however, the entity's usage is below the selected goal of 140 gpcd.

5.6.2 City of De Leon

The City of De Leon obtains its water supply through purchases of treated surface water under contract from the Upper Leon River Municipal Water District. The water supplied by the Upper Leon River Municipal Water District is diverted from Lake Proctor under contracts with the Brazos River Authority. The City of De Leon is projected to obtain up to 307 acft/yr of treated surface water supply from the Upper Leon River Municipal Water District through the planning period. No supply shortage is projected for the City of De Leon and no change in water supply is recommended. Conservation was also considered; however, the entity's usage is below the selected goal of 140 gpcd.

5.6.3 County-Other

Description of Supply

Entities comprising the Comanche County-Other WUG obtain their water supply primarily through groundwater production from the Trinity Aquifer. Additionally, Comanche County WSC purchases treated surface water under contract from the Upper Leon Municipal Water District. Shortages are projected for each decade within the planning period.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended for County-Other. Conservation was also considered; however, the entity's usage is below the selected goal of 140 gpcd. Associated costs are included for each strategy.

- a. Trinity Aquifer Development, Erath County
 - Cost Source: Volume II
 - Date to be Implemented: before 2030
 - Project Cost: \$5,359,000
 - Unit Cost: maximum of \$1,008/acft

Table 5.6-2. Recommended Plan Costs by Decade for Comanche County-Other

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	(454)	(449)	(440)	(449)	(468)	(488)
Conservation						
Supply From Plan Element (acft/yr)	—	—	—	—	—	—
Annual Cost (\$/yr)	—	—	—	—	—	—
<i>Projected Surplus/(Shortage) after Conservation</i>	(454)	(449)	(440)	(449)	(468)	(488)
Groundwater Development – Trinity Aquifer (Erath County)						
Supply From Plan Element (acft/yr)	488	488	488	488	488	488
Annual Cost (\$/yr)	\$492,000	\$492,000	\$115,000	\$115,000	\$115,000	\$115,000
Unit Cost (\$/acft)	\$1,008	\$1,008	\$236	\$236	\$236	\$236

5.6.4 Manufacturing

Comanche County Manufacturing entities obtain water supply through purchases of treated surface water from the City of Comanche, which is projected to provide up to 20 acft/yr of supply during the planning period. Additionally, local groundwater production from the Trinity Aquifer is also used by Manufacturing entities in the county. No shortages are projected and no change in water supply is recommended.

5.6.5 Steam-Electric

There is no projected demand for Comanche County Steam-Electric.

5.6.6 Mining

Description of Supply

Mining operations in Comanche County are supplied through groundwater production from the Trinity Aquifer. Supply projections show water shortages occurring until 2060.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to meet water needs for Comanche County-Mining. Conservation is recommended. Associated costs are included for each strategy.

- a. Conservation
 - Cost Source: Volume II
 - Date to be Implemented: before 2030
 - Annual Cost: not determined
- b. Trinity Aquifer Development, Erath County
 - Cost Source: Volume II
 - Date to be Implemented: before 2030
 - Project Cost: \$2,223,000
 - Unit Cost: maximum of \$639/acft

Table 5.6-3. Recommended Plan Costs by Decade for Comanche County – Mining

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	(232)	(314)	(151)	(65)	24	83
Conservation						
Supply From Plan Element (acft/yr)	13	26	26	19	13	9
Annual Cost (\$/yr)	ND	ND	ND	ND	ND	ND
<i>Projected Surplus/(Shortage) after Conservation (acft/yr)</i>	(219)	(288)	(125)	(46)	37	92
Groundwater Development – Trinity Aquifer						
Supply From Plan Element (acft/yr)	288	288	288	288	288	288
Annual Cost (\$/yr)	\$184,000	\$184,000	\$28,000	\$28,000	\$28,000	\$28,000
Unit Cost (\$/acft)	\$639	\$639	\$97	\$97	\$97	\$97

ND – Not determined. Costs to implement industrial conservation technologies will vary based on each location

5.6.7 Irrigation

Description of Supply

Comanche County Irrigation is supplied through groundwater production from the Trinity Aquifer and through purchases of raw surface water from the Brazos River Authority. Irrigation is projected to have shortages throughout the planning period. Comanche Irrigation has contracted for 6,652 acft/yr of surface water supplies from the Brazos River Authority, which can supply 5,529 acft/yr in 2020 and 5,347 acft/yr in 2070, based on water availability analyses prescribed under water planning guidelines.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to meet water needs for Comanche County-Irrigation. Conservation is recommended. Associated costs are included for each strategy.

- a. Conservation
 - Cost Source: Volume II
 - Date to be Implemented: before 2030
 - Annual Cost: maximum of \$3,106,912
 - Unit Cost: \$1,382/acft
- b. Firm Up BRA Little River Supplies
 - Cost Source: Volume II
 - Date to be Implemented: before 2030
 - Annual Cost: Costs borne by BRA
 - Unit Cost: Costs borne by BRA
- c. Leave Needs Unmet:
 - Cost Source: Cost of not meeting needs – see Appendix G
 - Date to be Implemented: before 2030

Table 5.6-4. Recommended Plan Costs by Decade for Comanche County – Irrigation

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	(15,078)	(15,147)	(15,151)	(15,220)	(15,224)	(15,292)
Conservation						
Supply From Plan Element (acft/yr)	964	1,606	2,248	2,248	2,248	2,248
Annual Cost (\$/yr)	\$1,332,000	\$2,219,000	\$3,107,000	\$3,107,000	\$3,107,000	\$3,107,000
<i>Projected Surplus/(Shortage) after Conservation (acft/yr)</i>	(14,114)	(13,541)	(12,903)	(12,972)	(12,976)	(13,044)
Firm Up BRA Little River Supplies						
Supply From Plan Element (acft/yr)	—	1,159	1,196	1,233	1,269	1,306
Annual Cost (\$/yr)	—	—	—	—	—	—
Unit Cost (\$/acft)	—	—	—	—	—	—
Leave Needs Unmet (acft/yr)	(12,991)	(12,382)	(11,707)	(11,739)	(11,707)	(11,738)

5.6.8 Livestock

No shortages are projected for Comanche County Livestock and no changes in water supply are recommended.

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5.7 Coryell County Water Supply Plan

Table 5.7-1 lists each water user group in Coryell County and their corresponding surplus or shortage in years 2040 and 2070. A brief summary of the water user groups and the plan for the selected water user are presented in the following subsections.

Table 5.7-1. Coryell County Surplus/(Shortage)

Water User Group	Surplus/(Shortage)		Comment
	2040 (acft/yr)	2070 (acft/yr)	
Central Texas College District	0	0	Projected surplus
City of Copperas Cove	3,473	(1,802)	Projected shortage - see plan below.
Coryell City Water Supply District	329	324	Projected surplus
Elm Creek WSC			See Bell County
Flat WSC	(23)	(62)	Projected shortage - see plan below.
Fort Gates WSC	(353)	(500)	Projected shortage - see plan below.
Fort Hood			See Bell County
City of Gatesville	(2,455)	(4,688)	Projected shortage - see plan below.
Kempner WSC			See Lampasas County
Mountain WSC	110	13	Projected surplus
Multi-County WSC	(91)	(174)	Projected shortage - see plan below.
Mustang Valley WSC			See Bosque County
City of Oglesby	148	129	Projected surplus
The Grove WSC			See Bell County
County-Other	(259)	(1,107)	Projected shortage - see plan below.
Manufacturing	0	0	No projected surplus or shortage
Steam-Electric	—	—	No projected demand
Mining	(296)	(242)	Projected shortage - see plan below.
Irrigation	736	736	Projected surplus
Livestock	0	0	No projected surplus or shortage

5.7.1 Central Texas College District

Description of Supply

The service area for the Central Texas College District is within both Coryell and Bell Counties. The quantities shown in Table 5.7-1 represent the cumulative totals for the Central Texas College District as a whole. Surpluses are projected from 2030 to 2070.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended for the Central Texas College District. Conservation is recommended to reduce usage to a goal of 140 gpcd.

Table 5.7-2. Recommended Plan Costs by Decade for the Central Texas College District

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	0	0	0	0	0	0
Conservation						
Supply From Plan Element (acft/yr)	—	7	4	3	3	3
Annual Cost (\$/yr)	—	\$4,000	\$2,000	\$2,000	\$2,000	\$2,000
<i>Projected Surplus/(Shortage) after Conservation</i>	—	7	4	3	3	3

5.7.2 City of Copperas Cove

Description of Supply

The service area for the City of Copperas Cove is within both Coryell and Lampasas Counties. The quantity shown in Table 5.7-1 represents the cumulative totals for the City of Copperas Cove as a whole. The City obtains its water supply solely through purchases of treated surface water under contract from Bell County WCID No.1. Bell County WCID No. 1 is projected to provide up to the contracted 8,824 acft/yr of treated surface water sourced from Lake Belton to the City of Copperas Cove at the beginning of the planning period; however, this contracted supply is prorated in later years and will only provide 5,304 acft/yr of supply by 2070, based on water availability analyses prescribed under water planning guidelines. Shortages are projected to begin by 2060. Conservation was considered; however, the entity’s usage is below the selected goal of 140 gpcd.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended for the City of Copperas Cove.

- a. Purchase Raw Water Supply from Fort Hood.
 - Cost Source: Volume II
 - Date to be Implemented: before 2060
 - Annual Cost: \$1,255,445
 - Unit Cost: \$100/acft
- b. Firm Up BRA Supplies.
 - Cost Source: Volume II



- Date to be Implemented: before 2070
- Annual Cost: Costs borne by BRA
- Unit Cost: Costs borne by BRA

Table 5.7-3. Recommended Plan Costs by Decade for the City of Copperas Cove

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	4,388	3,973	3,473	2,992	(125)	(1,802)
Conservation						
Supply From Plan Element (acft/yr)	—	—	—	—	—	—
Annual Cost (\$/yr)	—	—	—	—	—	—
<i>Projected Surplus/(Shortage) after Conservation</i>	4,388	3,973	3,473	2,992	(125)	(1,802)
Purchase Raw Water Supply from Fort Hood						
Supply From Plan Element (acft/yr)	—	—	—	—	125	1,285
Annual Cost (\$/yr)	—	—	—	—	\$12,500	\$128,500
Unit Cost (\$/acft)	—	—	—	—	\$100	\$100
Firm Up BRA Supplies						
Supply From Plan Element (acft/yr)	—	—	—	—	—	517
Annual Cost (\$/yr)	—	—	—	—	—	—
Unit Cost (\$/acft)	—	—	—	—	—	—

5.7.3 Coryell City Water Supply District

Description of Supply

Coryell City Water Supply District obtains its water supply primarily through purchases of treated surface water under contract from the City of Gatesville; the supply available to the District under this contract is projected to range from 933 acft/yr to 1,542 acft/yr. The District also purchases raw surface water under contract from the Brazos River Authority in the amount of 300 acft/yr which is treated by the City of Gatesville. Coryell City Water Supply District has contracted for 300 acft/yr of surface water supplies from the Brazos River Authority, which can supply 249 acft/yr in 2020 and 241 acft/yr in 2070, based on water availability analyses prescribed under water planning guidelines. The remainder of the District’s water supply is obtained through groundwater production from the Trinity Aquifer which is projected to provide 83 acft/yr of supply through the planning period. No shortages are projected for Coryell City Water Supply District and no changes in water supply are recommended. This WUG is located in Coryell and McLennan Counties. The quantity shown in Table 5.7-1 represents the cumulative totals for Coryell City Water Supply District.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended for the Coryell City Water Supply District. Conservation is recommended to reduce usage to a goal of 140 gpcd.

- a. Conservation
 - Cost Source: Volume II, Chapter 2
 - Date to be Implemented: before 2030
 - Annual Cost: maximum of \$10,640 in 2030
 - Unit Cost: \$560/acft
- b. Firm Up BRA Little River Supplies
 - Cost Source: Volume II
 - Date to be Implemented: before 2030
 - Project Cost: Costs borne by BRA
 - Unit Cost: Costs borne by BRA

Table 5.7-4. Recommended Plan Costs by Decade for Coryell City Water Supply District

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	332	331	329	327	326	324
Conservation						
Supply From Plan Element (acft/yr)	—	19	8	—	—	—
Annual Cost (\$/yr)	—	\$10,640	\$4,480	—	—	—
<i>Projected Surplus/(Shortage) after Conservation</i>	332	350	337	327	326	324
Firm Up BRA Little River Supplies						
Supply From Plan Element (acft/yr)	—	52	54	56	57	59
Annual Cost (\$/yr)	—	—	—	—	—	—
Unit Cost (\$/acft)	—	—	—	—	—	—

5.7.4 Flat WSC

Description of Supply

Flat Creek WSC obtains its water supply solely through purchases of treated surface water under contract with the City of Gatesville, which is projected to supply up to 102 acft/yr through the planning period. Shortages are projected for Flat Creek WSC beginning in 2030.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended for Flat WSC. Conservation is recommended to reduce usage to a goal of 140 gpcd.

a. Conservation

- Cost Source: Volume II
- Date to be Implemented: 2030
- Annual Cost: maximum of \$22,240 in 2070
- Unit Cost: \$560/acft

b. Purchase Additional Water from Gatesville

- Cost Source: Volume II
- Date to be Implemented: 2030
- Project Cost: N/A
- Unit Cost: \$1,309/acft

Table 5.7-5. Recommended Plan Costs by Decade for Flat WSC

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	2	(10)	(23)	(35)	(48)	(62)
Conservation						
Supply From Plan Element (acft/yr)	—	9	20	32	36	40
Annual Cost (\$/yr)	—	\$5,040	\$11,200	\$17,920	\$20,160	\$22,400
<i>Projected Surplus/(Shortage) after Conservation</i>	2	(1)	(3)	(3)	(12)	(22)
Purchase Additional Water from Gatesville						
Supply From Plan Element (acft/yr)	—	1	3	3	12	22
Annual Cost (\$/yr)	—	\$1,309	\$3,927	\$3,927	\$15,708	\$28,798
Unit Cost (\$/acft)	—	\$1,309	\$1,309	\$1,309	\$1,309	\$1,309

5.7.5 Fort Gates WSC

Description of Supply

Fort Gates WSC obtains its water supply through purchases of treated surface water from the City of Gatesville, which is projected to supply 120 acft/yr during the planning period. The entity also has a contract for purchasing raw surface water from the Brazos River Authority; however, Fort Gates WSC does not have facilities necessary to treat this water. Fort Gates WSC has contracted for 200 acft/yr of surface water supplies from the Brazos River Authority, which can supply 166 acft/yr in 2020 and 161 acft/yr in 2070, based on

water availability analyses prescribed under water planning guidelines. Shortages are projected for the across the planning period for Fort Gates WSC.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended for Flat WSC. Conservation is recommended to reduce usage to a goal of 140 gpcd. Needs remain unmet in 2020. These needs will only occur during a drought equivalent or worse than the drought of record. While not a strategy recommended by the Brazos G RWPG, the impacts of the unmet needs can be mitigated through demand management in the event of a serious drought prior to the recommended strategies coming online.

- a. Conservation
 - Cost Source: Volume II
 - Date to be Implemented: before 2030
 - Annual Cost: maximum of \$61,600
 - Unit Cost: \$560/acft
- b. Firm Up BRA Little River Supplies
 - Cost Source: Volume II
 - Date to be Implemented: before 2030
 - Annual Cost: Costs borne by BRA
 - Unit Cost: Costs borne by BRA
- c. Purchase Additional Diversion, Treatment, and Delivery of Supply from Gatesville. Strategy involves the City of Gatesville treating and delivering Fort Gates WSC's raw water supply under contract with the Brazos River Authority.
 - Cost Source: Volume II
 - Date to be Implemented: before 2030
 - Annual Cost: maximum of \$234,400
 - Unit Cost: \$1,172/acft
- d. Purchase Additional Water from Gatesville. Strategy involves purchasing additional treated water supply.
 - Cost Source: Volume II
 - Date to be Implemented: before 2030
 - Annual Cost: maximum of \$248,740
 - Unit Cost: \$1,309/acft

Table 5.7-6. Recommended Plan Costs by Decade for Fort Gates WSC

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	(260)	(303)	(353)	(399)	(449)	(500)
Conservation						
Supply From Plan Element (acft/yr)	—	33	73	93	101	110
Annual Cost (\$/yr)	—	\$18,480	\$40,880	\$52,080	\$56,560	\$61,600
<i>Projected Surplus/(Shortage) after Conservation</i>	(260)	(270)	(280)	(306)	(348)	(390)
Gatesville Treat and Deliver Existing Raw Supply (firmed up BRA supplies)						
Supply From Plan Element (acft/yr)		200	200	200	200	200
Annual Cost (\$/yr)		\$234,400	\$234,400	\$234,400	\$234,400	\$234,400
Unit Cost (\$/acft)		\$1,172	\$1,172	\$1,172	\$1,172	\$1,172
Purchase Additional Water from Gatesville (firmed up BRA supplies)						
Supply From Plan Element (acft/yr)		70	80	106	148	190
Annual Cost (\$/yr)		\$91,630	\$104,720	\$138,754	\$193,732	\$248,710
Unit Cost (\$/acft)		\$1,309	\$1,309	\$1,309	\$1,309	\$1,309

5.7.6 City of Gatesville

Description of Supply

The City of Gatesville obtains its water supply through purchases of raw water under contract from the Brazos River Authority. The City of Gatesville has contracted for 5,898 acft/yr of surface water supplies from the Brazos River Authority, which can supply 4,902 acft/yr in 2020 and 4,740 acft/yr in 2070, based on water availability analyses prescribed under water planning guidelines. The contracted supply volume is for 5,898 acft/yr; however, this contract is projected to be prorated and only provide a maximum of 4,902 acft/yr during the planning period. The City of Gatesville also provides treated surface water to a number of nearby WUGs through wholesale supply contracts.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to meet water needs for the City of Gatesville. Conservation is recommended to reduce usage to a goal of 140 gpcd. Needs remain unmet in 2020. These needs will only occur during a drought equivalent or worse than the drought of record. While not a strategy recommended by the Brazos G RWPG, the impacts of the unmet needs can be mitigated through demand management in the event of a serious drought prior to the recommended strategies coming online.

- a. Conservation
 - Cost Source: Volume II
 - Date to be Implemented: before 2030
 - Annual Cost: maximum of \$1,339,520 in 2070
 - Unit Cost: \$560/acft
- b. Firm Up BRA Little River Supplies
 - Cost Source: Volume II
 - Date to be Implemented: before 2030
 - Project Cost: Costs borne by BRA
 - Unit Cost: Costs borne by BRA
- c. Water Treatment Plant Expansion
 - Cost Source: Volume II
 - Date to be Implemented: before 2030.
 - Project Cost: \$9,577,000
 - Unit Cost: maximum of \$979 acft/yr
- d. Purchase Raw Water Supply from Multi-County WSC; supply would be provided out of the Coryell County OCR.
 - Cost Source: Volume II
 - Date to be Implemented: before 2030
 - Annual Cost: maximum of \$1,660,000
 - Unit Cost: \$2,017/acft

Table 5.7-7. Recommended Plan Costs by Decade for the City of Gatesville

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	(1,041)	(1,692)	(2,455)	(3,154)	(3,917)	(4,688)
Conservation						
Supply From Plan Element (acft/yr)	—	384	852	1,386	1,988	2,392
Annual Cost (\$/yr)	—	\$215,040	\$477,120	\$776,160	\$1,113,280	\$1,339,520
<i>Projected Surplus/(Shortage) after Conservation</i>	(1,041)	(1,308)	(1,603)	(1,768)	(1,929)	(2,296)
Additional Demands from Recommended Strategies from Others						
Increase Contract to Flat WSC (acft/yr)	—	(1)	(3)	(3)	(12)	(22)
Increase Contract to Fort Gates WSC (acft/yr)	—	(270)	(280)	(306)	(348)	(390)

Table 5.7-7. Recommended Plan Costs by Decade for the City of Gatesville

Plan Element	2020	2030	2040	2050	2060	2070
<i>Total Surplus/(Shortage) including Recommended Strategies</i>	—	(1,579)	(1,886)	(2,077)	(2,289)	(2,708)
Firm Up BRA Little River Supplies						
Supply From Plan Element (acft/yr)	—	1,028	1,060	1,093	1,125	1,158
Annual Cost (\$/yr)	—	—	—	—	—	—
Unit Cost (\$/acft)	—	—	—	—	—	—
Purchase Raw Water Supply from Multi-County WSC (Coryell County OCR)						
Supply From Plan Element (acft/yr)	—	550	823	981	1,152	1,528
Annual Cost (\$/yr)	—	\$1,109,000	\$1,660,000	\$1,019,000	\$1,197,000	\$680,000
Unit Cost (\$/acft)	—	\$2,017	\$2,017	\$1,039	\$1,039	\$445

5.7.7 Mountain WSC

Mountain WSC obtains its water supply through groundwater production from the Trinity Aquifer and through purchases of treated surface water under contract from the City of Gatesville which is projected to provide up to 280 acft/yr of supply. Available supply from the Trinity Aquifer is projected at 147 acft/yr. No shortages are projected for Mountain WSC and no changes to water supply are recommended. Conservation was considered; however, the entity’s usage is below the selected goal of 140 gpcd.

5.7.8 Multi-County WSC

Description of Supply

Multi-County WSC obtains its water supply through purchases of treated surface water under contract from the City of Hamilton, which is projected to provide 245 acft/yr of supply through the planning period. This WUG is located in Coryell and Hamilton Counties. The quantity shown in Table 5.7-1 represents the cumulative totals for Multi-County WSC.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to meet water needs for the Multi-County WSC. Conservation was considered; however, the entity’s usage is below the selected goal of 140 gpcd. Local officials have requested that the Coryell County Off-Channel Reservoir be evaluated and recommended as a water management strategy to meet future needs in Coryell County. The project would likely be developed in cooperation with the Brazos River Authority. The Multi-County WSC has been identified as the current project sponsor.

- a. Purchase additional water from City of Hamilton
 - Cost Source: Volume II
 - Date to be Implemented: before 2020
 - Unit Cost: \$250/acft
 - Annual Cost: maximum of \$41,750
- b. Coryell County Off-Channel Reservoir
 - Cost Source: Volume II
 - Date to be Implemented: before 2030
 - Unit Cost: maximum of \$2,017/acft
 - Annual Cost: maximum of \$2,574,000

Table 5.7-8. Recommended Plan Costs by Decade for Multi-County WSC

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	(46)	(67)	(91)	(115)	(144)	(174)
Conservation						
Supply From Plan Element (acft/yr)	—	—	—	—	—	—
Annual Cost (\$/yr)	—	—	—	—	—	—
<i>Projected Surplus/(Shortage) after Conservation</i>	(46)	(67)	(91)	(115)	(144)	(174)
Additional Demands from Recommended Strategies from Others						
Coryell County-Other (acft/yr)		1,308	1,308	1,308	1,308	1,308
<i>Total Surplus/(Shortage) Including Recommended Strategies</i>	(46)	(1,375)	(1,399)	(1,423)	(1,452)	(1,482)
Purchase from City of Hamilton						
Supply From Plan Element (acft/yr)	146	167	91	115	144	174
Annual Cost (\$/yr)	\$36,500	\$41,750	\$22,750	\$28,750	\$36,000	\$43,500
Unit Cost (\$/acft)	\$250	\$250	\$250	\$250	\$250	\$250
Coryell County Off-Channel Reservoir						
Supply From Plan Element (acft/yr)	—	1,276	1,001	843	663	277
Annual Cost (\$/yr)	—	\$2,574,000	\$2,019,000	\$876,000	\$689,000	\$123,000
Unit Cost (\$/acft)	—	\$2,017	\$2,017	\$1,039	\$1,039	\$455



5.7.9 City of Oglesby

The City of Oglesby obtains its water supply solely through groundwater production from the Trinity Aquifer which is projected to provide 211 acft/yr of groundwater supply. No shortages are projected for the City during the planning period and no changes to water supply are recommended. Conservation was considered; however, the entity's usage is below the selected target rate of 140 gpcd.

5.7.10 County-Other

Description of Supply

Water supply for County-Other entities is obtained through groundwater production from the Trinity Aquifer, which is projected to provide 614 acft/yr of groundwater supply. Shortages for Coryell County-Other are projected to occur before 2040. Local officials have requested that the Coryell County Off-Channel Reservoir be evaluated and recommended as a water management strategy to meet future needs in Coryell County. The project would likely be developed in cooperation with the Brazos River Authority. The Multi-County WSC has been identified as the current project sponsor.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to meet water needs for the entities in Coryell County-Other. Conservation was also considered; however, the entity's usage is below the selected goal of 140 gpcd.

- a. Purchase from Multi-County WSC (Coryell County Off-Channel Reservoir)
 - Strategy to develop new raw supply, only. Delivery and treatment would be required when supplies are needed and location is known.
 - Cost Source: Volume II
 - Date to be Implemented: before 2030
 - Project Cost: borne by Multi-County WSC
 - Unit Cost: maximum of \$2,017 acft/yr
- b. Groundwater Development – Trinity Aquifer
 - Cost Source: Volume II
 - Date to be Implemented: before 2040
 - Project Cost: \$4,710,000
 - Unit Cost: maximum of \$784/acft

Table 5.7-9. Recommended Plan Costs by Decade for Coryell County – Other

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	324	52	(259)	(525)	(815)	(1,107)
Conservation						
Supply From Plan Element (acft/yr)	—	—	—	—	—	—
Annual Cost (\$/yr)	—	—	—	—	—	—
<i>Projected Surplus/(Shortage) after Conservation</i>	324	52	(259)	(525)	(815)	(1,107)
Purchase from Multi-County WSC (Coryell County Off-Channel Reservoir)						
Supply From Plan Element (acft/yr)	—	1,308	1,308	1,308	1,308	1,308
Annual Cost (\$/yr)	—	\$2,638,236	\$2,638,236	\$1,359,000	\$1,359,000	\$595,140
Unit Cost (\$/acft)	—	\$2,017	\$2,017	\$1,039	\$1,039	\$455
Groundwater Development – Trinity Aquifer						
Supply From Plan Element (acft/yr)	—	—	259	525	815	1,107
Annual Cost (\$/yr)	—	—	\$203,000	\$305,000	\$407,000	\$376,000
Unit Cost (\$/acft)	—	—	\$784	\$581	\$499	\$340

5.7.11 Manufacturing

Coryell County Manufacturing obtains water supply through purchases of treated surface water under contract from the City of Gatesville. No shortage is projected and no changes in water supply are recommended.

5.7.12 Steam-Electric

Coryell County has no current or projected future demand for Steam-Electric; therefore, no recommendations have been made.

5.7.13 Mining

Description of Supply

Mining demand in Coryell County is projected to peak in 2020, and slowly decrease until 2070. Water supply to meet Mining demands is obtained solely through groundwater production from the Trinity Aquifer. Shortages are projected throughout the planning period.

Recommended Strategy

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to meet water needs for Coryell

County-Mining. Conservation is recommended. Associated costs are included for each strategy.

- a. Conservation
 - Cost Source: Volume II
 - Date to be Implemented: before 2030
 - Annual Cost: Not determined.
- b. Groundwater Development – Trinity Aquifer
 - Cost Source: Volume II
 - Date to be Implemented: before 2030
 - Project Cost: \$3,145,856
 - Unit Cost: maximum of \$222/acft

Table 5.7-10. Recommended Plan Costs by Decade for Coryell County – Mining

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	(1,315)	(877)	(296)	(168)	(203)	(242)
Conservation						
Supply From Plan Element (acft/yr)	45	54	34	25	28	31
Annual Cost (\$/yr)	ND	ND	ND	ND	ND	ND
<i>Projected Surplus/(Shortage) after Conservation (acft/yr)</i>	(1,270)	(823)	(262)	(143)	(175)	(211)
Groundwater Development - Trinity						
Supply From Plan Element (acft/yr)	1,270	1,270	1,270	1,270	1,270	1,270
Annual Cost (\$/yr)	\$282,000	\$282,000	\$61,000	\$61,000	\$61,000	\$61,000
Unit Cost (\$/acft)	\$222	\$222	\$48	\$48	\$48	\$48

ND – Not determined. Costs to implement industrial conservation technologies will vary based on each location.

5.7.14 Irrigation

No shortages are projected for Coryell County Irrigation and no changes in water supply are recommended.

5.7.15 Livestock

Livestock water supply is projected to meet demands through 2070 and no changes in water supply are recommended.

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5.8 Eastland County Water Supply Plan

Table 5.8-1 lists each water user group in Eastland County and their corresponding surplus or shortage in years 2040 and 2070. A brief summary of the water user groups and the plan for the selected water user are presented in the following subsection.

Table 5.8-1. Eastland County Surplus/(Shortage)

Water User Group	Surplus/(Shortage)		Comment
	2040 (acft/yr)	2070 (acft/yr)	
City of Cisco	217	227	Projected surplus
City of Eastland	1,481	1,400	Projected surplus
Fort Griffin SUD			See Stephens County
City of Gorman	82	83	Projected surplus
City of Ranger	1,327	1,330	Projected surplus
City of Rising Star	76	78	Projected surplus
Staff WSC	104	107	Projected surplus
Stephens Regional SUD			See Stephens County
County-Other	32	44	Projected surplus
Manufacturing	42	42	Projected surplus
Steam-Electric	—	—	No projected demand
Mining	(686)	(189)	Projected shortage - see plan below.
Irrigation	79	66	Projected surplus
Livestock	0	0	No projected surplus or shortage

5.8.1 City of Cisco

The City of Cisco obtains its water supply through diversions from Lake Cisco under a water right held by the City, which is projected to provide the City with up to 1,075 acft/yr of water supply. The City also provides sales of treated surface water to Eastland County-Other users. No shortages are projected for the City of Cisco and no changes in water supply are recommended.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended for the City of Cisco. Conservation is recommended to reduce usage to a goal of 140 gpcd.

- a. Conservation
 - Cost Source: Volume II
 - Date to be Implemented: before 2030

- Unit Cost: \$560/acft
- Annual Cost: maximum of \$29,120

Table 5.8-2. Recommended Plan Costs by Decade for City of Cisco

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	199	202	217	225	227	227
Conservation						
Supply From Plan Element (acft/yr)	—	52	52	44	42	42
Annual Cost (\$/yr)	—	\$29,120	\$29,120	\$24,640	\$23,520	\$23,520
<i>Projected Surplus/(Shortage) after Conservation</i>	199	254	269	269	269	269

5.8.2 City of Eastland

The City of Eastland obtains its water supply through purchases of treated surface water under contract with the Eastland County Water Supply District, which is projected to provide an annual supply beginning at 2,302 acft/yr at the beginning of the planning period and decreasing to 2,144 acft/yr at the end. The Eastland County Water Supply District sources raw surface water through diversions Lake Leon under a water right held by the water supply district. The City also provides sales of treated surface water under contract with Staff WSC, the City of Carbon, Westbound WSC, and Olden WSC; the latter three of entities are grouped in the County-Other WUG for Eastland County. No shortages are projected for the City of Eastland and no changes in water supply are recommended. Conservation was also considered; however, the entity’s usage is below the selected goal of 140 gpcd.

5.8.3 City of Gorman

The City of Gorman obtains its water supply through purchases of treated surface water under contract from the Upper Leon River Municipal Water District, which is projected to provide up to 169 acft/yr of supply. The water supplied by the Upper Leon River Municipal Water District is diverted from Lake Proctor under contracts with the Brazos River Authority. No shortages are projected for the City of Gorman and no changes in water supply are recommended. Conservation was also considered; however, the entity’s usage is below the selected goal of 140 gpcd.

5.8.4 City of Ranger

The City of Ranger obtains its water supply through purchases of treated surface water from the Eastland County Water Supply District, which is projected to provide up to 2,025 acft/yr across the planning period. The Eastland County Water Supply District sources raw surface water through diversions Lake Leon under a water right held by the water supply district. The City also provides sales of treated surface water and groundwater to Staff WSC. No shortages are projected for the City of Ranger and no changes in water supply are recommended.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended for the City of Ranger. Conservation is recommended to reduce usage to a goal of 140 gpcd.

a. Conservation

- Cost Source: Volume II
- Date to be Implemented: before 2030
- Unit Cost: \$560/acft
- Annual Cost: maximum of \$22,090

Table 5.8-3. Recommended Plan Costs by Decade for City of Ranger

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	1,314	1,317	1,327	1,329	1,330	1,330
Conservation						
Supply From Plan Element (acft/yr)	—	33	40	38	37	37
Annual Cost (\$/yr)	—	\$18,480	\$22,400	\$21,280	\$20,720	\$20,720
<i>Projected Surplus/(Shortage) after Conservation</i>	1,314	1,350	1,367	1,367	1,367	1,367

5.8.5 City of Rising Star

The City of Rising Star obtains its water supply solely through groundwater production from the Trinity Aquifer, which is projected to provide up to 170 acft/yr of supply. No shortages are projected for the City of Rising Star and no changes in water supply are recommended. Conservation was considered; however, the entity’s usage is below the selected goal of 140 gpcd.

5.8.6 Staff WSC

Staff WSC obtains its water supply through purchases of treated surface water under contract with the City of Eastland, and purchases of treated surface and groundwater from the City of Ranger. Total supply purchases are projected to provide 262 acft/yr of supply to Staff WSC through the planning period. No shortages are projected for Staff WSC and no changes in water supply are recommended. Conservation was also considered; however, the entity’s usage is below the selected goal of 140 gpcd.

5.8.7 County-Other

The entities comprising Eastland County-Other obtain water supply from multiple sources in the County. The City of Eastland sells treated surface water under contract to the City of Carbon, Westbound WSC, and Olden WSC; additionally, the City of Cisco also sells treated surface water to Westbound WSC. Entities comprising Eastland County-Other also rely on groundwater production from the Trinity Aquifer to meet demands. Water supply

contracts are projected to provide users Eastland County-Other users with up to 267 acft/yr of treated surface water while available groundwater supplies are projected at 203 acft/yr. No shortages are projected through the planning period and no changes in water supply are recommended. Conservation was also considered; however, the entity's usage is below the selected goal of 140 gpcd.

5.8.8 Manufacturing

Manufacturing in Eastland County is supplied with treated surface water from the Eastland County Water Supply District. The Eastland County Water Supply District sources raw surface water through diversions Lake Leon under a water right held by the water supply district. No water supply shortages are projected for Manufacturing in Eastland County and no change in water supply is recommended.

5.8.9 Steam-Electric

No Steam-Electric demand exists or is projected for the county.

5.8.10 Mining

Description of Supply

Mining operations in Eastland County obtain water supply solely through groundwater production from the Trinity Aquifer. Current groundwater allocations in the county exceed the MAG supply and are not projected to be available for production in the future.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to meet water needs for Eastland County-Mining. Conservation is recommended.

- a. Conservation
 - Cost Source: Volume II
 - Date to be Implemented: before 2030
 - Annual Cost: not determined
- b. Groundwater Development – Trinity Aquifer (Erath County)
 - Cost Source: Volume II
 - Date to be Implemented: before 2030
 - Project Cost: \$3,669,000
 - Unit Cost: maximum of \$371/acft



Table 5.8-4. Recommended Plan Costs by Decade for Eastland County – Mining

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	(921)	(930)	(686)	(471)	(275)	(189)
Conservation						
Supply From Plan Element (acft/yr)	35	59	65	50	36	30
Annual Cost (\$/yr)	ND	ND	ND	ND	ND	ND
<i>Projected Surplus/(Shortage) after Conservation (acft/yr)</i>	(886)	(871)	(621)	(421)	(239)	(159)
Groundwater Development – Trinity Aquifer						
Supply From Plan Element (acft/yr)	886	886	886	886	886	886
Annual Cost (\$/yr)	\$329,000	\$329,000	\$71,000	\$71,000	\$71,000	\$71,000
Unit Cost (\$/acft)	\$371	\$371	\$80	\$80	\$80	\$80

ND – Not determined. Costs to implement industrial conservation technologies will vary based on each location.

5.8.11 Irrigation

Irrigation in Eastland County is supplied through groundwater production from the Trinity Aquifer. No supply shortages are projected throughout the planning period and no change in water supply is recommended.

5.8.12 Livestock

All of the livestock demand for Eastland County is met with local surface water supplies. No change in water supply is recommended.

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5.9 Erath County Water Supply Plan

Table 5.9-1 lists each water user group in Erath County and their corresponding surplus or shortage in years 2040 and 2070.

Table 5.9-1. Erath County Surplus/(Shortage)

Water User Group	Surplus/(Shortage)		Comment
	2040 (acft/yr)	2070 (acft/yr)	
City of Dublin	73	24	Projected surplus
City of Gordon			See Palo Pinto County
City of Stephenville	2,553	1,933	Projected surplus
County-Other	310	(347)	Projected shortage - see plan below
Manufacturing	2	29	Projected shortage – see plan below
Steam-Electric	—	—	No projected demand
Mining	631	830	Projected surplus
Irrigation	360	360	Projected surplus
Livestock	0	0	No projected surplus or shortage

5.9.1 City of Dublin

The City of Dublin obtains its water supply through purchases of treated surface water under contract from the Upper Leon River Municipal Water District. The water supplied by the Upper Leon River Municipal Water District is diverted from Lake Proctor under contracts with the Brazos River Authority. The City of Dublin is projected to obtain up to 598 acft/yr of treated surface water supply from the Upper Leon River Municipal Water District through the planning period. The City also provides sales of treated surface water to Manufacturing entities and entities comprising the County-Other WUG in Erath County. No shortages are projected for the City of Dublin and no change in water supply is recommended. Conservation was also considered; however, the City’s usage is below the selected goal of 140 gpcd.

5.9.2 City of Stephenville

Description of Supply

The City of Stephenville obtains its water supply through groundwater production from the Trinity Aquifer and through purchases of treated surface water under contract with the Upper Leon River Municipal Water District. The Upper Leon River Municipal Water District has contracted with the Brazos River Authority for raw water supply from Lake Proctor. Treated water supply available under contract from the Upper Leon River Municipal Water District is projected at 1,862 acft/yr through the planning period while the groundwater supply available to the City is projected at 3,780 acft/yr. No supply shortages are projected for the City.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water supply plan is recommended for the City of Stephenville. Associated costs are included for each strategy. Conservation was also considered; however, the entity's usage is below the selected goal of 140 gpcd.

a. Trinity Aquifer Groundwater Development:

- Cost Source: Volume II
- Date to be Implemented: before 2030
- Project Cost: \$7,344,000
- Unit Cost: maximum of \$1,353/acft

Table 5.9-2. Recommended Plan Costs by Decade for City of Stephenville

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	2,954	2,740	2,553	2,353	2,139	1,933
Conservation						
Supply from Plan Element (acft/yr)	—	—	—	—	—	—
Annual Cost (\$/yr)	—	—	—	—	—	—
<i>Projected Surplus/(Shortage) after Conservation (acft/yr)</i>	2,954	2,740	2,553	2,353	2,139	1,933
Additional Demands from Recommended Strategies from Others						
Increase Supply to Erath County-Manufacturing (acft/yr)	(1)	(2)	—	—	—	—
<i>Total Needs Including Recommended Strategies (acft/yr)</i>	2,953	2,738	2,553	2,353	2,139	1,933
Groundwater Development – Trinity Aquifer						
Supply from Plan Element (acft/yr)	484	414	484	484	484	484
Annual Cost (\$/yr)	\$655,000	\$560,142	\$138,000	\$138,000	\$138,000	\$138,000
Unit Cost (\$/acft)	\$1,353	\$1,353	\$285	\$285	\$285	\$285

5.9.3 County-Other

Description of Supply

The water supply entities comprising County-Other rely primarily on groundwater production from the Trinity Aquifer for water supply. Some treated surface water supplies are provided through the City of Dublin and City of Gordon. Available Trinity Aquifer groundwater supplies are projected at 3,211 acft/yr, while treated surface water is projected to provide an additional 122 acft/yr of supply. Supply shortages are projected for the entity beginning by 2060.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water supply plan is recommended for the Erath County-Other. Associated costs are included for each strategy. Conservation was also considered; however, the entity's usage is below the selected goal of 140 gpcd.

a. Trinity Aquifer Groundwater Development:

- Cost Source: Volume II
- Date to be Implemented: before 2060
- Project Cost: \$1,350,000
- Unit Cost: maximum of \$438/acft

Table 5.9-3. Recommended Plan Costs by Decade for Erath County – Other

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	727	499	310	63	(148)	(347)
Conservation						
Supply from Plan Element (acft/yr)	—	—	—	—	—	—
Annual Cost (\$/yr)	—	—	—	—	—	—
<i>Projected Surplus/(Shortage) after Conservation (acft/yr)</i>	727	499	310	63	(148)	(347)
Groundwater Development – Trinity Aquifer						
Supply from Plan Element (acft/yr)	—	—	—	—	347	347
Annual Cost (\$/yr)	—	—	—	—	\$152,000	\$152,000
Unit Cost (\$/acft)	—	—	—	—	\$438	\$438

5.9.4 Manufacturing

Description of Supply

Manufacturing water supply in Erath County is obtained from multiple sources including through local groundwater production from the Trinity Aquifer, purchases of treated surface from the City of Dublin and County-Other entities, and groundwater purchases from the City of Stephenville. Manufacturing is projected to have a supply shortage until 2040.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water supply plan is recommended for the Erath County-Other. Conservation is recommended. Associated costs are included for each strategy.

- a. Conservation:
 - Cost Source: Volume II
 - Date to be Implemented: before 2030
 - Annual Cost: not determined
- b. Purchase additional groundwater supply from the City of Stephenville:
 - Cost Source: Volume II
 - Date to be Implemented: before 2030
 - Annual Cost: maximum of \$4,920/yr
 - Unit Cost: maximum of \$2,460/acft

Table 5.9-4. Recommended Plan Costs by Decade for Erath County – Manufacturing

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	(3)	(6)	2	9	18	29
Conservation						
Supply from Plan Element (acft/yr)	2	4	6	6	6	6
Annual Cost (\$/yr)	ND	ND	ND	ND	ND	ND
<i>Projected Surplus/(Shortage) after Conservation (acft/yr)</i>	(1)	(2)	8	15	24	35
Purchase additional supply from City of Stephenville						
Supply from Plan Element (acft/yr)	1	2	—	—	—	—
Annual Cost (\$/yr)	\$2,460	\$4,920	—	—	—	—
Unit Cost (\$/acft)	\$2,460	\$2,460	—	—	—	—

ND – Not determined. Costs to implement industrial conservation technologies will vary based on each location.

5.9.5 Steam-Electric

No Steam-Electric demand exists or is projected for the county.

5.9.6 Mining

Water supply for Mining in Erath County is obtained through groundwater production from the Trinity Aquifer. No water supply shortages are projected for Mining entities in the County through the planning period.

5.9.7 Irrigation

Irrigation in Erath County obtains water solely through local groundwater production from the Trinity Aquifer is projected to have a surplus of available water through the planning period. No change in water supply is recommended.



5.9.8 Livestock

Water supply for Livestock is obtained through local stock surface water impoundments. No shortages are projected for Livestock use and no changes in water supply are recommended.

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5.10 Falls County Water Supply Plan

Table 5.10-1 lists each water user group in Falls County and their corresponding surplus or shortage in years 2040 and 2070. For each water user group with a projected shortage, a water supply plan has been developed and is presented in the following subsections.

Table 5.10-1. Falls County Surplus/(Shortage)

Water User Group	Surplus/(Shortage)		Comment
	2040 (acft/yr)	2070 (acft/yr)	
Bell-Milam WSC			See Bell County
City of Bruceville-Eddy			See McLennan County
Cego-Durango WSC	27	22	Projected surplus
East Bell County WSC			See Bell County
Little Elm Valley WSC			See Bell County
City of Marlin	899	839	Projected surplus
North Milam WSC			See Milam County
City of Rosebud	454	449	Projected surplus
West Brazos WSC	455	417	Projected surplus
County-Other	69	87	Projected surplus
Manufacturing	—	—	No projected demand
Steam-Electric	—	—	No projected demand
Mining	(161)	(233)	Projected shortage - see plan below.
Irrigation	1,382	1,382	Projected surplus
Livestock	0	0	No projected surplus or shortage

5.10.1 Cego-Durango WSC

Cego-Durango WSC obtains its water supply solely through groundwater production from the Trinity Aquifer, which is projected to provide an available groundwater supply of 205 acft/yr through the planning period. No shortages are projected for Cego-Durango WSC through the planning period and no change in water supply is recommended.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water supply plan is recommended for the Cego-Durango WSC. Conservation is recommended to reduce usage to a goal of 140 gpcd.

- a. Conservation
 - Cost Source: Volume II
 - Date to be Implemented: before 2030

- Annual Cost: maximum of \$3,360 in 2030
- Unit Cost: \$560/acft

Table 5.10-2. Recommended Plan Costs by Decade for Cego-Durango WSC

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	29	25	27	32	27	22
Conservation						
Supply From Plan Element (acft/yr)	—	6	3	2	1	1
Annual Cost (\$/yr)	—	\$3,360	\$1,680	\$1,120	\$560	\$560
<i>Projected Surplus/(Shortage) after Conservation (acft/yr)</i>	29	31	30	34	28	23

5.10.2 City of Marlin

Description of Supply

The City of Marlin obtains its water supply through raw water diversions from local reservoirs and the Brazos River under water rights held by the City. The City owns and operates two existing reservoirs – Marlin City Lake and New Marlin Reservoir – that impound runoff from Big Sandy Creek. The City also has contracted to purchase raw surface water from the Brazos River Authority. Surface water supplies available through diversions by the City are projected to provide up to 2,250 acft/yr of supply at the beginning of the planning period, then decreasing to 2,000 acft/yr at the end of the period. Purchases of raw surface water under contract with the Brazos River Authority is projected to provide a constant supply of 1,200 acft/yr through the planning period.

Water Supply Plan

The supplies projected are adequate to meet the City’s water demand through 2070. Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water supply plan is recommended for the City of Marlin. Conservation is recommended to reduce usage to a goal of 140 gpcd.

a. Conservation

- Cost Source: Volume II
- Date to be Implemented: before 2030
- Annual Cost: maximum of \$408,800 in 2070
- Unit Cost: \$560/acft

b. Brushy Creek Reservoir

- Cost Source: Volume II
- Date to be Implemented: 2030



- Total Project Cost: \$33,229,000
- Annual Cost: maximum of \$2,493,000 (includes NRCS share of project)

Table 5.10-3. Recommended Plan Costs by Decade for the City of Marlin

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	951	892	899	950	896	839
Conservation						
Supply From Plan Element (acft/yr)	—	151	296	432	583	730
Annual Cost (\$/yr)	—	\$84,560	\$165,760	\$241,920	\$326,480	\$408,800
<i>Projected Surplus/(Shortage) after Conservation (acft/yr)</i>	951	1,043	1,195	1,382	1,479	1,569
Brushy Creek Reservoir						
Supply From Plan Element (acft/yr)	—	—	2,000	2,000	2,000	2,000
Annual Cost (\$/yr)	—	—	\$2,493,000	\$2,493,000	\$2,493,000	\$2,493,000
Unit Cost (\$/acft)	—	—	\$1,247	\$1,247	\$1,247	\$1,247

5.10.3 City of Rosebud

The City of Rosebud obtains its water supply primarily through purchases of treated surface water under contract from Central Texas WSC, which treats and delivers water from Stillhouse Hollow Lake through purchases under contract with the Brazos River Authority. This supply contract is projected to provide up to 525 acft/yr of supply to the City. Additionally, the City of Rosebud also contracts directly with the Brazos River Authority for purchases of raw surface water which is projected to provide 100 acft/yr of supply. No shortages are projected for the City of Rosebud. And no change in water supply is recommended. Conservation was also considered; however, the entity’s usage is below the selected goal of 140 gpcd.

5.10.4 West Brazos WSC

The service area for West Brazos WSC is located in multiple counties (McLennan and Falls) and obtains its water supply solely through groundwater production from the Trinity Aquifer. The values presented in Table 5.10-1 for West Brazos WSC represents the cumulative supply surplus for the WUG. Trinity Aquifer groundwater supply available to West Brazos WSC is projected at 815 to 817 acft/yr during the planning period. No supply shortages are projected through the planning period for West Brazos WSC and change in supply is recommended. Conservation was also considered; however, the entity’s usage is below the selected goal of 140 gpcd.

5.10.5 County-Other

Entities comprising Falls County-Other obtain water supply through purchases of treated surface water from Central Texas WSC and through local groundwater production from

the Brazos River Alluvium and Carrizo-Wilcox Aquifers. Supply purchases from Central Texas WSC are projected to provide a total of 92 acft/yr through the planning period; available groundwater supply from the Brazos River Alluvium Aquifer are projected at 170 acft/yr and available supply from the Carrizo-Wilcox Aquifer is projected to range between 514 and 530 acft/yr. No supply shortages are projected during the planning period and no change in supply is recommended.

Description of Supply

Various entities are dealing with elevated levels of arsenic in groundwater supplies and have been pursuing water management strategies through the FHLM WSC. Through a TWDB sponsored study coordinated by FHLM WSC, these entities have considered a regional brackish RO WTP in Limestone County, Carrizo-Wilcox Regional Groundwater in Limestone County, Tehuacana Reservoir, and supplies from City of Marlin (Brushy Creek Reservoir), and City of Waco. The recommended strategy is to provide for arsenic treatment for individual entities. This strategy does not provide new supply. Surpluses are projected through the year 2070.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended for Falls County-Other. Conservation was also considered; however, the entity’s usage is below the selected goal of 140 gpcd.

a. Upgrade Treatment for Arsenic

Entities within County-Other for which Arsenic treatment is recommended include Moore WS.

- Cost Source: Volume II
- Date to be Implemented: before 2030
- Project Cost: \$255,000
- Unit Cost: maximum of \$1,585/acft

Table 5.10-4. Recommended Plan Costs by Decade for the Falls County – Other

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	3	4	69	114	102	87
Conservation						
Supply From Plan Element (acft/yr)	—	—	—	—	—	—
Annual Cost (\$/yr)	—	—	—	—	—	—
<i>Projected Surplus/(Shortage) after Conservation</i>	3	4	69	114	102	87
Upgrade Treatment for Arsenic						

Table 5.10-4. Recommended Plan Costs by Decade for the Falls County – Other

Plan Element	2020	2030	2040	2050	2060	2070
Supply From Plan Element (acft/yr)	53	53	53	53	53	53
Annual Cost (\$/yr)	\$84,000	\$84,000	\$66,000	\$66,000	\$66,000	\$66,000
Unit Cost (\$/acft)	\$1,585	\$1,585	\$1,245	\$1,245	\$1,245	\$1,245

5.10.6 Manufacturing

No Manufacturing demand exists or is projected for the county.

5.10.7 Steam-Electric

No Steam-Electric demand exists or is projected for the county.

5.10.8 Mining

Description of Supply

Mining operations in Falls County obtain water supply solely through groundwater production from the Brazos River Alluvium Aquifer. Mining is projected to have a shortage of water through the year 2070.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water supply plan is recommended to meet the projected shortage of Falls County Mining. Associated costs are included for each strategy. Conservation is recommended.

a. Conservation

- Cost Source: Volume II
- Date to be Implemented: before 2030
- Annual Cost: Not determined

b. Reallocation from Falls County – Irrigation:

- Cost Source: Unknown – the exact location of the projected Mining demands in Falls County is unknown, but could logically be located near the supplies located in the county, and development of a cost is not feasible.
- Date to be Implemented: before 2030
- Annual Cost: not determined

Table 5.10-5. Recommended Plan Costs by Decade for Falls County – Mining

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage)</i>	(127)	(148)	(161)	(188)	(209)	(233)
Conservation						
Supply from Plan Element (acft/yr)	7	12	18	20	21	23
Annual Cost (\$/yr)	ND	ND	ND	ND	ND	ND
<i>Projected Surplus/(Shortage) after Conservation (acft/yr)</i>	(120)	(136)	(143)	(168)	(188)	(210)
Reallocation of Supplies from Falls County Irrigation						
Supply from Plan Element (acft/yr)	120	136	143	168	188	210
Annual Cost (\$/yr)	ND	ND	ND	ND	ND	ND
Unit Cost (\$/acft)	ND	ND	ND	ND	ND	ND

ND – Not determined. Costs to implement conservation technologies will vary based on each location and have not been determined.

5.10.9 Irrigation

Irrigation in Falls County obtains water supply through groundwater production from the Brazos River Alluvium. No supply shortages are projected for Irrigation through the planning period and no change in water supply is recommended.

Table 5.10-6. Recommended Plan Costs by Decade for Falls County – Irrigation

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage)</i>	1,382	1,382	1,382	1,382	1,382	1,382
BRA System Operation Surplus						
Supply from Plan Element (acft/yr)	309	309	309	309	309	309
Annual Cost (\$/yr)	\$23,484	\$23,484	\$23,484	\$23,484	\$23,484	\$23,484
Unit Cost (\$/acft)	\$76	\$76	\$76	\$76	\$76	\$76

5.10.10 Livestock

Livestock operations in Falls County obtain water supply through local stock surface water impoundments. No shortages are projected through the planning period and no change in water supply is recommended.

5.11 Fisher County Water Supply Plan

Table 5.11-1 lists each water user group in Fisher County and their corresponding surplus or shortage in years 2040 and 2070. For each water user group with a projected shortage, a water supply plan has been developed and is presented in the following subsections.

Table 5.11-1. Fisher County Surplus/(Shortage)

Water User Group	Surplus/(Shortage)		Comment
	2040 (acft/yr)	2070 (acft/yr)	
City of Roby	34	34	Projected surplus - see plan below.
City of Rotan	(19)	(66)	Projected shortage - see plan below.
The Bitter Creek WSC			See Nolan County
County-Other	6	7	Projected surplus
Manufacturing	54	54	Projected surplus
Steam-Electric	–	–	No projected demand
Mining	(143)	(22)	Projected shortage - see plan below.
Irrigation	782	782	Projected surplus
Livestock	0	0	No projected surplus or shortage

5.11.1 City of Roby

Description of Supply

Water supplies are obtained from the Seymour Aquifer at 34 ac-ft/yr and the City of Sweetwater from 124 acft/yr to 117 acft/yr from 2020 to 2070, respectively. No shortage is projected for the City of Roby throughout the planning period.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended for the City of Roby. The supplies projected are adequate to meet the City's water demand through 2070, although conservation is recommended to reduce usage to a goal of 140 gpcd.

a. Conservation

- Cost Source: Volume II
- Date to be Implemented: 2030
- Annual Cost: maximum of \$8,152 in 2040
- Unit Cost: \$560/acft

Table 5.11-2. Recommended Plan Costs by Decade for the City of Roby

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	34	34	34	34	34	34
Conservation						
Supply From Plan Element (acft/yr)	0	9	15	13	13	13
Annual Cost (\$/yr)	\$0	\$4,960	\$8,152	\$7,032	\$7,032	\$7,032
<i>Projected Surplus/(Shortage) after Conservation (acft/yr)</i>	34	43	49	47	47	47

5.11.2 City of Rotan

Description of Supply

The City of Rotan is currently purchasing water under contract from the City of Snyder from 73 acft/yr to 61 acft/yr in 2020 to 2070, respectively. The city also provides supply for manufacturing demand in Fisher County at 4 acft/yr. Shortages are projected by 2020.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB and in coordination with Region F, the following water management strategies are recommended to meet water needs for the City of Rotan. Conservation was considered; however, the entity's current per capita use rate is below the selected target rate of 140 gpcd.

- a. Water Supply from City of Snyder to meet Contract
 - Cost Source: Costs applied to CRMWD to meet contracts (2020 Region F Water Supply Plan)
 - Date to be Implemented: 2020
 - Project Cost: none, existing infrastructure assumed sufficient
 - Annual Cost: already contracted supplies

Table 5.11-3. Recommended Plan Costs by Decade for City of Rotan

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	(38)	(19)	(19)	(36)	(52)	(66)
Conservation						
Supply from Plan Element (acft/yr)	–	–	–	–	–	–
Annual Cost (\$/yr)	–	–	–	–	–	–
<i>Projected Surplus/(Shortage) after Conservation (acft/yr)</i>	(38)	(19)	(19)	(36)	(52)	(66)
Water Supply from City of Snyder						
Supply from Plan Element (acft/yr)	38	19	19	36	52	66
Annual Cost (\$/yr)	\$0	\$0	\$0	\$0	\$0	\$0
Unit Cost (\$/acft)	\$0	\$0	\$0	\$0	\$0	\$0

5.11.3 County-Other

Entities in Fisher County-Other receive supplies from the Seymour Aquifer at 76 acft/yr and are projected to have a surplus of water through the year 2070. No changes in water supply are recommended. Conservation was also considered; however, the entity's current per capita use rate is below the selected target rate of 140 gpcd.

5.11.4 Manufacturing

Description of Supply

Manufacturing obtains most of its supply from the Dockum Aquifer at 233 acft/yr in combination with minimal supplies from Hamlin at 2 acft/yr and Rotan at 4 acft/yr. Manufacturing is projected to have a surplus of water through the year 2070.

5.11.5 Steam-Electric

No Steam-Electric demand exists nor is projected for the county.

5.11.6 Mining

Description of Supply

Mining is projected to have a shortage of water through the year 2070. The main supply is from the Blaine Aquifer at 216 acft/yr.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to meet the projected shortage of Fisher County Mining. Conservation is recommended.

- a. Conservation
 - Cost Source: Volume II
 - Date to be Implemented: before 2030
 - Annual Cost: Costs to implement industrial conservation technologies will vary based on each location and have not been determined.
- b. Groundwater Development – Blaine Aquifer
 - Cost Source: Volume II
 - Date to be Implemented: before 2030
 - Project Cost: \$511,000
 - Unit Cost: Max of \$291 /acft (2020)

Table 5.11-4. Recommended Plan Costs by Decade for Fisher County – Mining

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	(191)	(186)	(143)	(97)	(57)	(22)
Conservation						
Supply from Plan Element (acft/yr)	12	20	25	22	19	17
Annual Cost (\$/yr)	ND	ND	ND	ND	ND	ND
<i>Projected Surplus/(Shortage) after Conservation (acft/yr)</i>	(179)	(166)	(118)	(75)	(38)	(5)
Groundwater Development – Blaine Aquifer						
Supply from Plan Element (acft/yr)	179	166	118	75	38	5
Annual Cost (\$/yr)	\$55,311	\$51,294	\$12,862	\$8,175	\$4,142	\$545
Unit Cost (\$/acft)	\$309	\$309	\$109	\$109	\$109	\$109

ND – Not Determined. Costs to implement industrial conservation technologies will vary based on each location.

5.11.7 Irrigation

Irrigation uses water supplies from the Blaine at 3,642 acft/yr and Seymour Aquifers at 1,820 acft/yr. Irrigation in Fisher County is projected to have a surplus of water through the year 2070 and no change in water supply is recommended.

5.11.8 Livestock

Livestock is projected to have a no additional need for water through the year 2070 and no changes in water supply are recommended.



5.12 Grimes County Water Supply Plan

Table 5.12-1 lists each water user group in Grimes County and their corresponding surplus or shortage in years 2040 and 2070. A brief summary of the water user groups and the plan for the selected water user are presented in the following subsections.

Table 5.12-1. Grimes County Surplus/(Shortage)

Water User Group	Surplus/(Shortage)		Comment
	2040 (acft/yr)	2070 (acft/yr)	
Dobbin Plantersville WSC	54	67	Projected surplus
G&W WSC	42	59	Projected surplus
City of Navasota	546	403	Projected surplus
TDCJ Luther Units	496	445	Projected surplus
TDCJ W. Pack Unit	178	107	Projected surplus
Wickson Creek SUD			See Brazos County
County-Other	53	122	Projected surplus
Manufacturing	142	213	Projected surplus
Steam-Electric	5,046	5,046	Projected surplus
Mining	(281)	62	Projected shortage - see plan below.
Irrigation	(151)	(151)	Projected shortage - see plan below.
Livestock	0	0	No projected surplus or shortage

5.12.1 Dobbin-Plantersville WSC

Dobbin Plantersville WSC serves customers in Grimes and Montgomery counties. The majority of the demand for the entity is in Montgomery County which is part of Region H. This section will only deal with the supply, demands and strategies that are within the Brazos G Area. Dobbin-Plantersville WSC obtains water supply through groundwater production from the Gulf Coast Aquifer, which is projected to provide 301 acft/yr in available supply. No water supply shortages are projected and no changes in water supply are recommended. Conservation was also considered; however, the entity’s usage is below the selected goal of 140 gpcd.

5.12.2 G&W WSC

G&W WSC serves customers in Grimes and Waller counties. The majority of the demand for the entity is in Waller County which is part of Region H. This section will only deal with the supply, demands and strategies that are the Brazos G Area. G & W WSC obtains water supply through groundwater production from the Gulf Coast Aquifer and through purchases of treated surface water from a supplier in in Region H. Total water supply available to G&W WSC is projected to range from 858 acft/yr at the beginning of the planning period to 2,256 acft/yr at the end. No shortages in supply are projected through

the planning period. No changes in water supply are recommended. Conservation was also considered; however, the entity’s usage is below the selected goal of 140 gpcd.

5.12.3 City of Navasota

Description of Supply

The City of Navasota obtains its water supply solely through groundwater production from the Gulf Coast Aquifer, which is projected to provide 2,153 acft/yr of supply. Additionally, the City provides a portion of supply under contract to Grimes County Manufacturing. No shortages are projected for the City through the planning period and no change to supply is recommended.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended for City of Navasota. Conservation is recommended to reduce usage to a goal of 140 gpcd.

- a. Conservation:
 - Cost Source: Volume II
 - Date to be Implemented: before 2030
 - Annual Cost: maximum of \$135,520
 - Unit Cost: \$560/acft

Table 5.12-2. Recommended Plan Costs by Decade for City of Navasota

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	565	553	546	525	474	403
Conservation						
Supply From Plan Element (acft/yr)	—	110	219	236	238	242
Annual Cost (\$/yr)	—	\$61,600	\$122,640	\$132,160	\$133,280	\$135,520
<i>Projected Surplus/(Shortage) after Conservation (acft/yr)</i>	565	663	765	761	712	645

5.12.4 TDCJ - Luther Units

Description of Supply

The Texas Department of Criminal Justice – Luther Units obtains its water supply through groundwater production from the Gulf Coast Aquifer, which is projected to provide 825 acft/yr of supply. No shortages are projected for the WUG through the planning period.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended for TDCJ – Luther Units. Conservation s recommended to reduce usage to a goal of 140 gpcd.

a. Conservation:

- Cost Source: Volume II
- Date to be Implemented: before 2030
- Annual Cost: maximum \$36,960 in 2070
- Unit Cost: \$560/acft

Table 5.12-3. Recommended Plan Costs by Decade for TDCJ – Luther Units

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	536	514	496	477	460	445
Conservation						
Supply From Plan Element (acft/yr)	—	25	54	61	64	66
Annual Cost (\$/yr)	—	\$14,000	\$30,240	\$34,160	\$35,840	\$36,960
<i>Projected Surplus/(Shortage) after Conservation (acft/yr)</i>	536	539	550	538	524	511

5.12.5 TDCJ – W. Pack Unit

Description of Supply

The Texas Department of Criminal Justice – W. Pack Unit obtains its water supply through groundwater production from the Gulf Cost Aquifer, which is projected to provide 631 acft/yr of supply. No shortages are projected for the WUG through the planning period.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended for TDCJ – W. Pack Unit. Conservation s recommended to reduce usage to a goal of 140 gpcd.

a. Conservation:

- Cost Source: Volume II
- Date to be Implemented: before 2030
- Annual Cost: maximum of \$92,960
- Unit Cost: \$560/acft

Table 5.12-4. Recommended Plan Costs by Decade for TDCJ – W. Pack Unit

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	234	202	178	151	127	107
Conservation						
Supply From Plan Element (acft/yr)	—	36	75	116	159	166
Annual Cost (\$/yr)	—	\$20,160	\$42,000	\$64,960	\$89,040	\$92,960
<i>Projected Surplus/(Shortage) after Conservation (acft/yr)</i>	234	238	253	267	286	273

5.12.6 County-Other

Entities comprising Grimes County-Other obtain water supply through groundwater production from the Gulf Coast and Carrizo-Wilcox Aquifers in the county, which when combined is projected to provide 1,251 acft/yr of available supply. County-Other entities are projected to have a supply surplus of supply through planning period and no change to supply is recommended. Conservation was also considered; however, the entity’s usage is below the selected goal of 140 gpcd.

5.12.7 Manufacturing

Manufacturing operations in Grimes County obtain water supply through groundwater production from the Gulf Coast Aquifer and through purchases of groundwater from the City of Navasota and Wickson Creek SUD. No shortages are projected and no change in supply is recommended.

5.12.8 Steam-Electric

Grimes County Steam-Electric obtains water supply primarily through purchases of raw water under from the City of Huntsville and the Brazos River Authority. Groundwater production from the Gulf Coast Aquifer is also used, though the quantity is relatively small compared to the surface water supplies. No supply shortages are projected for Steam-Electric entities and no change in water supply is recommended.

5.12.9 Mining

Description of Supply

Mining operations in Grimes County are supplied by groundwater from the Gulf Coast Aquifer. Demands for Mining are projected to increase resulting in shortages beginning in 2020.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to meet water needs for Grimes County-Mining. Conservation is recommended.

- a. Conservation
 - Cost Source: Volume II
 - Date to be Implemented: before 2030
 - Annual Cost: not determined
- b. Gulf Coast Aquifer Groundwater Development
 - Cost Source: Volume II
 - Date to be Implemented: before 2030
 - Project Cost: \$744,000
 - Unit Cost: maximum of \$168/acft

Table 5.12-5. Recommended Plan Costs by Decade for Grimes County – Mining

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	(133)	(412)	(281)	(150)	(19)	62
Conservation						
Supply From Plan Element (acft/yr)	10	30	33	24	15	9
Annual Cost (\$/yr)	ND	ND	ND	ND	ND	ND
<i>Projected Surplus/(Shortage) after Conservation (acft/yr)</i>	(123)	(382)	(248)	(126)	(4)	71
Groundwater Development – Gulf Coast Aquifer						
Supply From Plan Element (acft/yr)	382	382	382	382	382	382
Annual Cost (\$/yr)	\$64,000	\$64,000	\$12,000	\$12,000	\$12,000	\$12,000
Unit Cost (\$/acft)	\$168	\$168	\$31	\$31	\$31	\$31

ND – Not determined. Costs to implement industrial conservation technologies will vary based on each location

5.12.10 Irrigation

Description of Supply

Irrigation in Grimes County is supplied through groundwater production from the Gulf Coast, Brazos River Alluvium, and Navasota River Alluvium Aquifers. Water supply shortages are projected in each decade of the planning period for Irrigation.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to meet water needs for Grimes County-Irrigation.

- a. Conservation
 - Cost Source: Volume II
 - Date to be Implemented: before 2030
 - Annual Cost: maximum of \$64,357
 - Unit Cost: \$1,376/acft
- b. Gulf Coast Aquifer Groundwater Development
 - Cost Source: Volume II
 - Date to be Implemented: before 2030
 - Project Cost: \$623,000
 - Unit Cost: maximum of \$382/acft

Table 5.12-6. Recommended Plan Costs by Decade for Grimes County – Irrigation

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	(151)	(151)	(151)	(151)	(151)	(151)
Conservation						
Supply From Plan Element (acft/yr)	20	33	47	47	47	47
Annual Cost (\$/yr)	\$27,582	\$45,970	\$64,357	\$64,357	\$64,357	\$64,357
<i>Projected Surplus/(Shortage) after Conservation (acft/yr)</i>	(131)	(118)	(104)	(104)	(104)	(104)
Groundwater Development – Gulf Coast Aquifer						
Supply From Plan Element (acft/yr)	131	131	131	131	131	131
Annual Cost (\$/yr)	\$50,000	\$50,000	\$6,000	\$6,000	\$6,000	\$6,000
Unit Cost (\$/acft)	\$382	\$382	\$46	\$46	\$46	\$46

5.12.11 Livestock

Livestock in Grimes County is supplied through local stock surface water impoundments. No shortage is projected during the planning period and no change in water supply is recommended.

5.13 Hamilton County Water Supply Plan

Table 5.13–1 lists each water user group in Hamilton County and their corresponding surplus or shortage in years 2040 and 2070. A brief summary of the water user groups and the plan for the selected water user are presented in the following subsections.

Table 5.13–1. Hamilton County Surplus/(Shortage)

Water User Group	Surplus/(Shortage)		Comment
	2040 (acft/yr)	2070 (acft/yr)	
City of Hamilton	173	181	Projected surplus
City of Hico	396	400	Projected surplus
Multi-County WSC			See Coryell County
County-Other	28	30	Projected surplus
Manufacturing	0	0	No projected surplus or shortage
Steam-Electric	—	—	No projected demand
Mining	155	256	Projected shortage (2020) – See plan below
Irrigation	176	168	Projected surplus
Livestock	0	0	No projected surplus or shortage

5.13.1 City of Hamilton

Description of Supply

The City of Hamilton obtains its water supply through purchases of treated surface water under contract from the Upper Leon River Municipal Water District. The water supplied by the Upper Leon River Municipal Water District is diverted from Lake Proctor under contracts with the Brazos River Authority. The City of Hamilton is projected to obtain up to 921 acft/yr of treated surface water supply from the Upper Leon River Municipal Water District through the planning period. No shortages in water supply are projected for the City through the planning period and no change in supply is recommended.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following plan is recommended for City of Hamilton. Conservation is recommended to reduce usage to a goal of 140 gpcd.

- a. Conservation
 - Cost Source: Volume II
 - Date to be Implemented: before 2030
 - Unit Cost: \$560/acft
 - Annual Cost: \$16,800 in 2030

Table 5.13–2. Recommended Plan Costs by Decade for City of Hamilton

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	158	162	173	180	181	181
Conservation						
Supply From Plan Element (acft/yr)	—	30	19	12	11	11
Annual Cost (\$/yr)	—	\$16,800	\$10,640	\$6,720	\$6,160	\$6,160
<i>Projected Surplus/(Shortage) after Conservation (acft/yr)</i>	158	192	192	192	192	192
Additional Demands from Recommended Strategies from Others						
Increase Contract to Multi-County WSC (acft/yr)	(46)	(67)	(91)	(115)	(144)	(174)
<i>Total Surplus/(Shortage) Including Recommended Strategies</i>	112	125	101	77	48	18

5.13.2 City of Hico

The City of Hico obtains its water supply through groundwater production from the Trinity Aquifer, which is projected to provide a constant 567 acft/yr of supply through the planning period. No shortages in supply are projected for the City during the planning period and no change in water supply is recommended. Conservation was also considered; however, the entity’s usage is below the selected goal of 140 gpcd.

5.13.3 County-Other

Entities in Hamilton County-Other obtain their water supply through groundwater production from the Trinity Aquifer, which is projected to provide a constant 450 acft/yr of supply. No shortages are projected throughout the planning period and no change in water supply is recommended. Conservation was also considered; however, the entity’s usage is below the selected goal of 140 gpcd.

5.13.4 Manufacturing

Manufacturing water supply in Hamilton County is obtained through groundwater production from the Trinity Aquifer. No shortage is projected through the planning period and no change in water supply is recommended.

5.13.5 Steam-Electric

There is no projected water demand for Steam-Electric in Hamilton County.

5.13.6 Mining

Description of Supply

Mining operations in Hamilton County are supplied through groundwater production from the Trinity Aquifer. Shortages are projected to occur at the beginning of the planning period for Mining in Hamilton County.

Recommended Strategy

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following plan is recommended for Hamilton County Mining. Conservation is recommended. Associated costs are included for each strategy.

- a. Conservation
 - Cost Source: Volume II
 - Date to be Implemented: before 2030
 - Annual Cost: not determined
- b. Trinity Aquifer Groundwater Development
 - Cost Source: Volume II
 - Date to be Implemented: before 2030
 - Project Cost: \$548,000
- c. Unit Cost: maximum of \$368/acft

Table 5.13–3. Recommended Plan Costs by Decade for Hamilton County – Mining

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	(137)	20	155	256	256	256
Conservation						
Supply From Plan Element (acft/yr)	12	12	7	—	—	—
Annual Cost (\$/yr)	ND	ND	ND	—	—	—
<i>Projected Surplus/(Shortage) after Conservation (acft/yr)</i>	(125)	32	162	256	256	256
Groundwater Development – Trinity Aquifer						
Supply From Plan Element (acft/yr)	125	125	125	125	125	125
Annual Cost (\$/yr)	\$46,000	\$46,000	\$7,000	\$7,000	\$7,000	\$7,000
Unit Cost (\$/acft)	\$368	\$368	\$56	\$56	\$56	\$56

ND – Not determined. Costs to implement industrial conservation technologies will vary based on each location

5.13.7 Irrigation

Irrigation water supply in Hamilton County is obtained through groundwater production from the Trinity Aquifer. No water supply shortages are projected for Irrigation through the planning period and no change in water supply is recommended.

5.13.8 Livestock

Livestock water supply is obtained through local stock surface water impoundments and is projected to meet demands through the planning period. No change in water supply is recommended.



5.14 Haskell County Water Supply Plan

Table 5.14-1 lists each water user group in Haskell County and their corresponding surplus or shortage in years 2040 and 2070. A brief summary of the water user groups and the plan for the selected water user are presented in the following subsections.

Table 5.14-1. Haskell County Surplus/(Shortage)

Water User Group	Surplus/(Shortage)		Comment
	2040 (acft/yr)	2070 (acft/yr)	
City of Haskell	(468)	(499)	Projected shortage - see plan below.
City of Stamford			See Jones County
County-Other	19	1	Projected surplus
Manufacturing	—	—	No projected demand
Steam-Electric	—	—	No projected demand
Mining	(83)	(59)	Projected shortage - see plan below.
Irrigation	(14,462)	(15,835)	Projected shortage - see plan below.
Livestock	0	0	No projected surplus or shortage

5.14.1 City of Haskell

Description of Supply

Surface water supplies are obtained from a contract with North Central Texas Municipal Water Authority (NCTMWA). While the contract exceeds the City’s projected demands, the current supplies from the NCTMWA are not sufficient to meet demands through 2070.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended to meet the projected water shortage for the City of Haskell. Conservation was also considered; however, the entity’s usage is below the selected goal of 140 gpcd. Needs remain unmet in 2020. These needs will only occur during a drought equivalent or worse than the drought of record. While not a strategy recommended by the Brazos G RWPG, the impacts of the unmet needs can be mitigated through demand management in the event of a serious drought prior to the recommended strategies coming online.

- a. Lake Creek Reservoir. This strategy would be developed by NCTMWA to augment existing supplies.
 - Cost Source: Volume II
 - Project requires a subordination agreement with the BRA in order to develop sufficient supply
 - Date to be Implemented: before 2030

- Project Cost: none (cost would be borne by NCTMWA)
- Unit Cost: none (supply already purchased from NCTMWA)

Table 5.14-2. Recommended Plan Costs by Decade for City of Haskell

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	(477)	(473)	(468)	(471)	(483)	(499)
Conservation						
Supply From Plan Element (acft/yr)	—	—	—	—	—	—
Annual Cost (\$/yr)	—	—	—	—	—	—
<i>Projected Surplus/(Shortage) after Conservation (acft/yr)</i>	(477)	(473)	(468)	(471)	(483)	(499)
Lake Creek Reservoir						
Supply From Plan Element (acft/yr)	—	473	468	472	483	499
Annual Cost (\$/yr)	—	—	—	—	—	—
Unit Cost (\$/acft)	—	—	—	—	—	—

5.14.2 County-Other

Supplies for Haskell County other are obtained through groundwater production from the Seymour Aquifer and through contract supply purchases from the City of Stamford and NCTMWA. Although supplies from NCTMWA have been reduced due to projected availability of supplies, County-Other supplies are projected to be adequate to meet demands through 2070. No supply shortages are projected and no change in supply is recommended. Conservation was also considered; however, the entity’s usage is below the selected goal of 140 gpcd.

5.14.3 Manufacturing

No Manufacturing demand exists or is projected for the county.

5.14.4 Steam-Electric

No Steam-Electric demand exists or is projected for the county.

5.14.5 Mining

Description of Supply

Mining operations in Haskell County are supplied solely through groundwater production from the Seymour Aquifer; however, this aquifer is projected to have zero supply availability through the planning period.

Recommended Strategy

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to meet water needs for Haskell County-Mining. Conservation is recommended.

- a. Conservation
 - Cost Source: Volume II
 - Date to be Implemented: before 2030
 - Annual Cost: not determined
- b. Leave Needs Unmet:
 - Cost Source: Cost of not meeting needs – see appendix G
 - Date to be Implemented: before 2030

Table 5.14-3. Recommended Plan Costs by Decade for Haskell County – Mining

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	(93)	(92)	(83)	(74)	(66)	(59)
Conservation						
Supply From Plan Element (acft/yr)	3	5	6	5	5	4
Annual Cost (\$/yr)	ND	ND	ND	ND	ND	ND
<i>Projected Surplus/(Shortage) after Conservation (acft/yr)</i>	(90)	(87)	(77)	(69)	(61)	(55)
Leave Needs Unmet (acft/yr)	(90)	(87)	(77)	(69)	(61)	(55)

ND – Not determined. Costs to implement industrial conservation technologies will vary based on each location

5.14.6 Irrigation

Description of Supply

Haskell County Irrigation is supplied through groundwater production from the Seymour Aquifer; however, no available supply is projected for this aquifer through the planning period.

Recommended Strategy

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to meet water needs for Haskell County-Irrigation. Conservation is recommended.

- a. Conservation
 - Cost Source: Volume II
 - Date to be Implemented: before 2030
 - Annual Cost: maximum of \$6,391,940

- Unit Cost: \$1,594/acft
- b. Leave Needs Unmet:
- Cost Source: Cost of not meeting needs – see appendix G
 - Date to be Implemented: before 2030

Table 5.14-4. Recommended Plan Costs by Decade for Haskell County – Irrigation

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	(16,679)	(16,793)	(14,462)	(14,742)	(15,721)	(15,835)
Conservation						
Supply From Plan Element (acft/yr)	1,747	2,912	3,922	3,933	4,010	4,010
Annual Cost (\$/yr)	\$2,784,718	\$4,641,728	\$6,251,668	\$6,269,202	\$6,391,940	\$6,391,940
<i>Projected Surplus/(Shortage) after Conservation (acft/yr)</i>	(14,932)	(13,881)	(10,540)	(10,809)	(11,711)	(11,825)
Leave Needs Unmet (acft/yr)	(14,932)	(13,881)	(10,540)	(10,809)	(11,711)	(11,825)

5.14.7 Livestock

Livestock water supply is projected to meet demands through 2070 and no changes in water supply are recommended.

5.15 Hill County Water Supply Plan

Table 5.15-1 lists each water user group in Hill County and their corresponding surplus or shortage in years 2040 and 2070. For each water user group with a projected shortage, a water supply plan has been developed and is presented in the following subsections. Water supply plans are also presented for some entities that need pumping/conveyance facilities to utilize their existing water resources, or to become a regional provider.

Table 5.15-1. Hill County Surplus/(Shortage)

Water User Group	Surplus/(Shortage)		Comment
	2040 (acft/yr)	2070 (acft/yr)	
Birome WSC	197	180	Projected surplus
Bold Springs WSC			See McLennan County
Brandon-Irene WSC	208	151	Projected surplus
Chatt WSC	15	(12)	Projected shortage - see plan below.
Double Diamond Utilities	(25)	(93)	Projected shortage - see plan below.
Files Valley WSC	704	441	Projected surplus
Gholson WSC			See McLennan County
HILCO United Services	167	46	Projected surplus
Hill County WSC	317	262	Projected surplus
City of Hillsboro	1,510	1,185	Projected surplus
City of Hubbard	263	208	Projected surplus
City of Itasca	64	54	Projected surplus
Johnson County SUD			See Johnson County
Parker WSC			See Johnson County
Post Oak SUD	(4)	(184)	Projected shortage - see plan below.
City of Whitney	(49)	(77)	Projected shortage - see plan below.
Woodrow-Osceola WSC	343	297	Projected surplus
County-Other	(59)	(70)	Projected shortage - see plan below.
Manufacturing	54	69	Projected surplus
Steam-Electric	(4,120)	(4,120)	Projected shortage - see plan below.
Mining	623	926	Projected surplus
Irrigation	(210)	(211)	Projected shortage - see plan below.
Livestock	0	0	No projected surplus or shortage

5.15.1 Birome WSC

Birome WSC is located in Hill, Limestone, and McLennan Counties, however most of its demand is within Hill County. Birome WSC obtains its water from the Trinity Aquifer and

purchases water from Post Oak SUD. Surpluses are projected through 2070 for Birome WSC, and no changes in water supply are recommended. Conservation was considered; however, the entity’s usage is below the selected goal of 140 gpcd.

5.15.2 Brandon-Irene WSC

Brandon-Irene WSC is located in Hill, Ellis and Navarro County, however most of its demand is located in Hill County. Brandon-Irene WSC obtains its water from the Trinity Aquifer and surface water through a contract with Aquilla WSD. The WSC also provides supply to the City of Bynum in Hill County. Surpluses are projected through 2070 for Brandon Irene WSC, and no changes in water supply are recommended. Conservation was also considered; however, the entity’s usage is below the selected goal of 140 gpcd.

Table 5.15-2. Recommended Plan Costs by Decade for Brandon-Irene WSC

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	203	215	208	193	179	151
Conservation						
Supply From Plan Element (acft/yr)	—	—	—	—	—	—
Annual Cost (\$/yr)	—	—	—	—	—	—
<i>Projected Surplus/(Shortage) after Conservation (acft/yr)</i>	203	215	208	193	179	151
Additional Demands from Recommended Strategies from Others						
Increase Supplies to Hill County-Other (acft/yr)	57	63	59	66	63	70
<i>Projected Surplus/(Shortage) after Recommended Strategies (acft/yr)</i>	146	152	149	127	116	81

5.15.3 Chatt WSC

Description of Supply

Chatt WSC obtains water supply from the Trinity Aquifer and purchases treated surface water from Aquilla Water Supply. The WSC also provides water to Hill County Manufacturing. A shortage is projected for Chatt WSC beginning in 2060 and continuing through 2070.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following plan is recommended to meet projected needs. Associated costs are included for each strategy. Conservation was also considered; however, the entity’s usage is below the selected goal of 140 gpcd.

a. Purchase Water from Files Valley WSC

- Cost Source: Volume II

- Date to be Implemented: 2060
- Project Cost: Cost of purchase only
- Unit Cost: \$652/acft

Table 5.15-3. Recommended Plan Costs by Decade for Chatt WSC

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	23	22	15	7	(1)	(12)
Conservation						
Supply From Plan Element (acft/yr)	—	—	—	—	—	—
Annual Cost (\$/yr)	—	—	—	—	—	—
<i>Projected Surplus/(Shortage) after Conservation (acft/yr)</i>	23	22	15	7	(1)	(12)
Purchase Water from Files Valley WSC						
Supply From Plan Element (acft/yr)	—	—	—	—	1	12
Annual Cost (\$/yr)	—	—	—	—	\$652	\$7,820
Unit Cost (\$/acft)	—	—	—	—	\$652	\$652

5.15.4 Double Diamond Utilities

Description of Supply

Double Diamond Utilities is located in Hill and Johnson Counties, however most of its demand is located in Hill County. The Utility obtains water supply from the Trinity Aquifer and has a contract to purchase surface water from the Brazos River Authority (BRA), however the Utility does not have the infrastructure to utilize the BRA supply. With conservation as a recommended water management strategy, Double Diamond Utilities' water supply is projected to be sufficient throughout the planning period. Balances represented in Table 5.15-4 are for the entire Utility.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following plan is recommended to meet projected needs. Conservation is recommended to reduce usage to a goal of 140 gpcd.

- Conservation
 - Cost Source: Volume II
 - Date to be Implemented: by 2030
 - Project Cost: maximum of \$89,549 in 2070
 - Unit Cost: \$560/acft

- b. BRA System Operations
 - Cost Source: Volume II
 - Date to be Implemented: by 2030
 - Project Cost: maximum of \$29,640 in 2050
 - Unit Cost: \$76/acft

Table 5.15-4. Recommended Plan Costs by Decade for Double Diamond Utilities

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	0	(15)	(25)	(39)	(48)	(93)
Conservation						
Supply From Plan Element (acft/yr)	0	38	75	115	148	160
Annual Cost (\$/yr)	\$0	\$21,186	\$42,082	\$64,377	\$82,769	\$89,549
<i>Projected Surplus/(Shortage) after Conservation (acft/yr)</i>	0	23	50	76	100	67
BRA System Operations						
Supply From Plan Element (acft/yr)	367	378	390	390	390	390
Annual Cost (\$/yr)	\$27,892	\$28,728	\$29,640	\$29,640	\$29,640	\$29,640
Unit Cost (\$/acft)	\$76	\$76	\$76	\$76	\$76	\$76

5.15.5 Files Valley WSC

Files Valley WSC is located in Hill and Ellis (Region C) counties, however most of its demand is located in Hill County. The WSC has a contract for 1,709 acft/yr of treated surface water from Lake Aquilla through Aquilla Water Supply District. Files Valley WSC also provides water to Parker WSC and and Ellis County-Other entities. The WSC has a projected surplus throughout the planning period and no changes in water supply are recommended. Conservation was considered; however, the entity’s usage is below the selected goal of 140 gpcd.

5.15.6 HILCO United Services

HILCO United Services is located in Hill, Ellis, and Bosque counties, however most of its demand is located in Hill County. HILCO United Services obtains its water supply from the Trinity Aquifer and has a contract for 150 acft/yr of surface water from Lake Aquilla through the BRA. HILCO United Services has contracted for 150 acft/yr of surface water supplies from the Brazos River Authority, which can supply 150 acft/yr in 2020 and 143 acft/yr in 2070, based on water availability analyses proscribed under water planning guidelines. Surpluses are projected for HILCO United Services throughout all counties for the entire planning period. No changes in water supply are recommended. Conservation was considered; however, the entity’s usage is below the selected goal of 140 gpcd.

5.15.7 Hill County WSC

Hill County WSC obtains its water supply from the Trinity Aquifer and a treated surface water contract with Aquilla Water Supply District. The existing contract and production capacity of the wells and groundwater availability are adequate to supply the needs of the WSC through the year 2070. No change in water supply is recommended. Conservation was considered; however, the entity’s usage is below the selected goal of 140 gpcd.

5.15.8 City of Hillsboro

Description of Supply

The City of Hillsboro purchases its water supply from the Aquilla WSD and has surpluses projected through 2070.

Water Supply Plan

Although the City has sufficient supplies, working within the planning criteria established by the Brazos G RWPG and TWDB. Conservation is recommended to reduce usage to a goal of 140 gpcd.

a. Conservation

- Cost Source: Volume II
- Date to be Implemented: before 2030
- Annual Cost: maximum of \$292,621 in 2070
- Unit Cost: \$560/acft

Table 5.15-5. Recommended Plan Costs by Decade for the City of Hillsboro

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	1,846	1,564	1,510	1,442	1,378	1,185
Conservation						
Supply From Plan Element (acft/yr)	0	157	320	493	516	523
Annual Cost (\$/yr)	\$0	\$87,718	\$179,420	\$276,289	\$289,015	\$292,621
<i>Projected Surplus/(Shortage) after Conservation (acft/yr)</i>	1,846	1,721	1,830	1,935	1,894	1,708

5.15.9 City of Hubbard

Description of Supply

The City of Hubbard obtains its water supply the Trinity Aquifer and from Lake Navarro Mills through the Post Oak Special Utility District (SUD). The City of Hubbard has a projected surplus throughout the planning period. No change in water supply is recommended. Conservation was considered; however, the entity’s usage is below the selected goal of 140 gpcd.

5.15.10 City of Itasca

The City of Itasca obtains its water supply from the Trinity Aquifer. The production capacity of the wells and groundwater availability are adequate to supply the demands of the City of Itasca through the year 2070. No change in water supply is recommended. Conservation was considered; however, the entity’s usage is below the selected goal of 140 gpcd.

5.15.11 Post Oak SUD

Description of Supply

Post Oak SUD services Hill, Navarro, and Limestone counties, however the majority of demand is in Hill County. Post Oak SUD purchases raw and treated surface water supply from Corsicana and Trinity River Authority. The SUD has a projected water supply shortage beginning in 2020 and continuing throughout the planning period. Balance and strategies represented in Table 5.15-6 are for the entire SUD across all counties and planning areas.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following plan is recommended to meet projected needs. Associated costs are included for each strategy. Conservation was also considered; however, the entity’s usage is below the selected goal of 140 gpcd.

- a. Purchase Additional Supply from Corsicana
 - Cost Source: Volume II
 - Date to be Implemented: 2020
 - Annual Cost: maximum of \$281,274 in 2070
 - Unit Cost: \$2,591/acft

Table 5.15-6. Recommended Plan Costs by Decade for Post Oak SUD

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	0	0	(4)	(63)	(121)	(184)
Conservation (Region C conservation strategy)						
Supply From Plan Element (acft/yr)	—	—	1	1	1	1
Annual Cost (\$/yr)	—	—	—	—	—	—
<i>Projected Surplus/(Shortage) after Conservation (acft/yr)</i>	0	0	(3)	(62)	(120)	(183)
Purchase Additional Supply from Corsicana						
Supply From Plan Element (acft/yr)	—	—	3	62	120	183
Annual Cost (\$/yr)	—	—	\$7,773	\$160,600	\$131,000	\$338,200
Unit Cost (\$/acft)	—	—	\$1,092	\$1,848	\$1,848	\$2,167

5.15.12 City of Whitney

Description of Supply

The City of Whitney obtains its water supply from the Trinity Aquifer. The City of Whitney has also contracted with the Brazos River Authority for 750 acft/yr of supply from Lake Whitney; however, the City has not constructed the required infrastructure to utilize this supply.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following plan is recommended to meet projected needs. Associated costs are included. Conservation is recommended to reduce usage to a goal of 140 gpcd.

a. Conservation:

- Cost Source: Volume II
- Date to be Implemented: by 2030
- Annual Cost: maximum of \$43,126 in 2070
- Unit Cost: \$560/acft

Table 5.15-7. Recommended Plan Costs by Decade for City of Whitney

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	0	(38)	(49)	(67)	(75)	(77)
Conservation						
Supply From Plan Element (acft/yr)	0	38	76	74	75	77
Annual Cost (\$/yr)	\$0	\$21,109	\$42,318	\$41,530	\$41,905	\$43,126
<i>Projected Surplus/(Shortage) after Conservation (acft/yr)</i>	0	0	27	7	0	0

5.15.13 Woodrow-Osceola WSC

Woodrow-Osceola WSC obtains its water supply from the Trinity Aquifer. The existing production capacity of the wells and groundwater availability are adequate to supply the demands of the WSC through the year 2070. No change in water supply is recommended. Conservation was considered; however, the entity’s usage is below the selected goal of 140 gpcd.

5.15.14 County-Other

Description of Supply

Entities in Hill County-Other use Trinity and Woodbine Aquifer groundwater and surface water from Brandon-Irene WSC, Corsicana, and the Trinity River Authority. County-Other entities are projected to have a shortage in water supply from 2020 through 2070.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following plan is recommended to meet projected needs. Associated costs are included for each strategy. Conservation was also considered; however, the entity's usage is below the selected goal of 140 gpcd.

a. Purchase Additional Supply from Brandon-Irene WSC

- Cost Source: Volume II
- Date to be Implemented: 2020
- Project Cost: Cost of purchase only
- Unit Cost: \$1,629/acft

Table 5.15-8. Recommended Plan Costs by Decade for Hill County – Other

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	(57)	(63)	(59)	(67)	(64)	(70)
Conservation						
Supply From Plan Element (acft/yr)	—	—	—	—	—	—
Annual Cost (\$/yr)	—	—	—	—	—	—
<i>Projected Surplus/(Shortage) after Conservation (acft/yr)</i>	(57)	(63)	(59)	(66)	(63)	(70)
Purchase Additional Supply from Brandon-Irene WSC						
Supply From Plan Element (acft/yr)	57	63	59	66	63	70
Annual Cost (\$/yr)	\$92,868	\$102,643	\$96,126	\$107,531	\$102,643	\$114,048
Unit Cost (\$/acft)	\$1,629	\$1,629	\$1,629	\$1,629	\$1,629	\$1,629

5.15.15 Manufacturing

Hill County Manufacturing purchases its water supply from Chatt WSC and is projected to have sufficient water supplies through the year 2070. No changes in water supply are recommended. Conservation was considered; however, the entity's usage is below the selected goal of 140 gpcd.

5.15.16 Steam-Electric

Description of Supply

There is no current water supply for steam-electric operations in Hill County, however a shortage is projected from 2020 through 2070. A planned power generation project which formed the basis for those demand projections is no longer being pursued and the resulting shortages should be left unmet.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following plan is recommended for Hill County Steam-Electric. Associated costs are included.

- a. Leave Needs Unmet:
 - Cost Source: Cost of leaving needs unmet – see Appendix G
 - Date to be Implemented: 2020

Table 5.15-9. Recommended Plan Costs by Decade for Hill County – Steam-Electric

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	(4,120)	(4,120)	(4,120)	(4,120)	(4,120)	(4,120)
Conservation						
Supply From Plan Element (acft/yr)	—	—	—	—	—	—
Annual Cost (\$/yr)	—	—	—	—	—	—
<i>Projected Surplus/(Shortage) after Conservation (acft/yr)</i>	(4,120)	(4,120)	(4,120)	(4,120)	(4,120)	(4,120)
Leave Needs Unmet (acft/yr)	(4,120)	(4,120)	(4,120)	(4,120)	(4,120)	(4,120)

5.15.17 Mining

Description of Supply

Supplies for Mining in Hill County include groundwater from the Trinity, Woodbine, and Brazos River Alluvium Aquifers and from a BRA contract for 1,000 acft/yr. Mining is projected to have a shortage in 2020, while 2030 through 2070 show projected surpluses.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following plan is recommended for Hill County Mining. Associated costs are included for each strategy. Conservation is recommended.

- a. Conservation:
 - Cost Source: Volume II
 - Date to be Implemented: by 2030
 - Annual Cost: not determined
- b. Leave Needs Unmet:
 - Cost Source: Cost of leaving needs unmet – see Appendix G
 - Date to be Implemented: 2020

Table 5.15-10. Recommended Plan Costs by Decade for Hill County – Mining

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	(236)	208	623	995	962	926
Conservation						
Supply From Plan Element (acft/yr)	49	60	54	28	31	33
Annual Cost (\$/yr)	ND	ND	ND	ND	ND	ND
<i>Projected Surplus/(Shortage) after Conservation (acft/yr)</i>	(187)	208	623	995	962	926
Leave Needs Unmet (acft/yr)	(187)	—	—	—	—	—

ND – Not determined. Costs to implement industrial conservation technologies will vary based on each location

5.15.18 Irrigation

Description of Supply

Supplies for Irrigation in Hill County include groundwater from the Woodbine and Brazos River Alluvium Aquifers, and from a BRA contract for 1,000 acft/yr. Irrigation is projected to have shortages from 2020 through 2070.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following plan is recommended for Hill County Irrigation. Associated costs are included for each strategy. Conservation is recommended.

a. Conservation:

- Cost Source: Volume II
- Date to be Implemented: by 2030
- Annual Cost: maximum of \$83,334
- Unit Cost: \$680/acft

b. Groundwater Development – Woodbine Aquifer:

- Cost Source: Volume II
- Date to be Implemented: by 2030
- Project Cost: \$870,000
- Unit Cost: \$468/acft

Table 5.15-11. Recommended Plan Costs by Decade for Hill County – Irrigation

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	(210)	(211)	(210)	(211)	(210)	(211)
Conservation						
Supply From Plan Element (acft/yr)	53	88	123	123	123	123
Annual Cost (\$/yr)	\$35,714	\$59,524	\$83,334	\$83,334	\$83,334	\$83,334
<i>Projected Surplus/(Shortage) after Conservation (acft/yr)</i>	(158)	(124)	(88)	(89)	(88)	(89)
Groundwater Development – Woodbine Aquifer						
Supply From Plan Element (acft/yr)	158	158	158	158	158	158
Annual Cost (\$/yr)	\$74,000	\$74,000	\$13,000	\$13,000	\$13,000	\$13,000
Unit Cost (\$/acft)	\$468	\$468	\$82	\$82	\$82	\$82

5.15.19 Livestock

Livestock water supply is projected to meet demands through the year 2070 and no changes in water supply are recommended.

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5.16 Hood County Water Supply Plan

Table 5.16-1 lists each water user group in Hood County and their corresponding surplus or shortage in years 2040 and 2070. A brief summary of the water user groups and the plan for the selected water user are presented in the following subsections.

Table 5.16-1. Hood County Surplus/(Shortage)

Water User Group	Surplus/(Shortage)		Comment
	2040 (acft/yr)	2070 (acft/yr)	
Acton MUD	(1,126)	(4,203)	Projected shortage - see plan below
City of Granbury	144	(342)	Projected shortage - see plan below
City of Lipan	33	9	Projected surplus
Santo SUD			See Palo Pinto County
City of Tolar	41	4	Projected surplus
County-Other	(759)	924	Projected surplus
Manufacturing	10,008	10,008	Projected surplus
Steam-Electric	0	0	No projected surplus or shortage
Mining	(821)	(656)	Projected shortage - see plan below
Irrigation	417	417	Projected surplus
Livestock	0	0	No projected surplus or shortage

5.16.1 Acton MUD

Description of Supply

The Acton MUD service area includes portions of Hood and Johnson Counties. Acton MUD obtains its water supply from groundwater from the Trinity Aquifer and a contract with the Brazos River Authority for water from Lake Granbury. Treated surface water is constrained by the SWATS plant capacity, co-owned with Johnson County SUD through the Brazos Regional Public Utility Agency. The surpluses and shortages shown in Table 5.16-2 represent the cumulative totals for Acton MUD in Hood and Johnson Counties.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to meet the projected water shortage for Acton MUD. Conservation was considered; however, the entity's usage is below the selected goal of 140 gpcd.

- a. Groundwater Development – Trinity Aquifer
 - Cost Source: Volume II
 - Date to be implemented: by 2030

- Project Cost: \$965,000
 - Annual Cost: \$89,000
- b. Increase WTP Capacity (SWATS):
- Cost Source: Volume II
 - Date to be Implemented: by 2040
 - Project Cost: \$23,934,000 (Acton MUD portion)
 - Annual Cost: \$2,611,000
- c. Trinity Johnson County ASR
- Cost Source: Volume II
 - Date to be Implemented: by 2020
 - Project Cost: \$17,296,000 (Acton MUD portion)
 - Unit Cost: \$662/acft

Table 5.16-2. Recommended Plan Costs by Decade for Acton MUD

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	1,546	(50)	(1,126)	(1,708)	(2,933)	(4,203)
Conservation						
Supply From Plan Element (acft/yr)	—	—	—	—	—	—
Annual Cost (\$/yr)	—	—	—	—	—	—
<i>Projected Surplus/(Shortage) after Conservation (acft/yr)</i>	1,546	(50)	(1,126)	(1,708)	(2,933)	(4,203)
Groundwater Development – Trinity Aquifer (Hood and Johnson Counties)						
Supply From Plan Element (acft/yr)	—	51	51	51	51	451
Annual Cost (\$/yr)	—	\$89,000	\$89,000	\$21,000	\$21,000	\$185,812
Unit Cost (\$/acft)	—	\$1,745	\$1,745	\$412	\$412	\$412
Increase WTP Capacity (SWATS)						
Supply From Plan Element (acft/yr)	—	—	3,752	3,752	3,752	3,752
Annual Cost (\$/yr)	—	—	\$2,611,400	\$2,611,400	\$1,091,800	\$1,091,800
Unit Cost (\$/acft)	—	—	\$696	\$696	\$291	\$291
Alternative: Johnson County ASR						
Supply From Plan Element (acft/yr)	2,526	2,526	2,526	2,526	2,526	2,526
Annual Cost (\$/yr)	\$1,672,212	\$1,672,212	\$454,680	\$454,680	\$454,680	\$454,680
Unit Cost (\$/acft)	\$662	\$662	\$180	\$180	\$180	\$180

5.16.2 City of Granbury

Description of Supply

The City of Granbury obtains its water supply from groundwater from the Trinity Aquifer and a contract with the Brazos River Authority for water from Lake Granbury. There is a water treatment plant constraint on the surface water from Lake Granbury, and a water supply shortage is projected beginning in 2050.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to meet the projected water shortage for Granbury. Conservation was considered; however, the entity’s usage is below the selected goal of 140 gpcd.

- a. Granbury North Water Treatment Plant:
 - Cost Source: Volume II
 - Date to be Implemented: by 2030
 - Project Cost: \$45,500,000
 - Annual Cost: \$7,155,000 (maximum of phased costs)

Table 5.16-3. Recommended Plan Costs by Decade for the City of Granbury

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	673	365	144	(55)	(216)	(342)
Conservation						
Supply From Plan Element (acft/yr)	—	—	—	—	—	—
Annual Cost (\$/yr)	—	—	—	—	—	—
<i>Projected Surplus/(Shortage) after Conservation (acft/yr)</i>	673	365	144	(55)	(216)	(342)
Granbury North Water Treatment Plant						
Supply From Plan Element (acft/yr)	—	2,800	2,800	2,800	2,800	2,800
Annual Cost (\$/yr)	—	\$7,155,000	\$7,155,000	\$3,954,000	\$3,954,000	\$3,954,000
Unit Cost (\$/acft)	—	\$2,555	\$2,555	\$1,412	\$1,412	\$1,412

5.16.3 City of Lipan

The City of Lipan receives supply from the Trinity Aquifer. There is a surplus projected for the City throughout the planning period and no changes in water supply are recommended. Conservation was considered; however, the entity’s usage is below the selected goal of 140 gpcd.

5.16.4 City of Tolar

The City of Lipan receives supply from the Trinity Aquifer. There is a surplus projected for the City throughout the planning period and no changes in water supply are recommended. Conservation was considered; however, the entity’s usage is below the selected goal of 140 gpcd.

5.16.5 County-Other

Description of Supply

Entities in Hood County-Other receive groundwater from the Trinity Aquifer and surface water supplies through contracts with Acton MUD. Future population in County-Other is expected to decrease over time as those people begin to be served by retail water utilities. Shortages are projected from 2020 through 2050.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended to meet water needs for County-Other entities. Conservation was considered; however, the entity’s usage is below the selected goal of 140 gpcd.

- a. Trinity Aquifer Development
 - Cost Source: Volume II
 - Date to be Implemented: before 2030
 - Project Cost: \$6,210,000
 - Unit Cost: \$435/acft

Table 5.16-4. Plan Costs by Decade for Hood County – Other

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	(1,845)	(1,135)	(759)	(687)	77	924
Conservation						
Supply From Plan Element (acft/yr)	—	—	—	—	—	—
Annual Cost (\$/yr)	—	—	—	—	—	—
<i>Projected Surplus/(Shortage) after Conservation (acft/yr)</i>	(1,845)	(1,135)	(759)	(687)	77	924
Trinity Aquifer Development						
Supply From Plan Element (acft/yr)	1,845	1,845	1,845	1,845	1,845	1,845
Annual Cost (\$/yr)	\$803,000	\$803,000	\$366,000	\$366,000	\$366,000	\$366,000
Unit Cost (\$/acft)	\$435	\$435	\$198	\$198	\$198	\$198

5.16.6 Manufacturing

Hood County Manufacturing obtains treated water from the Trinity Aquifer untreated surface water from the BRA. Hood County Manufacturing is projected to have a surplus of water through the year 2070 and no changes in water supply are recommended.

5.16.7 Steam-Electric

Steam-Electric operations in Hood County are supplied by water from Lake Granbury. No shortages are projected and no change in water supply is recommended.

5.16.8 Mining

Description of Supply

Mining operations in Hood County are supplied by Trinity Groundwater. Demands for Mining are projected to increase significantly, resulting in shortages beginning in 2020.

Recommended Strategy

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to meet water needs for Hood County-Mining. Conservation is recommended.

- a. Conservation
 - Cost Source: Volume II
 - Date to be Implemented: before 2030
 - Annual Cost: not determined
- b. Groundwater Development – Trinity Aquifer
 - Cost Source: Volume II
 - Date to be Implemented: before 2030
 - Project Cost: \$1,027,000
 - Unit Cost: Max of \$112/acft

Table 5.16-5. Recommended Plan Costs by Decade for Hood County – Mining

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	(677)	(1,035)	(821)	(732)	(642)	(656)
Conservation						
Supply From Plan Element (acft/yr)	62	122	156	149	143	144
Annual Cost (\$/yr)	ND	ND	ND	ND	ND	ND
<i>Projected Surplus/(Shortage) after Conservation (acft/yr)</i>	(615)	(913)	(665)	(583)	(499)	(512)
Groundwater Well Development – Trinity Aquifer						
Supply From Plan Element (acft/yr)	913	913	913	913	913	913
Annual Cost (\$/yr)	\$102,000	\$102,000	\$30,000	\$30,000	\$30,000	\$30,000
Unit Cost (\$/acft)	\$112	\$112	\$33	\$33	\$33	\$33

ND – Not determined. Costs to implement industrial conservation technologies will vary based on each location

5.16.9 Irrigation

Hood County Irrigation is projected to have a surplus of 417 acft/yr through 2070. No changes in water supply are recommended.

Table 5.16-6. Recommended Plan Costs by Decade for Hood County – Irrigation

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage)</i>	417	417	417	417	417	417
BRA System Operation Surplus						
Supply from Plan Element (acft/yr)	774	774	774	774	774	774
Annual Cost (\$/yr)	\$58,824	\$58,824	\$58,824	\$58,824	\$58,824	\$58,824
Unit Cost (\$/acft)	\$76	\$76	\$76	\$76	\$76	\$76

5.16.10 Livestock

Livestock water supply is projected to meet demands through 2070 and no changes in water supply are recommended.

5.17 Johnson County Water Supply Plan

Table 5.17-1 lists each water user group in Johnson County and their corresponding surplus or shortage in years 2040 and 2070. A brief summary of the water user groups and the plan for the selected water user are presented in the following subsections.

Table 5.17-1. Johnson County Surplus/(Shortage)

Water User Group	Surplus/(Shortage)		Comment
	2040 (acft/yr)	2070 (acft/yr)	
Acton MUD			See Hood County
City of Alvarado	1,912	1,728	Projected surplus
Bethany WSC	1,003	852	Projected surplus
Bethesda WSC	(751)	(2,255)	Projected shortage - see plan below.
City of Burleson	(2,037)	(5,204)	Projected shortage - see plan below.
City of Cleburne	(1,097)	(7,324)	Projected shortage - see plan below.
City of Crowley	(5)	(21)	Projected shortage - see plan below.
Double Diamond Utilities			See Hill County
City of Forth Worth	0	(949)	Projected shortage - see plan below.
City of Godley	(22)	(65)	Projected shortage - see plan below.
City of Grandview	156	82	Projected surplus
Johnson County SUD	1,477	(1,491)	Projected shortage - see plan below.
City of Keene	785	477	Projected surplus
City of Mansfield	(507)	(1,375)	Projected shortage - see plan below.
Mountain Peak SUD	(523)	(1,397)	Projected shortage - see plan below.
Parker WSC	123	(145)	Projected shortage - see plan below.
City of Rio Vista	120	4	Projected surplus
City of Venus	(411)	(654)	Projected shortage - see plan below.
County-Other	1,155	1,365	Projected surplus
Manufacturing	1,438	2,518	Projected surplus
Steam-Electric	(571)	(571)	Projected shortage - see plan below.
Mining	(68)	107	Projected surplus - see plan below.
Irrigation	(269)	(269)	Projected shortage - see plan below.
Livestock	0	0	No projected surplus or shortage

5.17.1 City of Alvarado

The City of Alvarado obtains its water supply from the Trinity Aquifer at 196 acft/yr and treated surface water from Johnson County SUD at 2,241 acft/yr. No shortages are projected for the City of Alvarado and no change in water supply is recommended.

Conservation was considered; however, the entity's current per capita use rate is below the selected target rate of 140 gpcd.

5.17.2 Bethany WSC

Bethany WSC obtains its water supply from the Trinity Aquifer at 309 to 308 acft/yr and treated surface water from Johnson County SUD at 1,120 acft/yr. No shortages are projected for Bethany WSC and no change in water supply is recommended. Conservation was considered; however, the entity's current per capita use rate is below the selected target rate of 140 gpcd.

5.17.3 Bethesda WSC

Description of Supply

Bethesda WSC is located in Johnson and Tarrant (Region C) counties and obtains its water supply from the Trinity Aquifer at 2,333 acft/yr and surface water from Tarrant Regional Water District (TRWD) through the Fort Worth System at 3,703 to 7,912 acft/yr. Bethesda WSC is projected to have a shortage from 2030 to 2070. Balance and strategies represented in the table below are for the portion of the WSC in Brazos G.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, and in coordination with Region C, the following water management strategies are recommended to meet the projected water shortage for Bethesda WSC. Conservation is recommended to reduce usage to a goal of 140 gpcd.

- a. Conservation in Brazos G
 - Cost Source: Volume II
 - Date to be Implemented: before 2030
 - Unit Cost: \$560/acft
 - Annual Cost: maximum of \$1,248,493 in 2070
- b. Purchase Additional Supplies from Fort Worth
 - Cost Source: 2021 Region C Water Plan
 - Date to be Implemented: 2020
 - Project Cost: none
 - Unit Cost: \$531/acft (\$1.63/1,000 gal)



Table 5.17-2. Recommended Plan Costs by Decade for Bethesda WSC

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	0	(359)	(751)	(1,188)	(1,645)	(2,255)
Conservation						
Supply From Plan Element (acft/yr)	0	327	735	1,190	1,331	1,487
Annual Cost (\$/yr)	\$0	\$183,000	\$412,000	\$666,000	\$745,000	\$833,000
<i>Projected Surplus/(Shortage) after Conservation (acft/yr)</i>	0	(32)	(16)	2	(314)	(768)
Purchase additional supplies from Fort Worth						
Supply From Plan Element (acft/yr)	–	260	646	1,060	1,509	2,109
Annual Cost (\$/yr)	–	\$138,000	\$343,000	\$563,000	\$801,000	\$1,120,000
Unit Cost (\$/acft)	–	\$531	\$531	\$531	\$531	\$531

5.17.4 City of Burleson

Description of Supply

The City of Burleson obtains its water supply from Tarrant Regional Water District (TRWD) through the Fort Worth System, which ranges from 6,466 to 6,917 acft/yr. Burleson is projected to have a shortage from 2030 to 2070. Balance and strategies represented in the table below are for the entire city in both counties and regions.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to meet the projected water shortage for the City of Burleson. Conservation was considered in Brazos G but the current per capita use is below the targeted gpcd of 140. However, Region C has recommended conservation as a water management strategy.

- a. Conservation in Region C
 - See the 2021 Region C Water Plan
- b. Increase Delivery Infrastructure from Fort Worth
 - Cost Source: 2021 Region C Water Plan
 - Date to be Implemented: 2020
 - Project Cost: \$4,688,000 (cost of delivery infrastructure)
 - Unit Cost: \$162/acft

Table 5.17-3. Recommended Plan Costs by Decade for the City of Burleson

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	(3)	(1,045)	(2,037)	(3,066)	(4,112)	(5,204)
Conservation in Region C						
Supply From Plan Element (acft/yr)	48	54	57	87	118	141
<i>Projected Surplus/(Shortage) after Conservation (acft/yr)</i>	45	(991)	(1,980)	(2,979)	(3,994)	(5,063)
Purchase from Fort Worth						
Supply From Plan Element (acft/yr)	0	991	1,980	2,984	4,080	5,192
Annual Cost (\$/yr)	–	\$161,000	\$321,000	\$110,000	\$151,000	\$192,000
Unit Cost (\$/acft)	–	\$162	\$162	\$37	\$37	\$37

5.17.5 City of Cleburne

The City of Cleburne is projected to have a shortage beginning in 2040. The City of Cleburne obtains its water supply from direct reuse at 1,344 acft/yr, Pat Cleburne Reservoir 5,040 to 4,680 acft/yr, Trinity Aquifer 789 acft/yr and a contract with BRA that ranges from 2,971 to 885 acft/yr at 2020 to 2070, respectively. The City of Cleburne has contracted for 5,300 acft/yr of surface water supplies from the Brazos River Authority, which can supply 5,300 acft/yr in 2020 and 5,067 acft/yr in 2070, based on water availability analyses prescribed under water planning guidelines. Cleburne is projected to have a shortage from 2040 to 2070.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to meet the projected water shortage for the City of Cleburne. Conservation is recommended to reduce the City's gallons per capita per day (gpcd) to a goal of 140 gpcd.

- a. Conservation
 - Cost Source: Volume II
 - Date to be Implemented: before 2030
 - Capital Cost: \$729,070
 - Unit Cost: \$560/acft
- b. City of Cleburne West Loop Reuse Phase 1
 - Cost Source: City of Cleburne Water Supply and Reuse Integration Plan
 - Date to be Implemented: 202
 - Project Cost: \$10,203,000
 - Unit Cost: \$316/acft

- c. City of Cleburne West Loop Reuse Phase 2
 - Cost Source: City of Cleburne Water Supply and Reuse Integration Plan
 - Date to be Implemented: 2030
 - Project Cost: \$21,117,000
 - Unit Cost: \$422/acft
- d. Trinity Basin Purchase (Tarrant Regional Water District) Phase 1
 - Cost Source: City of Cleburne Water Supply and Reuse Integration Plan
 - Date to be Implemented: 2040
 - Project Cost: \$68,993,000
 - Unit Cost: \$1,665/acft
- e. Trinity Basin Purchase (Tarrant Regional Water District) Phase 2
 - Cost Source: City of Cleburne Water Supply and Reuse Integration Plan
 - Date to be Implemented: 2050
 - Project Cost: \$7,566,000
 - Unit Cost: \$815/acft
- f. Lake Whitney Desalination Phase 1
 - Cost Source: City of Cleburne Water Supply and Reuse Integration Plan
 - Date to be Implemented: 2060
 - Project Cost: \$89,369,000
 - Unit Cost: \$2,499/acft
- g. Lake Whitney Desalination Phase 2
 - Cost Source: City of Cleburne Water Supply and Reuse Integration Plan
 - Date to be Implemented: 2070
 - Project Cost: \$32,898,000
 - Unit Cost: \$2,066/acft
- h. Alternative Johnson County SUD Connection
 - Cost Source: City of Cleburne Water Supply and Reuse Integration Plan
 - Date to be Implemented: 2060
 - Project Cost: \$6,902,000
 - Unit Cost: \$1,597/acft

i. Alternative Lake Aquila Reallocation

- Cost Source: City of Cleburne Water Supply and Reuse Integration Plan
- See BRA Wholesale Water Provider

Table 5.17-4. Recommended Plan Costs by Decade for the City of Cleburne

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	1,831	763	(1,097)	(2,988)	(5,195)	(7,324)
Conservation						
Supply From Plan Element (acft/yr)	0	561	942	1,018	1,171	1,302
Annual Cost (\$/yr)	\$0	\$314,170	\$527,611	\$569,977	\$655,741	\$729,070
<i>Projected Surplus/(Shortage) after Conservation (acft/yr)</i>	1,831	1,324	(155)	(1,970)	(4,024)	(6,022)
Additional Demands from Recommended Strategies from Others						
Increase Reuse Amount to Johnson County Steam Electric (acft/yr)	571	571	571	571	571	571
Increase Reuse Amount to Johnson County Mining (acft/yr)	2,555	1,206	–	–	–	–
<i>Total Surplus/(Shortage) Including Recommended Strategies</i>	(1,295)	(453)	(726)	(2,541)	(4,595)	(6,593)
City of Cleburne West Loop Reuse: Phase 1						
Supply From Plan Element (acft/yr)	2,240	2,240	2,240	2,240	2,240	2,240
Annual Cost (\$/yr)	\$707,840	\$707,840	\$152,320	\$152,320	\$152,320	\$152,320
Unit Cost (\$/acft)	\$316	\$316	\$68	\$68	\$68	\$68
City of Cleburne West Loop Reuse: Phase 2						
Supply From Plan Element (acft/yr)	5,377	5,377	5,377	5,377	5,377	5,377
Annual Cost (\$/yr)	\$2,270,000	\$2,270,000	\$2,270,000	\$785,042	\$785,042	\$785,042
Unit Cost (\$/acft)	\$422	\$422	\$146	\$146	\$146	\$146
Trinity Basin Purchase Phase 1						
Supply From Plan Element (acft/yr)	–	–	5,601	5,601	5,601	5,601
Annual Cost (\$/yr)	–	–	\$9,325,665	\$9,325,665	\$4,469,598	\$4,469,598
Unit Cost (\$/acft)	–	–	\$1,665	\$1,665	\$798	\$798
Trinity Basin Purchase Phase 2						
Supply From Plan Element (acft/yr)	–	–	–	5,601	5,601	5,601
Annual Cost (\$/yr)	–	–	–	\$4,564,815	\$4,564,815	\$4,032,720

Table 5.17-4. Recommended Plan Costs by Decade for the City of Cleburne

Plan Element	2020	2030	2040	2050	2060	2070
Unit Cost (\$/acft)	–	–	–	\$815	\$815	\$720
Lake Whitney Desalination Phase 1						
Supply From Plan Element (acft/yr)	–	–	–	–	4,300	4,300
Annual Cost (\$/yr)	–	–	–	–	\$10,745,700	\$10,745,700
Unit Cost (\$/acft)	–	–	–	–	\$2,499	\$2,499
Lake Whitney Desalination Phase 2						
Supply From Plan Element (acft/yr)	–	–	–	–	–	3,100
Annual Cost (\$/yr)	–	–	–	–	–	\$6,404,600
Unit Cost (\$/acft)	–	–	–	–	–	\$2,066
Alternative: Johnson County SUD Connection						
Supply From Plan Element (acft/yr)	–	–	–	–	–	3,360
Annual Cost (\$/yr)	–	–	–	–	–	\$5,365,920
Unit Cost (\$/acft)	–	–	–	–	–	\$1,597
Alternative: Lake Aquilla Reallocation						

5.17.6 City of Crowley

Description of Supply

The City of Crowley is mostly located in Tarrant County; however, a portion of the city limits is within Johnson County. The City obtains its water from Fort Worth and is projected to have a shortage in Johnson County.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, and through coordination with Region C, the following water supply plan is recommended to meet water needs for the portion of the city within Johnson County (Brazos G). The full water plan for City of Crowley is discussed in the 2021 Region C Water Plan. Conservation was also considered; however, the entity’s usage is below the selected goal of 140 gpcd in Brazos G. Needs and supplies from strategies are for the Brazos G portion of Crowley only.

- a. Purchase additional supplies from Fort Worth
 - Cost Source: 2020 Region C Water Plan
 - Date to be Implemented: 2030
 - Project Cost: none
 - Unit Cost: \$531/acft (weighted average of Region C strategies)

Table 5.17-5. Recommended Plan Costs by Decade for the City of Crowley

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	0	(2)	(5)	(9)	(15)	(21)
Conservation (Region C strategy applied to Brazos G portion)						
Supply From Plan Element (acft/yr)	–	1	2	3	1	3
Annual Cost (\$/yr)	–	–	–	–	–	–
<i>Projected Surplus/(Shortage) after Conservation (acft/yr)</i>	0	(1)	(3)	(6)	(14)	(18)
Purchase from Fort Worth						
Supply From Plan Element (acft/yr)	–	1	3	6	14	18
Annual Cost (\$/yr)	–	\$531	\$1,600	\$3,200	\$7,400	\$9,600
Unit Cost (\$/acft)	–	\$531	\$531	\$531	\$531	\$531

5.17.7 City of Fort Worth

Description of Supply

The City of Fort Worth is a wholesale water provider in Region C in Tarrant County; however, a portion of the city limits is within Johnson County in Brazos G. The City obtains its water supply from surface water supplies located in Region C and is projected to have a shortage in Johnson County.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, and through coordination with Region C, the following water management strategies are recommended to meet water needs for the portion of the city within Johnson County and Brazos G. The full water plan for City of Fort Worth is discussed in the 2021 Region C Water Plan.

- a. Conservation
 - Cost Source: Volume II
 - Date to be Implemented: 2060
 - Unit Cost: \$560/acft
 - Annual Cost: maximum of \$186,204 in 2070
- b. Purchase additional supplies from Tarrant Regional Water District
 - Cost Source: 2021 Region C Water Plan
 - Date to be Implemented: 2050
 - Project Cost: \$0 Existing infrastructure assumed sufficient
 - Unit Cost: \$978/acft



Table 5.17-6. Recommended Plan Costs by Decade for the City of Fort Worth

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	0	0	0	(391)	(695)	(949)
Conservation						
Supply From Plan Element (acft/yr)	–	–	–	67	98	107
Annual Cost (\$/yr)	–	–	–	\$181,000	\$334,000	\$472,000
<i>Projected Surplus/(Shortage) after Conservation (acft/yr)</i>	0	0	0	(324)	(597)	(842)
Purchase from Tarrant Regional Water District						
Supply From Plan Element (acft/yr)	–	–	–	324	597	842
Annual Cost (\$/yr)	–	–	–	\$317,000	\$584,000	\$823,000
Unit Cost (\$/acft)	–	–	–	\$978	\$978	\$978

5.17.8 City of Godley

Description of Supply

The City of Godley obtains its water supply from groundwater from the Trinity Aquifer at 99 acft/yr. Based on the available groundwater supply, the City of Godley is projected to have shortages throughout the planning period.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended to meet water needs for the City of Godley. Conservation was considered; however, the entity’s current per capita use rate is below the selected target rate of 140 gpcd.

- a. Groundwater Development – Trinity Aquifer
 - Cost Source: Volume II
 - Date to be Implemented: before 2030
 - Project Cost: \$686,000
 - Unit Cost: \$1,423/acft

Table 5.17-7. Recommended Plan Costs by Decade for the City of Godley

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	(3)	(12)	(22)	(35)	(49)	(65)
Conservation						
Supply From Plan Element (acft/yr)	–	–	–	–	–	–
Annual Cost (\$/yr)	–	–	–	–	–	–

Table 5.17-7. Recommended Plan Costs by Decade for the City of Godley

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) after Conservation (acft/yr)</i>	(3)	(12)	(22)	(35)	(49)	(65)
Groundwater Development – Trinity Aquifer						
Supply From Plan Element (acft/yr)	3	12	22	35	49	65
Annual Cost (\$/yr)	\$4,269	\$17,076	\$5,082	\$8,085	\$11,319	\$15,015
Unit Cost (\$/acft)	\$1,423	\$1,423	\$231	\$231	\$231	\$231

5.17.9 City of Grandview

The City of Grandview obtains its water supply from groundwater from the Woodbine Aquifer at 369 acft/yr and is projected to have a surplus of water through the year 2070 and no changes in water supply are recommended. Conservation was considered; however, the entity’s current per capita use rate is below the selected target rate of 140 gpcd.

5.17.10 Johnson County SUD

Johnson County SUD is projected to have a shortage in 2020, 2060, and 2070, and a surplus in 2030 through 2050. This WUG is located in multiple counties (Johnson, Tarrant (Region C), Ellis (Region C), and Hill). The balance shown in the table below represent the cumulative totals within Brazos G for Johnson County SUD.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended to meet water needs for Johnson County SUD. Conservation was considered; however, the entity’s current per capita use rate is below the selected target rate of 140 gpcd.

- a. Groundwater Development – Trinity Aquifer
 - Cost Source: Volume II
 - Date to be Implemented: before 2030
 - Project Cost: \$9,306,000
 - Unit Cost: \$437/acft
- b. Increase WTP Capacity (SWATS):
 - Cost Source: Volume II
 - Date to be Implemented: by 2040
 - Project Cost: \$8,814,000 (Johnson County SUD portion)
 - Unit Cost: \$696/acft



- c. Alternative: Trinity Johnson County ASR
 - Cost Source: Volume II
 - Date to be Implemented: by 2020
 - Project Cost: \$19,789,000 (Johnson County SUD portion)
 - Unit Cost: \$634/acft

Table 5.17-8. Recommended Plan Costs by Decade for Johnson County SUD

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	(208)	1,432	1,477	179	(737)	(1,491)
Conservation						
Supply From Plan Element (acft/yr)	–	–	–	–	–	–
Annual Cost (\$/yr)	–	–	–	–	–	–
<i>Projected Surplus/(Shortage) after Conservation (acft/yr)</i>	(208)	1,432	1,477	179	(737)	(1,491)
Groundwater Development – Trinity Aquifer						
Supply From Plan Element (acft/yr)	208	–	–	–	737	1,491
Annual Cost (\$/yr)	\$90,896	–	–	–	\$35,376	\$71,568
Unit Cost (\$/acft)	\$437	–	–	–	\$48	\$48
WTP Expansion (SWATS)						
Supply From Plan Element (acft/yr)	–	–	1,529	1,529	1,529	1,529
Annual Cost (\$/yr)	–	–	\$1,065,000	\$1,065,000	\$445,000	\$445,000
Unit Cost (\$/acft)	–	–	\$696	\$696	\$291	\$291
Alternative: Johnson County ASR						
Supply From Plan Element (acft/yr)		5,739	5,739	5,739	5,739	5,740
Annual Cost (\$/yr)		\$3,799,200	\$3,799,200	\$3,799,200	\$3,799,200	\$3,799,200
Unit Cost (\$/acft)		\$662	\$662	\$662	\$662	\$662

5.17.11 City of Keene

The City of Keene obtains its water supply from groundwater from the Trinity Aquifer at 326-327 acft/yr and a contract with Johnson County SUD at 1,120 acft/yr. The City of Keene is expected to have a surplus and no changes in water supply are recommended. Conservation was considered; however, the entity’s current per capita use rate is below the selected target rate of 140 gpcd.

5.17.12 City of Mansfield

Description of Supply

The City of Mansfield is located in Tarrant, Ellis and Johnson counties with a majority of its population and demand in Tarrant County. The City obtains its water supply from

surface water from the Tarrant Regional Water District (TRWD), principally located in Region C. The table includes the balance for the Johnson County (Brazos G) portion only. More information on City of Mansfield is discussed in the 2021 Region C Water Plan. The City of Mansfield is projected to have shortages starting in 2020.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, and in coordination with Region C, the following water management strategy is recommended for the City of Mansfield. Conservation is recommended to reduce usage to a goal of 140 gpcd.

- a. Conservation
 - Cost Source: Volume II
 - Date to be Implemented: 2030
 - Unit Cost: \$560/acft
 - Annual Cost: maximum of \$516,488 in 2070
- b. Purchase additional supplies from Tarrant Regional Water District
 - Cost Source: 2021 Region C Water Plan
 - Date to be Implemented: 2020
 - Project Cost: \$0 Existing infrastructure assumed sufficient
 - Unit Cost: \$978/acft

Table 5.17-9. Recommended Plan Costs by Decade for City of Mansfield

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	(48)	(289)	(507)	(783)	(1,063)	(1,375)
Conservation						
Supply From Plan Element (acft/yr)	0	87	223	407	641	922
Annual Cost (\$/yr)	\$0	\$48,803	\$124,900	\$228,097	\$359,186	\$516,488
<i>Projected Surplus/(Shortage) after Conservation</i>	(48)	(202)	(284)	(376)	(422)	(453)
Purchase additional supplies from Tarrant Regional Water District						
Supply from Plan Element (acft/yr)	20	242	447	703	961	1,245
Annual Cost (\$/yr)	\$19,600	\$236,700	\$437,200	\$687,500	\$939,900	\$1,217,600
Unit Cost (\$/acft)	\$978	\$978	\$978	\$978	\$978	\$978

5.17.13 Mountain Peak SUD

Description of Supply

Mountain Peak SUD is located in Johnson and Ellis counties, with a majority of its population and demand in Ellis County (Region C). The WUG obtains its water supply from the City of Midlothian. A small shortage is projected for 2020, but after conservation a surplus is projected for Mountain Peak SUD through 2070. The Table below includes the balance for the Johnson County (Brazos G) portion only. More information on Mountain Peak SUD is discussed in the 2021 Region C Water Plan.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB and in coordination with Region C, the following water management strategy is recommended for Mountain Peak SUD. Conservation is recommended to reduce usage to a goal of 140 gpcd.

- a. Conservation
 - Cost Source: Volume II
 - Date to be Implemented: 2030
 - Unit Cost: \$338/acft (weighted cost of Region C strategy in 2020)
 - Annual Cost: maximum of \$2,405,711 in 2070
- b. Purchase additional supplies from Midlothian (various Region C strategies)
 - Cost Source: 2020 Region C Water Plan
 - Date to be Implemented: by 2030
 - Project Cost: \$0 (existing infrastructure assumed sufficient)
 - Unit Cost: \$609/acft (weighted cost of Region C strategies)

Table 5.17-10. Recommended Plan Costs by Decade for Mountain Peak SUD

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	(55)	(287)	(523)	(793)	(1,081)	(1,397)
Conservation (Region C sponsored strategy)						
Supply From Plan Element (acft/yr)	55	141	155	191	222	252
Annual Cost (\$/yr)	\$18,600	\$47,700	\$52,390	\$64,600	\$75,000	\$85,200
<i>Projected Surplus/(Shortage) after Conservation</i>	0	(146)	(368)	(602)	(859)	(1,145)
Purchase additional supplies from Midlothian (various Region C strategies)						
Supply From Plan Element (acft/yr)		146	368	602	859	1,145
Annual Cost (\$/yr)		\$57,336	\$193,246	\$358,681	\$477,884	\$696,997
Unit Cost (\$/acft)		\$393	\$525	\$596	\$556	\$609

5.17.14 Parker WSC

Description of Supply

Parker WSC is located in Hill and Johnson counties and obtains its water supply from the Trinity Aquifer at 274 acft/yr and surface water supplies from Files Valley WSC. Based on the existing supply available from groundwater, a shortage begins in 2060. The surplus/shortages shown in the table below represent the cumulative totals for Parker WSC.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended to meet water needs for Parker WSC. Conservation was considered; however, the entity's current per capita use rate is below the selected target rate of 140 gpcd.

- a. Trinity Aquifer Development
 - Cost Source: Volume II
 - Date to be Implemented: before 2060
 - Project Cost: \$1,045,000
 - Unit Cost: \$661/acft

Table 5.17-11. Recommended Plan Costs by Decade for Parker WSC

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	261	194	123	42	(48)	(145)
Conservation						
Supply From Plan Element (acft/yr)	–	–	–	–	–	–
Annual Cost (\$/yr)	–	–	–	–	–	–
<i>Projected Surplus/(Shortage) after Conservation</i>	261	194	123	42	(48)	(145)
Groundwater Development – Trinity Aquifer						
Supply From Plan Element (acft/yr)	0	0	0	0	48	145
Annual Cost (\$/yr)	–	–	–	–	\$31,728	\$95,845
Unit Cost (\$/acft)	–	–	–	–	\$661	\$661

5.17.15 City of Rio Vista

Description of Supply

The City of Rio Vista obtains its water supply from groundwater from the Trinity Aquifer at 334 acft/yr. No shortages are projected for the City of Alvarado and no change in water supply is recommended. Conservation was considered; however, the entity's current per capita use rate is below the selected target rate of 140 gpcd.

5.17.16 City of Venus

Description of Supply

The City of Venus obtains its water supply from the Woodbine Aquifer at 103 acft/yr and surface water from the City of Midlothian in Region C ranges from 200 to 268 acft/yr. The city has a projected shortage starting in 2020.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB and in coordination with Region C, the following water management strategies are recommended to meet water needs for the City of Venus. Conservation is recommended to reduce usage to a goal of 140 gpcd. Note all shortages and supplies from strategies are totals for Region C and Brazos G.

- a. Conservation
 - Cost Source: Volume II
 - Date to be Implemented: 2030
 - Annual Cost: maximum of \$91,183 in 2070
 - Unit Cost: \$556/acft (weighted average of Brazos G and Region C strategies)
- a. Purchase Water from Midlothian (various Region C strategies)
 - Cost Source: 2021 Region C Water Plan
 - Date to be Implemented: 2020
 - Project Cost: N/A
 - Unit Cost: \$534/acft (maximum of weighted average of Region C strategies)

Table 5.17-12. Recommended Plan Costs by Decade for City of Venus

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	(92)	(309)	(411)	(462)	(549)	(654)
Conservation (Brazos G and Region C strategies)						
Supply From Plan Element (acft/yr)	0	62	119	132	148	166
Annual Cost (\$/yr)	\$0	\$34,204	\$65,135	\$73,366	\$81,893	\$92,123
<i>Projected Surplus/(Shortage) after Conservation</i>	(92)	(247)	(292)	(330)	(401)	(488)
Purchase Water from Midlothian (various Region C strategies)						
Supply From Plan Element (acft/yr)	92	247	292	330	401	488
Annual Cost (\$/yr)	\$0	\$21,327	\$86,433	\$151,643	\$189,380	\$260,683
Unit Cost (\$/acft)	\$0	\$86	\$296	\$460	\$472	\$534

5.17.17 County-Other

Entities in Johnson County-Other obtain water supply from the Trinity Aquifer at 7 acft/yr and as well as treated surface water from Johnson County SUD at 1,507 to 2,981 acft/yr and Grand Prairie at 188 to 531 acft/yr. A surplus of supply is projected for Johnson County-Other through 2070. No changes in water supply are recommended. Conservation was also considered; however, the entity’s usage is below the selected goal of 140 gpcd

5.17.18 Manufacturing

Johnson County Manufacturing is supplied by the Trinity Aquifer at 194 acft/yr, and the cities of Burleson at 2 acft/yr, Cleburne at 2,239 to 4,182 acft/yr and Hillsboro at 6 to 12 acft/yr. No shortage is projected for Johnson County Manufacturing and no changes in water supply are recommended.

5.17.19 Steam-Electric

Description of Supply

Johnson County Steam-Electric currently receives 1,344 acft/yr of reuse and potable water supplies from the City of Cleburne. Johnson County Steam-Electric is projected to have shortages through year 2070. Conservation for Steam-Electric use is not recommended by the Brazos G RWPG.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to meet water needs for Johnson County Steam-Electric.

- a. Purchase reuse water from the City of Cleburne
 - Cost Source: Volume II
 - Date to be Implemented: before 2030
 - Project Cost: \$30,238,000
 - Unit Cost: \$427/acft

Table 5.17-13. Recommended Plan Costs by Decade for Johnson County – Steam-Electric

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	(571)	(571)	(571)	(571)	(571)	(571)
Conservation						
Supply From Plan Element (acft/yr)	–	–	–	–	–	–
Annual Cost (\$/yr)	–	–	–	–	–	–
<i>Projected Surplus/(Shortage) after Conservation</i>	(571)	(571)	(571)	(571)	(571)	(571)
Purchase reuse water from the City of Cleburne						

Table 5.17-13. Recommended Plan Costs by Decade for Johnson County – Steam-Electric

Plan Element	2020	2030	2040	2050	2060	2070
Supply From Plan Element (acft/yr)	571	571	571	571	571	571
Annual Cost (\$/yr)	\$243,817	\$243,817	\$84,508	\$84,508	\$84,508	\$84,508
Unit Cost (\$/acft)	\$427	\$427	\$148	\$148	\$148	\$148
<i>Projected Surplus/(Shortage) after Reuse (acft/yr)</i>	0	0	0	0	0	0

5.17.20 Mining

Description of Supply

Johnson County Mining obtains its water supply from Cleburne at 1,344 acft/yr. Johnson County Mining is projected to have a shortage in 2020 and 2030, surpluses from 2040 through 2070.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to meet water needs for Johnson County Mining. Conservation is recommended.

- a. Conservation
 - Cost Source: Volume II
 - Date to be Implemented: 2030
 - Annual Cost: Not determined
- b. Purchase reuse water from the City of Cleburne
 - Cost Source: Volume II
 - Date to be Implemented: before 2030
 - Project Cost: \$2,099,198
 - Unit Cost: \$211/acft

Table 5.17-14. Recommended Plan Costs by Decade for Johnson County – Mining

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	(2,679)	(1,345)	(68)	430	286	107
Conservation						
Supply From Plan Element (acft/yr)	124	139	106	71	81	94
Annual Cost (\$/yr)	ND	ND	ND	ND	ND	ND
<i>Projected Surplus/(Shortage) after Conservation</i>	(2,555)	(1,206)	38	430	286	107

Table 5.17-14. Recommended Plan Costs by Decade for Johnson County – Mining

Plan Element	2020	2030	2040	2050	2060	2070
Purchase reuse water from the City of Cleburne						
Supply From Plan Element (acft/yr)	2,555	1,206	–	–	–	–
Annual Cost (\$/yr)	\$539,105	\$254,466	–	–	–	–
Unit Cost (\$/acft)	\$211	\$211	–	–	–	–
ND – Not Determined. Costs to implement industrial conservation technologies will vary based on each location						

5.17.21 Irrigation

Johnson County Irrigation obtains its water supply from the Trinity Aquifer at 167 acft/yr and the Woodbine Aquifer at 130 acft/yr. Shortages are projected for Johnson County Irrigation.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to meet water needs for Johnson County Irrigation. Conservation is recommended.

- a. Conservation
 - Cost Source: Volume II
 - Date to be Implemented: before 2030
 - Unit Cost \$1,241/acft
 - Annual Cost: maximum of \$6,464
- b. BRA System Operations (Double Diamond Retreat)
 - Cost Source: Volume II
 - Date to be Implemented: before 2030
 - Project Cost: \$95,792,000
 - Unit Cost: \$4,497/acft

Table 5.17-15. Recommended Plan Costs by Decade for Johnson County – Irrigation

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	(269)	(269)	(269)	(269)	(269)	(269)
Conservation						
Supply From Plan Element (acft/yr)	17	28	40	40	40	40
Annual Cost (\$/yr)	\$21,075	\$35,125	\$49,175	\$49,175	\$49,175	\$49,175



Table 5.17-15. Recommended Plan Costs by Decade for Johnson County – Irrigation

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) after Conservation</i>	(252)	(241)	(229)	(229)	(229)	(229)
Purchase water through BRA System Operations from Double Diamond Retreat						
Supply From Plan Element (acft/yr)	252	241	229	229	229	229
Annual Cost (\$/yr)	\$1,133,244	\$1,083,777	\$318,310	\$318,310	\$318,310	\$318,310
Unit Cost (\$/acft)	\$4,497	\$4,497	\$1,390	\$1,390	\$1,390	\$1,390

5.17.22 Livestock

Livestock water supply is projected to meet demands through 2070 and no changes in water supply are recommended.

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5.18 Jones County Water Supply Plan

Table 5.18-1 lists each water user group in Jones County and their corresponding surplus or shortage in years 2040 and 2070. For each water user group with a projected shortage, a water supply plan has been developed and is presented in the following subsections.

Table 5.18-1. Jones County Surplus/(Shortage)

Water User Group	Surplus/(Shortage)		Comment
	2040 (acft/yr)	2070 (acft/yr)	
City of Abilene			See Taylor County
City of Anson	0	0	No projected surplus or shortage
Hamby WSC	148	143	Projected surplus
City of Hamlin	77	17	Projected surplus - see plan below.
Hawley WSC	113	94	Projected surplus
City of Stamford	309	242	Projected surplus - see plan below.
County-Other	(92)	(121)	Projected shortage - see plan below.
Manufacturing	0	0	No projected demand
Steam-Electric	0	0	No projected demand
Mining	(139)	(90)	Projected shortage - see plan below.
Irrigation	(191)	(191)	Projected shortage - see plan below.
Livestock	0	0	No projected surplus or shortage

5.18.1 City of Anson

Description of Supply

The City of Anson receives surface water supplies the West Central Texas MWD at 365 to 402 acft/yr. No shortages are projected for the City of Anson. Conservation was considered; however, the entity's usage is below the selected goal of 140 gpcd. No changes to Anson's water supplies are recommended.

5.18.2 Hamby WSC

Description of Supply

The Hamby WSC receives surface water supplies from the City of Anson, ranging from 495 to 532 acft/yr. A surplus is projected for the Hamby WSC. Conservation was considered; however, the entity's usage is below the selected goal of 140 gpcd. No changes in the water supply plan are recommended.

5.18.3 City of Hamlin

Description of Supply

The City of Hamlin receives surface water supplies from the City of Anson, which ranges in 495 to 532 acft/yr. A surplus is projected for the City of Hamlin.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended for the City of Hamlin.

Conservation is recommended to reduce the City's gallons per capita per day (gpcd) to a goal of 140 gpcd.

a. Conservation

- Cost Source: Volume II
- Date to be Implemented: 2030
- Unit Cost: \$560/acft
- Annual Cost: maximum of \$32,500 in 2070

Table 5.18-2. Recommended Plan Costs by Decade for City of Hamlin

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	109	89	77	53	35	17
Conservation						
Supply From Plan Element (acft/yr)	0	30	55	57	57	58
Annual Cost (\$/yr)	\$0	\$16,824	\$31,024	\$31,750	\$31,730	\$32,500
<i>Projected Surplus/(Shortage) after Conservation</i>	109	119	132	110	92	75

5.18.4 Hawley WSC

Hawley WSC is located in multiple counties (Taylor, and Jones). The balance shown in the table below represents the cumulative totals for Hawley WSC. Hawley WSC is supplied with water from the City of Abilene at 307 acft/yr and City of Anson at 221 acft/yr. Hawley WSC provides supply to meet the current and projected demands for the City of Hawley. No shortages are projected for Hawley WSC through 2070 and no change in water supply is recommended. Conservation was considered; however, the entity's usage is below the selected goal of 140 gpcd. No changes in the water supply plan are recommended.

5.18.5 City of Stamford

The City of Stamford is located in Jones and Haskell Counties. The balance shown below represents the cumulative totals for City of Stamford. The City has a contract with BRA to compensate BRA for the reduction in yield of its system as the result of the City's upstream diversion. The City of Stamford's supply is sufficient to meet the current and projected

demands for the City. No shortages are projected through 2070 and no change in water supply is recommended.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended for the City of Stamford. Conservation is recommended to reduce usage to a goal of 140 gpcd.

- a. Conservation
 - Cost Source: Volume II
 - Date to be Implemented: 2030
 - Unit Cost: \$560/acft
 - Annual Cost: maximum of \$193,513 in 2070

Table 5.18-3. Recommended Plan Costs by Decade for City of Stamford

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	360	329	309	284	261	242
Conservation						
Supply From Plan Element (acft/yr)	0	68	136	212	285	342
Annual Cost (\$/yr)	\$0	\$38,000	\$76,000	\$119,000	\$160,000	\$192,000
<i>Projected Surplus/(Shortage) after Conservation</i>	360	397	445	496	546	584

5.18.6 County-Other

Entities in County-Other receive supplies through the City of Stamford at 89 acft/yr and the Seymour Aquifer at 201 acft/yr. County-Other entities are projected to have a shortage of water throughout the planning period.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended for the County Other Jones. Conservation was considered; however, the entity’s usage is below the selected goal of 140 gpcd.

- a. Purchase Additional Supplies from City of Abilene
 - Cost Source: Abilene Water Rates 2019
 - Date to be Implemented: 2020
 - Project Cost: none
 - Unit Cost: \$2,347/acft (\$7.20/1,000 gal)

Table 5.18-4. Recommended Plan Costs by Decade for Jones County-Other

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	(68)	(82)	(92)	(102)	(112)	(121)
Conservation						
Supply From Plan Element (acft/yr)	–	–	–	–	–	–
Annual Cost (\$/yr)	–	–	–	–	–	–
<i>Projected Surplus/(Shortage) after Conservation</i>	(68)	(82)	(92)	(102)	(112)	(121)
Purchase Additional Supplies from City of Abilene						
Supply From Plan Element (acft/yr)	68	82	92	102	112	121
Annual Cost (\$/yr)	\$159,596	\$192,454	\$215,924	\$239,394	\$262,864	\$283,987
Unit Cost (\$/acft)	\$2,347	\$2,347	\$2,347	\$2,347	\$2,347	\$2,347

5.18.7 Manufacturing

There is no projected demand for Manufacturing in Jones County and no changes in water supply are recommended.

5.18.8 Steam-Electric

There is no projected demand for Steam-Electric in Jones County and no changes in water supply are recommended.

5.18.9 Mining

Description of Supply

Jones County Mining obtains its water supply from run-of-the river water rights which are not reliable in the drought of record and the Seymour Aquifer at 79 acft/yr. Jones County Mining is projected to have a shortage between 2020 and 2070.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to meet water needs for Jones County-Mining. Conservation is recommended.

a. Conservation

- Cost Source: Volume II
- Date to be Implemented: 2030
- Annual Cost: not determined

- b. Purchase Additional Supplies from City of Abilene
 - Cost Source: Abilene Water Rates 2019
 - Date to be Implemented: 2020
 - Project Cost: none
 - Unit Cost: \$2,347/acft (\$7.20/1,000 gal)

Table 5.18-5. Recommended Plan Costs by Decade for Jones County – Mining

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	(160)	(155)	(139)	(120)	(104)	(90)
Conservation						
Supply From Plan Element (acft/yr)	7	12	15	14	13	12
Annual Cost (\$/yr)	ND	ND	ND	ND	ND	ND
<i>Projected Surplus/(Shortage) after Conservation (acft/yr)</i>	(153)	(143)	(124)	(106)	(91)	(78)
Purchase Additional Supplies from City of Abilene						
Supply From Plan Element (acft/yr)	153	143	124	106	91	78
Annual Cost (\$/yr)	\$359,091	\$335,621	\$291,028	\$248,782	\$213,577	\$183,066
Unit Cost (\$/acft)	\$2,347	\$2,347	\$2,347	\$2,347	\$2,347	\$2,347

ND – Not determined. Costs to implement industrial conservation technologies will vary based on each location

5.18.10 Irrigation

Description of Supply

Jones County Irrigation is supplied by the Seymour Aquifer at 2,638 acft/yr. Irrigation is projected to have a shortage of water beginning in 2020 through 2070, but conservation will limit shortages to occur only in 2020 and 2030.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to meet water needs for Jones County-Irrigation. Conservation is recommended.

- a. Conservation
 - Cost Source: Volume II
 - Date to be Implemented: 2030
 - Annual Cost: \$28,462 maximum in 2070
 - Unit Cost: \$1,409/acft

b. Purchase Additional Supplies from City of Abilene

- Cost Source: Abilene Water Rates 2019
- Date to be Implemented: 2020
- Project Cost: none
- Unit Cost: \$2,347/acft (\$7.20/1,000 gal)

Table 5.18-6. Recommended Plan Costs by Decade for Jones County – Irrigation

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	(191)	(191)	(191)	(191)	(191)	(191)
Conservation						
Supply From Plan Element (acft/yr)	85	141	198	198	198	198
Annual Cost (\$/yr)	\$119,575	\$199,292	\$279,009	\$279,009	\$279,009	\$279,009
Unit Cost (\$/acft)	\$1,409	\$1,409	\$1,409	\$1,409	\$1,409	\$1,409
<i>Projected Surplus/(Shortage) after Conservation (acft/yr)</i>	(106)	(50)	7	7	7	7
Purchase Additional Supplies from City of Abilene						
Supply From Plan Element (acft/yr)	106	50	–	–	–	–
Annual Cost (\$/yr)	\$248,782	\$117,350	–	–	–	–
Unit Cost (\$/acft)	\$2,347	\$2,347	–	–	–	–

5.18.11 Livestock

Livestock water supply is projected to meet demands through 2070 and no changes in water supply are recommended.

5.19 Kent County Water Supply Plan

Table 5.19-1 lists each water user group in Kent County and their corresponding surplus or shortage in years 2040 and 2070. A brief summary of each water user group supply is presented in the following subsections.

Table 5.19-1. Kent County Surplus/(Shortage)

Water User Group	Surplus/(Shortage)		Comment
	2040 (acft/yr)	2070 (acft/yr)	
City of Jayton	(112)	(111)	Projected shortage - see plan below.
County-Other	0	0	No projected surplus or shortage
Manufacturing	0	0	No projected demand
Steam-Electric	0	0	No projected demand
Mining	686	695	Projected surplus
Irrigation	634	634	Projected surplus
Livestock	0	0	No projected surplus or shortage

5.19.1 City of Jayton

Description of Supply

Water supply for the City of Jayton is from the Seymour Aquifer. Jayton has sufficient supplies through 2070. However, the TCEQ has mandated that the City put in reverse osmosis treatment for its groundwater supply due to high levels of chlorides, sulfates, and total dissolved solids. Shortages are projected due to a treatment constraint from 2020 through 2070.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water supply plan is recommended to meet for the City of Jayton. Associated costs are included for each strategy. Conservation is recommended to reduce usage to a goal of 140 gpcd.

a. Conservation

- Cost Source: Volume II
- Date to be Implemented: before 2030
- Annual Cost: maximum of \$4,507 in 2030
- Unit Cost: \$560/acft

- b. New Water Treatment Plant (0.4 MGD)
 - Cost Source: Volume II
 - Date to be Implemented: before 2030
 - Project Cost: \$3,555,000
 - Unit Cost: \$2,851
- c. Alternative: Purchase Water from the Salinity Control Project
 - Cost Source: Volume II
 - Date to be Implemented: before 2030
 - Project Cost: \$2,115,000 for City's portion
 - Unit Cost: \$2,593/acft

Table 5.19-2. Recommended Plan Costs by Decade for City of Jayton

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	(118)	(115)	(112)	(111)	(111)	(111)
Conservation						
Supply From Plan Element (acft/yr)	0	8	5	4	4	4
Annual Cost (\$/yr)	\$0	\$4,507	\$2,827	\$2,267	\$2,267	\$2,267
<i>Projected Surplus/(Shortage) after Conservation (acft/yr)</i>	(118)	(107)	(107)	(107)	(107)	(107)
New Water Treatment Plant (0.4 MGD)						
Supply From Plan Element (acft/yr)	249	249	249	249	249	249
Annual Cost (\$/yr)	\$710,000	\$710,000	\$460,000	\$460,000	\$460,000	\$460,000
Unit Cost (\$/acft)	\$2,851	\$2,851	\$1,847	\$1,847	\$1,847	\$1,847
Purchase Water from the Salt Fork Water Quality Cooperation Salinity Control Project						
Supply From Plan Element (acft/yr)	–	118	118	118	118	118
Annual Cost (\$/yr)	–	\$306,000	\$157,000	\$157,000	\$157,000	\$157,000
Unit Cost (\$/acft)	–	\$2,593	\$1,331	\$1,331	\$1,331	\$1,331

5.19.2 County-Other

Water supply for County-Other is from local groundwater and the Seymour Aquifer. No shortages are projected throughout the planning period, demand is equal to supply. Conservation was considered; however, the entity's usage is below the selected goal of 140 gpcd.

5.19.3 Manufacturing

No Manufacturing demand exists or is projected for the county.



5.19.4 Steam-Electric

No Steam-Electric demand exists or is projected for the county.

5.19.5 Mining

No shortages are projected for Mining, surpluses are projected through 2070, and no changes in water supply are recommended.

5.19.6 Irrigation

No shortages are projected for Irrigation, a surplus of 634 acft/yr is projected through 2070. No changes in water supply are recommended.

5.19.7 Livestock

No shortages are projected for Livestock, the demand equals the supply, and no changes in water supply are recommended.

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5.20 Knox County Water Supply Plan

Table 5.20–1 lists each water user group in Knox County and their corresponding surplus or shortage in years 2040 and 2070. A brief summary of each water user group supply is presented in the following subsections.

Table 5.20–1. Knox County Surplus/(Shortage)

Water User Group	Surplus/(Shortage)		Comment
	2040 (acft/yr)	2070 (acft/yr)	
Baylor SUD			See Young County
Knox City	(235)	(256)	Projected shortage - see plan below.
City of Munday	(249)	(270)	Projected shortage - see plan below.
County-Other	12	2	Projected surplus
Manufacturing	0	0	No projected surplus or shortage
Steam-Electric	–	–	No projected demand
Mining	(9)	(8)	Projected shortage - see plan below.
Irrigation	(13,590)	(13,381)	Projected shortage - see plan below
Livestock	0	0	No projected surplus or shortage

5.20.1 Knox City

Description of Supply

Knox City obtains its water supply through purchases of treated surface water under contract from the North Central Texas Municipal Water Authority (NCTMWA) and through local groundwater production from the Seymour Aquifer. The City is contracted to purchase up to 260 acft/yr from the NCTMWA; however, due to availability of supplies, this contract is prorated to provide a maximum of only 11 acft/yr during the planning period. Additionally, no local groundwater supply from the Seymour Aquifer is projected to be available to the City. Needs remain unmet in 2020. These needs will only occur during a drought equivalent or worse than the drought of record. While not a strategy recommended by the Brazos G RWPG, the impacts of the unmet needs can be mitigated through demand management in the event of a serious drought prior to the recommended strategies coming online.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended for Knox City. Conservation is recommended to reduce usage to a goal of 140 gpcd.

- a. Conservation
 - Cost Source: Volume II
 - Date to be Implemented: before 2030

- Annual Cost: maximum of \$30,240 in 2070
 - Unit Cost: \$560/acft
- b. Lake Creek Reservoir. This strategy would be developed by NCTMWA to augment existing supplies.
- Cost Source: Volume II
 - Project requires a subordination agreement with the BRA
 - Date to be Implemented: before 2030
 - Project Cost: none (cost would be borne by NCTMWA)
 - Unit Cost: none (supply already purchased from NCTMWA)

Table 5.20–2. Recommended Plan Costs by Decade for Knox City

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	(226)	(231)	(235)	(244)	(250)	(256)
Conservation						
Supply From Plan Element (acft/yr)	—	17	36	52	53	54
Annual Cost (\$/yr)	—	\$9,520	\$20,160	\$29,120	\$29,680	\$30,240
<i>Projected Surplus/(Shortage) after Conservation (acft/yr)</i>	(226)	(214)	(199)	(191)	(197)	(202)
Lake Creek Reservoir						
Supply From Plan Element (acft/yr)	—	214	199	192	197	202
Annual Cost (\$/yr)	—	—	—	—	—	—
Unit Cost (\$/acft)	—	—	—	—	—	—

5.20.2 City of Munday

Description of Supply

City of Munday obtains surface water via a contract with North Central Texas Municipal Water Authority (NCTMWA) and exempt groundwater use in the city limits from the Seymour Aquifer. The City is contracted to purchase up to 268 acft/yr from the NCTMWA; however, due to availability of supplies, this contract is prorated to provide a maximum of only 11 acft/yr during the planning period. Additionally, no local groundwater supply from the Seymour Aquifer is projected to be available to the City.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended for the City of Munday. Conservation is recommended to reduce usage to a goal of 140 gpcd. Needs remain unmet in 2020. These needs will only occur during a drought equivalent or worse than the drought of record. While not a strategy recommended by the Brazos G RWPG, the impacts

of the unmet needs can be mitigated through demand management in the event of a serious drought prior to the recommended strategies coming online.

a. Conservation

- Cost Source: Volume II
- Date to be Implemented: before 2030
- Annual Cost: maximum of \$20,160 in 2070
- Unit Cost: \$560/acft

b. Lake Creek Reservoir. This strategy would be developed by NCTMWA to augment existing supplies.

- Cost Source: Volume II
 - Project requires a subordination agreement with the BRA
- Date to be Implemented: before 2030
- Project Cost: none (cost would be borne by NCTMWA)
- Unit Cost: none (supply already purchased from NCTMWA)

Table 5.20–3. Recommended Plan Costs by Decade for the City of Munday

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	(242)	(246)	(249)	(258)	(264)	(270)
Conservation						
Supply From Plan Element (acft/yr)	—	17	35	36	35	36
Annual Cost (\$/yr)	—	\$9,520	\$19,960	\$20,160	\$19,600	\$20,160
<i>Projected Surplus/(Shortage) after Conservation (acft/yr)</i>	(242)	(229)	(214)	(222)	(228)	(234)
Lake Creek Reservoir						
Supply From Plan Element (acft/yr)	—	229	214	222	228	234
Annual Cost (\$/yr)	—	—	—	—	—	—
Unit Cost (\$/acft)	—	—	—	—	—	—

5.20.3 County-Other

Entities in Knox County-Other obtain water supply through groundwater production from the Seymour and Blaine Aquifers and through purchases of surface water under contracts with the NCTMWA. The combined supply under contract with the NCTMWA is for 131 acft/yr; however, this annual supply is projected to be prorated and only provide a maximum of 6 acft/yr during the planning period. No future local groundwater supply is projected to be available from the Seymour Aquifer; local available supply to Knox County-Other users from the Blaine Aquifer is projected at 100 acft/yr. No water supply shortages are projected and no change in water supply is recommended. Conservation was also considered; however, the current usage is below the selected goal of 140 gpcd.

5.20.4 Manufacturing

Description of Supply

Manufacturing entities in Knox County are projected to have a constant shortage during the planning period; no existing water supplies are currently allocated for this WUG.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended for Manufacturing:

- a. Groundwater Development – Blaine Aquifer
 - Cost Source: Volume II
 - Date to be Implemented: before 2030
 - Project Cost: \$331,000
 - Unit Cost: maximum of \$1,120/acft

Table 5.20–4. Recommended Plan Costs by Decade for Knox County – Manufacturing

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	0	0	0	0	0	0
Conservation						
Supply From Plan Element (acft/yr)	—	—	—	—	—	—
Annual Cost (\$/yr)	—	—	—	—	—	—
<i>Projected Surplus/(Shortage) after Conservation (acft/yr)</i>	0	0	0	0	0	0
Groundwater Development – Blaine Aquifer						
Supply From Plan Element (acft/yr)	25	25	25	25	25	25
Annual Cost (\$/yr)	\$28,000	\$28,000	\$5,000	\$5,000	\$5,000	\$5,000
Unit Cost (\$/acft)	\$1,120	\$1,120	\$200	\$200	\$200	\$200

5.20.5 Steam-Electric

No Steam-Electric demand exists or is projected for the county.

5.20.6 Mining

Description of Supply

No water supplies are currently allocated for Mining operations in Knox County. Water supply shortages are projected for Mining beginning in 2020.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended for Mining. Conservation is recommended.

- a. Conservation
 - Cost Source: Volume II, Chapter 2
 - Date to be Implemented: before 2030
 - Annual Cost: not determined
- b. Groundwater Development – Blaine Aquifer
 - Cost Source: Volume II
 - Date to be Implemented: before 2030
 - Project Cost: \$178,000
 - Unit Cost: maximum of \$560

Table 5.20–5. Recommended Plan Costs by Decade for Knox County – Mining

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	(9)	(10)	(9)	(9)	(8)	(8)
Conservation						
Supply From Plan Element (acft/yr)	—	1	1	1	1	1
Annual Cost (\$/yr)	—	ND	ND	ND	ND	ND
<i>Projected Surplus/(Shortage) after Conservation (acft/yr)</i>	(9)	(9)	(8)	(8)	(7)	(7)
Groundwater Development – Blaine Aquifer						
Supply From Plan Element (acft/yr)	25	25	25	25	25	25
Annual Cost (\$/yr)	\$14,000	\$14,000	\$1,000	\$1,000	\$1,000	\$1,000
Unit Cost (\$/acft)	\$560	\$560	\$40	\$40	\$40	\$40

ND – Not determined. Costs to implement industrial conservation technologies will vary based on each location

5.20.7 Irrigation

Description of Supply

Knox County Irrigation obtains water supplies from the Seymour and the Blaine Aquifer as well as surface water supplies from Lake Davis and run-of-the river water rights. Irrigation shortages are projected through 2070.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended for Irrigation. Conservation is recommended.

- a. Conservation
 - Cost Source: Volume II
 - Date to be Implemented: before 2030
 - Annual Cost: maximum of \$4,702,742
 - Unit Cost: \$1,662/acft
- b. Groundwater Development – Blaine Aquifer
 - Cost Source: Volume II
 - Date to be Implemented: before 2030
 - Project Cost: \$631,000
 - Unit Cost: maximum of \$136/acft
- c. Leave Needs Unmet:
 - Cost Source: Cost of not meeting needs – see Appendix G
 - Date to be Implemented: before 2030

Table 5.20–6. Recommended Plan Costs by Decade for Knox County – Irrigation

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	(14,884)	(17,282)	(13,590)	(11,488)	(11,188)	(13,381)
Conservation						
Supply From Plan Element (acft/yr)	1,319	2,199	2,791	2,665	2,829	2,829
Annual Cost (\$/yr)	\$2,193,453	\$3,655,754	\$4,640,020	\$4,431,025	\$4,702,742	\$4,702,742
<i>Projected Surplus/(Shortage) after Conservation (acft/yr)</i>	(13,565)	(15,083)	(10,799)	(8,823)	(8,359)	(10,552)
Groundwater Development – Blaine Aquifer						
Supply From Plan Element (acft/yr)	405	405	405	405	405	405
Annual Cost (\$/yr)	\$55,000	\$55,000	\$11,000	\$11,000	\$11,000	\$11,000
Unit Cost (\$/acft)	\$136	\$136	\$27	\$27	\$27	\$27
Leave Needs Unmet (acft/yr)	(13,160)	(14,678)	(10,394)	(8,418)	(7,954)	(10,117)

5.20.8 Livestock

No shortages are projected for Livestock, the demand equals the supply, and no changes in water supply are recommended.

5.21 Lampasas County Water Supply Plan

Table 5.21-1 lists each water user group in Lampasas County and their corresponding surplus or shortage in years 2040 and 2070. A brief summary of the water user groups and the plan for the selected water user are presented in the following subsections.

Table 5.21-1. Lampasas County Surplus/(Shortage)

Water User Group	Surplus/(Shortage)		Comment
	2040 (acft/yr)	2070 (acft/yr)	
City of Copperas Cove			See Coryell County
Corix Utilities Texas, Inc			See Washington county
Kempner WSC	(970)	(1,664)	Projected shortage - see plan below.
City of Lampasas	(308)	(600)	Projected shortage - see plan below.
County-Other	100	190	Projected surplus
Manufacturing	(22)	(3)	Projected shortage - see plan below.
Steam-Electric	0	0	No projected demand
Mining	(137)	(209)	Projected shortage - see plan below.
Irrigation	(233)	(242)	Projected shortage - see plan below.
Livestock	0	0	No projected surplus or shortage

5.21.1 Kempner WSC

Kempner WSC has service area in portions of Coryell, Bell, Lampasas and Burnet (Region K) Counties. Kempner WSC has contracted for 8,900 acft/yr of surface water supplies from the Brazos River Authority, which can supply 7,397 acft/yr in 2020 and 7,153 acft/yr in 2070, based on water availability analyses prescribed under water planning guidelines. Kempner’s supplies are constrained by water treatment capacity to 3,965 acft/yr. Kempner WSC sells supplies to the Lampasas County-Other, Lampasas County Mining, and Salado WSC water user groups. Shortages are projected for Kempner WSC in 2020 through 2070.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to meet water needs for Kempner WSC. Conservation is recommended to reduce usage to a goal of 140 gpcd. Kempner WSC has no shortages in the Region K portion; however, the Region K RWPG has recommended conservation and drought management strategies. Shortages and strategies shown are for the Brazos G portion only.

- a. Conservation
 - Cost Source: Volume II
 - Date to be Implemented: before 2030

- Unit Cost: \$560/acft
 - Annual Cost: maximum of \$139,376 in 2070
- b. Firm Up BRA Little River Supplies
- Cost Source: Volume II
 - Date to be Implemented: before 2030
 - Project Cost: Costs borne by BRA
 - Unit Cost: Costs borne by BRA
- c. Increase Water Treatment Plant Capacity
- Cost Source: Volume II
 - Date to be Implemented: before 2030
 - Project Cost: \$10,821,000
 - Unit Cost: \$879/acft

Table 5.21-2. Recommended Plan Costs by Decade for Kempner WSC

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	(470)	(740)	(970)	(1,211)	(1,445)	(1,664)
Conservation						
Supply From Plan Element (acft/yr)	0	234	233	229	237	249
Annual Cost (\$/yr)	\$0	\$131,221	\$130,715	\$128,005	\$132,825	\$139,376
<i>Projected Surplus/(Shortage) after Conservation (acft/yr)</i>	(470)	(506)	(737)	(982)	(1,208)	(1,415)
Additional Demands from Recommended Strategies from Others						
Increase Contract Amount to City of Lampasas (acft/yr)	121	226	308	403	504	600
Increase Contract Amount to City of Lampasas to then sell to Manufacturing (acft/yr)	7	16	7	4	–	–
Total Needs Including Recommended Strategies	(598)	(748)	(1,045)	(1,389)	(1,712)	(2,015)
Firm Up BRA Little River Supplies						
Supply From Plan Element (acft/yr)	–	1,551	1,600	1,649	1,698	1,747
Annual Cost (\$/yr)	–	–	–	–	–	–
Unit Cost (\$/acft)	–	–	–	–	–	–
Increase WTP Capacity						
Supply From Plan Element (acft/yr) ^A	1,120	1,120	1,120	2,015	2,015	2,015
Annual Cost (\$/yr)	\$984,480	\$984,480	\$477,120	\$858,390	\$858,390	\$858,390
Unit Cost (\$/acft)	\$879	\$879	\$426	\$426	\$426	\$426

A – Quantity represents increase in treatment capacity required to develop existing supplies currently constrained by treatment capacity. Existing contracted supplies are sufficient to meet shortage if treatment capacity is expanded.



5.21.2 City of Lampasas

Description of Supply

The City of Lampasas has contracted for water supply from Kempner WSC at 1,144 to 1,068 acft/yr. City of Lampasas has contracted for 3,500 acft/yr of surface water supplies from the Brazos River Authority, which can supply 2,909 acft/yr in 2020 and 2,813 acft/yr in 2070, based on water availability analyses prescribed under water planning guidelines. City of Lampasas supplies are constrained by water treatment capacity. The City provides supply for Lampasas County-Manufacturing demands. Shortages are projected beginning in 2020 and last through 2070. Needs remain unmet in 2020. These needs will only occur during a drought equivalent or worse than the drought of record. While not a strategy recommended by the Brazos G RWPG, the impacts of the unmet needs can be mitigated through demand management in the event of a serious drought prior to the recommended strategies coming online.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to meet water needs for the City of Lampasas. Conservation was considered; however, the entity's usage is below the selected goal of 140 gpcd.

- d. Firm Up BRA Little River Supplies
 - Cost Source: Volume II
 - Date to be Implemented: before 2030
 - Project Cost: costs borne by BRA
 - Unit Cost: costs borne by BRA

Table 5.21-3. Recommended Plan Costs by Decade for City of Lampasas

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	(121)	(226)	(308)	(403)	(504)	(600)
Conservation						
Supply From Plan Element (acft/yr)	–	–	–	–	–	–
Annual Cost (\$/yr)	–	–	–	–	–	–
<i>Projected Surplus/(Shortage) after Conservation</i>	(121)	(226)	(308)	(403)	(504)	(600)
Firm Up BRA Little River Supplies						
Supply From Plan Element (acft/yr)	–	610	629	649	668	687
Annual Cost (\$/yr)	–	–	–	–	–	–
Unit Cost (\$/acft)	–	–	–	–	–	–

5.21.3 County-Other

Entities included in Lampasas County-Other obtain water supply from the Trinity Aquifer at 5 acft/yr and Marble Falls Aquifer at 6 acft/yr. Surpluses are projected through 2070 and no changes in water supply are recommended. Conservation was considered; however, the entity’s current per capita use rate is below the selected target rate of 140 gpcd.

5.21.4 Manufacturing

Lampasas County Manufacturing obtains its water supply the City of Lampasas at 137 to 213 acft/yr and run-of-river rights at 48 to 0 acft/yr from 2020 to 2070. Based on the available surface water supply, Lampasas County Manufacturing is projected to have a shortage through 2050 after conservation.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to meet water needs for the Lampasas County Manufacturing. Conservation is recommended.

- a. Conservation
 - Cost Source: Volume II
 - Date to be Implemented: by 2030
 - Annual Cost: not determined
- b. Increase treatment contract with City of Lampasas
 - Cost Source: Volume II
 - Date to be Implemented: 2020
 - Project Cost: Existing infrastructure assumed sufficient
 - Unit Cost: \$500/acft

Table 5.21-4. Recommended Plan Costs by Decade for Lampasas County-Manufacturing

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	(13)	(27)	(22)	(19)	(11)	(3)
Conservation						
Supply From Plan Element (acft/yr)	6	11	15	15	15	15
Annual Cost (\$/yr)	ND	ND	ND	ND	ND	ND
<i>Projected Surplus/(Shortage) after Conservation</i>	(7)	(16)	(7)	(4)	4	12
Increase treated water contract from City of Lampasas						
Supply From Plan Element (acft/yr)	7	16	7	4	–	–
Annual Cost (\$/yr)	\$3,500	\$8,000	\$3,500	\$2,000	–	–
Unit Cost (\$/acft)	\$500	\$500	\$500	\$500	\$500	\$500

ND – Not determined. Costs to implement industrial conservation technologies will vary based on each location.



5.21.5 Steam-Electric

No Steam-Electric demand is projected for Lampasas County.

5.21.6 Mining

Description of Supply

Lampasas County Mining currently obtains its water supply from Kempner WSC at 25 acft/yr and the Ellenburger-San Saba Aquifer at 79 acft/yr. Mining is projected to have shortages starting in 2020 to 2070.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended for Lampasas County-Mining. Conservation is recommended.

- a. Conservation
 - Cost Source: Volume II
 - Date to be Implemented: by 2030
 - Annual Cost: not determined
- b. Groundwater Development – Ellenburger-San Saba Aquifer
 - Cost Source: Volume II
 - Date to be Implemented: by 2030
 - Project Cost: \$2,051,000
 - Unit Cost: \$936

Table 5.21-5. Recommended Plan Costs by Decade for Lampasas County – Mining

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	(94)	(117)	(137)	(157)	(182)	(209)
Conservation						
Supply From Plan Element (acft/yr)	6	11	17	18	20	22
Annual Cost (\$/yr)	ND	ND	ND	ND	ND	ND
<i>Projected Surplus/(Shortage) after Conservation (acft/yr)</i>	(88)	(106)	(120)	(139)	(162)	(187)
Groundwater Development – Ellenburger-San Saba Aquifer						
Supply From Plan Element (acft/yr)	88	106	120	139	162	187
Annual Cost (\$/yr)	\$82,368	\$99,216	\$19,680	\$22,796	\$26,568	\$30,668
Unit Cost (\$/acft)	\$936	\$936	\$164	\$164	\$164	\$164

ND – Not determined. Costs to implement industrial conservation technologies will vary based on each location.

5.21.7 Irrigation

Description of Supply

Lampasas County Irrigation is supplied by the Trinity and Marble Falls Aquifers at 208 acft/yr and run of the river water rights at 103 to 88 acft/yr. Irrigation is projected to have shortages beginning in 2020 through 2070.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to meet water needs for Lampasas County-Irrigation. Conservation is recommended.

- a. Conservation
 - Cost Source: Volume II
 - Date to be Implemented: by 2030
 - Annual Cost: maximum of \$5,936 in 2030
 - Unit Cost: \$1,285/acft
- b. Groundwater Development – Marble Falls Aquifer
 - Cost Source: Volume II
 - Date to be Implemented: by 2030
 - Project Cost: \$2,054,000
 - Unit Cost: Max of \$834/ acft/yr

Table 5.21-6. Recommended Plan Costs by Decade for Lampasas County – Irrigation

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	(227)	(230)	(233)	(236)	(239)	(242)
Conservation						
Supply From Plan Element (acft/yr)	16	27	38	38	38	38
Annual Cost (\$/yr)	\$20,734	\$34,557	\$48,380	\$48,380	\$48,380	\$48,380
Unit Cost (\$/acft)	\$1,285	\$1,285	\$1,285	\$1,285	\$1,285	\$1,285
<i>Projected Surplus/(Shortage) after Conservation (acft/yr)</i>	(211)	(203)	(195)	(198)	(201)	(204)
Groundwater Development – Marble Falls Aquifer						
Supply From Plan Element (acft/yr)	211	203	195	198	201	204
Annual Cost (\$/yr)	\$175,974	\$169,302	\$29,055	\$29,502	\$29,949	\$30,396
Unit Cost (\$/acft)	\$834	\$834	\$149	\$149	\$149	\$149

5.21.8 Livestock

Livestock water supply is projected to meet demands through 2070 and no changes in water supply are recommended.

5.22 Lee County Water Supply Plan

Table 5.22-1 lists each water user group in Lee County and their corresponding surplus or shortage in years 2040 and 2070. A brief summary of the water user groups and the plan for the selected water user are presented in the following subsections.

Table 5.22-1. Lee County Surplus/(Shortage)

Water User Group	Surplus/(Shortage)		Comment
	2040 (acft/yr)	2070 (acft/yr)	
Aqua WSC	0	0	No projected surplus or shortage - see plan below.
City of Giddings	400	351	Projected surplus - see plan below.
Lee County WSC	2,035	1,517	Projected surplus
City of Lexington	387	377	Projected surplus - see plan below.
Southwest Milam WSC			See Milam County
County-Other	7	1	Projected surplus
Manufacturing	7	10	Projected surplus
Steam-Electric	0	0	No projected demand
Mining	3,115	3,324	Projected surplus, shortage in 2020-2030 - see plan below.
Irrigation	197	207	Projected surplus
Livestock	0	0	No projected surplus or shortage

5.22.1 Aqua WSC

Description of Supply

Aqua WSC is located in Lee (Brazos G) and Bastrop (Region K), Fayette (Region K), Travis (Region K), and Caldwell (Region L) Counties with a majority of its demand in Bastrop County. Aqua WSC obtains its water supply from groundwater from the Carrizo-Wilcox Aquifer. Based on the existing supply available from groundwater, demands are projected to match supplies from year 2020 through year 2070.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, and in coordination with Regions K and L, the following water management strategy is recommended for Aqua WSC. Conservation is recommended to reduce usage to a goal of 140 gpcd. The conservation strategy is shown for only the Brazos G recommended strategy. Regions K and L also recommend water conservation in their plans.

- a. Conservation
 - Cost Source: Volume II
 - Date to be Implemented: 2030
 - Annual Cost: maximum of \$2,244 in 2040
 - Unit Cost: \$560/acft

Table 5.22-2. Recommended Plan Costs by Decade for Aqua WSC

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	0	0	0	0	0	0
Conservation						
Supply From Plan Element (acft/yr)	0	11	4	0	0	0
Annual Cost (\$/yr)	\$0	\$5,983	\$2,244	\$225	\$0	\$0
<i>Projected Surplus/(Shortage) after Conservation (acft/yr)</i>	0	11	4	0	0	0

5.22.2 City of Giddings

Description of Supply

The City of Giddings obtains its water supply from groundwater from the Carrizo-Wilcox Aquifer at 1,730 to 1,725 acft/yr. The City of Giddings sells water to Lee County Manufacturing at 13 to 18 acft/yr. There are surpluses projected through 2070.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended for the City of Giddings. Conservation is recommended to reduce usage to a goal of 140 gpcd.

- a. Conservation
 - Cost Source: Volume II
 - Date to be Implemented: 2030
 - Annual Cost: maximum of \$134,243 in 2070
 - Unit Cost: \$560/acft

Table 5.22-3. Recommended Plan Costs by Decade for City of Giddings

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	576	461	400	380	362	351
Conservation						
Supply From Plan Element (acft/yr)	0	95	199	237	238	240
Annual Cost (\$/yr)	\$0	\$52,980	\$111,538	\$132,735	\$133,385	\$134,243
<i>Projected Surplus/(Shortage) after Conservation</i>	576	556	599	617	600	591

5.22.3 Lee County WSC

Lee County WSC is located in Lee, Bastrop (Region K) and Fayette (Region K) counties. The majority of water demand is located in Lee County. The WSC obtains its water supply from groundwater from the Queen City Aquifer at 133 to 136 acft/yr, the Carrizo Wilcox at 3,934 acft/yr, and the Sparta Aquifer at 272 acft/yr. Balance and strategies represented in the table below are for the entire WSC in all counties and regions. No shortages are projected for the planning period. Conservation was considered; however, the entity's current per capita use rate is below the selected target rate of 140 gpcd.

5.22.4 City of Lexington

Description of Supply

The City of Lexington obtains its water supply from the Carrizo-Wilcox Aquifer at 667 acft/yr. No shortages are projected for the City of Lexington, surpluses are projected through 2070.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended for the City of Lexington. Conservation is recommended to reduce usage to a goal of 140 gpcd.

a. Conservation

- Cost Source: Volume II
- Date to be Implemented: 2030
- Annual Cost: maximum of \$11,812 in 2060
- Unit Cost: \$560/acft

Table 5.22-4. Recommended Plan Costs by Decade for City of Lexington

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	423	399	387	383	379	377
Conservation						
Supply From Plan Element (acft/yr)	0	20	23	21	21	21
Annual Cost (\$/yr)	\$0	\$11,025	\$12,601	\$11,591	\$11,812	\$11,790
<i>Projected Surplus/(Shortage) after Conservation</i>	423	419	410	404	400	398

5.22.5 County-Other

Entities in Lee County-Other receive supplies from the Carrizo-Wilcox Aquifer at 156 acft/yr. County-Other is projected to have a surplus of water through the year 2070 and no changes in water supply are recommended. Conservation was considered; however, the entity’s current per capita use rate is below the selected target rate of 140 gpcd.

5.22.6 Manufacturing

Manufacturing is supplied from City of Giddings at 13 to 18 acft/yr and is projected to have a surplus of water through the year 2070 and no changes in water supply are recommended.

5.22.7 Steam-Electric

No Steam-Electric demand exists nor is projected for the county.

5.22.8 Mining

Description of Supply

Mining operations in Lee County are supplied water from the Carrizo-Wilcox at 2,905 to 3,324 acft/yr from 2020 to 2070. Shortages are projected from 2020 to 2030 and surpluses for Mining are projected between 2040 and 2070.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to meet water needs for Lee County-Mining. Conservation is recommended.

a. Conservation

- Cost Source: Volume II
- Date to be Implemented: 2020
- Annual Cost: not determined



- b. Groundwater Development – Carrizo-Wilcox Aquifer
 - Cost Source: Volume II
 - Date to be Implemented: 2020 and 2030
 - Project Cost: \$3,077,000
 - Unit Cost: \$1,413

Table 5.22-5. Recommended Plan Costs by Decade for Lee County – Mining

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	(275)	(169)	3,115	3,221	3,324	3,324
Conservation						
Supply From Plan Element (acft/yr)	95	159	0	0	0	0
Annual Cost (\$/yr)	ND	ND	ND	ND	ND	ND
<i>Projected Surplus/(Shortage) after Conservation (acft/yr)</i>	(180)	(10)	3,115	3,221	3,324	3,324
Groundwater Development – Carrizo-Wilcox Aquifer						
Supply From Plan Element (acft/yr)	180	10	–	–	–	–
Annual Cost (\$/yr)	\$254,340	\$14,130	–	–	–	–
Unit Cost (\$/acft)	\$1,413	\$1,413	–	–	–	–

ND – Not determined. Costs to implement industrial conservation technologies will vary based on each location

5.22.9 Irrigation

Lee County Irrigation is supplied from run-of-the river water rights at 1 acft/yr, the Carrizo-Wilcox Aquifer at 781 to 783 acft/yr from 2020 to 2070, and the Queen City Aquifer at 576 to 591 acft/yr from 2020 to 2070. Irrigation is projected to have a surplus of water through the year 2070 and no changes in water supply are recommended.

5.22.10 Livestock

Livestock water supply is projected to meet demands through 2070 and no changes in water supply are recommended.

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5.23 Limestone County Water Supply Plan

Table 5.23-1 lists each water user group in Limestone County and their corresponding surplus or shortage in years 2040 and 2070. A brief summary of the water user groups and the plan for the selected water user are presented in the following subsections.

Table 5.23-1. Limestone County Surplus/(Shortage)

Water User Group	Surplus/(Shortage)		Comment
	2040 (acft/yr)	2070 (acft/yr)	
Birome WSC			See Hill County
Bistone MWSD	28	28	Projected surplus
City of Coolidge	209	141	Projected surplus
City of Groesbeck	(667)	(665)	Projected shortage - see plan below.
City of Mart			See McLennan County
City of Mexia	284	(182)	Projected shortage - see plan below.
Point Enterprise WSC	15	0	Projected surplus
Post Oak SUD			See Hill County
Prairie Hill WSC	137	105	Projected surplus
SLC WSC	15	6	Projected surplus
Tri-County SUD	1,168	1,169	Projected surplus
White Rock WSC	536	517	Projected surplus
County-Other	243	236	Projected surplus
Manufacturing	(314)	(313)	Projected shortage - see plan below.
Steam-Electric	(388)	(388)	Projected shortage - see plan below.
Mining	(6,707)	(8,267)	Projected shortage - see plan below.
Irrigation	28	28	Projected surplus
Livestock	0	0	No projected surplus or shortage

5.23.1 Bistone Municipal Water Supply District

Description of Supply

Bistone Municipal Water Supply District obtains its water supply through groundwater production from the Carrizo-Wilcox Aquifer, through diversions of surface water from Lake Mexia under water rights held by the District, and through purchases of treated surface water under contract with the City of Mexia. Available groundwater supplies from the Carrizo-Wilcox Aquifer are projected at a constant 2,067 acft/yr through the planning period, and available supply through treated water purchases from the City of Mexia is projected at 28 acft/yr. Water supply obtained through surface water diversions by the

District is projected to have an availability of 1,100 acft/yr at the beginning of the planning period, which will decrease to 600 acft/yr by 2070.

Bistone Municipal Water Supply District also provides sales of treated surface water under contract with the City of Coolidge, White Rock WSC, and Mexia State School which is grouped within the Limestone County-Other WUG. Additionally, the Bistone Municipal Water Supply District provides sales of Carrizo-Wilcox groundwater produced by the District to the City of Mexia. No shortages in water supply are projected for Bistone Municipal Water Supply District though the planning period, however, with additional demands projected from its wholesale customers, Bistone will need to develop additional supplies in 2060 and 2070.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to for the Bistone Municipal Water Supply District. Conservation is recommended to reduce usage to a goal of 140 gpcd.

- a. Conservation
 - Cost Source: Volume II
 - Date to be Implemented: before 2030
 - Annual Cost: maximum of \$58,240
 - Unit Cost: \$560/acft
- b. Carrizo-Wilcox Aquifer Development
 - Cost Source: Volume II
 - Date to be Implemented: before 2060
 - Project Cost: \$1,772,000
 - Unit Cost: \$358.70/acft

Table 5.23-2. Recommended Plan Costs by Decade for Bistone Municipal Water Supply District

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	116	28	28	28	28	28
Conservation						
Supply From Plan Element (acft/yr)	—	20	40	62	83	104
Annual Cost (\$/yr)	—	\$11,200	\$22,400	\$34,720	\$46,480	\$58,240
<i>Projected Surplus/(Shortage) after Conservation (acft/yr)</i>	116	48	68	90	111	132
Additional Demands from Recommended Strategies from Others						
Increase Groundwater Supply to City of Mexia (includes supplies to Wortham (Region C)) (acft/yr)	—	—	—	—	(186)	(363)

Table 5.23-2. Recommended Plan Costs by Decade for Bistone Municipal Water Supply District

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr) Including Recommended Strategies</i>	106	31	47	65	(75)	(231)
Groundwater Development – Carrizo-Wilcox Aquifer						
Supply From Plan Element (acft/yr)	—	—	—	—	274	97
Annual Cost (\$/yr)	—	—	—	—	\$98,400	\$34,800
Unit Cost (\$/acft)	—	—	—	—	\$359	\$359

5.23.2 City of Coolidge

Description of Supply

The City of Coolidge obtains its water supply through purchases of treated surface water under contracts with the Bistone Municipal Water Supply District and Post Oak SUD; water provided by Post Oak SUD is sourced within Region C. Total treated water supplies available to the City are projected to range between 392 to 430 acft/yr. No shortages are projected for the City of Coolidge during the planning period and no change is recommended to water supply.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, and in coordination with Region C, the following water management strategies are recommended for the City of Coolidge. Conservation is recommended to reduce usage to a goal of 140 gpcd.

- a. Conservation
 - Cost Source: Volume II
 - Date to be Implemented: before 2030
 - Annual Cost: maximum of \$2,240
 - Unit Cost: \$560/acft

Table 5.23-3. Recommended Plan Costs by Decade for City of Coolidge

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	197	198	209	190	169	141
Conservation						
Supply From Plan Element (acft/yr)	—	4	—	—	—	—
Annual Cost (\$/yr)	—	\$2,240	—	—	—	—
<i>Projected Surplus/(Shortage) after Conservation (acft/yr)</i>	197	202	209	190	169	141

5.23.3 City of Groesbeck

Description of Supply

The City of Groesbeck obtains its water supply through diversions from the Navasota River; however, no surface water supplies are projected as being available to the City during the planning period. The City owns senior water rights (priority date of 1921) on the Navasota River and has limited storage available from Springfield Lake. The City has purchased a quarry to temporarily store water supply to manage the most recent drought. However; until a permanent solution is identified, the City of Groesbeck is projected to have shortages.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to meet the projected water shortage for the City of Groesbeck. Conservation was considered; however, the entity's usage is below the selected goal of 140 gpcd. Needs remain unmet in 2020. These needs will only occur during a drought equivalent or worse than the drought of record. While not a strategy recommended by the Brazos G RWPG, the impacts of the unmet needs can be mitigated through demand management in the event of a serious drought prior to the recommended strategies coming online.

- a. Groesbeck Off-Channel Reservoir
 - Cost Source: Volume II
 - Date to be Implemented: 2030
 - Project Cost: \$23,599,000
 - Unit Cost: maximum of \$1,056/acft

Table 5.23-4. Recommended Plan Costs by Decade for City of Groesbeck

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	(688)	(677)	(667)	(665)	(668)	(665)
Conservation						
Supply From Plan Element (acft/yr)	—	—	—	—	—	—
Annual Cost (\$/yr)	—	—	—	—	—	—
<i>Projected Surplus/(Shortage) after Conservation (acft/yr)</i>	(688)	(677)	(667)	(665)	(668)	(665)
Groesbeck OCR						
Supply From Plan Element (acft/yr)	—	1,755	1,755	1,755	1,755	1,755
Annual Cost (\$/yr)	—	\$1,853,000	\$1,853,000	\$750,000	\$379,000	\$379,000
Unit Cost (\$/acft)	—	\$1,056	\$1,056	\$427	\$216	\$216

5.23.4 City of Mexia

Description of Supply

The City of Mexia obtains its water supply through contracted purchases of Carrizo-Wilcox groundwater produced by the Bistone Municipal Water Supply District, which is projected to provide 2,067 acft/yr of available supply at the beginning of the planning period and decreasing to 1,615 acft/yr in 2070. The City also provides sales of treated water to the Bistone Municipal Water Supply District, White Rock WSC, Manufacturing entities in Limestone County, and the City of Wortham (Region C). Additionally, the City sells Carrizo-Wilcox groundwater purchased from the Bistone Municipal Water District to County-Other users in Limestone County, including the City of Shiloh and the 84 West WSC. Shortages in available water supply for the City are projected to occur in 2060.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to meet the projected water shortage for the City of Mexia. Conservation was considered; however, the entity’s usage is below the selected goal of 140 gpcd.

- a. Obtain additional groundwater from Bistone Municipal Water Supply District
 - Cost Source: Volume II, Chapter 14
 - Project requires Bistone Municipal Water Supply District to develop additional Carrizo-Wilcox groundwater supply.
 - Date to be Implemented: before 2060
 - Annual Cost: maximum of \$130,680
 - Unit Cost: \$359/acft

Table 5.23-5. Recommended Plan Costs by Decade for City of Mexia

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	530	443	284	115	(43)	(182)
Conservation						
Supply From Plan Element (acft/yr)	—	—	—	—	—	—
Annual Cost (\$/yr)	—	—	—	—	—	—
<i>Projected Surplus/(Shortage) after Conservation (acft/yr)</i>	530	443	284	115	(43)	(182)
Additional Demands from Recommended Strategies from Others						
Increase sales to Wortham (Region C) (acft/yr)	(10)	(17)	(21)	(25)	(143)	(181)
<i>Projected Surplus/(Shortage) (acft/yr) Including Recommended Strategies</i>	520	426	263	90	(186)	(363)

Table 5.23-5. Recommended Plan Costs by Decade for City of Mexia

Plan Element	2020	2030	2040	2050	2060	2070
Purchase additional Groundwater from Bistone Municipal Water Supply District (includes supply to Wortham)						
Supply From Plan Element (acft/yr)	—	—	—	—	186	363
Annual Cost (\$/yr)	—	—	—	—	\$66,960	\$130,680
Unit Cost (\$/acft)	—	—	—	—	\$360	\$360

5.23.5 Point Enterprise WSC

Point Enterprise WSC’s service area includes portions of Limestone and Freestone Counties (Region C). This section addresses only the supply, demands and strategies that are within the Brazos G Area. Point Enterprise WSC obtains water supply through groundwater production from the Carrizo-Wilcox Aquifer. No supply shortages are projected during the planning period and no change in water supply is recommended. Conservation was considered; however, the entity’s usage is below the selected goal of 140 gpcd.

5.23.6 Prairie Hill WSC

Description of Supply

Prairie Hill WSC obtains its water supply solely through groundwater production from the Carrizo-Wilcox Aquifer, which is projected to provide a constant 395 acft/yr of supply through the planning period. No shortages are projected for Prairie Hill WSC and no change in water supply is recommended.

Various entities are dealing with elevated levels of arsenic in groundwater supplies and have been pursuing water management strategies through the FHLM WSC. Through a TWDB sponsored study coordinated by FHLM WSC, these entities have considered a regional brackish RO WTP in Limestone County, Carrizo-Wilcox Regional Groundwater in Limestone County, Tehuacana Reservoir, and supplies from City of Marlin (Brushy Creek Reservoir), and City of Waco. The recommended strategy is to provide for arsenic treatment for individual entities. This strategy does not provide new supply.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to meet the projected water shortage for Prairie Hill WSC. Conservation is recommended to reduce usage to a goal of 140 gpcd.

- a. Conservation
 - Cost Source: Volume II
 - Date to be Implemented: before 2030
 - Annual Cost: maximum of \$3,360 in 2030
 - Unit Cost: \$560/acft



- b. Upgrade Treatment for Arsenic
 - Cost Source: Volume II
 - Date to be Implemented: before 2030
 - Project Cost: \$1,408,000
 - Unit Cost: maximum of \$1,000/acft

Table 5.23-6. Recommended Plan Costs by Decade for Prairie Hill WSC

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	154	145	137	126	114	105
Conservation						
Supply From Plan Element (acft/yr)	—	4	1	—	—	—
Annual Cost (\$/yr)	—	\$2,240	\$560	—	—	—
<i>Projected Surplus/(Shortage) after Conservation</i>	154	149	138	126	114	105
Upgrade Treatment for Arsenic						
Supply From Plan Element (acft/yr)	268	268	268	268	268	268
Annual Cost (\$/yr)	\$268,000	\$268,000	\$286,000	\$169,000	\$169,000	\$169,000
Unit Cost (\$/acft)	\$1,000	\$1,000	\$631	\$631	\$631	\$631

5.23.7 SLC WSC

SLC WSC obtains its water supply through groundwater production from the Carrizo-Wilcox Aquifer and through purchases of raw surface water under contract from the Brazos River Authority. Local groundwater production is projected to provide 123 acft/yr of supply through the planning period, while surface water purchases are projected to provide a constant 200 acft/yr. No shortages in water supply are projected for SLC WSC through the planning period and no change in supply is recommended. Conservation was also considered; however, the entity’s usage is below the selected goal of 140 gpcd.

5.23.8 Tri-County SUD

Tri-County SUD obtains its water supply through groundwater production from the Trinity and Carrizo-Wilcox Aquifers in Falls County and from the Carrizo-Wilcox Aquifer in Robertson County. Total groundwater supply available for production by the SUD is projected to range between 1,420 to 1,430 acft/yr during the planning period. No water supply shortages are projected and no change in supply is recommended for Tri-County SUD. Conservation was also considered; however, the entity’s usage is below the selected goal of 140 gpcd.

5.23.9 White Rock WSC

White Rock WSC obtains its water supply through purchases of treated water under contracts with the Bistone Municipal Water Supply District and the City of Mexia. These contracts are projected to provide a constant 761 acft/yr of supply through the planning

period. No shortages in water supply are projected for White Rock WSC during the planning period and no change in water supply is recommended. Conservation was also considered; however, the entity's usage is below the selected goal of 140 gpcd.

5.23.10 County-Other

Description of Supply

Entities in County-Other obtain water supply through local groundwater production from the Carrizo-Wilcox and Trinity Aquifers, though purchases of groundwater from the City of Mexia by 84 West WSC and the City of Shiloh, and through purchases of treated surface water from the Bistone Municipal Water Supply District by the Mexia State School. Groundwater supplies available for local production are projected at a constant 5 acft/yr; purchases of groundwater and treated surface water are projected to provide 534 acft/yr through the planning period. No supply shortages are projected and no change in water supply is recommended. Conservation was also considered; however, the entity's usage is below the selected goal of 140 gpcd.

5.23.11 Manufacturing

Description of Supply

Limestone County Manufacturing obtains its water supply through purchases of treated water from the City of Mexia and City of Groesbeck and through purchases of groundwater from the City of Coolidge. Manufacturing in the County is projected to experience water supply shortages throughout the planning period.

Recommended Strategy

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended for Limestone County-Manufacturing. Conservation is recommended.

- a. Conservation
 - Cost Source: Volume II
 - Date to be Implemented: before 2030
 - Annual Cost: not determined
- b. Carrizo-Wicox Aquifer Development
 - Cost Source: Volume II
 - Date to be Implemented: before 2030
 - Project Cost: \$1,767,000
 - Unit Cost: maximum of \$525/acft

Table 5.23-7. Recommended Plan Costs by Decade for the Limestone County – Manufacturing

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	(259)	(314)	(314)	(314)	(313)	(313)
Conservation						
Supply From Plan Element (acft/yr)	10	19	26	26	26	26
Annual Cost (\$/yr)	ND	ND	ND	ND	ND	ND
<i>Projected Surplus/(Shortage) after Conservation</i>	(249)	(295)	(288)	(314)	(314)	(313)
Groundwater Development – Carrizo-Wilcox Aquifer						
Supply From Plan Element (acft/yr)	314	314	314	314	314	314
Annual Cost (\$/yr)	\$165,000	\$165,000	\$41,000	\$41,000	\$41,000	\$41,000
Unit Cost (\$/acft)	\$525	\$525	\$131	\$131	\$131	\$131

ND – Not determined. Costs to implement industrial conservation technologies will vary based on each location.

5.23.12 Steam-Electric

Description of Supply

Steam-Electric water demand in Limestone County is associated with the NRG (formerly Reliant Energy) power plant located at Lake Limestone. NRG has contracted with the Brazos River Authority for up to 21,837 acft/yr of raw water supply through purchases of raw water from Lake Limestone. Additionally, NRG utilizes local groundwater produced from the Carrizo-Wilcox Aquifer; this supply is projected to provide an additional 711 acre-feet of annual supply. Limestone County Steam-Electric is projected to have shortages from 2030 through the year 2070.

Recommended Strategy

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to meet water needs for Limestone County-Mining. The Brazos G RWPG does not recommend conservation for Steam-Electric use.

- a. Carrizo-Wilcox Aquifer Development
 - Cost Source: Volume II
 - Date to be Implemented: before 2030
 - Project Cost: \$1,709,000
 - Unit Cost: maximum of \$363//acft

Table 5.23-8. Recommended Plan Costs by Decade for Limestone County – Steam-Electric

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	(388)	(388)	(388)	(388)	(388)	(388)
Groundwater Development - Carrizo-Wilcox Aquifer						
Supply From Plan Element (acft/yr)	388	388	388	388	388	388
Annual Cost (\$/yr)	\$141,000	\$141,000	\$21,000	\$21,000	\$21,000	\$21,000
Unit Cost (\$/acft)	\$363	\$363	\$54	\$54	\$54	\$54

5.23.13 Mining

Description of Supply

Mining operations in Limestone County are supplied by Carrizo-Wilcox groundwater. Demands for Mining exceed current supplies resulting in shortages beginning in 2020.

Recommended Strategy

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to meet water needs for Limestone County-Mining. Conservation is recommended.

a. Conservation

- Cost Source: Volume II
- Date to be Implemented: before 2030
- Annual Cost: not determined

b. Leave Needs Unmet

- Mining activity in Limestone County has slowed down since the release of the most recent demand projections and current mine operations are focused on reclamation. Projected demands and corresponding shortages are not anticipated to be realized during the planning period.
- Cost Source: Cost of not meeting needs – see Appendix G
- Date to be Implemented: before 2030

Table 5.23-9. Recommended Plan Costs by Decade for Limestone County – Mining

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	(7,159)	(6,767)	(6,707)	(7,181)	(7,647)	(8,267)
Conservation						
Supply From Plan Element (acft/yr)	310	496	691	724	756	800
Annual Cost (\$/yr)	ND	ND	ND	ND	ND	ND
<i>Projected Surplus/(Shortage) after Conservation (acft/yr)</i>	(6,849)	(6,271)	(6,016)	(6,457)	(6,891)	(7,467)
Leave Needs Unmet (acft/yr)	(6,849)	(6,271)	(6,016)	(6,457)	(6,891)	(7,467)

ND – Not determined. Costs to implement industrial conservation technologies will vary based on each location.

5.23.14 Irrigation

Irrigation in Limestone County obtains water supply through local groundwater production from the Carrizo-Wilcox Aquifer and through purchases of surface water from Limestone County-Other entities. Irrigation is projected to have a surplus of water supply throughout the planning period. No change in water supply is recommended.

5.23.15 Livestock

Water supply for Livestock in Limestone County is obtained from local stock surface water impoundments, which are projected to meet demands through the planning period. No change in water supply is recommended.

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5.24 McLennan County Water Supply Plan

Table 5.24-1 lists each water user group in McLennan County and their corresponding surplus or shortage in years 2040 and 2070. A brief summary of the water user groups and the plan for the selected water user are presented in the following subsections.

Table 5.24-1. McLennan County Surplus/(Shortage)

Water User Group	Surplus/(Shortage)		Comment
	2040 (acft/yr)	2070 (acft/yr)	
Axtell WSC	108	79	Projected surplus – see plan below.
City of Bellmead	2,056	1,896	Projected surplus – see plan below.
Birome WSC			See Hill County
Bold Springs WSC	876	828	Projected surplus
City of Bruceville-Eddy	379	170	Projected surplus – see plan below.
Central Bosque WSC	359	359	Projected surplus
Chalk Bluff WSC	466	472	Projected surplus
Coryell City Water Supply District			See Coryell County
City of Crawford	21	17	Projected surplus – see plan below.
Cross Country WSC	228	212	Projected surplus – see plan below.
East Crawford WSC	(154)	(219)	Projected shortage – see plan below.
Elm Creek WSC			See Bell County
EOL WSC	138	97	Projected surplus
Gholson WSC	399	316	Projected surplus
H&H WSC	94	46	Projected surplus
City of Hewitt	(1,172)	(2,262)	Projected shortage – see plan below.
Highland Park WSC			See Bosque County
Hilltop WSC	324	307	Projected surplus
City of Lacy-Lakeview	292	131	Projected surplus – see plan below.
Leroy Tours Gerald WSC	235	211	Projected surplus
Levi WSC	383	364	Projected surplus
City of Lorena	503	406	Projected surplus – see plan below.
City of Mart	(180)	(244)	Projected shortage – see plan below.
City of McGregor	1,505	1,360	Projected surplus
McLennan County WCID 2	406	356	Projected surplus
City of Moody	379	337	Projected surplus
North Bosque WSC	(190)	(522)	Projected shortage – see plan below.
Prairie Hill WSC			See Limestone County

Table 5.24-1. McLennan County Surplus/(Shortage)

Water User Group	Surplus/(Shortage)		Comment
	2040 (acft/yr)	2070 (acft/yr)	
City of Riesel	144	134	Projected surplus
City of Robinson	(1,048)	(2,255)	Projected shortage – see plan below.
Ross WSC	366	307	Projected surplus
Spring Valley WSC	175	121	Projected surplus
Texas State Technical College	0	0	No projected surplus or shortage – see plan below.
City of Valley Mills			See Bosque County
City of Waco	5,023	(2,908)	Projected shortage – see plan below.
City of West	922	887	Projected surplus – see plan below.
West Brazos WSC			See Falls County
Windsor Water	131	111	Projected surplus
City of Woodway	82	139	Projected surplus – see plan below.
County-Other	172	667	Projected surplus – see plan below.
Manufacturing	(2,463)	(1,309)	Projected shortage – see plan below.
Steam-Electric	16,453	16,405	Projected surplus
Mining	(2,322)	(3,478)	Projected shortage – see plan below.
Irrigation	955	1,195	Projected surplus
Livestock	0	0	No projected surplus or shortage

5.24.1 Axtell WSC

Description of Supply

Axtell WSC obtains its water supply from the Trinity Aquifer (287 acft/yr). No shortages are projected for Axtell WSC.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended for Axtell WSC. Conservation was considered; however, the entity’s current per capita use rate is below the selected target rate of 140 gpcd. To reduce arsenic concentrations, Axtell plans to purchase treated water to blend with water purchased from the City of Waco. This purchase may be made through the FHLM WSC.

- a. Purchase water from City of Waco to blend to reduce arsenic concentrations
 - Cost Source: Volume II
 - Date to be Implemented: 2020



- Unit Cost: assumed unit cost of \$3,273/acft (\$10.15/1,000 gallons) for wholesale treated water, including transmission costs

Table 5.24–2. Recommended Plan Costs by Decade for Axtell WSC

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	121	115	108	100	89	79
Conservation						
Supply From Plan Element (acft/yr)	–	–	–	–	–	–
Annual Cost (\$/yr)	–	–	–	–	–	–
<i>Projected Surplus/(Shortage) after Conservation (acft/yr)</i>	121	115	108	100	89	79
Purchase water from the City of Waco for Arsenic Blending						
Supply From Plan Element (acft/yr)	83	86	90	94	99	104
Annual Cost (\$/yr)	\$271,659	\$281,478	\$294,570	\$307,662	\$324,027	\$340,392
Unit Cost (\$/acft)	\$3,273	\$3,273	\$3,273	\$3,273	\$3,273	\$3,273

5.24.2 City of Bellmead

Description of Supply

The City of Bellmead obtains its water supply from the Trinity Aquifer at 2,000 acft/yr. The City of Bellmead also has contracted with the City of Waco at 1,344 acft/yr for supplemental surface water supply from Lake Waco, but has no plans to utilize the contract. No shortages are projected for the City of Bellmead; however, the City of Waco and the City of Bellmead are considering alternate water supply in order to reduce Bellmead’s dependence on Trinity Aquifer groundwater. The purchase of supplemental reuse water from WMARSS is recommended to reduce demands on the Trinity Aquifer.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended for the City of Bellmead. Conservation was also considered; however, the entity’s current per capita use rate is below the selected target rate of 140 gpcd.

- Purchase reuse water from WMARSS (Bellmead/Lacy-Lakeview Reuse). The reuse supply will reduce demands for landscape irrigation at existing or future parks, schools, ball fields, and other green spaces. Reuse water may also potentially supply existing or future industrial customers.
 - Cost Source: Volume II
 - Date to be Implemented: by 2020
 - Project Cost: None. City of Waco is the project sponsor. Entity will purchase from the City.
 - Unit Cost: \$424/acft

Table 5.24–3. Recommended Plan Costs by Decade for City of Bellmead

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	2,111	2,083	2,056	2,013	1,956	1,896
Conservation						
Supply From Plan Element (acft/yr)	–	–	–	–	–	–
Annual Cost (\$/yr)	–	–	–	–	–	–
<i>Projected Surplus/(Shortage) after Conservation (acft/yr)</i>	2,111	2,083	2,056	2,013	1,956	1,896
WMARSS Bellmead/Lacy Lakeview Reuse						
Supply From Plan Element (acft/yr)	1,121	1,121	1,121	1,121	1,121	1,121
Annual Cost (\$/yr)	\$949,760	\$949,760	\$275,520	\$275,520	\$275,520	\$275,520
Unit Cost (\$/acft)	\$424	\$424	\$123	\$123	\$123	\$123
<i>Projected Surplus/(Shortage) after Reuse (acft/yr)</i>	3,232	3,204	3,177	3,134	3,077	3,017

5.24.3 Bold Springs WSC

Bold Springs WSC obtains its water supply from the Trinity Aquifer at 613 acft/yr and surface water from the City of Waco at 560 acft/yr. No shortages are projected for Bold Springs WSC and no change in water supply is recommended. Conservation was considered; however, the entity’s current per capita use rate is below the selected target rate of 140 gpcd.

5.24.4 City of Bruceville-Eddy

Description of Supply

The City of Bruceville-Eddy obtains its water supply from the Trinity Aquifer (618 acft/yr) and has a contract for surface water from Bluebonnet WSC (908 to 878 acft/yr from 2020 to 2070) for supplemental water supplies. No shortages are projected for the City of Bruceville-Eddy. This WUG is located in multiple counties (McLennan and Falls). The surpluses shown in the table below represent the cumulative totals for the City of Bruceville-Eddy.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended for Bruceville-Eddy. Conservation is recommended to reduce usage to a goal of 140 gpcd.

- a. Conservation
 - Cost Source: Volume II
 - Date to be Implemented: before 2030
 - Unit Cost: \$560/acft
 - Annual Cost: maximum of \$76,802in 2070



Table 5.24–4. Recommended Plan Costs by Decade for City of Bruceville-Eddy

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	496	436	379	315	243	170
Conservation						
Supply From Plan Element (acft/yr)	0	79	129	126	130	137
Annual Cost (\$/yr)	\$0	\$44,281	\$72,327	\$70,382	\$73,005	\$76,802
<i>Projected Surplus/(Shortage) after Conservation</i>	496	515	508	441	373	307

5.24.5 Central Bosque WSC

Central Bosque WSC obtains its water supply from 128 to 164 acft/yr from a contract with McGregor and 359 acft/yr from a contract with Waco. No shortages are projected for Central Bosque WSC and no change in water supply is recommended. Conservation was considered; however, the entity’s current per capita use rate is below the selected target rate of 140 gpcd.

5.24.6 Chalk Bluff WSC

Chalk Bluff WSC obtains its water supply from the Trinity Aquifer at 715 acft/yr. No shortages are projected for the Chalk Bluff WSC. Conservation was considered; however, the entity’s current per capita use rate is below the selected target rate of 140 gpcd.

5.24.7 City of Crawford

Description of Supply

The City of Crawford obtains its water supply from the Trinity Aquifer at 167 acft/yr. No shortages are projected for City of Crawford and no change in water supply is recommended.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended for the City of Crawford. Conservation is recommended to reduce Crawford’s per-capita usage below the selected target rate of 140 gpcd.

- a. Conservation
 - Cost Source: Volume II
 - Date to be Implemented: before 2030
 - Annual Cost: maximum of \$15,589 in 2070
 - Unit Cost: \$560/acft

Table 5.24–5. Recommended Plan Costs by Decade for City of Crawford

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	19	20	21	20	19	17
Conservation						
Supply From Plan Element (acft/yr)	0	11	21	28	27	28
Annual Cost (\$/yr)	\$0	\$6,128	\$11,921	\$15,665	\$15,347	\$15,589
<i>Projected Surplus/(Shortage) after Conservation</i>	19	31	42	48	46	45

5.24.8 Cross Country WSC

Description of Supply

Cross Country WSC obtains its water supply from groundwater from the Trinity Aquifer at 780 acft/yr. Cross Country WSC is projected to have a surplus through the year 2070. This WUG is located in McLennan and Bosque Counties. The surplus/shortages shown in the table below represent the cumulative totals for Cross Country WSC.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to meet water needs for the Cross Country WSC. Conservation is recommended to reduce usage to a goal of 140 gpcd.

- a. Conservation
 - Cost Source: Volume II
 - Date to be Implemented: before 2030
 - Annual Cost: maximum of \$4,390 in 2070
 - Unit Cost: \$560/acft

Table 5.24–6. Recommended Plan Costs by Decade for Cross Country WSC

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	234	229	228	224	218	212
Conservation						
Supply From Plan Element (acft/yr)	0	23	14	9	8	8
Annual Cost (\$/yr)	\$0	\$13,048	\$7,812	\$5,222	\$4,454	\$4,390
<i>Projected Surplus/(Shortage) after Conservation</i>	234	252	242	233	226	220



5.24.9 East Crawford WSC

East Crawford WSC obtains its water supply from groundwater from the Trinity Aquifer at 215 acft/yr. A shortage is projected through the year 2070.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to meet water needs for the East Crawford WSC. Conservation is recommended to reduce usage to a goal of 140 gpcd.

- a. Conservation
 - Cost Source: Volume II
 - Date to be Implemented: before 2030
 - Annual Cost: maximum of \$92,035 in 2070
 - Unit Cost: \$560/acft
- b. Purchase water from City of Waco
 - Cost Source: Volume II
 - Date to be Implemented: 2020
 - Unit Cost: assumed unit cost of \$3,273/acft (\$10.15/1,000 gallons) for wholesale treated water, including transmission costs

Table 5.24–7. Recommended Plan Costs by Decade for East Crawford WSC

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	(113)	(135)	(154)	(175)	(197)	(219)
Conservation						
Supply From Plan Element (acft/yr)	0	30	61	94	129	164
Annual Cost (\$/yr)	\$0	\$16,656	\$34,035	\$52,745	\$72,264	\$92,035
<i>Projected Surplus/(Shortage) after Conservation</i>	(113)	(105)	(93)	(81)	(68)	(55)
Purchase from Waco						
Supply From Plan Element (acft/yr)	113	105	93	81	68	55
Annual Cost (\$/yr)	\$369,849	\$343,665	\$304,389	\$265,113	\$222,564	\$100,815
Unit Cost (\$/acft)	\$3,273	\$3,273	\$3,273	\$3,273	\$3,273	\$1,833

5.24.10 EOL WSC

The EOL WSC obtains its water supply from groundwater from the Trinity Aquifer at 387 acft/yr. A surplus is projected through the year 2070; and, there are no changes recommended to the water supply. To reduce arsenic concentrations, Axtell plans to purchase treated water to blend with water purchased from the City of Waco. This purchase may be made through the FHLM WSC.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended for EOL WSC. Conservation was considered; however, the entity’s current per capita use rate is below the selected target rate of 140 gpcd. To reduce arsenic concentrations, EOL WSC plans to purchase treated water to blend with water purchased from the City of Waco.

- a. Purchase water from City of Waco to blend to reduce arsenic concentrations
 - Cost Source: Volume II
 - Date to be Implemented: 2020
 - Unit Cost: assumed unit cost of \$3,273/acft (\$10.15/1,000 gallons) for wholesale treated water, including transmission costs

Table 5.24–8. Recommended Plan Costs by Decade for EOL WSC

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	156	147	138	126	111	97
Conservation						
Supply From Plan Element (acft/yr)	–	–	–	–	–	–
Annual Cost (\$/yr)	–	–	–	–	–	–
<i>Projected Surplus/(Shortage) after Conservation</i>	156	147	138	126	111	97
Purchase water from the City of Waco for Arsenic Blending						
Supply From Plan Element (acft/yr)	116	120	125	131	131	138
Annual Cost (\$/yr)	\$379,668	\$392,760	\$409,125	\$428,763	\$428,763	\$451,674
Unit Cost (\$/acft)	\$3,273	\$3,273	\$3,273	\$3,273	\$3,273	\$3,273
<i>Projected Surplus/(Shortage) after Conservation</i>	272	267	263	257	242	235

5.24.11 Gholson WSC

The Gholson WSC obtains its water supply from groundwater from the Trinity Aquifer at 766 acft/yr. Gholson WSC is split between Hill and McLennan counties, with primary demands in the McLennan County. A surplus is projected through the year 2070; and, there are no changes recommended to the water supply. Conservation was considered; however, the entity’s current per capita use rate is below the selected target rate of 140 gpcd.

5.24.12 H & H WSC

The H & H WSC obtains its water supply from groundwater from the Trinity Aquifer at 387 acft/yr. A surplus is projected through the year 2070; and, there are no changes recommended to the water supply. Conservation was considered; however, the entity’s current per capita use rate is below the selected target rate of 140 gpcd.

5.24.13 City of Hewitt

Description of Supply

The City of Hewitt obtains its water supply from groundwater from the Trinity Aquifer at 1,429 acft/yr and has a contract with the City of Waco at 1,120 acft/yr for a supplemental supply from Lake Waco.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to meet water needs for the City of Hewitt. Associated costs are included for each strategy. Conservation is recommended to reduce usage to a goal of 140 gpcd. Needs remain unmet in 2020. These needs will only occur during a drought equivalent or worse than the drought of record. While not a strategy recommended by the Brazos G RWPG, the impacts of the unmet needs can be mitigated through demand management in the event of a serious drought prior to the recommended strategies coming online.

- a. Conservation
 - Cost Source: Volume II
 - Date to be Implemented: before 2030
 - Annual Cost: maximum of \$144,415 in 2070
 - Unit Cost: \$560/acft
- b. Purchase reuse water from WMARSS (Bulhide Creek Reuse). The reuse supply will reduce demands for landscape irrigation at existing or future parks, schools, ball fields, and other green spaces. Reuse water may also potentially supply existing or future industrial customers.
 - Cost Source: Volume II
 - Date to be Implemented: 2030
 - Project Cost: None. City of Waco is the project sponsor. Entity will purchase from the City.
 - Unit Cost: \$543/acft
- c. Purchase additional water from City of Waco
 - Cost Source: Volume II
 - Date to be Implemented: 2050
 - Unit Cost: assumed unit cost of \$2,164/acft (\$6.64/1,000 gallons) for wholesale treated water

Table 5.24–9. Recommended Plan Costs by Decade for City of Hewitt

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	(480)	(844)	(1,172)	(1,522)	(1,893)	(2,262)
Conservation						
Supply From Plan Element (acft/yr)	0	247	236	227	240	258
Annual Cost (\$/yr)	\$0	\$138,568	\$131,977	\$126,958	\$134,402	\$144,415
<i>Projected Surplus/(Shortage) after Conservation (acft/yr)</i>	(480)	(597)	(936)	(1,295)	(1,653)	(2,004)
WMARSS – Bullhide Creek Reuse						
Supply From Plan Element (acft/yr)	–	1,233	1,233	1,233	1,233	1,233
Annual Cost (\$/yr)	–	\$669,519	\$669,519	\$218,241	\$218,241	\$218,241
Unit Cost (\$/acft)	–	\$543	\$543	\$177	\$177	\$177
<i>Projected Surplus/(Shortage) after Reuse (acft/yr)</i>	(480)	636	297	(62)	(420)	(77)
Purchase Water from City of Waco						
Supply From Plan Element (acft/yr)	–	–	–	62	420	771
Annual Cost (\$/yr)	–	–	–	\$134,168	\$908,880	\$1,668,444
Unit Cost (\$/acft)	–	–	–	\$2,164	\$2,164	\$2,164

5.24.14 Hilltop WSC

The Hilltop WSC obtains its water supply from groundwater from the Trinity Aquifer at 329 acft/yr and a contract with Waco at 101 acft/yr. A surplus is projected through the year 2070; and, there are no changes recommended to the water supply. Conservation was considered; however, the entity’s current per capita use rate is below the selected target rate of 140 gpcd.

5.24.15 City of Lacy-Lakeview

Description of Supply

The City of Lacy-Lakeview obtains its water supply from the City of Waco at 1,120 acft/yr. Based on the current contracted amount, the City of Lacy-Lakeview is projected to have a surplus of supplies. Supplemental reuse water from WMARSS is recommended to reduce demands on water supplied by the City of Waco.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended for the City of Lacy-Lakeview. Purchase reuse water from WMARSS (Bellmead/Lacy-Lakeview Reuse). The reuse supply will reduce demands for landscape irrigation at existing or future parks, schools, ball fields, and other green spaces. Reuse water may also potentially supply existing or

future industrial customers. Conservation was considered; however, the entity’s current per capita use rate is below the selected target rate of 140 gpcd.

a. WMARSS – Bellmead/Lacy-Lakeview Reuse

- Cost Source: Volume II
- Date to be Implemented: 2020
- Project Cost: None. City of Waco is the project sponsor. Entity will purchase from the City.
- Unit Cost: \$424/acft

Table 5.24–10. Recommended Plan Costs by Decade for City of Lacy-Lakeview

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	375	332	292	243	188	131
Conservation						
Supply From Plan Element (acft/yr)	–	–	–	–	–	–
Annual Cost (\$/yr)	–	–	–	–	–	–
<i>Projected Surplus/(Shortage) after Conservation (acft/yr)</i>	375	332	292	243	188	131
WMARSS – Bellmead/Lacy-Lakeview Reuse						
Supply From Plan Element (acft/yr)	745	745	745	745	745	745
Annual Cost (\$/yr)	\$315,880	\$315,880	\$91,635	\$91,635	\$91,635	\$91,635
Unit Cost (\$/acft)	\$424	\$424	\$123	\$123	\$123	\$123
<i>Projected Surplus/(Shortage) after Reuse (acft/yr)</i>	1,120	1,077	1,037	988	933	876

5.24.16 Leroy Tours Gerald WSC

Description of Supply

The Leroy Tours Gerald WSC obtains its water supply from groundwater from the Trinity Aquifer at 383 acft/yr. A surplus is projected through the year 2070; and, there are no changes recommended to the water supply except to pursue a strategy to reduce arsenic levels.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended for Leroy Tours Gerald WSC. Conservation was considered; however, the entity’s current per capita use rate is below the selected target rate of 140 gpcd. An alternative strategy is to treat for arsenic at each well head.

- a. Purchase Water from Waco for Arsenic Blending
 - Cost Source: Volume II
 - Date to be Implemented: by 2020
 - Project Cost: None; delivered by FHLM WSC
 - Unit Cost: \$3,273/acft

Table 5.24–11. Recommended Plan Costs by Decade for Leroy Tours Gerald WSC

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	244	239	235	228	220	211
Conservation						
Supply From Plan Element (acft/yr)	–	–	–	–	–	–
Annual Cost (\$/yr)	–	–	–	–	–	–
<i>Projected Surplus/(Shortage) after Conservation (acft/yr)</i>	244	239	235	228	220	211
Purchase Water from Waco for Arsenic Blending						
Supply From Plan Element (acft/yr)	70	72	74	78	82	86
Annual Cost (\$/yr)	\$229,110	\$235,656	\$242,202	\$255,294	\$268,386	\$281,478
Unit Cost (\$/acft)	\$3,273	\$3,273	\$3,273	\$3,273	\$3,273	\$3,273

5.24.17 Levi WSC

The Levi WSC obtains its water supply from groundwater from the Trinity Aquifer at 498 acft/yr. A surplus is projected through the year 2070; and, there are no changes recommended to the water supply. Conservation was considered; however, the entity’s current per capita use rate is below the selected target rate of 140 gpcd.

5.24.18 City of Lorena

Description of Supply

The City of Lorena obtains its water supply from a contract with the Brazos River Authority (treated by the City of Robinson) at 1,000 acft/yr, City of Robinson at 560 acft/yr, and the Trinity Aquifer at 322 acft/yr. No shortages are projected for the City of Lorena; however, purchase of supplemental reuse water from WMARSS is recommended to reduce demands on groundwater from the Trinity Aquifer.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended for the City of Lorena. Conservation is recommended to reduce usage to a goal of 140 gpcd.



- a. Conservation
 - Cost Source: Volume II
 - Date to be Implemented: before 2030
 - Annual Cost: maximum of \$1,777 in 2030
 - Unit Cost: \$560/acft
- b. Purchase reuse water from WMARSS (Bullhide Creek Reuse). The reuse supply will reduce demands for landscape irrigation at existing or future parks, schools, ball fields, and other green spaces. Reuse water may also potentially supply existing or future industrial customers
 - Cost Source: Volume II
 - Date to be Implemented: 2020
 - Project Cost: None. City of Waco is the project sponsor. Entity will purchase from the City.
 - Unit Cost: \$543/acft

Table 5.24–12. Recommended Plan Costs by Decade for the City of Lorena

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	563	531	503	472	439	406
Conservation						
Supply From Plan Element (acft/yr)	0	3	–	–	–	–
Annual Cost (\$/yr)	\$0	\$1,777	–	–	–	–
<i>Projected Surplus/(Shortage) after Conservation (acft/yr)</i>	563	534	503	472	439	406
WMARSS – Bullhide Creek Reuse						
Supply From Plan Element (acft/yr)	448	448	448	448	448	448
Annual Cost (\$/yr)	\$243,264	\$243,264	\$79,296	\$79,296	\$79,296	\$79,296
Unit Cost (\$/acft)	\$543	\$543	\$177	\$177	\$177	\$177
<i>Projected Surplus/(Shortage) after Reuse (acft/yr)</i>	1,011	976	951	920	887	854

5.24.19 City of Mart

Description of Supply

The City of Mart obtains its water supply from the Trinity Aquifer at 203 acft/yr. Based on the available groundwater supply and no firm yield from Lake Mart, the City of Mart is projected to have a shortage through the year 2070. The City is located in multiple counties (McLennan and Limestone). The shortages shown in the table below represent the cumulative totals for the City of Mart.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended for the City of Mart. Conservation was considered; however, the entity’s current per capita use rate is below the selected target rate of 140 gpcd.

- a. Purchase water from City of Waco
 - Cost Source: Volume II
 - Date to be Implemented: 2020
 - Unit Cost: assumed unit cost of \$2,164/acft (\$6.64/1,000 gallons) for wholesale treated water
- b. Trinity ASR McLennan County
 - Cost Source: Volume II
 - Date to be Implemented: 2020
 - Project Cost: \$2,884,000 (City’s portion)
 - Unit Cost: \$3,317/acft

Table 5.24–13. Recommended Plan Costs by Decade for the City of Mart

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	(149)	(165)	(180)	(200)	(221)	(244)
Conservation						
Supply From Plan Element (acft/yr)	–	–	–	–	–	–
Annual Cost (\$/yr)	–	–	–	–	–	–
<i>Projected Surplus/(Shortage) after Conservation (acft/yr)</i>	(149)	(165)	(180)	(200)	(221)	(244)
Purchase Water Supply from City of Waco						
Supply From Plan Element (acft/yr)	149	165	180	200	221	244
Annual Cost (\$/yr)	\$322,436	\$357,060	\$389,520	\$432,800	\$478,244	\$528,016
Unit Cost (\$/acft)	\$2,164	\$2,164	\$2,164	\$2,164	\$2,164	\$2,164
Trinity ASR McLennan County						
Supply From Plan Element (acft/yr)		250	250	250	250	250
Annual Cost (\$/yr)		\$829,250	\$829,250	\$329,000	\$329,000	\$329,000
Unit Cost (\$/acft)		\$3,317	\$3,317	\$1,316	\$1,316	\$1,316

5.24.20 City of McGregor

Description of Supply

The City of McGregor obtains its water supply from a contract with Bluebonnet WSC at 1,851 to 1,792 acft/yr and BRA from 518 to 473 acft/yr from 2020 to 2070, respectively.

The City of McGregor has contracted for 810 acft/yr of surface water supplies from the Brazos River Authority, which can supply 673 acft/yr in 2020 and 651 acft/yr in 2070, based on water availability analyses prescribed under water planning guidelines. The city also sells water to Central Bosque WSC and Manufacturing entities in McLennan County. No shortages are projected for the City of McGregor and no changes in water supply are recommended.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended for the City of McGregor. Conservation was considered; however, the entity’s current per capita use rate is below the selected target rate of 140 gpcd.

a. Firm Up BRA Little River Supplies

BRA provides this supply under contract to entity. BRA to develop any combinations of strategies as described in Section 5.38.2 to firm up this amount.

- Cost Source: BRA to firm up water supply
- Date to be Implemented: before 2030
- Project Cost: Costs borne by BRA
- Unit Cost: Costs borne by BRA

Table 5.24–14. Recommended Plan Costs by Decade for the City of McGregor

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	1,568	1,536	1,505	1,463	1,413	1,360
Conservation						
Supply From Plan Element (acft/yr)	–	–	–	–	–	–
Annual Cost (\$/yr)	–	–	–	–	–	–
<i>Projected Surplus/(Shortage) after Conservation (acft/yr)</i>	1,568	1,536	1,505	1,463	1,413	1,360
Firm Up BRA Little River Supplies						
Supply From Plan Element (acft/yr)	–	141	146	150	155	159
Annual Cost (\$/yr)	–	–	–	–	–	–
Unit Cost (\$/acft)	–	–	–	–	–	–

5.24.21 McLennan County WCID 2

McLennan County WCID 2 obtains its water supply from the Trinity Aquifer at 705 acft/yr. No shortages are projected for the City of McGregor and no changes in water supply are recommended. Conservation was considered; however, the entity’s current per capita use rate is below the selected target rate of 140 gpcd.

5.24.22 City of Moody

The City of Moody obtains its water supply from the Trinity Aquifer at 211 acft/yr and Bluebonnet WSC at 388 to 375 acft/yr in 2020 to 2070, respectively. No shortages are projected for the City of Moody, and no changes in water supply are recommended. Conservation was considered; however, the entity's current per capita use rate is below the selected target rate of 140 gpcd.

5.24.23 North Bosque WSC

Description of Supply

North Bosque WSC obtains its water supply from the Trinity Aquifer at 605 acft/yr. Based on the available groundwater supply, North Bosque WSC is projected to have a shortage through the year 2070. Conservation is recommended to reduce North Bosque gallons per capita per day (gpcd) to a goal of 140 gpcd.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended for North Bosque WSC. Associated costs are included for each strategy.

- a. Conservation
 - Cost Source: Volume II
 - Date to be Implemented: before 2030
 - Annual Cost: maximum of \$231,191 in 2070
 - Unit Cost: \$560/acft
- b. Trinity ASR McLennan County (from Waco)
 - Cost Source: Volume II
 - Date to be Implemented: 2030
 - Project Cost: \$2,884,000 (City's portion)
 - Unit Cost: \$1,9755/acft



Table 5.24–15. Recommended Plan Costs by Decade for North Bosque WSC

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	39	(82)	(190)	(300)	(412)	(522)
Conservation						
Supply From Plan Element (acft/yr)	0	57	131	219	319	413
Annual Cost (\$/yr)	\$0	\$31,966	\$73,373	\$122,562	\$178,740	\$231,191
<i>Projected Surplus/(Shortage) after Conservation (acft/yr)</i>	39	(25)	(59)	(81)	(93)	(109)
Trinity ASR McLennan County (purchase from Waco)						
Supply From Plan Element (acft/yr)	–	200	200	200	200	200
Annual Cost (\$/yr)	–	\$129,000	\$129,000	\$13,000	\$13,000	\$13,000
Unit Cost (\$/acft)	–	\$1,975	\$1,120	\$1,120	\$1,120	\$1,120

5.24.24 City of Riesel

Description of Supply

The City of Riesel obtains its water supply from the Trinity Aquifer at 181 acft/yr and County, Other McLennan at 125 acft/yr. Based on the available groundwater supply, the City of Riesel is projected to have a shortage through the year 2070. No shortages are projected for the City of Riesel, and no changes in water supply are recommended. Conservation was also considered; however, the entity’s current per capita use rate is below the selected target rate of 140 gpcd.

5.24.25 City of Robinson

Description of Supply

The City of Robinson obtains its water supply from the Trinity Aquifer at 1,101 acft/yr and surface water from the Brazos River at 1,126 acft/yr. The city also has a 560 acft/yr contract to provide treated supply to the City of Lorena, which utilizes Lorena’s contract with the BRA. Based on the constrained supply amounts, the City of Robinson is projected to have shortages. Although the City has sufficient raw water supply to meet its future needs, the City’s water treatment plant has an annual average capacity of 1,125 acft.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended for the City of Robinson. Associated costs are included for each strategy. Conservation is recommended to reduce usage to a goal of 140 gpcd.

- a. Conservation
 - Cost Source: Volume II
 - Date to be Implemented: 2030
 - Annual Cost: maximum \$376,263 in 2070
 - Unit Cost: \$560/acft
- b. Expand Water Treatment Plant (4 MGD)
 - Cost Source: Volume II
 - Date to be Implemented: before 2030
 - Project Cost: \$16,813,000
 - Unit Cost: Max of \$481/acft

Table 5.24–16. Recommended Plan Costs by Decade for City of Robinson

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	(245)	(669)	(1,048)	(1,444)	(1,851)	(2,255)
Conservation						
Supply From Plan Element (acft/yr)	0	220	504	557	612	672
Annual Cost (\$/yr)	\$0	\$123,429	\$282,196	\$311,757	\$342,962	\$376,263
<i>Projected Surplus/(Shortage) after Conservation</i>	(245)	(449)	(544)	(887)	(1,239)	(1,583)
Expand WTP (4 MGD)						
Supply From Plan Element (acft/yr)	4,311	4,108	3,905	3,701	3,498	3,295
Annual Cost (\$/yr)	\$2,073,591	\$1,975,948	\$847,385	\$803,117	\$759,066	\$715,015
Unit Cost (\$/acft)	\$481	\$481	\$217	\$217	\$217	\$217

5.24.26 Ross WSC

The Ross WSC obtains its water supply from the Trinity Aquifer at 445 acft/yr and surface water from the City of Waco at 280 acft/yr. No shortages are projected for the Ross WSC, and no changes in water supply are recommended. Conservation was considered; however, the entity’s current per capita use rate is below the selected target rate of 140 gpcd.

5.24.27 Spring Valley WSC

The Spring Valley WSC obtains its water supply from the Trinity Aquifer at 176 acft/yr and from Bluebonnet WSC at 291 to 282 acft/yr in 2020 to 2070, respectively. No shortages are projected for the Spring Valley WSC, and no changes in water supply are recommended. Conservation was considered; however, the entity’s current per capita use rate is below the selected target rate of 140 gpcd.



5.24.28 Texas State Technical College

Texas State Technical College obtains its water supply from the City of Waco at 888 to 1,193 acft/yr in 2020 to 2070, respectively. No shortages are projected for the Texas State Technical College.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended for Texas State Technical College. Associated costs are included for each strategy. Conservation is recommended to reduce usage to a goal of 140 gpcd.

- a. Conservation
 - Cost Source: Volume II
 - Date to be Implemented: 2030
 - Annual Cost: maximum \$261,221 in 2070
 - Unit Cost: \$560/acft

Table 5.24–17. Recommended Plan Costs by Decade for Texas State Technical College

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	0	0	0	0	0	0
Conservation						
Supply From Plan Element (acft/yr)	0	88	180	274	370	466
Annual Cost (\$/yr)	\$0	\$49,556	\$100,841	\$153,629	\$207,027	\$261,221
<i>Projected Surplus/(Shortage) after Conservation (acft/yr)</i>	0	88	180	274	370	466

5.24.29 City of Waco

The City of Waco obtains its water supply from surface water from Lake Waco, for which it owns water rights. The City supplies several neighboring communities with treated water. A portion of the city’s treated wastewater is also contracted to irrigation and industrial customers in the County. The City is projected to have a shortage of supplies starting in 2060.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended for the City of Waco. Associated costs are included for each strategy. Conservation is recommended to reduce usage to a goal of 140 gpcd. Waco plans to expand the Riverside WTP, which will cost an inflation-adjusted \$13,000,000 and utilize Brazos River water at the Riverside WTP, which will cost an additional \$15,000,000. Those strategies are not shown here.

- a. Conservation
 - Cost Source: Volume II
 - Date to be Implemented: 2030
 - Annual Cost: maximum \$6,964,137 in 2070
 - Unit Cost: \$560/acft
- b. Waco WMARSS Reuse Projects McLennan I-84
 - Cost Source: Volume II
 - Date to be Implemented: 2020
 - Project Cost: \$28,249,000
 - Unit Cost: \$3,711/acft
- c. Reuse WMARSS Bellmead/Lacy-Lakeview
 - Cost Source: Volume II
 - Date to be Implemented: 2020
 - Project Cost: \$28,249,000
 - Unit Cost: \$424/acft
- d. Waco WMARSS Reuse Projects Flat Creek Reuse
 - Cost Source: Volume II
 - Date to be Implemented: 2020
 - Project Cost: \$20,014,000
 - Unit Cost: \$350/acft
- e. Waco WMARSS Reuse Projects North-China Spring
 - Cost Source: Volume II
 - Date to be Implemented: 2020
 - Project Cost: \$25,888,000
 - Unit Cost: \$2,635/acft
- f. Trinity ASR McLennan County
 - Cost Source: Volume II
 - Date to be Implemented: 2020
 - Project Cost: \$2,884,000
 - Unit Cost: \$645/acft



Table 5.24–18. Recommended Plan Costs by Decade for City of Waco

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	9,510	7,271	5,023	2,517	(123)	(2,908)
Conservation (includes meter replacement project)						
Supply From Plan Element (acft/yr)	698	4,820	7,706	10,858	14,246	15,176
Annual Cost (\$/yr)	\$1,533,000	\$2,981,000	\$3,257,000	\$4,952,000	\$6,775,000	\$7,219,000
<i>Projected Surplus/(Shortage) after Conservation</i>	10,208	12,091	12,729	13,375	14,123	12,268
Additional Demands from Recommended Strategies from Others						
Increase Contract Amount to East Crawford WSC (acft/yr)	113	105	93	81	68	55
Increase Contract Amount to City of Hewitt (acft/yr)	–	–	–	62	420	771
Increase Contract Amount to City of Mart (acft/yr)	149	165	180	200	221	244
New Contract with Axtel WSC	83	86	90	94	99	104
New Contract with EOL WSC	116	120	125	131	131	138
<i>Total Surplus/(Shortage) Including Recommended Strategies</i>	9,747	11,615	12,241	12,807	13,184	10,956
Waco WMARSS Reuse Projects – McLennan I-84						
Supply From Plan Element (acft/yr)	1,400	1,400	1,400	1,680	1,680	1,680
Annual Cost (\$/yr)	\$5,195,400	\$5,195,400	\$3,537,800	\$4,245,360	\$4,245,360	\$4,245,360
Unit Cost (\$/acft)	\$3,711	\$3,711	\$2,527	\$2,527	\$2,527	\$2,527
Waco WMARSS Reuse Projects – Bellmead/Lacy-Lakeview						
Supply From Plan Element (acft/yr)	374	374	374	374	374	374
Annual Cost (\$/yr)	\$158,576	\$158,576	\$46,002	\$46,002	\$46,002	\$46,002
Unit Cost (\$/acft)	\$424	\$424	\$123	\$123	\$123	\$123
Waco WMARSS Reuse Projects – Flat Creek						
Supply From Plan Element (acft/yr)	2,147	2,147	2,147	2,147	2,147	2,147
Annual Cost (\$/yr)	\$2,746,000	\$2,746,000	\$291,992	\$291,992	\$291,992	\$291,992
Unit Cost (\$/acft)	\$350	\$350	\$136	\$136	\$136	\$136
Waco WMARSS Reuse Projects – North-China Spring						
Supply From Plan Element (acft/yr)	1,120	1,120	1,120	1,120	1,120	1,120
Annual Cost (\$/yr)	\$4,998,750	\$4,869,750	\$490,750	\$490,750	\$490,750	\$490,750
Unit Cost (\$/acft)	\$2,635	\$2,635	\$701	\$701	\$701	\$701
<i>Projected Surplus/(Shortage) after Reuse</i>	14,090	14,419	14,936	15,659	15,901	13,537

Table 5.24–18. Recommended Plan Costs by Decade for City of Waco

Plan Element	2020	2030	2040	2050	2060	2070
Trinity ASR McLennan County						
Supply From Plan Element (acft/yr)		7,550	7,550	7,550	7,550	7,550
Annual Cost (\$/yr)		\$4,869,750	\$4,869,750	\$490,750	\$490,750	\$490,750
Unit Cost (\$/acft)		\$645	\$645	\$65	\$65	\$65

5.24.30 City of West

Description of Supply

The City of West obtains its water supply from the Trinity Aquifer at 268 acft/yr and the 1,120 acft/yr from the City of Waco. Surpluses are projected through 2070.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended for the City of West. Conservation is recommended to reduce usage to a goal of 140 gpcd.

- a. Conservation
 - Cost Source: Volume II
 - Date to be Implemented: 2030
 - Annual Cost: maximum \$2,788 in 2030
 - Unit Cost: \$560/acft

Table 5.24–19. Recommended Plan Costs by Decade for City of West

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	931	927	922	914	901	887
Conservation						
Supply From Plan Element (acft/yr)	0	21	12	6	5	5
Annual Cost (\$/yr)	\$0	\$11,651	\$6,635	\$3,212	\$2,676	\$2,788
<i>Projected Surplus/(Shortage) after Conservation</i>	931	948	934	920	906	892

5.24.31 Windsor Water

Windsor Water obtains its water supply from the Trinity Aquifer at 245 acft/yr. No shortages are projected for the Windsor Water, and no changes in water supply are recommended. Conservation was considered; however, the entity’s current per capita use rate is below the selected target rate of 140 gpcd.

5.24.32 City of Woodway

Description of Supply

The City of Woodway obtains its water supply from the Trinity Aquifer at 2,454 acft/yr from Lake Waco from the City of Waco at 0 to 989 acft/yr, and from Bluebonnet WSC at 1,319 to 1,275 acft/yr from 2020 to 2070. The City provides 2 acft/yr for McLennan County Manufacturing. The supply contracts are adequate to meet demands; however under drought conditions, Bluebonnet WSC may not be able to provide the full contract amount to all of its customers, including Woodway. Conservation is recommended to reduce usage to a goal of 140 gpcd.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended for the City of Woodway.

- a. Conservation
 - Cost Source: Volume II
 - Date to be Implemented: 2030
 - Annual Cost: maximum \$968,857 in 2070
 - Unit Cost: \$560/acft

Table 5.24–20. Recommended Plan Costs by Decade for City of Woodway

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	308	78	82	111	119	139
Conservation						
Supply From Plan Element (acft/yr)	0	308	635	988	1,357	1,730
Annual Cost (\$/yr)	\$0	\$172,428	\$355,402	\$553,058	\$759,670	\$968,857
<i>Projected Surplus/(Shortage) after Conservation</i>	308	386	717	1,099	1,476	1,869

5.24.33 County-Other

Description of Supply

McLennan County-Other entities obtain water supply from groundwater from the Trinity Aquifer at 968 and surface water from a contract with H&H WSC at 78 to 99 acft/yr from 2020 to 2070. Entities in County-Other provide additional supply to Riesel and provide supply to steam-electric power and manufacturing customers in McLennan County.

Various entities are dealing with elevated levels of arsenic in groundwater supplies and have been pursuing water management strategies through the FHLM WSC. A shortage is projected for 2020 and after there are surpluses through 2070.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended for McLennan County-Other. Conservation was considered; however, the entity’s usage is below the selected goal of 140 gpcd.

a. Upgrade Treatment for Arsenic

This is a treatment strategy and does not increase the supply available to these entities. Total treatment is estimated at 917 acft/yr.

- Cost Source: Volume II
- Date to be Implemented: by 2030
- Project Cost: \$4,425,000
- Unit Cost: \$911/acft

Table 5.24–21. Recommended Plan Costs by Decade for the McLennan County – Other

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	(222)	14	172	349	511	667
Conservation						
Supply From Plan Element (acft/yr)	–	–	–	–	–	–
Annual Cost (\$/yr)	–	–	–	–	–	–
<i>Projected Surplus/(Shortage) after Conservation</i>	(222)	14	172	349	511	667
Upgrade Treatment for Arsenic						
Supply From Plan Element (acft/yr)	250	250	250	250	250	250
Annual Cost (\$/yr)	\$227,750	\$227,750	\$142,750	\$142,750	\$142,750	\$142,750
Unit Cost (\$/acft)	\$911	\$911	\$571	\$571	\$571	\$571

5.24.34 Manufacturing

Description of Supply

Water supply for manufacturing in McLennan County is obtained by purchase from a city or water supply corporation, from Trinity Aquifer wells operated by the manufacturing entity, and from run-of-river rights. McLennan County Manufacturing is projected to have shortages beginning in 2020. However, purchase of supplemental reuse water from WMARSS is recommended to reduce demands on water supplied by the run-of-river rights, Lake Waco and groundwater from the Trinity Aquifer.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to meet water needs for McLennan County Manufacturing. Conservation is recommended.



- a. Conservation
 - Cost Source: Volume II
 - Date to be Implemented: before 2030
 - Annual Cost: Not determined
- b. WMARSS Flat Creek Reuse Project
 - Cost Source: Volume II
 - Date to be Implemented: before 2030
 - Project Cost: None. City of Waco is the project sponsor. Entity will purchase from the City.
 - Unit Cost: \$205/acft

Table 5.24–22. Recommended Plan Costs by Decade for McLennan County – Manufacturing

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	(543)	(2,824)	(2,463)	(2,094)	(1,764)	(1,309)
Conservation						
Supply From Plan Element (acft/yr)	144	373	522	522	522	522
Annual Cost (\$/yr)	ND	ND	ND	ND	ND	ND
<i>Projected Surplus/(Shortage) after Conservation (acft/yr)</i>	(399)	(2,451)	(1,941)	(1,572)	(1,242)	(787)
Purchase Reuse Supplies from WMARSS – Flat Creek Project						
Supply From Plan Element (acft/yr)	2,500	2,500	2,500	2,500	2,500	2,500
Annual Cost (\$/yr)	\$875,000	\$875,000	\$340,000	\$340,000	\$340,000	\$340,000
Unit Cost (\$/acft)	\$350	\$350	\$136	\$136	\$136	\$136
<i>Projected Surplus/(Shortage) after Reuse (acft/yr)</i>	2,101	49	559	928	1,258	1,713

ND – Not Determined. Costs to implement industrial conservation technologies will vary based on each location.

5.24.35 Steam-Electric

McLennan County Steam-Electric obtains its water supply from Tradinghouse Reservoir, Lake Creek Reservoir, the Trinity Aquifer, and from WMARSS reuse. No shortage is projected for McLennan County Steam-Electric and no changes in water supply are recommended.

5.24.36 Mining

Description of Supply

Mining operations in McLennan County are supplied by Brazos River Alluvium groundwater at 735 acft/yr. Demands for Mining are projected to increase significantly resulting in shortages beginning in 2020.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to meet water needs for McLennan County-Mining. Associated costs are included for each strategy. Conservation is recommended.

a. Conservation

- Cost Source: Volume II
- Date to be Implemented: before 2030
- Annual Cost: not determined

b. WMARSS Flat Creek Reuse Project

- Cost Source: Volume II
- Date to be Implemented: before 2030
- Project Cost: None. City of Waco is the project sponsor. Entity will purchase from the City.
- Unit Cost: \$350

Table 5.24–23. Recommended Plan Costs by Decade for McLennan County – Mining

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	(1,800)	(2,262)	(2,322)	(2,770)	(3,094)	(3,478)
Conservation						
Supply From Plan Element (acft/yr)	76	150	214	246	268	295
Annual Cost (\$/yr)	ND	ND	ND	ND	ND	ND
<i>Projected Surplus/(Shortage) after Conservation (acft/yr)</i>	(1,724)	(2,112)	(2,108)	(2,524)	(2,826)	(3,183)
WMARSS Flat Creek Reuse Project						
Supply From Plan Element (acft/yr)	3,200	3,200	3,200	3,200	3,200	3,200
Annual Cost (\$/yr)	\$1,120,000	\$1,120,000	\$435,200	\$435,200	\$435,200	\$435,200
Unit Cost (\$/acft)	\$350	\$350	\$136	\$136	\$136	\$136
<i>Projected Surplus/(Shortage) after Reuse (acft/yr)</i>	1,476	1,088	1,092	676	374	17

ND – Not determined. Costs to implement industrial conservation technologies will vary based on each location

5.24.37 Irrigation

Description of Supply

McLennan County Irrigation is supplied by groundwater from the Trinity Aquifer at 561 acft/yr and the Brazos River Alluvium at 4,259 acft/yr, and run of the river water rights at 937 to 1,337 acft/yr from 2020 to 2070. No shortages are projected for Irrigation and no changes in water supply are recommended.



5.24.38 Livestock

Livestock water supply is projected to meet demands through 2070 and no changes in water supply are recommended.

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5.25 Milam County Water Supply Plan

Table 5.25-1 lists each water user group in Milam County and their corresponding surplus or shortage in years 2040 and 2070. For each water user group with a projected shortage, a water supply plan has been developed and is presented in the following subsections.

Table 5.25-1. Milam County Surplus/(Shortage)

Water User Group	Surplus/(Shortage)		Comment
	2040 (acft/yr)	2070 (acft/yr)	
Bell-Milam Falls WSC			See Bell County
City of Cameron ¹	(1,623)	(1,794)	Projected shortage - see plan below.
Milano WSC	37	25	Projected surplus
North Milam WSC	114	140	Projected surplus - see plan below.
City of Rockdale	(613)	(609)	Projected shortage - see plan below.
Salem Elm Ridge WSC	285	269	Projected surplus
Southwest Milam WSC	(419)	(619)	Projected shortage - see plan below.
City of Thorndale	12	(10)	Projected shortage - see plan below.
County-Other	21	4	Projected surplus
Manufacturing	1	1	Projected surplus
Steam-Electric	(32,254)	(32,254)	Projected shortage – see plan below
Mining	47	57	Projected surplus
Irrigation	(205)	93	Projected surplus (shortage only 2030 & 2040) - see plan below.

- Note that DB22 does not account for the infrastructure constraint shown that results in loss of supply for Cameron.

5.25.1 City of Cameron

Description of Supply

The City of Cameron obtains its water supply from run-of-the-river rights at 2,615 acft/yr. The city provides supply to North Milam WSC, Salem Elm Ridge WSC, and to Manufacturing. No shortages are projected for the City of Cameron.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended for the City of Cameron. Conservation is recommended to reduce usage to a goal of 140 gpcd.

- a. Conservation
 - Cost Source: Volume II
 - Date to be Implemented: 2030
 - Unit Cost: \$560/acft
 - Annual Cost: maximum of \$260,663 in 2070
- b. New Little River Intake and Raw Water Pipeline
 - Cost Source: Volume II
 - Date to be Implemented: 2030
 - Project Cost: \$13,006,000
 - Unit Cost: \$407/acft (maximum of phased costs)

Table 5.25-2. Recommended Plan Costs by Decade for City of Cameron

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	1,252	(1,590)	(1,623)	(1,681)	(1,738)	(1,794)
Conservation						
Supply From Plan Element (acft/yr)	0	107	218	339	449	465
Annual Cost (\$/yr)	\$0	\$60,061	\$122,024	\$190,045	\$251,609	\$260,663
<i>Projected Surplus/(Shortage) after Conservation</i>	1,252	(1,483)	(1,405)	(1,342)	(1,289)	(1,329)
New Little River Intake and Raw Water Pipeline						
Supply From Plan Element (acft/yr)	-	2,615	2,615	2,615	2,615	2,615
Annual Cost (\$/yr)	-	\$1,064,000	\$1,064,000	\$209,200	\$209,200	\$209,200
Unit Costt (\$/acft)	-	\$407	\$407	\$80	\$80	\$80

5.25.2 Milano WSC

Milano WSC obtains its water supply from the Carrizo-Wilcox Aquifer at 520 to 496 acft/yr. This WUG is located in Milam and Burleson Counties. No shortages are projected for Milano WSC and no changes in water supply are recommended. Conservation was considered; however, the entity’s current per capita use rate is below the selected target rate of 140 gpcd.

5.25.3 North Milam WSC

Description of Supply

North Milam WSC obtains its water supply from the Carrizo-Wilcox Aquifer at 520 to 496 acft/yr. This WUG is located in multiple counties (Milam and Burleson). The surplus shown

in the table below and represents the cumulative total for North Milam WSC. No shortages are projected for North Milam WSC.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended for the North Milam WSC. Conservation is recommended to reduce usage to a goal of 140 gpcd.

a. Conservation

- Cost Source: Volume II
- Date to be Implemented: 2030
- Unit Cost: \$560/acft
- Annual Cost: maximum of \$10,529,260,663 in 2070

Table 5.25-3. Recommended Plan Costs by Decade for North Milam WSC

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	214	140	114	144	151	140
Conservation						
Supply From Plan Element (acft/yr)	0	19	19	18	18	19
Annual Cost (\$/yr)	\$0	\$10,640	\$10,640	\$10,080	\$10,080	\$10,640
<i>Projected Surplus/(Shortage) after Conservation</i>	214	159	133	162	169	159

5.25.4 City of Rockdale

Description of Supply

The City of Rockdale obtains its water supply from groundwater from the Carrizo-Wilcox Aquifer at 1,094 to 771 acft/yr from 2020 to 2070. Shortage are projected for the City of Rockdale through 2070.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended for the City of Rockdale. Conservation is recommended to reduce usage to a goal of 140 gpcd.

a. Conservation

- Cost Source: Volume II
- Date to be Implemented: 2030
- Annual Cost: maximum of \$116,966 in 2070
- Unit Cost: \$560/acft

b. Water Supply from Lee County Carrizo-Wilcox Wells

- Cost Source: Volume II
- Date to be Implemented: 2020
- Project Cost: \$5,086,000
- Unit Cost: \$1,034/acft

Table 5.25-4. Recommended Plan Costs by Decade for City of Rockdale

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	(79)	(289)	(613)	(558)	(562)	(609)
Conservation						
Supply From Plan Element (acft/yr)	0	89	180	198	202	209
Annual Cost (\$/yr)	\$0	\$49,787	\$100,957	\$110,661	\$113,303	\$116,966
<i>Projected Surplus/(Shortage) after Conservation</i>	(79)	(200)	(433)	(360)	(360)	(400)
Water Supply from Lee County Carrizo Wilcox Wells						
Supply From Plan Element (acft/yr)	79	200	433	360	360	400
Annual Cost (\$/yr)	\$81,686	\$206,800	\$89,631	\$74,520	\$74,520	\$82,800
Unit Cost (\$/acft)	\$1,03	\$1,034	\$207	\$207	\$207	\$207

5.25.5 Salem Elm Ridge WSC

Salem Elm Ridge WSC obtains its water supply from Cameron at 125 acft/yr and Central Texas WSC at 297 acft/yr. No shortages are projected for Salem Elm Ridge WSC and no changes in water supply are recommended. Conservation was considered; however, the entity's current per capita use rate is below the selected target rate of 140 gpcd.

5.25.6 Southwest Milam WSC

Description of Supply

Southwest Milam WSC obtains its water supply from groundwater from the Carrizo-Wilcox Aquifer at 1,635 to 1,512 acft/yr. This WUG is located in multiple counties (Milam, Lee, Williamson, and Burleson). The surplus/shortages shown in the table below represent the cumulative totals for Southwest Milam WSC. Southwest Milam WSC is projected to have a surplus from 2020 and a shortage from 2030 through the year 2070.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended for Southwest Milam WSC. Conservation is recommended to reduce usage to a goal of 140 gpcd.



- a. Conservation
 - Cost Source: Volume II
 - Date to be Implemented: 2030
 - Annual Cost: maximum of \$47,447 in 2070
 - Unit Cost: \$560/acft
- b. Water Supply from Lee County Carrizo Wilcox Wells
 - Cost Source: Volume II
 - Date to be Implemented: 2030
 - Project Cost: \$5,080,000
 - Unit Cost: \$853/acft

Table 5.25-5. Recommended Plan Costs by Decade for Southwest Milam WSC

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	169	(225)	(419)	(386)	(465)	(619)
Conservation						
Supply From Plan Element (acft/yr)	0	25	54	61	73	85
Annual Cost (\$/yr)	\$0	\$14,082	\$30,407	\$34,396	\$40,872	\$47,447
<i>Projected Surplus/(Shortage) after Conservation</i>	169	(200)	(365)	(325)	(392)	(534)
Water Supply from Lee County Carrizo-Wilcox Wells						
Supply From Plan Element (acft/yr)	–	200	365	325	392	534
Annual Cost (\$/yr)	–	\$170,600	\$311,345	\$59,800	\$72,128	\$98,256
Unit Cost (\$/acft)	–	\$853	\$853	\$184	\$184	\$184

5.25.7 City of Thorndale

The City of Thorndale is located in Milam and partially in Williamson County. The city obtains its water supply from Southwest Milam WSC at 202 acft/yr. Shortages are projected for the City of Thorndale in 2060 to 2070.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended. Conservation was considered; however, the entity’s current per capita use rate is below the selected target rate of 140 gpcd.

- a. Water Supply from Lake Granger ASR
 - Cost Source: Volume II
 - Date to be Implemented: 2060
 - Project Cost: \$99,820,000 (sum of 2 phases)
 - Unit Cost: Max of \$77/acft (BRA System Rate)

Table 5.25-6. Recommended Plan Costs by Decade for Thorndale

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	19	14	12	5	(2)	(10)
Conservation						
Supply From Plan Element (acft/yr)	–	–	–	–	–	–
Annual Cost (\$/yr)	–	–	–	–	–	–
Water Supply from Lake Granger ASR						
Supply From Plan Element (acft/yr)	–	–	–	–	2	10
Annual Cost (\$/yr)	–	–	–	–	\$154	\$770
Unit Cost (\$/acft)	–	–	–	–	\$77	\$77

5.25.8 County-Other

Entities in County-Other obtain supplies from Brazos River Alluvium Aquifer at 160 acft/yr. County Other is projected to have a surplus of water through the year 2070 and no changes in water supply are recommended. Conservation was considered; however, the entity's current per capita use rate is below the selected target rate of 140 gpcd.

5.25.9 Manufacturing

Manufacturing receives supplies from City of Cameron at 14 acft/yr. Manufacturing is projected to have sufficient water supplies through the year 2070 and no changes in water supply are recommended.

5.25.10 Steam-Electric

Description of Supply

Milam County Steam-Electric obtains its water supply from Lake Alcoa, a water right for diversions from the Little River, contractual supply from BRA and the Carrizo-Wilcox Aquifer. Milam County Steam Electric has contracted for 5,000 acft/yr of surface water supplies from the Brazos River Authority, which can supply 4,156 acft/yr in 2020 and 4,019 acft/yr in 2070, based on water availability analyses prescribed under water planning guidelines. Based on the available supplies, Milam County Steam-Electric is projected to have surpluses throughout the planning period.

Water Supply Plan

Power generation has ceased at the facility associated with the Milam County Steam-Electric demands and supplies. Therefore, the BGRWPG has opted to recommend strategies to use those supplies for other purposes, and the demands for Milam County Steam-Electric use will not be met.

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to meet water needs for Milam County-Steam Electric.

- a. Leave Needs Unmet
 - Date to be Implemented: 2020

Table 5.25-7. Recommended Plan Costs by Decade for Milam County – Steam Electric

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	(32,254)	(32,254)	(32,254)	(32,254)	(32,254)	(32,254)
Conservation						
Supply From Plan Element (acft/yr)	–	–	–	–	–	–
Annual Cost (\$/yr)	–	–	–	–	–	–
<i>Projected Surplus/(Shortage) after Conservation (acft/yr)</i>	(32,254)	(32,254)	(32,254)	(32,254)	(32,254)	(32,254)
Leave Needs Unmet (acft/yr)	(32,254)	(32,254)	(32,254)	(32,254)	(32,254)	(32,254)

5.25.11 Mining

Milam County Mining obtains its water supply from the Carrizo-Wilcox Aquifer at 76 to 71 acft/yr, from 2020 to 2070, used for mine reclamation. Milam County Mining is projected to have adequate supplies between 2020 and 2070.

5.25.12 Irrigation

Description of Supply

Milam County Irrigation is supplied by groundwater from the Carrizo-Wilcox, Queen City and Brazos River Alluvium Aquifers as well as run of the river water rights. Irrigation is projected to have shortages in 2030 and 2040, which can be met through conservation.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to meet water needs for Milam County-Irrigation. Conservation is recommended.

- a. Conservation
- Cost Source: Volume II
 - Date to be Implemented: by 2030
 - Annual Cost: maximum \$59,755 in 2070
 - Unit Costs: \$ 1,542/acft

Table 5.25-8. Recommended Plan Costs by Decade for Milam County – Irrigation

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	239	(104)	(205)	4	93	93
Conservation						
Supply From Plan Element (acft/yr)	195	325	455	455	455	455
Annual Cost (\$/yr)	\$300,861	\$501,435	\$702,009	\$702,009	\$702,009	\$702,009
<i>Projected Surplus/(Shortage) after Conservation (acft/yr)</i>	434	221	250	459	548	548

5.25.13 Livestock

Livestock water supply is projected to meet demands through 2070 and no changes in water supply are recommended.

5.26 Nolan County Water Supply Plan

Table 5.26-1 lists each water user group in Nolan County and their corresponding surplus or shortage in years 2040 and 2070. For each water user group with a projected shortage, a water supply plan has been developed and is presented in the following subsections.

Table 5.26-1. Nolan County Surplus/(Shortage)

Water User Group	Surplus/(Shortage)		Comment
	2040 (acft/yr)	2070 (acft/yr)	
Bitter Creek WSC	(213)	(229)	Projected shortage - see plan below.
City of Roscoe	(90)	(107)	Projected shortage - see plan below.
City of Sweetwater	(350)	(521)	Projected shortage - see plan below.
County-Other	11	2	Projected surplus
Manufacturing	(33)	(35)	Projected shortage - see plan below.
Steam-Electric	0	0	No projected demand
Mining	(53)	6	Shortage to projected surplus - see plan below.
Irrigation	(8,237)	(8,237)	Projected shortage
Livestock	0	0	No projected surplus or shortage

5.26.1 Bitter Creek WSC

Description of Supply

The Bitter Creek WSC obtains its water supply from the Dockum Aquifer at 109 acft/yr. This WUG is located in Nolan and Fisher Counties. The surpluses shown in the table below represent the cumulative totals for Bitter Creek WSC in both counties. Shortages are projected through 2070.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended to meet water needs for Bitter Creek WSC. Conservation was considered; however, the entity's current per capita use rate is below the selected target rate of 140 gpcd.

- a. Purchase Water Supply from Sweetwater
 - Cost Source: Volume II
 - Date to be Implemented: 2020
 - Project Cost: Existing infrastructure assumed sufficient
 - Unit Cost: \$1,031/acft (Sweetwater Wholesale Rate)

Table 5.26-2. Recommended Plan Costs by Decade for Bitter Creek WSC

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	(218)	(216)	(213)	(219)	(224)	(229)
Conservation						
Supply From Plan Element (acft/yr)	–	–	–	–	–	–
Annual Cost (\$/yr)	–	–	–	–	–	–
<i>Projected Surplus/(Shortage) after Conservation (acft/yr)</i>	(218)	(216)	(213)	(219)	(224)	(229)
Additional Water from Sweetwater						
Supply From Plan Element (acft/yr)	218	216	213	219	224	229
Annual Cost (\$/yr)	\$224,758	\$222,696	\$219,603	\$225,789	\$230,944	\$236,099
Unit Cost (\$/acft)	\$1,031	\$1,031	\$1,031	\$1,031	\$1,031	\$1,031

5.26.2 City of Roscoe

Description of Supply

The City of Roscoe obtains groundwater from the Dockum Aquifer at 115 acft/yr. A need is projected for the City of Roscoe through 2070.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended to meet water needs for Bitter Creek WSC. Conservation was considered; however, the entity’s current per capita use rate is below the selected target rate of 140 gpcd.

- a. Purchase Water Supply from Sweetwater
 - Cost Source: Volume II
 - Date to be Implemented: 2020
 - Project Cost: Existing infrastructure assumed sufficient
 - Unit Cost: \$1,031/acft (Sweetwater Wholesale Rate)

Table 5.26-3. Recommended Plan Costs by Decade for Roscoe

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	(84)	(88)	(90)	(96)	(101)	(107)
Conservation						
Supply From Plan Element (acft/yr)	–	–	–	–	–	–
Annual Cost (\$/yr)	–	–	–	–	–	–
<i>Projected Surplus/(Shortage) after Conservation (acft/yr)</i>	(84)	(88)	(90)	(96)	(101)	(107)
Additional Water from Sweetwater to meet Contract						
Supply From Plan Element (acft/yr)	84	88	90	96	101	107
Annual Cost (\$/yr)	\$86,604	\$90,728	\$92,790	\$98,976	\$104,131	\$110,317
Unit Cost (\$/acft)	\$1,031	\$1,031	\$1,031	\$1,031	\$1,031	\$1,031

5.26.3 City of Sweetwater

Description of Supply

The City of Sweetwater obtains groundwater from the Dockum Aquifer at 339 to 353 acft/yr from 2020 to 2070. The City of Sweetwater supplies water to Bronte, County Other-Taylor, Manufacturing-Nolan, and Roby. A shortage is projected for the City of Sweetwater through 2070.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended to meet water needs for the City of Sweetwater. Conservation was considered; however, the entity’s current per capita use rate is below the selected target rate of 140 gpcd.

a. Purchase from Abilene (Cedar Ridge Reservoir)

The City of Abilene is pursuing the Cedar Ridge Reservoir project to develop the supplies necessary to meet Abilene’s future municipal demands and contractual sales.

- Cost Source: Volume II
- Date to be Implemented: 2020
- Project Cost: \$21,667,019
- Unit Cost: \$1,115/acft

b. Additional water from Oak Creek Reservoir Conjunctive use

- Cost Source: Volume II
- Date to be Implemented: 2020
- Project Cost: None infrastructure is in place

Table 5.26-4. Recommended Plan Costs by Decade for Sweetwater

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	(296)	(333)	(350)	(413)	(469)	(521)
Conservation						
Supply From Plan Element (acft/yr)	–	–	–	–	–	–
Annual Cost (\$/yr)	–	–	–	–	–	–
<i>Projected Surplus/(Shortage) after Conservation (acft/yr)</i>	(296)	(333)	(350)	(413)	(469)	(521)
Additional Demands from Recommended Strategies from Others						
Sell water to Bitter Creek WSC (acft/yr)	218	216	213	219	224	229
Sell water to City of Roscoe (acft/yr)	84	88	90	96	101	107
Increase Reuse Amount to Nolan County Manufacturing (acft/yr)	–	5	–	–	–	–
Increase contract to Nolan County Mining	71	211	186	166	147	131
Sell water to Bronte (Region F)		210	209	207	207	207
Sell water to Robert Lee (Region F)		238	239	239	239	239
<i>Total Needs Including Recommended Strategies</i>	(669)	(1,301)	(1,287)	(1,340)	(1,387)	(1,434)
Purchase from Abilene						
Supply From Plan Element (acft/yr)		1,651	1,668	1,731	1,787	1,839
Annual Cost (\$/yr)		\$1,840,865	\$428,676	\$444,867	\$459,259	\$472,623
Unit Cost (\$/acft)		\$1,115	\$257	\$257	\$257	\$257
Additional Water from Oak Creek Conjunctive Use (Brazos G) and Subordination (Region F)						
Supply From Plan Element (acft/yr)	1,127	1,052	1,052	1,054	1,054	1,054
Annual Cost (\$/yr)	–	–	–	–	–	–
Unit Cost (\$/acft)	–	–	–	–	–	–

5.26.4 County-Other

Description of Supply

Entities in Nolan County-Other obtains water from the Edwards-Trinity Aquifer at 139 acft/yr. A surplus is projected through 2070. Conservation was considered; however, the entity’s current per capita use rate is below the selected target rate of 140 gpcd. No changes are recommended to the Water Supply Plan.

5.26.5 Manufacturing

Description of Supply

Nolan County Manufacturing obtains its water supply from the Dockum Aquifer, City of Sweetwater and from the Edwards-Trinity (Plateau) Aquifer. Manufacturing is projected to have a shortage beginning in year 2030.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to meet water needs for Nolan County-Manufacturing. Conservation is recommended.

- a. Conservation
 - Cost Source: Volume II
 - Date to be Implemented: by 2030
 - Annual Cost: not determined
- b. Additional Water Supply from Sweetwater
 - Cost Source: Volume II
 - Date to be Implemented: 2030
 - Project Cost: N/A. Infrastructure assumed sufficient
 - Unit Cost: \$1,031/acft

Table 5.26-5. Recommended Plan Costs by Decade for Nolan County – Manufacturing

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	52	(31)	(33)	(35)	(35)	(35)
Conservation						
Supply From Plan Element (acft/yr)	13	26	37	37	37	37
Annual Cost (\$/yr)	ND	ND	ND	ND	ND	ND
<i>Projected Surplus/(Shortage) after Conservation (acft/yr)</i>	52	(5)	4	2	2	2

Table 5.26-5. Recommended Plan Costs by Decade for Nolan County – Manufacturing

Plan Element	2020	2030	2040	2050	2060	2070
Purchase from Sweetwater						
Supply From Plan Element (acft/yr)	–	5	–	–	–	–
Annual Cost (\$/yr)	–	\$5,155	–	–	–	–
Unit Cost (\$/acft)	–	\$1,031	–	–	–	–

ND – Not determined. Costs to implement industrial conservation technologies will vary based on each location.

5.26.6 Mining

Description of Supply

Nolan County Mining obtains its water supply from the Dockum and Edwards-Trinity (Plateau) Aquifers. Based on the available groundwater supply, Nolan County Mining is projected to have a shortage between 2020 and 2070.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to meet water needs for Nolan County-Mining. Conservation is recommended.

- a. Conservation
 - Cost Source: Volume II
 - Date to be Implemented: by 2030
 - Annual Cost: not determined
- b. Purchase Water Supply from Sweetwater
 - Cost Source: Volume II
 - Date to be Implemented: 2020
 - Project Cost: Existing infrastructure assumed sufficient
 - Unit Cost: \$1,031/acft (Sweetwater Wholesale Rate)

Table 5.26-6. Recommended Plan Costs by Decade for Nolan County – Mining

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	(78)	(75)	(53)	(31)	(11)	6
Conservation						
Supply From Plan Element (acft/yr)	7	11	14	12	11	10
Annual Cost (\$/yr)	ND	ND	ND	ND	ND	ND

Table 5.26-6. Recommended Plan Costs by Decade for Nolan County – Mining

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) after Conservation (acft/yr)</i>	(218)	(211)	(186)	(166)	(147)	(131)
Additional Water from Sweetwater						
Supply From Plan Element (acft/yr)	71	211	186	166	147	131
Annual Cost (\$/yr)	\$223,861	\$223,861	\$223,861	\$223,861	\$223,861	\$223,861
Unit Cost (\$/acft)	\$1,018	\$1,018	\$1,018	\$1,018	\$1,018	\$1,018

ND – Not determined. Costs to implement industrial conservation technologies will vary based on each location

5.26.7 Irrigation

Description of Supply

Nolan County Irrigation obtains its water supply from the Dockum and Edwards Trinity Aquifer and run-of-river diversions from the Brazos River. Based on the available supply, Nolan County Irrigation is projected to have a shortage between 2020 and 2070.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to meet water needs for Nolan County-Irrigation. Conservation is recommended.

- a. Conservation
 - Cost Source: Volume II
 - Date to be Implemented: before 2030
 - Annual Cost: max \$109,733 in 2040
 - Unit Cost: \$1,494/acft
- b. Leave Needs Unmet

New supplies for irrigation would be cost prohibitive to develop and most farms would switch to dry-land crops or allow fields to go fallow during a prolonged drought.

- Cost Source: Cost of not meeting needs – will be provided by TWDB
- Date to be Implemented: 2020

Table 5.26-7. Recommended Plan Costs by Decade for Nolan County – Irrigation

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	(8,237)	(8,237)	(8,237)	(8,237)	(8,237)	(8,237)
Conservation						
Supply From Plan Element (acft/yr)	347	578	809	809	809	809
Annual Cost (\$/yr)	\$518,232	\$863,720	\$1,209,208	\$1,209,208	\$1,209,208	\$1,209,208
<i>Projected Surplus/(Shortage) after Conservation (acft/yr)</i>	(6,572)	(6,341)	(6,110)	(6,110)	(6,110)	(6,110)
Leave Needs Unmet (acft/yr)	(6,572)	(6,341)	(6,110)	(6,110)	(6,110)	(6,110)

5.26.8 Livestock

Livestock water supply is projected to meet demands through 2070 and no changes in water supply are recommended.

5.27 Palo Pinto County Water Supply Plan

Table 5.27-1 lists each water user group in Palo Pinto County and their corresponding surplus or shortage in years 2040 and 2070. For each water user group with a projected shortage, a water supply plan has been developed and is presented in the following subsections.

Table 5.27-1. Palo Pinto County Surplus/(Shortage)

Water User Group	Table 5.27-1. Palo Pinto County Surplus/(Shortage)		Comment
	2040 (acft/yr)	2070 (acft/yr)	
City of Gordon	(160)	(175)	Projected shortage - see plan below.
Lake Palo Pinto Area WSC	33	11	Projected surplus
City of Mineral Wells	(594)	(1,200)	Projected shortage - see plan below.
North Rural WSC	55	44	Projected surplus
Palo Pinto WSC	56	47	Projected surplus
Parker County SUD			See Region C
Possum Kingdom WSC	(206)	(290)	Projected shortage - see plan below.
Santo SUD	35	(14)	Projected shortage - see plan below.
Sportsmans World MUD	(47)	(61)	Projected shortage - see plan below.
Stephens Regional SUD			See Stephens County
City of Strawn	(46)	(59)	Projected shortage - see plan below.
Sturdivant Progress WSC	57	33	Projected surplus
County-Other	(187)	(177)	Projected shortage - see plan below.
Manufacturing	1,197	1,197	Projected surplus
Steam-Electric	11,601	11,601	Projected surplus
Mining	(622)	(232)	Projected shortage – see plan below.
Irrigation	(2,326)	(2,326)	Projected shortage - see plan below.
Livestock	0	0	No projected surplus or shortage

5.27.1 City of Gordon

Description of Supply

The City of Gordon is split between Erath and Palo Pinto Counties; however, the majority of the City’s demand is located in Palo Pinto County. Gordon receives supply from Lake CB Long, but the reservoir has a zero firm yield based on water availability analyses prescribed under water planning guidelines. Water shortages are projected between 2020 and 2070.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to meet water needs for the City of Gordon. Conservation is recommended to reduce usage to a goal of 140 gpcd.

a. Conservation

- Cost Source: Volume II
- Date to be Implemented: by 2030
- Annual Cost: \$25,286 in 2070
- Unit Cost: \$560/acft

b. Purchase Water from Strawn

- Cost Source: Volume II
- Date to be Implemented: by 2030
- Annual Cost: \$318,549
- Unit Cost: \$2,167/acft (\$6.65 per 1,000 gallons)

Table 5.27-2. Recommended Plan Costs by Decade for City of Gordon

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	(147)	(155)	(160)	(166)	(171)	(175)
Conservation						
Supply From Plan Element (acft/yr)	0	12	24	36	42	43
Annual Cost (\$/yr)	\$0	\$6,771	\$13,689	\$21,479	\$24,802	\$25,286
<i>Projected Surplus/(Shortage) after Conservation (acft/yr)</i>	(147)	(143)	(136)	(130)	(129)	(132)
Purchase Water from Strawn (additional Trinity Aquifer supplies)						
Supply From Plan Element (acft/yr)	147	147	148	148	148	148
Annual Cost (\$/yr)	\$318,600	\$318,500	\$320,700	\$320,700	\$320,700	\$320,700
Unit Cost (\$/acft)	\$2,167	\$2,167	\$2,167	\$2,167	\$2,167	\$2,167

5.27.2 Lake Palo Pinto Area WSC

Lake Palo Pinto Area WSC obtains its water supply from Palo Pinto County MWD. The WSC has a projected surplus throughout the planning period, and no changes to water supply are recommended. Conservation was considered; however, the current per capita use rate is below the target rate of 140 gpcd.

5.27.3 City of Mineral Wells

Description of Supply

The City of Mineral Wells is split between Parker County in Region C and Palo Pinto County (Brazos G), however the majority of demand lies within Palo Pinto County. The City obtains water supply from Lake Mineral Wells and from Palo Pinto County MWD 1. Mineral Wells provides water to Palo Pinto WSC, Santo SUD, Sturdivant Progress WSC, North Rural WSC, Palo Pinto County-Other and Manufacturing entities, and to various users in Region C. Due to a prorated reduction in treated surface water supply from Palo Pinto County MWD 1, water shortages are projected for the City of Mineral Wells from 2020 through 2070. Balances shown are for the entire City, including areas in Parker County and Region C. Water conservation as a recommended water management strategy is shown for both the Brazos G and Region C portions.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to meet water needs for the City of Mineral Wells. Conservation is recommended to reduce usage to a goal of 140 gpcd. Needs remain unmet in 2020. These needs will only occur during a drought equivalent or worse than the drought of record. While not a strategy recommended by the Brazos G RWPG, the impacts of the unmet needs can be mitigated through demand management in the event of a serious drought prior to the recommended strategies coming online.

- a. Conservation
 - Cost Source: Volume II
 - Date to be Implemented: 2030
 - Annual Cost: \$18,836
 - Unit Cost: \$560/acft
- b. Turkey Peak Reservoir – Lake Palo Pinto Enlargement
 - Cost Source: Volume II
 - Date to be Implemented: by 2030
 - Annual Cost: \$5,935,000
 - Unit Cost: \$733/acft

Table 5.27-3. Recommended Plan Costs by Decade for City of Mineral Wells

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	(168)	(403)	(594)	(800)	(1,007)	(1,200)
Conservation						
Supply From Plan Element (acft/yr) (Brazos G)	—	34	—	—	—	—

Table 5.27-3. Recommended Plan Costs by Decade for City of Mineral Wells

Plan Element	2020	2030	2040	2050	2060	2070
Supply From Plan Element (acft/yr) (Region C portion)	17	21	3	4	5	6
Annual Cost (\$/yr) (Brazos G portion only)	—	\$18,836	—	—	—	—
<i>Projected Surplus/(Shortage) after Conservation (acft/yr)</i>	<i>(151)</i>	<i>(348)</i>	<i>(591)</i>	<i>(796)</i>	<i>(1,002)</i>	<i>(1,194)</i>
Additional Demands from Recommended Strategies from Others						
Increase Contract Amount to Santo SUD (acft/yr)	—	—	—	—	—	14
Increase Contract Amount to County-Other (acft/yr)	191	190	187	187	184	177
<i>Total Surplus/(Shortage) Including Recommended Strategies (acft/yr)</i>	<i>(342)</i>	<i>(538)</i>	<i>(778)</i>	<i>(983)</i>	<i>(1,186)</i>	<i>(1,385)</i>
Turkey Peak Reservoir – Lake Palo Pinto Enlargement						
Supply From Plan Element (acft/yr)	—	543	778	983	1,186	1,386
Annual Cost (\$/yr)	—	\$398,000	\$570,000	\$598,000	\$721,000	\$136,000
Unit Cost (\$/acft)	—	\$733	\$608	\$608	\$98	\$98

5.27.4 North Rural WSC

North Rural WSC is split between Parker County in Region C and Palo Pinto County (Brazos G), however the majority of demand lies within Palo Pinto County. North Rural WSC obtains its water supply from the City of Mineral Wells. No shortages are projected for the WSC and no changes in water supply are recommended throughout the planning period. Conservation was considered; however, the current per capita use rate is below the targeted rate of 140 gpcd.

5.27.5 Palo Pinto WSC

Palo Pinto obtains its water supply from the City of Mineral Wells. No shortages are projected for the WSC and no changes in water supply are recommended throughout the planning period. Conservation was considered; however, the current per capita use rate is below the targeted rate of 140 gpcd.

5.27.6 Possum Kingdom WSC

Description of Supply

Possum Kingdom WSC is split between Stephens and Palo Pinto County. The WSC receives supply from the Brazos River Authority. Water shortages are projected between 2020 and 2070.



Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to meet water needs for the Possum Kingdom WSC. Conservation is recommended to reduce usage to a goal of 140 gpcd.

- a. Conservation
 - Cost Source: Volume II
 - Date to be Implemented: by 2030
 - Annual Cost: \$222,404 in 2070
 - Unit Cost: \$560/acft
- b. BRA System Operations
 - Cost Source: Volume II
 - Date to be Implemented: 2020
 - Annual Cost: \$146,984
 - Unit Cost: \$76/acft
- c. Voluntary Redistribution from Palo Pinto Manufacturing
 - Cost Source: Volume II
 - Date to be Implemented: 2020
 - Annual Cost: Cost of purchase only, maximum of \$9,027 in 2020
 - Unit Cost: \$76.50/acft

Table 5.27-4. Recommended Plan Costs by Decade for Possum Kingdom WSC

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	(118)	(171)	(206)	(240)	(268)	(290)
Conservation						
Supply From Plan Element (acft/yr)	0	80	161	243	323	397
Annual Cost (\$/yr)	\$0	\$44,691	\$90,098	\$135,915	\$180,692	\$222,404
<i>Projected Surplus/(Shortage) after Conservation (acft/yr)</i>	(118)	(91)	(45)	3	55	107
BRA System Operations						
Supply From Plan Element (acft/yr)	1,934	1,934	1,934	1,934	1,934	1,934
Annual Cost (\$/yr)	\$146,984	\$146,984	\$146,984	\$146,984	\$146,984	\$146,984
Unit Cost (\$/acft)	\$76	\$76	\$76	\$76	\$76	\$76

Table 5.27-4. Recommended Plan Costs by Decade for Possum Kingdom WSC

Plan Element	2020	2030	2040	2050	2060	2070
Voluntary Redistribution from Palo Pinto Manufacturing						
Supply From Plan Element (acft/yr)	118	91	45	—	—	—
Annual Cost (\$/yr)	\$9,027	\$6,962	\$3,443	—	—	—
Unit Cost (\$/acft)	\$76.50	\$76.50	\$76.50	—	—	—

5.27.7 Santo SUD

Description of Supply

Santo SUD is split between Hood and Palo Pinto counties as well as Parker County in Region C, however the majority of the SUD’s demand lies within Palo Pinto County. Santo SUD obtains treated surface water supply from the City of Mineral Wells. Values shown below reflect the Brazos G portion only of Santo SUD.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to meet the entity’s water needs. Conservation was considered, however the current per capita use rate is below the targeted rate of 140 gpcd.

- a. Purchase Additional Supply from the City of Mineral Wells
 - Cost Source: Volume II
 - Date to be Implemented: 2070
 - Annual Cost: \$29,232
 - Unit Cost: \$2,088/acft

Table 5.27-5. Recommended Plan Costs by Decade for Santo SUD

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	55	43	35	22	5	(14)
Conservation						
Supply From Plan Element (acft/yr)	—	—	—	—	—	—
Annual Cost (\$/yr)	—	—	—	—	—	—
<i>Projected Surplus/(Shortage) after Conservation (acft/yr)</i>	55	43	35	22	5	(14)



Table 5.27-5. Recommended Plan Costs by Decade for Santo SUD

Plan Element	2020	2030	2040	2050	2060	2070
Purchase Additional Supply from the City of Mineral Wells						
Supply From Plan Element (acft/yr)	—	—	—	—	—	14
Annual Cost (\$/yr)	—	—	—	—	—	\$29,232
Unit Cost (\$/acft)	—	—	—	—	—	\$2,088

5.27.8 Sportsmans World MUD

Description of Supply

Sportsman World MUD is supplied by surface water from the main stem of the Brazos River. The MUD has a projected shortage from 2020 through 2070.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to meet water needs for Sportsman World MUD. Conservation is recommended to reduce usage to a goal of 140 gpcd.

- a. Conservation
 - Cost Source: Volume II
 - Date to be Implemented: 2030
 - Annual Cost: maximum of \$32,921 in 2070
 - Unit Cost: \$560/acft
- b. BRA System Operations
 - Cost Source: Volume II
 - Date to be Implemented: 2020
 - Annual Cost: \$22,000
 - Unit Cost: \$76/acft
- c. Voluntary Redistribution from Palo Pinto Manufacturing
 - Cost Source: Volume II
 - Date to be Implemented: 2020
 - Annual Cost: Cost of purchase only, maximum of \$2,525 in 2020
 - Unit Cost: \$76.50/acft

Table 5.27-6. Recommended Plan Costs by Decade for Sportsmans World MUD

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	(33)	(42)	(47)	(53)	(57)	(61)
Conservation						
Supply From Plan Element (acft/yr)	0	13	24	36	48	59
Annual Cost (\$/yr)	\$0	\$7,052	\$13,466	\$20,356	\$26,766	\$32,921
<i>Projected Surplus/(Shortage) after Conservation (acft/yr)</i>	(33)	(29)	(23)	(17)	(9)	(2)
BRA System Operations						
Supply From Plan Element (acft/yr)	290	290	290	290	290	290
Annual Cost (\$/yr)	\$22,040	\$22,040	\$22,040	\$22,040	\$22,040	\$22,040
Unit Cost (\$/acft)	\$76	\$76	\$76	\$76	\$76	\$76
Voluntary Redistribution from Palo Pinto Manufacturing						
Supply From Plan Element (acft/yr)	33	29	23	17	9	2
Annual Cost (\$/yr)	\$2,607	\$2,291	\$1,817	\$1,343	\$711	\$158
Unit Cost (\$/acft)	\$76.50	\$76.50	\$76.50	\$76.50	\$76.50	\$76.50

5.27.9 City of Strawn

Description of Supply

The City of Strawn is supplied by surface water from Lake Tucker and Trinity Aquifer and is projected to have shortages through 2070.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended for the City of Strawn.

- a. Conservation
 - Cost Source: Volume II
 - Date to be Implemented: 2030
 - Annual Cost: \$13,319 in 2070
 - Unit Cost: \$560/acft
- b. Groundwater Development – Trinity Aquifer (Erath County)
 - Cost Source: Volume II
 - Date to be Implemented: by 2030



- Project Cost: \$2,447,000
- Unit Cost: \$1,401/acft

Table 5.27-7. Recommended Plan Costs by Decade for City of Strawn

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	(35)	(42)	(46)	(50)	(55)	(59)
Conservation						
Supply From Plan Element (acft/yr)	0	11	23	22	23	24
Annual Cost (\$/yr)	\$0	\$6,320	\$12,832	\$12,407	\$12,836	\$13,319
<i>Projected Surplus/(Shortage) after Conservation (acft/yr)</i>	(35)	(31)	(23)	(28)	(32)	(35)
Additional Demands from Recommended Plans from Others						
Supply Contract to Gordon (acft/yr)	147	147	141	140	140	140
<i>Total Surplus/(Shortage) Including Recommended Strategies (acft/yr)</i>	(182)	(178)	(164)	(168)	(172)	(175)
Groundwater Development – Trinity Aquifer (Erath County)						
Supply From Plan Element (acft/yr)	182	182	183	183	183	183
Annual Cost (\$/yr)	\$255,000	\$255,000	\$83,000	\$83,000	\$83,000	\$83,000
Unit Cost (\$/acft)	\$1,401	\$1,401	\$456	\$456	\$456	\$456

5.27.10 Sturdivant Progress WSC

Sturdivant Progress WSC purchases treated water from the City of Mineral Wells. The WSC’s contract is projected to provide sufficient supply through the planning period. Conservation was considered; however, the current per capita use rate is below the targeted rate of 140 gpcd. No changes in water supply are recommended.

5.27.11 County-Other

Description of Supply

Entities in Palo Pinto County-Other obtain treated surface water from the City of Mineral Wells. There is a projected shortage for County-Other from 2020 through 2070.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following plan is recommended for Palo-Pinto County-Other entities. Conservation was also considered; however, the current per capita use rate is below the targeted rate of 140 gpcd.

a. Purchase Additional Water from the City of Mineral Wells

- Cost Source: Volume II
- Date to be Implemented: by 2030
- Annual Cost: Maximum of \$398,808 in 2020
- Unit Cost: \$2,088/acft

Table 5.27-8. Recommended Plan Costs by Decade for Palo Pinto – County-Other

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	(191)	(190)	(187)	(187)	(184)	(177)
Conservation						
Supply From Plan Element (acft/yr)	—	—	—	—	—	—
Annual Cost (\$/yr)	—	—	—	—	—	—
<i>Projected Surplus/(Shortage) after Conservation (acft/yr)</i>	(191)	(190)	(187)	(187)	(184)	(177)
Purchase Additional Water from the City of Mineral Wells						
Supply From Plan Element (acft/yr)	191	190	187	187	184	177
Annual Cost (\$/yr)	\$398,808	\$396,720	\$390,456	\$390,456	\$384,192	\$369,576
Unit Cost (\$/acft)	\$2,088	\$2,088	\$2,088	\$2,088	\$2,088	\$2,088

5.27.12 Manufacturing

Palo Pinto County Manufacturing obtains its water supply from the City of Mineral Wells and the Brazos River Authority. Palo Pinto County Manufacturing shows a projected surplus. In order to meet the needs of other WUGs within Palo Pinto County, a portion of the Manufacturing supply is recommended to be voluntarily redistributed to Possum Kingdom WSC and Sportsmans World MUD.

Table 5.27-9. Recommended Plan Costs by Decade for Palo Pinto – Manufacturing

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	1,199	1,197	1,197	1,197	1,197	1,197
Conservation						
Supply From Plan Element (acft/yr)	—	—	—	—	—	—
Annual Cost (\$/yr)	—	—	—	—	—	—
<i>Projected Surplus/(Shortage) after Conservation (acft/yr)</i>	1,199	1,197	1,197	1,197	1,197	1,197

Table 5.27-9. Recommended Plan Costs by Decade for Palo Pinto – Manufacturing

Plan Element	2020	2030	2040	2050	2060	2070
Additional Demands from Recommended Plans from Others						
Increase Contract Amount to Possum Kingdom WSC (acft/yr)	118	91	45	0	0	0
Increase Contract Amount to Sportsmans World MUD (acft/yr)	33	29	23	17	9	2
<i>Balance Including Recommended Strategies for others (acft/yr)</i>	1,350	1,317	1,265	1,214	1,206	1,199
BRA System Operations Supplies						
Supply From Plan Element (acft/yr)	15	15	15	15	15	15
Annual Cost (\$/yr)	\$1,140	\$1,140	\$1,140	\$1,140	\$1,140	\$1,140

5.27.13 Steam-Electric

Palo Pinto County Steam-Electric obtains its water supply from Palo Pinto County MWD No. 1, the Brazos River Authority, and from Palo Pinto County-Other entities. Steam-Electric is projected to have surplus supplies through the planning period and no change to water supply is recommended.

5.27.14 Mining

Description of Supply

Palo Pinto County Mining obtains its water supply from Trinity Aquifer, Brazos River Authority, and from Palo Pinto County-Other entities. Mining operations have a projected shortage throughout the planning period.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following plan is recommended for Palo-Pinto County-Other entities. Conservation is recommended.

a. Conservation

- Cost Source: Volume II
- Date to be Implemented: by 2030
- Unit Cost: Not determined (ND). Costs to implement industrial conservation technologies will vary based on each location

b. Groundwater Development – Trinity Aquifer (Erath County)

- Cost Source: Volume II
- Date to be Implemented: by 2030
- Project Cost: \$4,885,000
- Unit Cost: \$699/acft

Table 5.27-10. Recommended Plan Costs by Decade for Palo Pinto – Mining

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	(653)	(844)	(622)	(477)	(333)	(232)
Conservation						
Supply From Plan Element (acft/yr)	20	42	44	34	24	16
Annual Cost (\$/yr)	ND	ND	ND	ND	ND	ND
<i>Projected Surplus/(Shortage) after Conservation (acft/yr)</i>	(633)	(802)	(578)	(443)	(309)	(216)
Groundwater Development – Trinity Aquifer (Erath County)						
Supply From Plan Element (acft/yr)	653	844	622	477	333	232
Annual Cost (\$/yr)	\$456,447	\$589,956	\$181,002	\$138,807	\$96,903	\$67,512
Unit Cost (\$/acft)	\$699	\$699	\$291	\$291	\$291	\$291

ND – Not determined. Costs to implement industrial conservation technologies will vary based on each location

5.27.15 Irrigation

Description of Supply

Palo Pinto County Irrigation obtains its water supply from run of the river water rights and the BRA. Based on the available supply, Palo Pinto County Irrigation is projected to have a shortage between 2020 and 2070.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to meet water needs for Palo Pinto County-Irrigation. Conservation is recommended.

a. Conservation

- Cost Source: Volume II
- Date to be Implemented: by 2030
- Annual Cost: \$40,825
- Unit Cost: \$1,045/acft



b. Groundwater Development – Trinity Aquifer (Erath County)

- Cost Source: Volume II
- Date to be Implemented: by 2030
- Project Cost: \$49,832,000
- Unit Cost: \$2,230 /acft

Table 5.27-11. Recommended Plan Costs by Decade for Palo Pinto County – Irrigation

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	(2,326)	(2,326)	(2,326)	(2,326)	(2,326)	(2,326)
Conservation						
Supply From Plan Element (acft/yr)	90	151	211	211	211	211
Annual Cost (\$/yr)	\$94,437	\$157,396	\$220,354	\$220,354	\$220,354	\$220,354
<i>Projected Surplus/(Shortage) after Conservation (acft/yr)</i>	(2,236)	(2,175)	(2,115)	(2,115)	(2,115)	(2,115)
Groundwater Development – Trinity Aquifer (Erath County)						
Supply From Plan Element (acft/yr)	2,236	2,175	2,115	2,115	2,115	2,115
Annual Cost (\$/yr)	\$4,986,000	\$4,850,000	\$1,400,000	\$1,400,000	\$1,400,000	\$1,400,000
Unit Cost (\$/acft)	\$2,230	\$2,230	\$662	\$662	\$662	\$662

5.27.16 Livestock

Livestock water supply is projected to meet demands through 2070 and no changes in water supply are recommended.

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5.28 Robertson County Water Supply Plan

Table 5.28-1 lists each water user group in Robertson County and their corresponding surplus or shortage in years 2040 and 2070. A brief summary of the water user groups and the plan for the selected water user are presented in the following subsections.

Table 5.28-1. Robertson County Surplus/(Shortage)

Water User Group	Surplus/(Shortage)		Comment
	2040 (acft/yr)	2070 (acft/yr)	
Bethany-Hearne WSC	0	0	No projected surplus or shortage
City of Bremond	186	141	Projected surplus
City of Calvert	349	350	Projected surplus
City of Franklin	917	738	Projected surplus
City of Hearne	1,729	1,724	Projected surplus
Robertson County WSC	(235)	(526)	Projected shortage - see plan below.
Twin Creek WSC	390	325	Projected surplus
Wellborn SUD			See Brazos County
Wickson Creek SUD			See Brazos County
County-Other	10	11	Projected surplus
Manufacturing	4,566	4,566	Projected surplus
Steam-Electric	0	0	No projected surplus or shortage
Mining	3,687	3,687	Projected surplus
Irrigation	(17,100)	(17,921)	Projected shortage - see plan below.
Livestock	0	0	No projected surplus or shortage

5.28.1 Beathany-Hearne WSC

Bethany-Hearne WSC purchases its water supply from the City of Hearne. Supply is projected to meet demand throughout the planning period. Conservation was considered; however, the entity's usage is below the selected goal of 140 gpcd.

5.28.2 City of Bremond

Description of Supply

The City of Bremond obtains its water supply from the Carrizo-Wilcox Aquifer. No shortages are projected for the City.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended for the City of Bremond. Conservation is recommended to reduce usage to a goal of 140 gpcd.

a. Conservation

- Cost Source: Volume II
- Date to be Implemented: by 2030
- Annual Cost: maximum of \$13,365 in 2070
- Unit Cost: \$560/acft

Table 5.28-2. Recommended Plan Costs by Decade for City of Bremond

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	210	198	186	171	156	141
Conservation						
Supply From Plan Element (acft/yr)	0	13	21	21	23	24
Annual Cost (\$/yr)	\$0	\$7,514	\$11,700	\$12,021	\$12,605	\$13,365
<i>Projected Surplus/(Shortage) after Conservation (acft/yr)</i>	210	211	207	192	179	165

5.28.3 City of Calvert

The City of Calvert obtains its water supply from the Carrizo-Wilcox Aquifer. No shortages are projected for the City. Conservation was considered; however, the entity's usage is below the selected goal of 140 gpcd.

5.28.4 City of Franklin

The City of Franklin obtains its water supply from the Carrizo-Wilcox Aquifer. No shortages are projected for the City of Franklin. Conservation was considered; however, the entity's usage is below the selected goal of 140 gpcd.

5.28.5 City of Hearne

Description of Supply

The City of Hearne obtains its water supply from the Carrizo-Wilcox Aquifer. The City also provides supply to Robertson County Manufacturing and Bethany Hearne WSC. No shortages are projected for the City of Hearne.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended for the City of Hearne. Conservation is recommended to reduce usage to a goal of 140 gpcd.



- a. Conservation
 - Cost Source: Volume II
 - Date to be Implemented: by 2030
 - Annual Cost: \$23,914 in 2030
 - Unit Cost: \$560/acft

Table 5.28-3. Recommended Plan Costs by Decade for City of Hearne

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	2,040	1,899	1,729	1,729	1,728	1,724
Conservation						
Supply From Plan Element (acft/yr)	0	43	22	19	17	17
Annual Cost (\$/yr)	\$0	\$23,914	\$12,577	\$10,897	\$9,777	\$9,777
<i>Projected Surplus/(Shortage) after Conservation (acft/yr)</i>	2,040	1,942	1,751	1,748	1,745	1,741

5.28.6 Robertson County WSC

Description of Supply

Robertson County WSC obtains its water supply from the Carrizo-Wilcox Aquifer. The entity also provides supply to Robertson County Steam and Electric. Robertson County WSC has a projected shortage throughout the planning period.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended for Robertson County WSC. Conservation was also considered; however, the entity’s usage is below the selected goal of 140 gpcd.

- a. Groundwater Development
 - Cost Source: Volume II
 - Date to be Implemented: by 2030
 - Project Cost: \$3,440,000
 - Unit Cost: \$813/acft

Table 5.28-4. Recommended Plan Costs by Decade for Robertson County WSC

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	(81)	(157)	(235)	(332)	(433)	(526)
Conservation						
Supply From Plan Element (acft/yr)	—	—	—	—	—	—
Annual Cost (\$/yr)	—	—	—	—	—	—
<i>Projected Surplus/(Shortage) after Conservation (acft/yr)</i>	(81)	(157)	(235)	(332)	(433)	(526)
Groundwater Development – Carrizo-Wilcox Aquifer						
Supply From Plan Element (acft/yr)	550	550	550	550	550	550
Annual Cost (\$/yr)	\$447,000	\$447,000	\$205,000	\$205,000	\$205,000	\$205,000
Unit Cost (\$/acft)	\$813	\$813	\$373	\$373	\$373	\$373

5.28.7 Twin Creek WSC

Description of Supply

Twin Creek WSC obtains its water supply from the Carrizo-Wilcox Aquifer. A surplus is projected for Twin Creek WSC throughout the planning period.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended for the City of Hearne. Conservation is recommended to reduce usage to a goal of 140 gpcd.

a. Conservation

- Cost Source: Volume II
- Date to be Implemented: by 2030
- Annual Cost: \$13,811 in 2070
- Unit Cost: \$560/acft

Table 5.28-5. Recommended Plan Costs by Decade for Twin Creek WSC

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	427	408	390	368	347	325
Conservation						
Supply From Plan Element (acft/yr)	0	21	23	23	23	25
Annual Cost (\$/yr)	\$0	\$11,642	\$13,153	\$13,003	\$12,995	\$13,811
<i>Projected Surplus/(Shortage) after Conservation (acft/yr)</i>	427	429	413	391	370	350

5.28.8 County-Other

Description of Supply

Robertson County-Other entities obtain water supply from groundwater from the Carrizo-Wilcox Aquifer. No shortages are projected for Robertson County-Other. Conservation was considered; however, the entity's usage is below the selected goal of 140 gpcd.

5.28.9 Manufacturing

Water supply for manufacturing in Robertson County is obtained by purchase from the City of Hearne and from Carrizo-Wilcox wells operated by the manufacturing entity. Manufacturing is projected to have a surplus of 4,566 acft/yr through the year 2070 and no changes in water supply are recommended.

5.28.10 Steam-Electric

Robertson County Steam-Electric entities obtain water supply from the Carrizo-Wilcox Aquifer, contracts with the Brazos River Authority, and groundwater purchased from Robertson County WSC. No shortages are projected and no change in water supply is recommended.

5.28.11 Mining

Mining operations in Robertson County are supplied by Carrizo-Wilcox Groundwater. Surpluses are projected for Robertson County Mining throughout the planning period.

5.28.12 Irrigation

Description of Supply

Robertson County Irrigation is supplied by the Carrizo-Wilcox, Queen City, Sparta, and Brazos River Alluvium Aquifers. Current pumping in the Brazos River Alluvium greatly exceeds the MAG for Robertson County. Irrigation is projected to have shortages beginning in 2020 and continuing through 2070.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to meet water needs for Robertson County-Irrigation. Conservation is recommended.

- a. Conservation
 - Cost Source: Volume II
 - Date to be Implemented: by 2030
 - Unit Cost: \$857/acft

b. Leave Needs Unmet

- New supplies for irrigation would be cost prohibitive to develop and most farms would switch to dry-land crops or allow fields to go fallow during a prolonged drought.
- Cost Source: Cost of not meeting needs – see Appendix G
- Date to be Implemented: 2020

Table 5.28-6. Recommended Plan Costs by Decade for Robertson County – Irrigation

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	(12,851)	(16,181)	(17,100)	(17,718)	(17,829)	(17,921)
Conservation						
Supply From Plan Element (acft/yr)	2,375	3,959	5,579	5,612	5,612	5,612
Annual Cost (\$/yr)	\$561,438	\$935,730	\$1,318,692	\$1,326,302	\$1,326,319	\$1,326,319
<i>Projected Surplus/(Shortage) after Conservation (acft/yr)</i>	(10,476)	(12,222)	(11,521)	(12,106)	(12,217)	(12,309)
Leave Needs Unmet (acft/yr)	(10,476)	(12,222)	(11,521)	(12,106)	(12,217)	(12,309)

5.28.13 Livestock

Livestock water supply is projected to meet demands through 2070 and no changes in water supply are recommended.

5.29 Shackelford County Water Supply Plan

Table 5.29-1 lists each water user group in Shackelford County and their corresponding surplus or shortage in years 2040 and 2070. For each water user group with a projected shortage, a water supply plan has been developed and is presented in the following subsections.

Table 5.29-1. Shackelford County Surplus/(Shortage)

Water User Group	Surplus/(Shortage)		Comment
	2040 (acft/yr)	2070 (acft/yr)	
City of Albany	113	114	Projected surplus - see plan below.
Fort Griffin SUD			See Stephens County
Hamby WSC			See Jones County
Stephens Regional SUD			See Stephens County
Callahan County WSC			See Callahan County
County-Other	12	15	Projected surplus
Manufacturing	37	37	Projected surplus
Steam-Electric	0	0	No projected demand
Mining	(348)	(33)	Projected shortage - see plan below.
Irrigation	100	100	Projected surplus
Livestock	0	0	No projected surplus or shortage

5.29.1 City of Albany

Description of Supply

Water supply for the City of Albany is from Hubbard Creek Reservoir, owned by the West Central Texas MWD at 659 to 738 acft/yr and from Lake McCarty at 75 to 0 acft/yr based on yields from 2020 to 2070, respectively. The City of Albany sells water to Fort Griffin SUD.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended. Conservation is recommended to reduce usage to a goal of 140 gpcd.

a. Conservation:

- Cost Source: Volume II
- Date to be Implemented: before 2030
- Annual Cost: maximum of \$130,213 in 2070
- Unit Cost \$560/acft

Table 5.29-2. Recommended Plan Costs by Decade for the City of Albany

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	130	99	113	113	114	114
Conservation						
Supply From Plan Element (acft/yr)	0	50	98	146	191	233
Annual Cost (\$/yr)	\$0	\$28,174	\$54,976	\$81,965	\$107,034	\$130,213
<i>Projected Surplus/(Shortage) after Conservation (acft/yr)</i>	130	149	211	259	305	347
Additional Demands from Recommended Strategies from Others						
Increase Reuse Amount to Fort Griffin SUD (acft/yr)	2	2	2	2	2	2
<i>Total Surplus/(Shortage) Including Recommended Strategies</i>	128	147	209	257	303	345

5.29.2 County-Other

Description of Supply

Water supplies from County-Other are from a minor unnamed aquifer at 25 acft/yr. Projections indicate sufficient water supply for County-Other and no change in water supply is recommended. Conservation was considered; however, the entity's current per capita use rate is below the selected target rate of 140 gpcd.

5.29.3 Manufacturing

Projections indicate a surplus of water for Manufacturing and no changes in water supply are recommended.

5.29.4 Steam-Electric

No Steam-Electric demand is projected for the county.

5.29.5 Mining

Description of Supply

Surface water for Mining in Shackelford County is obtained from Fort Griffin SUD at 2 acft/yr, run of river water rights at 5 to 6 acft/yr and Cross Timbers Aquifer at 202 acft/yr. Projections indicate an increase in water demand for Mining and shortages projected beginning in 2020. Changes in water supply are recommended.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to meet water needs for Mining. Associated costs are included for each strategy. Conservation is recommended.

- a. Conservation
 - Cost Source: Volume II
 - Date to be Implemented: by 2030
 - Unit Cost: not determined
- b. Leave Needs Unmet

New supplies for irrigation would be cost prohibitive to develop and most farms would switch to dry-land crops or allow fields to go fallow during a prolonged drought.

- Cost Source: Cost of not meeting needs – will be provided by TWDB
- Date to be Implemented: 2020

Table 5.29-3. Recommended Plan Costs by Decade for Shackelford County – Mining

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	(353)	(538)	(348)	(232)	(118)	(33)
Conservation						
Supply From Plan Element (acft/yr)	17	37	39	31	23	17
Annual Cost (\$/yr)	ND	ND	ND	ND	ND	ND
Unit Cost (\$/acft)	ND	ND	ND	ND	ND	ND
<i>Projected Surplus/(Shortage) after Conservation (acft/yr)</i>	(336)	(501)	(309)	(201)	(95)	(16)
Leave Needs Unmet (acft/yr)	(336)	(501)	(309)	(201)	(95)	(16)

ND – Not determined. Costs to implement industrial conservation technologies will vary based on each location

5.29.6 Irrigation

Irrigation obtains water supply from the Cross Timbers Aquifer at 350 acft/yr. There are some irrigation rights located along the Clear Fork of the Brazos River; however, there is no surface water availability for those rights during a repeat of the drought of record. Supplies appear to be sufficient to meet demands and no water supply changes or conservation are recommended.

5.29.7 Livestock

No future shortages are projected in the Livestock category and no changes in water supply are recommended.

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5.30 Somervell County Water Supply Plan

Table 5.30-1 lists each water user group in Somervell County and their corresponding surplus or shortage in years 2040 and 2070. A brief summary of the water user groups and the plan for the selected water user are presented in the following subsections.

Table 5.30-1. Somervell County Surplus/(Shortage)

Water User Group	Surplus/(Shortage)		Comment
	2040 (acft/yr)	2070 (acft/yr)	
City of Glen Rose	(90)	(179)	Projected shortage - see plan below.
Somervell County Water District	1,402	1,379	Projected surplus
County-Other	(92)	(183)	Projected shortage - see plan below.
Manufacturing	4	4	Projected surplus
Steam-Electric	(35,579)	(35,867)	Projected shortage - see plan below.
Mining	(455)	(280)	Projected shortage - see plan below.
Irrigation	172	172	Projected surplus
Livestock	0	0	No projected surplus or shortage

5.30.1 City of Glen Rose

Description of Supply

The City of Glen Rose obtains its water supply from groundwater from the Trinity Aquifer. Based on the available groundwater supply, the City of Glen Rose is projected to have a shortage from 2030 through year 2070.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to meet the projected water shortage for City of Glen Rose. Conservation is recommended to reduce usage to a goal of 140 gpcd.

- a. Conservation:
 - Cost Source: Volume II
 - Date to be Implemented: before 2030
 - Annual Cost: maximum of \$103,132 in 2070
- b. Purchase Supply from Somervell County Water Supply Project
 - The project will treat raw water from the Wheeler Branch Off-Channel Reservoir and transmit the treated water to customers of the Somervell County Water District. Phases 1-4 of the project are complete and are located in the immediate vicinity of Glen Rose.

- Cost Source: Volume II
- Date to be Implemented: by 2035
- Annual Cost: \$52,950 (based on current cost of service for highest rate tier (\$3.25/1000 gal) published by the Somervell County WSD)

Table 5.30-2. Recommended Plan Costs by Decade for City of Glen Rose

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	8	(50)	(90)	(123)	(154)	(179)
Conservation						
Supply From Plan Element (acft/yr)	0	52	108	169	179	184
Annual Cost (\$/yr)	\$0	\$28,898	\$60,585	\$94,655	\$100,198	\$103,132
<i>Projected Surplus/(Shortage) after Conservation (acft/yr)</i>	8	2	18	46	25	5
Alternative: Somervell County Water Supply Project						
Supply From Plan Element (acft/yr)	—	50	50	50	50	50
Annual Cost (\$/yr)	—	\$52,950	\$52,950	\$52,950	\$52,950	\$52,950
Unit Cost (\$/acft)	—	\$1,059	\$1,059	\$1,059	\$1,059	\$1,059

5.30.2 Somervell County Water District

Description of Supply

Somervell County Water District obtains its supply through groundwater from the Trinity Aquifer and from the Wheeler Off-Channel Reservoir. No shortages are projected for the Somervell County Water District.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended for Somervell County Water District to help meet the needs of adjacent water users, including County-Other entities and the City of Glen Rose. Conservation was considered; however, the entity's usage is below the selected goal of 140 gpcd.

a. Somervell County Water Supply Project

- The project will treat raw water from the Wheeler Branch Off-Channel Reservoir and transmit the treated water to customers of the Somervell County Water District. Phases 1 – 4 are complete and provide 1,400 acft/yr of supply. Remaining phases will supply an additional 600 acft/yr.
- Cost Source: Volume II
- Date to be Implemented: by 2030
- Total Project Cost (Phases 7A and 9 – 17): \$36,250,000
- Annual Cost: \$3,546,000

Costs are shown for the additional supply of water made available by the remaining phases, which are planned for completion by 2035. Costs shown are for new infrastructure only, and do not include existing debt service for existing phases of the project or for costs for supply from Wheeler Branch Reservoir.

Table 5.30-3. Recommended Plan Costs by Decade for Somervell County Water District

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	1,424	1,411	1,402	1,394	1,386	1,379
Conservation						
Supply From Plan Element (acft/yr)	—	—	—	—	—	—
Annual Cost (\$/yr)	—	—	—	—	—	—
<i>Projected Surplus/(Shortage) after Conservation</i>	1,424	1,411	1,402	1,394	1,386	1,379
Somervell County Water Supply Project						
Supply From Plan Element (acft/yr)	—	600	600	600	600	600
Annual Cost (\$/yr)	—	\$3,546,000	\$3,546,000	\$995,000	\$995,000	\$995,000
Unit Cost (\$/acft)	—	\$5,910	\$5,910	\$1,658	\$1,658	\$1,658

5.30.3 County-Other

Description of Supply

Somervell County-Other obtains its water supply from groundwater from the Trinity Aquifer, and water supply shortages are projected beginning in 2030. However, the Somervell County Water District has completed the Wheeler Branch Off-Channel Reservoir, and is implementing infrastructure to utilize that resource throughout the county. Phases 1 – 4 are complete and provide 1,400 acft/yr of supply. Remaining phases will supply an additional 600 acft/yr.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended for County-Other entities. Conservation was considered; however, the entity’s usage is below the selected goal of 140 gpcd.

a. Somervell County Water Supply Project

- The project will treat raw water from the Wheeler Branch Off-Channel Reservoir and transmit the treated water to customers of the Somervell County Water District.
- Cost Source: Volume II

- Date to be Implemented: by 2035
- Annual Cost: \$193,800 (based on current cost of service for highest rate tier (\$3.25/1000 gal))

Table 5.30-4. Recommended Plan Costs by Decade for Somervell County – Other

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	0	(54)	(92)	(125)	(156)	(183)
Conservation						
Supply From Plan Element (acft/yr)	—	—	—	—	—	—
Annual Cost (\$/yr)	—	—	—	—	—	—
<i>Projected Surplus/(Shortage) after Conservation</i>	0	(54)	(92)	(125)	(156)	(183)
Somervell County Water Supply Project						
Supply From Plan Element (acft/yr)	—	183	183	183	183	183
Annual Cost (\$/yr)	—	\$193,800	\$193,800	\$193,800	\$193,800	\$193,800
Unit Cost (\$/acft)	—	\$1,059	\$1,059	\$1,059	\$1,059	\$1,059

5.30.4 Manufacturing

Somervell County Manufacturing obtains its water supply from groundwater from the Trinity Aquifer. There are surpluses projected through 2070 and no changes are recommended to the water supply.

5.30.5 Steam-Electric

Description of Supply

Somervell County Steam-Electric obtains water supply from the Squaw Creek Reservoir and from the Brazos River Authority through Lake Granbury. Somervell County Steam-Electric is projected to have shortages beginning in year 2020 and continuing through year 2070. Local groundwater currently supplies potable water for plant staff and high-quality process water for boiler feed at the Comanche Peak Steam Electric Station. When the Somervell County Water Supply Project is developed, some potable water and process water for the Comanche Peak Station will be obtained from the project.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to meet water needs for Somervell County Steam-Electric. Conservation was not applied to this plan because the steam-electric facilities are assumed to be built with technologies minimizing water use as much as practicable.



- a. Somervell County Water Supply Project
 - Cost Source: Volume II
 - Date to be Implemented: fully phased by 2035
 - Annual Cost: \$741,300 (based on current cost of service for highest rate tier (\$3.25/1000 gal) published by the Somervell County WSD¹)
- b. Leave Needs Unmet
 - Significant demand is associated with the plan to expand the Comanche Peak Steam Electric Station, however there are no longer plans to move forward with this expansion. Therefore, these needs should be left unmet.
 - Cost Source: Cost of not meeting needs – see Appendix G
 - Date to be Implemented: 2020

Table 5.30-5. Recommended Plan Costs by Decade for Somervell County – Steam-Electric

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	(35,387)	(35,483)	(35,579)	(35,675)	(35,771)	(35,867)
Conservation						
Supply From Plan Element (acft/yr)	—	—	—	—	—	—
Annual Cost (\$/yr)	—	—	—	—	—	—
<i>Projected Surplus/(Shortage) after Conservation (acft/yr)</i>	(35,387)	(35,483)	(35,579)	(35,675)	(35,771)	(35,867)
Somervell County Water Supply Project						
Supply From Plan Element (acft/yr)	—	700	700	700	700	700
Annual Cost (\$/yr)	—	\$45,137,000	\$45,137,000	\$1,160,600	\$1,160,600	\$1,160,600
Unit Cost (\$/acft)	—	\$5,910	\$5,910	\$1,658	\$1,658	\$1,658
Leave Needs Unmet (acft/yr)	(35,387)	(34,773)	(34,879)	(34,975)	(35,071)	(35,167)

5.30.6 Mining

Description of Supply

Mining operations in Somervell County are supplied by Trinity Aquifer groundwater. Demands for Mining are projected to increase significantly resulting in shortages beginning in 2020.

¹ http://www.scwd.com/uploads/1/2/8/1/12818560/scwd_service_policy_5-14.pdf

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to meet water needs for Somervell County-Mining. Conservation is recommended.

- a. Conservation
 - Cost Source: Volume II
 - Date to be Implemented: before 2030
 - Annual Cost: not determined
- b. Groundwater Development – Trinity Aquifer
 - Cost Source: Volume II
 - Date to be Implemented: before 2030
 - Project Cost: \$876,000
 - Unit Cost: Max of \$200/acft (2020)
- c. BRA System Operations
 - Cost Source: Volume II
 - Date to be Implemented: before 2030
 - Project Cost: \$4,104
 - Unit Cost: \$76
- d. Leave Needs Unmet
 - Cost Source: Cost of not meeting needs – see Appendix G
 - Date to be Implemented: 2030 – 2039

Table 5.30-6. Recommended Plan Costs by Decade for Somervell County – Mining

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	(421)	(588)	(455)	(369)	(307)	(280)
Conservation						
Supply From Plan Element (acft/yr)	33	64	80	74	70	68
Annual Cost (\$/yr)	ND	ND	ND	ND	ND	ND
<i>Projected Surplus/(Shortage) after Conservation (acft/yr)</i>	(388)	(524)	(375)	(295)	(237)	(212)
BRA System Operations						
Supply From Plan Element (acft/yr)	54	54	54	54	54	54
Annual Cost (\$/yr)	\$4,104	\$4,104	\$4,104	\$4,104	\$4,104	\$4,104
Unit Cost (\$/acft)	\$76	\$76	\$76	\$76	\$76	\$76



Table 5.30-6. Recommended Plan Costs by Decade for Somervell County – Mining

Plan Element	2020	2030	2040	2050	2060	2070
Groundwater Well Development – Trinity Aquifer						
Supply From Plan Element (acft/yr)	426	426	426	426	426	426
Annual Cost (\$/yr)	\$85,000	\$85,000	\$23,000	\$23,000	\$23,000	\$23,000
Unit Cost (\$/acft)	\$200	\$200	\$54	\$54	\$54	\$54
Leave Needs Unmet (acft/yr)	—	(44)	—	—	—	—

ND – Not determined. Costs to implement industrial conservation technologies will vary based on each location

5.30.7 Irrigation

Somervell County Irrigation is projected to have a surplus of 172 acft/yr through the year 2070. No changes in water supply are recommended.

5.30.8 Livestock

Livestock water supply is projected to meet demands through 2070 and no changes in water supply are recommended.

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5.31 Stephens County Water Supply Plan

Table 5.31-1 lists each water user group in Stephens County and their corresponding surplus or shortage in years 2040 and 2070. A brief summary of the water user groups and the plan for the selected water user are presented in the following subsections.

Table 5.31-1. Stephens County Surplus/(Shortage)

Water User Group	Surplus/(Shortage)		Comment
	2040 (acft/yr)	2070 (acft/yr)	
City of Breckenridge	877	868	Projected surplus
Fort Belknap WSC			See Young County
Fort Griffin SUD	(2)	(2)	Projected shortage - see plan below.
Possum Kingdom WSC			See Palo Pinto County
Staff WSC			See Eastland County
Stephens Regional SUD	173	176	Projected surplus
County-Other	7	6	Projected surplus
Manufacturing	0	0	No projected surplus or shortage
Steam-Electric	0	0	No projected demand
Mining	(2,869)	(1,184)	Projected shortage - see plan below.
Irrigation	(121)	(121)	Projected shortage - see plan below.
Livestock	0	0	No projected surplus or shortage

5.31.1 City of Breckenridge

Description of Supply

The City of Breckenridge obtains water from Hubbard Creek Reservoir through the West Central Texas Municipal Water District and from Lake Daniel. Projections indicate a surplus of water for the City of Breckenridge, and no change in supply is recommended.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended for the City of Breckenridge. Conservation is recommended to reduce usage to a goal of 140 gpcd.

- a. Conservation
 - Cost Source: Volume II
 - Date to be Implemented: by 2030
 - Annual Cost: maximum of \$28,388 in 2030
 - Unit Cost: \$560/acft

Table 5.31-2. Recommended Plan Costs by Decade for City of Breckenridge

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	882	871	877	879	878	868
Conservation						
Supply From Plan Element (acft/yr)	0	51	29	16	15	14
Annual Cost (\$/yr)	\$0	\$28,388	\$16,070	\$9,154	\$8,221	\$8,113
<i>Projected Surplus/(Shortage) after Conservation</i>	882	922	906	895	893	882

5.31.2 Fort Griffin SUD

Description of Supply

Fort Griffin SUD purchases treated surface water from the City of Albany and distributes to a number of counties. Of those counties, Stephens has the highest demand and is considered the SUD’s primary county. The projections in Table 5.31-3 represent cumulative water supply shortages. Fort Griffin SUD also has a contract for 353 acft/yr from the BRA, but does not have infrastructure to utilize that supply.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended for Fort Griffin SUD. Conservation was considered; however, the entity’s usage is below the selected goal of 140 gpcd.

- a. Purchase Treated Water Supply from the City of Albany
 - Cost Source: Volume II
 - Date to be Implemented: 2020
 - Annual Cost: \$3,878
 - Unit Cost: Cost of purchase \$1,939/acft
- b. Alternative: Build Infrastructure to Utilize BRA Supply
 - Cost: Not determined
 - Date to be Implemented: by 2030



Table 5.31-3. Recommended Plan Costs by Decade for Fort Griffin SUD

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	(2)	(2)	(2)	(2)	(2)	(2)
Conservation						
Supply From Plan Element (acft/yr)	–	–	–	–	–	–
Annual Cost (\$/yr)	–	–	–	–	–	–
<i>Projected Surplus/(Shortage) after Conservation</i>	(2)	(2)	(2)	(2)	(2)	(2)
Purchase Treated Water Supply from the City of Albany						
Supply From Plan Element (acft/yr)	2	2	2	2	2	2
Annual Cost (\$/yr)	\$3,878	\$3,878	\$3,878	\$3,878	\$3,878	\$3,878
Unit Cost (\$/acft)	\$1,939	\$1,939	\$1,939	\$1,939	\$1,939	\$1,939
Alternative: Build Infrastructure to Utilize BRA Supply						

5.31.3 Stephens Regional SUD

Stephens Regional SUD is located in multiple counties (Eastland, Shackelford, Palo Pinto, Throckmorton and Stephens). The surplus shown in Table 5.31-4 represents the cumulative totals for Stephens Regional SUD in all the counties it serves. The current supply comes through the Brazos River Authority for supply from Possum Kingdom Reservoir. The WUG also provides supply to the City of Woodson (Throckmorton County-Other). Since water needs are met throughout the planning period no water management strategies are recommended for Stephens Regional SUD. Conservation was considered; however, the entity’s usage is below the selected goal of 140 gpcd.

5.31.4 County-Other

Water supply for county-other entities is obtained from local groundwater. Projections indicate adequate water supply and no changes are recommended. Conservation was considered; however, the entity’s usage is below the selected goal of 140 gpcd.

5.31.5 Manufacturing

The City of Breckenridge provides supply to meet Stephens County Manufacturing needs. No shortage is projected and no changes in water supply are recommended.

5.31.6 Steam-Electric

Stephens County has no projected demand for Steam-Electric.

5.31.7 Mining

Description of Supply

Mining operations in Stephens County obtain supply from Possum Kingdom Reservoir through the Brazos River Authority and from the Cross Timbers Aquifer. Mining demand in Stephens County is projected to peak in 2030, and slowly decrease until 2070. A shortage of supplies is projected beginning in 2020.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management plan is recommended to meet water needs for Stephens County-Mining. Conservation is recommended.

- a. Conservation
 - Cost Source: Volume II
 - Date to be Implemented: by 2030
 - Annual Cost: not determined
- b. Leave Needs Unmet
 - Cost Source: Cost of not meeting needs – see Appendix G
 - Date to be Implemented: 2020

Table 5.31-4. Recommended Plan Costs by Decade for Stephens County – Mining

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	(3,475)	(3,552)	(2,869)	(2,236)	(1,668)	(1,184)
Conservation						
Supply From Plan Element (acft/yr)	152	257	312	268	228	194
Annual Cost (\$/yr)	ND	ND	ND	ND	ND	ND
<i>Projected Surplus/(Shortage) after Conservation (acft/yr)</i>	(3,323)	(3,295)	(2,557)	(1,968)	(1,440)	(990)
Leave Needs Unmet (acft/yr)	(3,323)	(3,295)	(2,557)	(1,968)	(1,440)	(990)

ND – Not Determined. Costs to implement industrial conservation technologies will vary based on each location.

5.31.8 Irrigation

Description of Supply

Stephens County Irrigation obtains 31 acft/yr of groundwater supply from the Cross Timbers Aquifer. Irrigation is projected to have a shortage of supply through 2070.



Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to meet water needs for Stephens County-Irrigation. Conservation is recommended.

- a. Conservation
 - Cost Source: Volume II
 - Date to be Implemented: by 2030
 - Annual Cost: maximum of \$15,840
 - Unit Cost: 1,489/acft
- b. Groundwater Development – Other Aquifer
 - Cost Source: Volume II
 - Date to be Implemented: by 2030
 - Project Cost: \$143,000
 - Unit Cost: Max of \$400/acft (2020)
- c. Leave Needs Unmet
 - Cost Source: Cost of not meeting needs – see Appendix G
 - Date to be Implemented: 2020

Table 5.31-5. Recommended Plan Costs by Decade for Stephens County – Irrigation

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	(121)	(121)	(121)	(121)	(121)	(121)
Conservation						
Supply From Plan Element (acft/yr)	5	8	11	11	11	11
Annual Cost (\$/yr)	\$6,789	\$11,314	\$15,840	\$15,840	\$15,840	\$15,840
<i>Projected Surplus/(Shortage) after Conservation (acft/yr)</i>	(116)	(113)	(110)	(110)	(110)	(110)
Groundwater Development – Other Aquifer						
Supply From Plan Element (acft/yr)	30	30	30	30	30	30
Annual Cost (\$/yr)	\$12,000	\$12,000	\$2,000	\$2,000	\$2,000	\$2,000
Unit Cost (\$/acft)	\$400	\$400	\$67	\$67	\$67	\$67
Leave Needs Unmet (acft/yr)	(80)	(80)	(80)	(80)	(80)	(80)

5.31.9 Livestock

Stephens County Livestock obtains water from local supply and is projected to meet demands through 2070. No changes in water supply are recommended.

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5.32 Stonewall County Water Supply Plan

Table 5.32-1 lists each water user group in Stonewall County and their corresponding surplus or shortage in years 2040 and 2070. A brief description of each water user group has been developed and is presented in the following subsections.

Table 5.32-1. Stonewall County Surplus/(Shortage)

Water User Group	Surplus/(Shortage)		Comment
	2040 (acft/yr)	2070 (acft/yr)	
City of Aspermont	(41)	(52)	Projected shortage - see plan below.
County-Other	6	6	Projected surplus
Manufacturing	(58)	(58)	Projected shortage - see plan below.
Steam-Electric	0	0	No projected demand
Mining	(318)	(144)	Projected shortage - see plan below.
Irrigation	4	3	Projected surplus
Livestock	0	0	No projected surplus or shortage

5.32.1 City of Aspermont

Description of Supply

The City of Aspermont is supplied from North Central Texas Municipal Water Authority (NCTMWA) and from local groundwater sources, primarily from the Seymour Aquifer. The City has a projected water supply shortage beginning in 2020 and increasing through 2070; however, with conservation the City is able to decrease their projected shortage to where there is a surplus beginning in 2050.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended for City of Aspermont. Associated costs are included for each strategy. Conservation is recommended to reduce usage to a goal of 140 gpcd.

a. Conservation:

- Cost Source: Volume II
- Date to be Implemented: before 2030
- Annual Cost: maximum of \$49,856 in 2070
- Unit Cost: \$560/acft

- b. Purchase Water from the Salt Fork Water Quality Cooperation Salinity Control Project
 - Cost Source: Volume II
 - Date to be Implemented: by 2030
 - Project Cost: \$8,254,000 for City's portion
 - Unit Cost: \$3,823/acft
- c. Lake Creek Reservoir. This strategy would be developed by NCTMWA to augment existing supplies.
 - Cost Source: Volume II
 - Project requires a subordination agreement with the BRA
 - Date to be Implemented: by 2030
 - Project Cost: none (cost would be borne by NCTMWA)
 - Unit Cost: none (supply already purchased from NCTMWA)

Table 5.32-2. Recommended Plan Costs by Decade for the City of Aspermont

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	(39)	(39)	(41)	(50)	(51)	(52)
Conservation						
Supply From Plan Element (acft/yr)	0	19	37	56	73	89
Annual Cost (\$/yr)	\$0	\$10,820	\$20,664	\$31,593	\$40,917	\$49,856
<i>Projected Surplus/(Shortage) after Conservation (acft/yr)</i>	(39)	(20)	(4)	6	22	37
Purchase Water from the Salt Fork Water Quality Cooperation Salinity Control Project						
Supply From Plan Element (acft/yr)	—	249	249	249	249	249
Annual Cost (\$/yr)	—	\$952,000	\$952,000	\$371,000	\$371,000	\$371,000
Unit Cost (\$/acft)	—	\$3,823	\$3,823	\$1,490	\$1,490	\$1,490
Lake Creek Reservoir						
Supply From Plan Element (acft/yr)	—	20	4	—	—	—
Annual Cost (\$/yr)	—	—	—	—	—	—
Unit Cost (\$/acft)	—	—	—	—	—	—

5.32.2 County-Other

Stonewall County-Other entities obtain their groundwater supply from the Blaine Aquifer. A surplus is projected throughout the planning period and no changes in water supply are

recommended. Conservation was considered; however, the entity’s usage is below the selected goal of 140 gpcd.

5.32.3 Manufacturing

Description of Supply

There is no water supply currently allocated for Stonewall County Manufacturing entities, however projections indicate a manufacturing demand and shortages beginning in 2020.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to meet the projected water shortage for Mining. Associated costs are included for each strategy. Conservation is recommended.

- a. Conservation:
 - Cost Source: Volume II
 - Date to be Implemented: by 2020
 - Unit Cost: not determined
- b. Groundwater Development (Blaine Aquifer):
 - Cost Source: Volume II
 - Date to be Implemented: by 2020
 - Project Cost: \$192,000
 - Unit Cost: Max of \$268/acft (2020)

Table 5.32-3. Recommended Plan Costs by Decade for Stonewall County – Manufacturing

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	(58)	(58)	(58)	(58)	(58)	(58)
Conservation						
Supply From Plan Element (acft/yr)	2	3	4	4	4	4
Annual Cost (\$/yr)	ND	ND	ND	ND	ND	ND
<i>Projected Surplus/(Shortage) after Conservation (acft/yr)</i>	(56)	(55)	(54)	(54)	(54)	(54)
Groundwater Well Development – Blaine Aquifer						
Supply From Plan Element (acft/yr)	56	56	56	56	56	56
Annual Cost (\$/yr)	\$15,000	\$15,000	\$2,000	\$2,000	\$2,000	\$2,000
Unit Cost (\$/acft)	\$268	\$268	\$34	\$34	\$34	\$34

ND – Not determined. Costs to implement industrial conservation technologies will vary based on each location

5.32.4 Steam-Electric

No Steam-Electric demand exists or is projected for the county.

5.32.5 Mining

Description of Supply

Groundwater supply for Mining in Stonewall County is obtained from the Blaine Aquifer. Projections indicate a decrease in water demand for Mining, however shortages are projected from 2020 through 2070.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to meet the projected water shortage for Mining. Associated costs are included for each strategy. Conservation is recommended.

- a. Conservation:
 - Cost Source: Volume II
 - Date to be Implemented: by 2020
 - Unit Cost: not determined
- b. Groundwater Development (Blaine Aquifer):
 - Cost Source: Volume II
 - Date to be Implemented: by 2020
 - Project Cost: \$687,000
 - Unit Cost: Max of \$218/acft

Table 5.32-4. Recommended Plan Costs by Decade for Stonewall County – Mining

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	(390)	(382)	(318)	(252)	(194)	(144)
Conservation						
Supply From Plan Element (acft/yr)	18	29	36	31	27	24
Annual Cost (\$/yr)	ND	ND	ND	ND	ND	ND
<i>Projected Surplus/(Shortage) after Conservation (acft/yr)</i>	(372)	(353)	(282)	(221)	(167)	(120)
Groundwater Well Development – Blaine Aquifer						
Supply From Plan Element (acft/yr)	372	372	372	372	372	372
Annual Cost (\$/yr)	\$81,000	\$81,000	\$33,000	\$33,000	\$33,000	\$33,000
Unit Cost (\$/acft)	\$218	\$218	\$89	\$89	\$89	\$89

ND – Not determined. Costs to implement industrial conservation technologies will vary based on each location



5.32.6 Irrigation

Stonewall County Irrigation entities obtain groundwater supply from the Blaine and Seymour Aquifers. A surplus in supply is projected and no changes in water supply are recommended.

5.32.7 Livestock

Livestock water supply is projected to meet demands through 2070 and no changes in water supply are recommended.

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5.33 Taylor County Water Supply Plan

Table 5.33-1 lists each water user group in Taylor County and their corresponding surplus or shortage in years 2040 and 2070. A brief summary of the water user groups and the plan for the selected water user are presented in the following subsections.

Table 5.33-1. Taylor County Surplus/(Shortage)

Water User Group	Surplus/(Shortage)		Comment
	2040 (acft/yr)	2070 (acft/yr)	
City of Abilene	(6,763)	(19,771)	Projected shortage - see plan below.
Coleman County SUD			See Callahan County
Hamby WSC			See Jones County
Hawley WSC			See Jones County
City of Lawn	20	13	Projected surplus - see plan below.
City of Merkel	(25)	(41)	Projected shortage - see plan below.
North Runnels WSC	(31)	(31)	See Region F Plan
Potosi WSC	(542)	(586)	Projected shortage - see plan below.
Steamboat Mountain WSC	(155)	(171)	Projected shortage - see plan below.
City of Tye	(4)	(13)	Projected shortage - see plan below.
View Caps WSC	0	(9)	Projected shortage - see plan below.
County-Other	287	(197)	Projected shortage - see plan below.
Manufacturing	0	0	No projected surplus or shortage
Steam-Electric	0	0	No projected demand
Mining	(232)	(181)	Projected shortage - see plan below.
Irrigation	(1,266)	(1,266)	Projected shortage - see plan below.
Livestock	0	0	No projected surplus or shortage

5.33.1 City of Abilene

Description of Supply

The City of Abilene obtains its water supply from surface water from Fort Phantom Hill Reservoir, Fort Phantom Hill Reuse, BRA Main Stem System (Possum Kingdom Reservoir), Hubbard Creek Reservoir and O.H. Ivie (Region F) Reservoir. Abilene also has a wastewater reuse system for non-potable use, with water stored in Lake Kirby. The City supplies several neighboring communities and projected demands indicate shortages through 2070. This WUG is located in Taylor and Jones Counties. Conservation is recommended to reduce the City of Abilene gallons per capita per day (gpcd) to a goal of 140 gpcd.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water supply plan is recommended to meet water needs for the City of Abilene.

- a. Conservation
 - Cost Source: Volume II
 - Date to be Implemented: before 2030
 - Annual Cost: \$560/acft
- b. BRA System Operations Supply
 - Cost Source: Volume II
 - Date to be Implemented: before 2030
 - Project Cost: \$591,881
 - Unit Cost: \$76.50/acft
- c. Water Treatment Plant Expansion
 - Cost Source: Volume II
 - Date to be Implemented: before 2060
 - Project Cost: \$61,665,000
 - Unit Cost: \$0.88/acft
- d. West Texas Water Partnership
 - Cost Source: See 2021 Region F Regional Water Plan
 - Date to be Implemented: before 2030
 - Project Cost: see Region F Water Plan
- e. Unit Cost: maximum of \$1,783/acft Cedar Ridge Reservoir
 - Cost Source: Volume II
 - Date to be Implemented: 2030
 - Project Cost: \$283,646,000
 - Unit Cost: \$853/acft

Table 5.33-2. City of Abilene Demands and Supplies

Projected Demands	Year (acft/yr)					
	2020	2030	2040	2050	2060	2070
Major Water Contract Holders						
City of Abilene	22,261	22,698	23,050	23,440	23,874	24,238
Existing Contractual Sales						
City of Ballinger	1,250	1,250	1,250	1,250	1,250	1,250
City of Baird	77	77	77	77	77	77



Table 5.33-2. City of Abilene Demands and Supplies

Projected Demands	Year (acft/yr)					
	2020	2030	2040	2050	2060	2070
Major Water Contract Holders						
Blair WSC (Taylor C-O)	77	77	77	77	77	77
City of Buffalo Gap (Taylor C-O)	153	153	153	153	153	153
City of Clyde	307	307	307	307	307	307
City of Clyde	11,837	11,837	11,837	11,837	11,837	11,837
City of Lawn	153	153	153	153	153	153
City of Merkel	353	353	353	353	353	353
City of Tye	184	184	184	184	184	184
Eula WSC	61	61	61	61	61	61
Hamby WSC	308	308	308	308	308	308
Hawley WSC	307	307	307	307	307	307
Potosi WSC	307	307	307	307	307	307
Steamboat Mountain WSC	307	307	307	307	307	307
S.U.N. WSC (Taylor C-O)	230	230	230	230	230	230
Tuscola-Taylor County WCID No. 1 (Taylor C-O)	92	92	92	92	92	92
View Caps WSC	199	199	199	199	199	199
County Aggregated Demands						
Taylor County Manufacturing	585	671	671	671	671	671
Total Existing Demands	16,787	16,873	16,873	16,873	16,873	16,873
Recommended Strategies¹						
BAIRD (increase contract amount)	155	152	150	154	159	164
MERKEL (increase contract amount)	20	23	25	29	35	41
Potosi WSC (increase contract amount)	506	525	542	557	572	586
Steamboat Mountain WSC (increase contract amount)	148	151	155	159	165	171
Sweetwater	1,614	1,651	1,668	1,731	1,787	1,839
City of Tye (increase contract amount)	–	2	4	7	11	13
View Caps WSC (increase contract amount)	–	–	–	3	6	9
City of Winters (Region F Recommended Strategy)	212	212	212	212	212	212
CALLAHAN COUNTY-MINING	141	136	119	107	97	87
JONES COUNTY-OTHER	68	82	92	102	112	121
JONES COUNTY-IRRIGATION	106	50	–	–	–	–

Table 5.33-2. City of Abilene Demands and Supplies

Projected Demands	Year (acft/yr)					
	2020	2030	2040	2050	2060	2070
Major Water Contract Holders						
JONES COUNTY-MINING	153	143	124	106	91	78
TAYLOR COUNTY-OTHER	93	93	96	113	125	135
TAYLOR COUNTY-IRRIGATION	1,217	1,184	1,152	1,152	1,152	1,152
TAYLOR COUNTY-MINING	245	237	206	188	172	–
Total Recommended Strategies	4,678	4,641	4,545	4,620	4,696	4,608
Total Demands	43,726	44,212	44,468	44,933	45,443	45,719
Supply Source						
Lake Abilene ²	0	0	0	0	0	0
Lake Kirby ³	0	0	0	0	0	0
BRA Main Stem System ⁴	10,400	10,400	10,400	7,910	7,910	7,910
Lake O.H. Ivie (Colorado River MWD) ⁵	4,794	4,634	4,460	4,030	3,600	3,190
Fort Phantom Hill ⁶	2,300	2,200	2,100	2,000	1,900	1,100
Fort Phantom Hill Reuse ⁷	7,840	7,840	7,840	7,840	7,840	7,840
West Central Texas MWD (Hubbard)	13,077	10,720	8,360	6,000	3,640	1,300
Total Supply	38,411	35,794	33,160	27,780	24,890	21,340
Projected Balance						
Water Balance/(Shortage) (current contracts and supplies)	(637)	(3,777)	(6,763)	(12,533)	(15,857)	(19,771)
Water Balance/(Shortage) (with Recommended Strategies)	(5,315)	(8,418)	(11,308)	(17,153)	(20,553)	(24,379)

¹ WUG needs after conservation

² Lake Abilene is not considered a dependable supply by the City and is currently not used.

³ Lake Kirby is used primarily to store reuse water for the City's reuse customers. Reuse demands are not included in the water demand projections for the City.

⁴ Consistent with the City of Abilene's Purpose and Need memorandum, BRA supplies to Abilene are assumed to be reduced by 24% to account for reductions in supply due to future more severe droughts.

⁵ Updated yields with subordination, 16.54% of the projected yield of Ivie. Reduced by 6% for RO efficiency. 2020-2040 are the supply numbers provided by Region F while 2050-2070 are from the City's P&N.

⁶ Fort Phantom Hill Reservoir Supply is 2-year safe yield less 2,500 acft/yr (Clyde Water Right) for 2020-2060. The 2070 supply matches the City's P&N.

⁷ Fort Phantom Hill Reuse is indirect potable reuse into the reservoir from Abilene's advanced treatment plant known as the Hamby Water Reclamation Facility.



Table 5.33-3. Recommended Plan Costs by Decade for the City of Abilene

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	(637)	(3,777)	(6,763)	(12,533)	(15,857)	(19,771)
Conservation						
Supply From Plan Element (acft/yr)	0	1,624	2,197	2,001	1,995	2,023
Annual Cost (\$/yr)	\$0	\$909,351	\$1,230,407	\$1,120,538	\$1,117,158	\$1,132,889
<i>Projected Surplus/(Shortage) after Conservation</i>	(637)	(2,153)	(4,566)	(10,532)	(13,862)	(17,748)
BRA System Operations Supply						
Supply From Plan Element (acft/yr) ¹	5,673	6,890	6,890	5,230	5,230	5,230
Annual Cost (\$/yr)	\$2,391,000	\$2,391,000	\$2,391,000	\$1,616,000	\$1,616,000	\$1,616,000
Unit Cost (\$/acft)	\$347	\$347	\$347	\$309	\$309	\$309
Abilene WTP Expansion (23.2 MGD)						
Supply From Plan Element (acft/yr)	–	26,005	26,005	26,005	26,005	26,005
Annual Cost (\$/yr)	–	\$22,884	\$22,884	\$22,884	\$22,884	\$22,884
Unit Cost (\$/acft)	–	\$0.88	\$0.88	\$0.88	\$0.88	\$0.88
West Texas Water Partnership Supply						
Supply From Plan Element (acft/yr)	–	8,400	8,400	8,400	8,400	8,400
Annual Cost (\$/yr)	–	\$14,977,200	\$14,977,200	\$3,385,200	\$3,385,200	\$3,385,200
Unit Cost (\$/acft)	–	\$1,783	\$1,783	\$403	\$403	\$403
Cedar Ridge Reservoir						
Supply From Plan Element (acft/yr)	–	18,815	18,889	16,300	13,200	10,100
Annual Cost (\$/yr)	–	\$24,535,000	\$28,560,000	\$29,340,000	\$5,016,000	\$5,020,000
Unit Cost (\$/acft)	–	\$1,304	\$1,512	\$1,800	\$380	\$497

¹ Supplies assumed to decrease due to reductions in BRA System Operations supply from future more severe droughts.

5.33.2 City of Lawn

Description of Supply

City of Lawn obtains its water a contract with the City of Abilene at 153 acft/yr. No shortages are projected for City of Lawn and no changes in water supply are recommended.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water supply plan is recommended to meet water needs for the City of Abilene. Conservation is recommended to reduce usage to a goal of 140 gpcd.

- a. Conservation
 - Cost Source: Volume II
 - Date to be Implemented: before 2030
 - Annual Cost: \$560/acft

Table 5.33-4. Recommended Plan Costs by Decade for City of Lawn

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	25	22	20	17	15	13
Conservation						
Supply From Plan Element (acft/yr)	–	10	20	23	23	23
Annual Cost (\$/yr)	\$0	\$5,619	\$10,944	\$13,018	\$12,908	\$13,062
<i>Projected Surplus/(Shortage) after Conservation</i>	25	32	40	40	38	36

5.33.3 City of Merkel

Description of Supply

The City of Merkel obtains surface water from local sources and from the City of Abilene at 353 acft/yr. A shortage is projected starting in year 2020 for the City of Merkel.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended to meet water needs for the City of Merkel. Conservation was considered; however, the entity’s usage is below the selected goal of 140 gpcd.

- a. Water Supply from Abilene
 - Cost Source: Assumed wholesale rate
 - Date to be Implemented: 2020
 - Project Cost: \$0 (Current infrastructure assumed to be adequate)
 - Unit Cost: \$1,694/acft

Table 5.33-5. Recommended Plan Costs by Decade for the City of Merkel

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	(20)	(23)	(25)	(29)	(35)	(41)
Conservation						
Supply From Plan Element (acft/yr)	–	–	–	–	–	–
Annual Cost (\$/yr)	–	–	–	–	–	–
<i>Projected Surplus/(Shortage) after Conservation</i>	(20)	(23)	(25)	(29)	(35)	(41)
Purchase from Abilene						
Supply From Plan Element (acft/yr)	20	23	25	29	35	41
Annual Cost (\$/yr)	\$33,880	\$38,962	\$42,350	\$49,126	\$59,290	\$69,454
Unit Cost (\$/acft)	\$1,694	\$1,694	\$1,694	\$1,694	\$1,694	\$1,694

5.33.4 North Runnels WSC

See the Region F plan. The need in Brazos G will be met with sales from the City of Winters.

5.33.5 Potosi WSC

Description of Supply

The Potosi WSC purchases water from the City of Abilene at 307 acft/yr, and shows a projected shortage starting in 2020. This WUG is located in multiple counties (Taylor and Callahan). The shortages shown in the table below represent the cumulative totals for Potosi WSC.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended to meet water needs for Potosi WSC. Conservation was considered; however, the entity’s current per capita use rate is below the selected target rate of 140 gpcd.

- a. Purchase Additional Water Supply from Abilene
 - Cost Source: Assumed wholesale rate
 - Date to be Implemented: before 2020
 - Project Cost: \$0 (Current infrastructure assumed to be adequate)
 - Unit Cost: \$1,694/acft

Table 5.33-6. Recommended Plan Costs by Decade for Potosi WSC

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	(506)	(525)	(542)	(557)	(572)	(586)
Conservation						
Supply From Plan Element (acft/yr)	–	–	–	–	–	–
Annual Cost (\$/yr)	–	–	–	–	–	–
<i>Projected Surplus/(Shortage) after Conservation (acft/yr)</i>	(506)	(525)	(542)	(557)	(572)	(586)
Purchase from City of Abilene						
Supply From Plan Element (acft/yr)	506	525	542	557	572	586
Annual Cost (\$/yr)	\$857,164	\$889,350	\$918,148	\$943,558	\$968,968	\$992,684
Unit Cost (\$/acft)	\$1,694	\$1,694	\$1,694	\$1,694	\$1,694	\$1,694

5.33.6 Steamboat Mountain WSC

Description of Supply

Steamboat Mountain WSC purchases water from the City of Abilene at 228 acft/yr, and shows a projected shortage starting in 2020.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended to meet water needs for Steamboat Mountain WSC. Conservation was considered; however, the entity’s current per capita use rate is below the selected target rate of 140 gpcd.

- a. Purchase Additional Water Supply from Abilene
 - Cost Source: Assumed wholesale rate
 - Date to be Implemented: before 2020
 - Project Cost: \$0 (Current infrastructure assumed to be adequate)
 - Unit Cost: \$1,694/acft



Table 5.33-7. Recommended Plan Costs by Decade for Steamboat Mountain WSC

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	(148)	(151)	(155)	(159)	(165)	(171)
Conservation						
Supply From Plan Element (acft/yr)	–	–	–	–	–	–
Annual Cost (\$/yr)	–	–	–	–	–	–
<i>Projected Surplus/(Shortage) after Conservation</i>	(148)	(151)	(155)	(159)	(165)	(171)
Purchase from City of Abilene						
Supply From Plan Element (acft/yr)	148	151	155	159	165	171
Annual Cost (\$/yr)	\$250,712	\$255,794	\$262,570	\$269,346	\$279,510	\$289,674
Unit Cost (\$/acft)	\$1,694	\$1,694	\$1,694	\$1,694	\$1,694	\$1,694

5.33.7 City of Tye

Description of Supply

The City of Tye purchases water from the City of Abilene at 184 acft/yr, and shows a small need throughout the planning period starting in 2030.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended for the City of Tye. Conservation was considered; however, the entity’s current per capita use rate is below the selected target rate of 140 gpcd.

- a. Water Supply from Abilene (BRA System Operations Supply)
 - Cost Source: Assumed wholesale rate
 - Date to be Implemented: before 2020
 - Project Cost: \$0 (Current infrastructure assumed to be adequate)
 - Unit Cost: \$1,694/acft

Table 5.33-8. Recommended Plan Costs by Decade for the City of Tye

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	0	(2)	(4)	(7)	(11)	(13)
Conservation						
Supply From Plan Element (acft/yr)	–	–	–	–	–	–
Annual Cost (\$/yr)	–	–	–	–	–	–
<i>Projected Surplus/(Shortage) after Conservation</i>	0	(2)	(4)	(7)	(11)	(13)
Purchase from Abilene (BRA System Operations Supply)						
Supply From Plan Element (acft/yr)	0	2	4	7	11	13
Annual Cost (\$/yr)	–	\$3,388	\$6,776	\$11,858	\$18,634	\$22,022
Unit Cost (\$/acft)	–	\$1,694	\$1,694	\$1,694	\$1,694	\$1,694

5.33.8 View Caps WSC

Description of Supply

View Caps WSC purchases water from the City of Abilene at 199 acft/yr. There is a small need starting in 2050. Conservation was considered; however, the entity’s current per capita use rate is below the selected target rate of 140 gpcd.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended for View Caps WSC.

- a. Water Supply from Abilene (BRA System Operations Supply)
 - Cost Source: Assumed wholesale rate
 - Date to be Implemented: before 2020
 - Project Cost: \$0 (Current infrastructure assumed to be adequate)
 - Unit Cost: \$1,694/acft



Table 5.33-9. Recommended Plan Costs by Decade for the View Caps WSC

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	4	2	0	(3)	(6)	(9)
Conservation						
Supply From Plan Element (acft/yr)	–	–	–	–	–	–
Annual Cost (\$/yr)	–	–	–	–	–	–
<i>Projected Surplus/(Shortage) after Conservation</i>	4	2	0	(3)	(6)	(9)
Purchase from Abilene (BRA System Operations Supply)						
Supply From Plan Element (acft/yr)	–	–	–	9	13	15
Annual Cost (\$/yr)	–	–	–	\$15,246	\$22,022	\$25,410
Unit Cost (\$/acft)	–	–	–	\$1,694	\$1,694	\$1,694

5.33.9 County-Other

Description of Supply

County-Other Taylor obtains water supply from Abilene, Steamboat Mountain WSC, and Sweetwater. The water supply entities for Taylor County-Other show a projected shortage.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended for the County-Other entities. Conservation was considered; however, the entity’s current per capita use rate is below the selected target rate of 140 gpcd.

- a. Water Supply from Abilene (Cedar Ridge Reservoir)
 - Cost Source: Assumed wholesale rate
 - Date to be Implemented: before 2020
 - Project Cost: \$0 (Current infrastructure assumed to be adequate)
 - Unit Cost: \$1,694/acft

Table 5.33-10. Recommended Plan Costs by Decade for Taylor County-Other

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	382	336	287	224	166	(197)
Conservation						
Supply From Plan Element (acft/yr)	–	–	–	–	–	–
Annual Cost (\$/yr)	–	–	–	–	–	–
<i>Projected Surplus/(Shortage) after Conservation</i>	382	336	287	224	166	(197)
Purchase from Abilene (Cedar Ridge Reservoir)						
Supply From Plan Element (acft/yr)	–	93	96	113	125	197
Annual Cost (\$/yr)	–	\$157,542	\$162,624	\$191,422	\$211,750	\$228,690
Unit Cost (\$/acft)	–	\$1,694	\$1,694	\$1,694	\$1,694	\$1,694

5.33.10 Manufacturing

Taylor County Manufacturing receives water from the City of Abilene at 1,248 to 2,019 acft/yr, from 2020 to 2070 respectively. A surplus is projected for Manufacturing in Taylor County. No changes in water supply are recommended.

5.33.11 Steam-Electric

The water supply entities for Taylor County Steam-Electric show no projected demand.

5.33.12 Mining

Description of Supply

Mining operations in Taylor County obtains water from the Edwards-Trinity Plateau at 134 acft/yr. Mining is projected to show shortages beginning in 2020. Conservation is recommended for Mining.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to meet water needs for Taylor County-Mining. Associated costs are included for each strategy.

a. Conservation

- Cost Source: Volume II
- Date to be Implemented: before 2020
- Annual Cost: not determined



b. Purchase from Abilene

- Cost Source: Assumed wholesale rate
- Date to be Implemented: 2020
- Project Cost: Not enough information to cost delivery
- Unit Cost: \$1,694/acft (BRA wholesale rate only)

Table 5.33-11. Recommended Plan Costs by Decade for Taylor County – Mining

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	(257)	(257)	(232)	(212)	(195)	(181)
Conservation						
Supply From Plan Element (acft/yr)	12	20	26	24	23	22
Annual Cost (\$/yr)	ND	ND	ND	ND	ND	ND
<i>Projected Surplus/(Shortage) after Conservation (acft/yr)</i>	(245)	(237)	(206)	(188)	(172)	(159)
Purchase from Abilene						
Supply From Plan Element (acft/yr)	–	237	206	188	172	159
Annual Cost (\$/yr)	–	\$401,478	\$348,964	\$318,472	\$291,368	\$269,346
Unit Cost (\$/acft)	–	\$1,694	\$1,694	\$1,694	\$1,694	\$1,694
ND – Not determined. Costs to implement industrial conservation technologies will vary based on each location						

5.33.13 Irrigation

Description of Supply

Taylor County Irrigation is supplied by groundwater from the Edwards-Trinity at 355 acft/yr and Trinity Aquifer at 14 acft/yr. Irrigation is projected to have shortages beginning in 2020.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to meet water needs for Taylor County-Irrigation.

a. Conservation

- Cost Source: Volume II
- Date to be Implemented: before 2020
- Annual Cost: \$1,924/acft

b. Purchase from Abilene

- Cost Source: Assumed wholesale rate
- Date to be Implemented: 2020
- Project Cost: Not enough information to cost delivery
- Unit Cost: \$1,694/acft (BRA wholesale rate only)

Table 5.33-12. Recommended Plan Costs by Decade for Taylor County – Irrigation

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	(1,266)	(1,266)	(1,266)	(1,266)	(1,266)	(1,266)
Conservation						
Supply From Plan Element (acft/yr)	49	82	114	114	114	114
Annual Cost (\$/yr)	\$94,375	\$157,291	\$220,207	\$220,207	\$220,207	\$220,207
<i>Projected Surplus/(Shortage) after Conservation (acft/yr)</i>	(1,217)	(1,184)	(1,152)	(1,152)	(1,152)	(1,152)
Purchase from Abilene						
Supply From Plan Element (acft/yr)	1,217	1,184	1,152	1,152	1,152	1,152
Annual Cost (\$/yr)	\$2,061,598	\$2,005,696	\$1,951,488	\$1,951,488	\$1,951,488	\$1,951,488
Unit Cost (\$/acft)	\$1,694	\$1,694	\$1,694	\$1,694	\$1,694	\$1,694

5.33.14 Livestock

Livestock water supply is projected to meet demands through 2070 and no changes in water supply are recommended.

5.34 Throckmorton County Water Supply Plan

Table 5.34-1 lists each water user group in Throckmorton County and their corresponding surplus or shortage in years 2040 and 2070. For each water user group with a projected shortage, a water supply plan has been developed and is presented in the following subsections.

Table 5.34-1. Throckmorton County Surplus/(Shortage)

Water User Group	Surplus/(Shortage)		Comment
	2040 (acft/yr)	2070 (acft/yr)	
Baylor SUD			See Young County
Fort Belknap WSC			See Young County
Fort Griffin SUD			See Stephens County
Stephens Regional SUD			See Stephens County
City of Throckmorton	(147)	(177)	Projected shortage - see plan below.
County-Other	71	72	Projected surplus
Manufacturing	—	—	No projected demand
Steam-Electric	—	—	No projected demand
Mining	(67)	(12)	Projected shortage - see plan below.
Irrigation	(157)	(157)	Projected shortage - see plan below.
Livestock	0	0	No projected surplus or shortage

5.34.1 City of Throckmorton

Description of Supply

The City of Throckmorton obtains its water supply through diversions from Lake Throckmorton authorized under a water right held by the City; projected availability of supply under this water right is limited to 50 acft/yr at the beginning of the planning period and decreases to zero by 2070. Should Lake Throckmorton become unreliable, the City is connected to receive supply from Graham through Fort Belknap WSC. Water supply shortages are projected for the City of Throckmorton throughout the planning period.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and the TWDB, the following water supply plan is recommended for the City of Throckmorton. Conservation is recommended to reduce usage to a goal of 140 gpcd. Associated costs are included for each strategy. Needs remain unmet in 2020. These needs will only occur during a drought equivalent or worse than the drought of record. While not a strategy recommended by the Brazos G RWPG, the impacts of the unmet needs can be mitigated through demand management in the event of a serious drought prior to the recommended strategies coming online.

- a. Conservation
 - Cost Source: Volume II
 - Date to be Implemented: before 2030
 - Annual Cost: maximum of \$24,640 in 2060
 - Unit Cost: \$560/acft
- b. Water Supply from New Throckmorton Reservoir:
 - Cost Source: Volume II
 - Project requires a subordination agreement with the BRA
 - Date to be Implemented: before 2030
 - Project Cost: \$68,103,000
 - Unit Cost: maximum of \$1,687/acft

Table 5.34-2. Recommended Plan Costs by Decade for the City of Throckmorton

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	(135)	(141)	(147)	(157)	(167)	(177)
Conservation						
Supply From Plan Element (acft/yr)	—	14	26	40	44	44
Annual Cost (\$/yr)	—	\$7,840	\$14,560	\$22,400	\$24,640	\$24,640
<i>Projected Surplus/(Shortage) after Conservation (acft/yr)</i>	(135)	(127)	(121)	(117)	(123)	(133)
Additional Needs in Recommended Strategies for Others						
Provide Treated Water Sales to City of Graham (acft/yr)		1,500	1,500	1,500	1,500	1,500
<i>Total Surplus/(Shortage) Including Recommended Strategies</i>	(135)	(1,627)	(1,621)	(1,617)	(1,623)	(1,633)
New Throckmorton Reservoir						
Supply From Plan Element (acft/yr)	—	3,500	3,500	3,500	3,500	3,500
Annual Cost (\$/yr)	—	\$5,905,000	\$5,905,000	\$3,497,000	\$1,911,000	\$1,911,000
Unit Cost (\$/acft)	—	\$1,687	\$1,687	\$999	\$546	\$546

5.34.2 County-Other

The entities in Throckmorton County-Other receive their water supply through groundwater production from the Cross Timbers Aquifer, through diversions of local surface water authorized under a water right, and through purchases of treated surface water supplies under contract from Stephens Regional SUD. Future water supply is projected to be available from Stephens Regional SUD, only, in the amount of 99 acft/yr. No shortages are projected no change in water supply is recommended. Conservation was also considered; however, the entity’s usage is below the selected goal 140 gpcd.



5.34.3 Manufacturing

No Manufacturing demand exists or is projected for the county.

5.34.4 Steam-Electric

No Steam-Electric demand exists or is projected for the county.

5.34.5 Mining

Description of Supply

Mining in Throckmorton County obtains water supply through groundwater production from local aquifers. Projections show Mining will experience water supply shortages in each decade of the planning period.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to meet water needs for Mining. Conservation is recommended. Associated costs are included for each strategy.

- a. Conservation:
 - Cost Source: Volume II
 - Date to be Implemented: before 2030
 - Unit Cost: not determined
- b. Cross Timbers Aquifer Development:
 - Cost Source: Volume II
 - Date to be Implemented: before 2030
 - Project Cost: \$344,000
 - Unit Cost: maximum of \$321/acft

Table 5.34-3. Recommended Plan Costs by Decade for Throckmorton County – Mining

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	(90)	(87)	(67)	(46)	(28)	(12)
Conservation						
Supply From Plan Element (acft/yr)	6	10	12	11	9	8
Annual Cost (\$/yr)	ND	ND	ND	ND	ND	ND
<i>Projected Surplus/(Shortage) after Conservation (acft/yr)</i>	(84)	(77)	(55)	(36)	(19)	(4)
Groundwater Development – Cross Timbers Aquifer						
Supply From Plan Element (acft/yr)	84	84	84	84	84	84
Annual Cost (\$/yr)	\$27,000	\$27,000	\$3,000	\$3,000	\$3,000	\$3,000
Unit Cost (\$/acft)	\$321	\$321	\$36	\$36	\$36	\$36

ND – Not determined. Costs to implement industrial conservation technologies will vary based on each location

5.34.6 Irrigation

Description of Supply

Irrigation in Throckmorton County does not have a defined source for water supply. Water demands for irrigation are projected to remain constant across the planning period; with no defined supply, water supply shortages are also projected across the entire planning period.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to meet water needs for Mining. Conservation is recommended. Associated costs are included for each strategy:

- a. Conservation:
 - Cost Source: Volume II
 - Date to be Implemented: before 2030
 - Annual Cost: maximum of \$23,273
 - Unit Cost: \$2,118/acft
- b. Cross Timbers Aquifer Development:
 - Cost Source: Volume II
 - Date to be Implemented: before 2030
 - Project Cost: \$405,000
 - Unit Cost: maximum of \$217/acft



Table 5.34-4. Recommended Plan Costs by Decade for Throckmorton County – Irrigation

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	(157)	(157)	(157)	(157)	(157)	(157)
Conservation						
Supply From Plan Element (acft/yr)	5	8	11	11	11	11
Annual Cost (\$/yr)	\$9,974	\$16,624	\$23,273	\$23,273	\$23,273	\$23,273
<i>Projected Surplus/(Shortage) after Conservation (acft/yr)</i>	(152)	(149)	(146)	(146)	(146)	(146)
Groundwater Development – Cross Timbers Aquifer						
Supply From Plan Element (acft/yr)	152	152	152	152	152	152
Annual Cost (\$/yr)	\$33,000	\$33,000	\$2,000	\$2,000	\$2,000	\$2,000
Unit Cost (\$/acft)	\$217	\$217	\$33	\$33	\$33	\$33

5.34.7 Livestock

No water supply shortages are projected and no change in water supply is recommended.

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5.35 Washington County Water Supply Plan

Table 5.35-1 lists each water user group in Washington County and their corresponding surplus or shortage in years 2040 and 2070. A brief summary of the water user groups and the plan for the selected water user are presented in the following subsections.

Table 5.35-1. Washington County Surplus/(Shortage)

Water User Group	Surplus/(Shortage)		Comment
	2040 (acft/yr)	2070 (acft/yr)	
City of Brenham	(1,120)	(1,681)	Projected shortage - see plan below.
Central Washington County WSC	184	163	Projected surplus
Chappell Hill WSC	118	105	Projected surplus
Corix Utilities Texas, Inc	(399)	(498)	Projected shortage - see plan below.
West End WSC	0	0	OOR WUG Region H
County-Other	51	48	Projected surplus
Manufacturing	(6)	(6)	Projected shortage - see plan below.
Steam-Electric	0	0	No projected demand
Mining	(625)	(186)	Projected shortage - see plan below.
Irrigation	200	200	Projected surplus
Livestock	0	0	No projected surplus or shortage

5.35.1 City of Brenham

Description of Supply

The City of Brenham obtains its water supply through a contract with the Brazos River Authority for 4,200 acft/yr of water supply from Lake Somerville. The supply is currently restrained by water treatment plant capacity to 3,701 acft/yr, creating shortages starting in 2020.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended for Brenham. Conservation is recommended to reduce usage to a goal of 140 gpcd.

a. Conservation

- Cost Source: Volume II
- Date to be Implemented: 2030
- Unit Cost: \$560/acft
- Annual Cost: maximum of \$922,943 in 2070

b. Groundwater Development – Gulf Coast Aquifer

- Cost Source: Volume II
- Date to be Implemented: 2020
- Project Cost: \$2,958,000
- Unit Cost: \$527 acft/yr

c. BRA System Operation

- Cost Source: Volume II
- Date to be Implemented: 2020
- Project Cost: \$58,824
- Unit Cost: \$76 acft/yr

Table 5.35-2. Recommended Plan Costs by Decade for City of Brenham

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	(628)	(926)	(1,120)	(1,337)	(1,524)	(1,681)
Conservation						
Supply From Plan Element (acft/yr)	0	367	755	1,170	1,592	1,648
Annual Cost (\$/yr)	\$0	\$205,297	\$422,922	\$654,982	\$891,575	\$922,943
<i>Projected Surplus/(Shortage) after Conservation</i>	(628)	(559)	(365)	(167)	68	(33)
BRA System Operation						
Supply From Plan Element (acft/yr)	774	774	774	774	774	774
Annual Cost (\$/yr)	\$58,824	\$58,824	\$58,824	\$58,824	\$58,824	\$58,824
Unit Cost (\$/acft)	\$76	\$76	\$76	\$76	\$76	\$76
Groundwater Development – Gulf Coast Aquifer						
Supply From Plan Element (acft/yr)	628	559	365	167	–	33
Annual Cost (\$/yr)	\$330,956	\$294,593	\$71,540	\$32,732	–	\$6,468
Unit Cost (\$/acft)	\$527	\$52	\$196	\$196	–	\$196

5.35.2 Central Washington County WSC

Central Washington County WSC obtains water from the Gulf Coast Aquifer System at 452 acft/yr. It is projected to have a surplus through the year 2070 and no changes in water supply are recommended. Conservation was considered; however, the entity’s current per capita use rate is below the selected target rate of 140 gpcd.

5.35.3 Chappell Hill WSC

Chappell Hill WSC obtains water from the Gulf Coast Aquifer System at 268 ac-ft/yr. It is projected to have a surplus through the year 2070 and no changes in water supply are

recommended. Conservation was considered; however, the entity’s current per capita use rate is below the selected target rate of 140 gpcd.

5.35.4 Corix Utilities

Description of Supply

Corix Utilities Texas Inc. obtains its water supply from surface water from LCRA at 526 to 525 acft/yr and other groundwater sources at 758 acft/yr from Ellenberger-San Saba, Gulf Coast Aquifer, and other alluvial sources. Shortages are projected for Corix Utilities from 2020 to 2070 in Region G.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to meet water needs for Corix Utilities. Conservation was considered; however, the entity’s current per capita use rate is below the selected target rate of 140 gpcd.

- a. Groundwater Development – Gulf Coast Aquifer
 - Cost Source: Volume II
 - Date to be Implemented: 2020
 - Project Cost: \$1,853,359
 - Unit Cost: \$512/acft

Table 5.35-3. Recommended Plan Costs by Decade for Corix Utilities

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	(349)	(370)	(399)	(437)	(468)	(498)
Conservation						
Supply From Plan Element (acft/yr)	–	–	–	–	–	–
Annual Cost (\$/yr)	–	–	–	–	–	–
<i>Projected Surplus/(Shortage) after Conservation</i>	(349)	(370)	(399)	(437)	(468)	(498)
Groundwater Development – Gulf Coast Aquifer						
Supply From Plan Element (acft/yr)	349	370	399	437	468	498
Annual Cost (\$/yr)	\$178,688	\$189,440	\$41,496	\$45,448	\$48,672	\$51,792
Unit Cost (\$/acft)	\$512	\$512	\$104	\$104	\$104	\$104

5.35.5 County-Other

Washington County-Other is projected to have a surplus through the year 2070 and no changes in water supply are recommended. Conservation was considered; however, the entity’s current per capita use rate is below the selected target rate of 140 gpcd.

5.35.6 Manufacturing

Description of Supply

Water supply for manufacturing in Washington County is obtained by from the Gulf Coast Aquifer at 369 acft/yr and from Brenham at 208 acft/yr. Washington County Manufacturing is projected to have shortages beginning in 2030.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to meet water needs for Washington County Manufacturing. Conservation is recommended.

a. Conservation

- Cost Source: Volume II
- Date to be Implemented: 2020
- Annual Cost: Not determined

Table 5.35-4. Recommended Plan Costs by Decade for Washington County – Manufacturing

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	0	(6)	(6)	(6)	(6)	(6)
Conservation						
Supply From Plan Element (acft/yr)	17	29	41	41	41	41
Annual Cost (\$/yr)	ND	ND	ND	ND	ND	ND
<i>Projected Surplus/(Shortage) after Conservation</i>	0	23	35	35	35	35

ND – Not determined. Costs to implement industrial conservation technologies will vary based on each location

5.35.7 Steam-Electric

No Steam-Electric demand exists nor is projected for the county.

5.35.8 Mining

Description of Supply

Mining operations in Washington County are supplied by Brazos River Alluvium groundwater at 78 acft/yr. Demands for Mining are projected to increase significantly resulting in shortages beginning in 2020.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to meet water needs for Washington County-Mining. Conservation is recommended.



- a. Conservation
 - Cost Source: Volume II
 - Date to be Implemented: 2020
 - Annual Cost: not determined
- b. Groundwater Development – Gulf Coast Aquifer
 - Cost Source: Volume II
 - Date to be Implemented: 2020
 - Project Cost: \$3,348,000
 - Unit Cost: \$508/acft

Table 5.35-5. Recommended Plan Costs by Decade for Washington County – Mining

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	(491)	(788)	(625)	(460)	(295)	(186)
Conservation						
Supply From Plan Element (acft/yr)	17	43	49	38	26	18
Annual Cost (\$/yr)	ND	ND	ND	ND	ND	ND
<i>Projected Surplus/(Shortage) after Conservation (acft/yr)</i>	(474)	(745)	(576)	(422)	(269)	(168)
Groundwater Development – Gulf Coast Aquifer						
Supply From Plan Element (acft/yr)	474	745	576	422	269	168
Annual Cost (\$/yr)	\$240,792	\$378,460	\$110,592	\$81,024	\$51,648	\$32,256
Unit Cost (\$/acft)	\$508	\$508	\$192	\$192	\$192	\$192

ND – Not determined. Costs to implement industrial conservation technologies will vary based on each location

5.35.9 Irrigation

Irrigation obtains water from the Gulf Coast Aquifer at 416 acft/yr and Brazos River Alluvial Aquifer at 93 acft/yr. There is a projected surplus of water supplies and no changes in water supply are recommended.

5.35.10 Livestock

Livestock water supply is projected to meet demands through 2070 and no changes in water supply are recommended.

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5.36 Williamson County Water Supply Plan

Table 5.36-1 lists each water user group in Williamson County and their corresponding surplus or shortage in years 2040 and 2070. A brief summary of the water user groups and the plan for the selected water user are presented in the following subsections.

Table 5.36-1. Williamson County Surplus/(Shortage)

Water User Group	Surplus/(Shortage) ¹		Comment
	2040 (acft/yr)	2070 (acft/yr)	
City of Bartlett	(251)	(382)	Projected shortage - see plan below.
Bell-Milam Falls WSC			See Bell County
Block House MUD	280	287	Projected surplus
Brushy Creek MUD	(191)	(231)	Projected shortage - see plan below.
City of Cedar Park	(4,759)	(4,768)	Projected shortage - see plan below.
Fern Bluff MUD	0	0	No projected surplus or shortage
City of Florence	(42)	(72)	Projected shortage - see plan below.
City of Georgetown	(28,300)	(66,632)	Projected shortage - see plan below.
City of Granger	2	(56)	Projected shortage - see plan below.
City of Hutto	(3,304)	(10,703)	Projected shortage - see plan below.
Jarrell-Schwertner	1,819	839	Projected surplus
Jonah Water SUD	290	290	Projected surplus
City of Leander	(8,258)	(19,041)	Projected shortage - see plan below.
City of Liberty Hill	(90)	(90)	Projected shortage - see plan below.
Manville WSC	439	0	Projected surplus - see Region K Plan
Paloma Lake MUD 1	0	0	No projected surplus or shortage
Paloma Lake MUD 2	0	0	No projected surplus or shortage
City of Pflugerville	6	10	Projected surplus - see Region K Plan
City of Round Rock	(8,830)	(16,566)	Projected shortage - see plan below.
Sonterra MUD	2,323	2,269	Projected surplus
Southwest Milam WSC			See Milam County
City of Taylor	0	0	No projected surplus or shortage
City of Thorndale			See Milam County
Walsh Ranch MUD	0	0	No projected surplus or shortage
Williamson County MUD 9	0	0	No projected surplus or shortage
Williamson County MUD 10	0	0	No projected surplus or shortage
Williamson County MUD 11	0	0	No projected surplus or shortage
Williamson County WSID 3	90	0	Projected surplus
Williamson-Travis Counties MUD 1	212	217	Projected surplus
County-Other	(3,631)	(37,814)	Projected shortage - see plan below.
Manufacturing	285	285	Projected surplus

Table 5.36-1. Williamson County Surplus/(Shortage)

Water User Group	Surplus/(Shortage) ¹		Comment
	2040 (acft/yr)	2070 (acft/yr)	
Steam-Electric	—	—	No projected demand
Mining	(6,923)	(10,745)	Projected shortage - see plan below.
Irrigation	(172)	(172)	Projected shortage - see plan below.
Livestock	0	0	No projected surplus or shortage

5.36.1 City of Bartlett

Description of Supply

The City of Bartlett obtains its water supply from groundwater from the Trinity Aquifer. Based on the available groundwater supply, the City of Bartlett is projected to have shortages through the year 2070. This WUG is located in multiple counties (Williamson and Bell). The shortages shown in Table 5.36-1 represent the cumulative totals for the City of Bartlett.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended for the City of Bartlett.

- a. Conservation
 - Cost Source: Volume II
 - Date to be Implemented: before 2030
 - Annual Cost: maximum of \$39,200
 - Unit Cost: \$560/acft
- b. Purchase Supply from Jarrell-Schwertner WSC
 - Cost Source: Volume II
 - Date to be Implemented: before 2030
 - Annual Cost: \$672,375
 - Unit Cost: \$2,445/acft
- c. Alternative Strategy: Develop Trinity Aquifer Well
 - Cost Source: Volume II
 - Date to be Implemented: 2030
 - Project Cost: \$1,872,000
 - Unit Cost: maximum of \$669/acft

Table 5.36-2. Recommended Plan Costs by Decade for City of Bartlett

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	(183)	(214)	(251)	(291)	(336)	(382)
Conservation						
Supply From Plan Element (acft/yr)	—	28	61	82	99	107
Annual Cost (\$/yr)	—	\$8,400	\$17,920	\$29,120	\$36,400	\$39,200
<i>Projected Surplus/(Shortage) after Conservation</i>	(102)	(86)	(69)	(65)	(69)	(82)
Purchase Supply from Jarrell-Schwertner WSC						
Supply From Plan Element (acft/yr)	275	275	275	275	275	275
Annual Cost (\$/yr)	\$672,375	\$672,375	\$672,375	\$672,375	\$672,375	\$672,375
Unit Cost (\$/acft)	\$2,445	\$2,445	\$2,445	\$2,445	\$2,445	\$2,445
Alternative Strategy: Develop Trinity Aquifer Well						
Supply From Plan Element (acft/yr)	275	275	275	275	275	275
Annual Cost (\$/yr)	\$184,000	\$184,000	\$52,000	\$52,000	\$52,000	\$52,000
Unit Cost (\$/acft)	\$669	\$669	\$189	\$189	\$189	\$189

5.36.2 Blockhouse MUD

Blockhouse MUD obtains its water supply from the City of Cedar Park. No shortages are projected for Blockhouse MUD and no changes in water supply are recommended. Conservation was considered; however, the entity’s current per capita use rate is below the selected target rate of 120 gpcd.

5.36.3 Brushy Creek MUD

Description of Supply

Brushy Creek MUD obtains its water supply from a contract with the Brazos River Authority for water from Stillhouse Hollow Reservoir and from local groundwater. Brushy Creek MUD has a projected shortage through 2070. Brushy Creek MUD has contracted for 4,000 acft/yr of surface water supplies from the Brazos River Authority, which can supply 3,325 acft/yr in 2020 and 3,215 acft/yr in 2070, based on water availability analyses prescribed under water planning guidelines.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended for Brushy Creek MUD.

- a. Conservation
 - Cost Source: Volume II
 - Date to be Implemented: before 2030
 - Unit Cost: \$560/acft
 - Annual Cost: maximum of \$147,280 in 2040
- b. Purchase Supplies from Round Rock
 - Cost Source: Volume II
 - Date to be Implemented: before 2020
 - Annual Cost: \$228,000
 - Unit Cost: \$912/acft

Table 5.36-3. Recommended Plan Costs by Decade for Brushy Creek MUD

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	(246)	(206)	(191)	(193)	(210)	(231)
Conservation						
Supply From Plan Element (acft/yr)	—	233	263	243	238	237
Annual Cost (\$/yr)	—	\$130,480	\$147,280	\$136,080	\$133,280	\$132,720
<i>Projected Surplus/(Shortage) after Conservation</i>	(246)	27	72	50	28	6
Firm Up BRA Little River Supplies						
Supply From Plan Element (acft/yr)	—	697	719	741	763	785
Annual Cost (\$/yr)	—	—	—	—	—	—
Unit Cost (\$/acft)	—	—	—	—	—	—
Purchase Supplies from Round Rock						
Supply From Plan Element (acft/yr)	250	—	—	—	—	—
Annual Cost (\$/yr)	\$228,000	—	—	—	—	—
Unit Cost (\$/acft)	\$912	—	—	—	—	—

5.36.4 City of Cedar Park

Description of Supply

The City of Cedar Park is located in Williamson County and part of Travis County (Region K) and provides wholesale water to entities in Williamson and Travis Counties. The City has an 18,000 acft/yr contract from LCRA for Highland Lakes supply. Cedar Park is a



participant in the Brushy Creek Regional Utility Authority to develop additional supplies from the Highland Lakes in Region K. The project is under construction and remaining phases are under development. Based on the available surface water supply and contractual commitments to supply water to wholesale customers, the City of Cedar Park is projected to have a shortage through the year 2070. Table 5.36-4 includes additional information on existing contracts and water supplies for the City of Cedar Park. Table 5.36-5 presents the water supply plan for the portion of Cedar Park in Brazos G.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to meet the projected water shortage for the City of Cedar Park.

- a. Conservation: Additional advanced conservation was considered and not applied since no shortage remains in later decades after applying conservation.
 - Cost Source: Volume II
 - Date to be Implemented: before 2030
 - Unit Cost: \$560/acft
- b. Brushy Creek RUA Water Supply Project
 - Cost Source: Volume II
 - Date to be Implemented: before 2030
 - Total Project Cost: \$73,104,200 (city's portion of cost)
 - Unit Cost: \$598/acft
- c. Reuse
 - Cost Source: Volume II
 - Date to be Implemented: before 2030
 - Project Cost: \$7,184,000
 - Unit Cost: maximum of \$543/acft

Table 5.36-4. Recommended Plan Costs by Decade for the City of Cedar Park

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	(2,887)	(4,603)	(4,759)	(4,792)	(4,775)	(4,768)
Conservation						
Supply From Plan Element (acft/yr)		1,887	3,638	5,212	6,515	6,833
Annual Cost (\$/yr)	—	\$1,056,720	\$2,037,280	\$2,918,720	\$3,648,960	\$3,826,480
<i>Projected Surplus/(Shortage) after Conservation</i>	(2,887)	(2,716)	(1,121)	420	1,740	2,115

Table 5.36-4. Recommended Plan Costs by Decade for the City of Cedar Park

Plan Element	2020	2030	2040	2050	2060	2070
Brushy Creek RUA Water Supply Project¹						
Supply From Plan Element (acft/yr)	1	1	1	1	1	1
Annual Cost (\$/yr)	\$13,763,000	\$13,763,000	\$9,280,000	\$9,280,000	\$9,280,000	\$9,280,000
Unit Cost (\$/acft)	\$598	\$598	\$403	\$403	\$403	\$403
Reuse						
Supply From Plan Element (acft/yr)	2,886	2,715	1,120	1,120	1,120	1,120
Annual Cost (\$/yr)	\$1,567,098	\$1,474,245	\$103,000	\$103,000	\$103,000	\$103,000
Unit Cost (\$/acft)	\$543	\$543	\$92	\$92	\$92	\$92

1 – The LCRA contract is shown as a current supply to Cedar Park. This strategy provides additional flexibility to take supplies during drought by a deep water intake in Lake Travis.

5.36.5 Fern Bluff MUD

Description of Supply

Fern Bluff MUD obtains its water supply from groundwater from the Edwards-Balcones Fault Zone, Highland Lakes, and Direct Reuse. The demand is equal to supply balances shown in Table 5.36-1 represent the cumulative totals for Fern Bluff MUD.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended for the Fern Bluff MUD.

a. Conservation

- Cost Source: Volume II
- Date to be Implemented: before 2030
- Annual Cost: maximum in 2070 of \$214,100
- Unit Cost: \$560/acft

Table 5.36-5. Recommended Plan Costs by Decade for Fern Bluff MUD

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	0	0	0	0	0	0
Conservation						
Supply From Plan Element (acft/yr)	—	101	197	285	367	382
Annual Cost (\$/yr)	—	\$56,839	\$110,401	\$159,586	\$205,481	\$214,100
<i>Projected Surplus/(Shortage) after Conservation</i>	—	101	197	285	367	382

5.36.6 City of Florence

Description of Supply

The City of Florence obtains its water supply from groundwater from the Trinity Aquifer. Based on the City’s available groundwater supply, the City of Florence is projected to have a shortage through the year 2070.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended for the City of Florence. Conservation was considered; however, the entity’s current per capita use rate is below the selected target rate of 120 gpcd.

- a. Purchase from Georgetown
 - Cost Source: Volume II
 - Date to be Implemented: 2020
 - Annual Cost: maximum of \$56,304
 - Unit Cost: \$782/acft

Table 5.36-6. Recommended Plan Costs by Decade for the City of Florence

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	(35)	(38)	(42)	(50)	(59)	(72)
Conservation						
Supply From Plan Element (acft/yr)	—	—	—	—	—	—
Annual Cost (\$/yr)	—	—	—	—	—	—
<i>Projected Surplus/(Shortage) after Conservation</i>	(35)	(38)	(42)	(50)	(59)	(72)
Purchase from Georgetown						
Supply From Plan Element (acft/yr)	35	38	42	50	59	72
Annual Cost (\$/yr)	\$27,370	\$29,716	\$32,844	\$39,100	\$46,138	\$56,304
Unit Cost (\$/acft)	\$782	\$782	\$782	\$782	\$782	\$782

5.36.7 City of Georgetown

Description of Supply

The City of Georgetown obtains its water supply from groundwater from the Edwards-BFZ (Northern Segment) Aquifer and contracts with the Brazos River Authority for water from Lake Georgetown and Stillhouse Hollow Reservoir. The City of Georgetown has contracted for 45,707 acft/yr of surface water supplies from the Brazos River Authority,

which can supply 37,990 acft/yr in 2020 and 36,737 acft/yr in 2070, based on water availability analyses prescribed under water planning guidelines. Based on the available treatment capacity of the city's water treatment plant, the City of Georgetown is projected to have a shortage from 2030 through the year 2070.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended for The City of Georgetown. Associated costs are included for each strategy. Needs remain unmet in 2020. These needs will only occur during a drought equivalent or worse than the drought of record. While not a strategy recommended by the Brazos G RWPG, the impacts of the unmet needs can be mitigated through demand management in the event of a serious drought prior to the recommended strategies coming online that will firm up supplies from the BRA.

- a. Conservation
 - Cost Source: Volume II
 - Date to be Implemented: before 2030
 - Annual Cost: maximum of \$16,162,702
 - Unit Cost: \$560/acft
- b. Firm up BRA Little River Supplies
 - Cost Source: Volume II
 - Date to be Implemented: before 2030
 - Project Cost: Costs borne by BRA
 - Unit Cost: Costs borne by BRA
- c. Increase Treatment Plant Capacity
 - Cost Source: Volume II
 - Date to be Implemented: before 2030
 - Project Cost: \$85,760,000
 - Unit Cost: \$584/acft
- d. Lake Georgetown ASR
 - Cost Source: Volume II
 - Date to be Implemented: before 2040
 - Project Cost: \$306,276,000
 - Unit Cost: maximum of \$3,910/acft



- e. Reuse – Dove Springs
 - Cost Source: Volume II
 - Date to be Implemented: before 2030
 - Project Cost: \$6,270,000
 - Unit Cost: maximum of \$349/acft
- f. Alcoa Property Supply – Surface Water
 - Cost Source: Volume II
 - Date to be Implemented: before 2050
 - Project Cost: \$121,448,000
 - Unit Cost: maximum of \$1,244/acft
- g. Alternative: Lake Whitney Reallocation (Purchase from BRA)

These are project costs for intake, water treatment plant, pump station, and pipeline, but do not include BRA's costs for the reallocation water management strategy.

 - Cost Source: Volume II
 - Date to be Implemented: 2060
 - Project Cost: \$306,683,000
 - Unit Cost: maximum of \$1,617/acft
- h. Alternative: Williamson County Groundwater – South Option
 - Cost Source: Volume II
 - Date to be Implemented: before 2020
 - Project Cost: \$392,793,000
 - Unit Cost: maximum of \$3,434/acft

Table 5.36-7. Recommended Plan Costs by Decade for City of Georgetown

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	(10,272)	(19,148)	(28,300)	(39,354)	(52,048)	(66,632)
Conservation						
Supply From Plan Element (acft/yr)	—	2,957	7,271	13,126	20,510	29,228
Annual Cost (\$/yr)	—	\$1,656,000	\$4,072,000	\$7,351,000	\$11,486,000	\$16,368,000
<i>Projected Surplus/(Shortage) after Conservation</i>	(10,272)	(16,191)	(21,029)	(26,228)	(31,538)	(37,404)

Table 5.36-7. Recommended Plan Costs by Decade for City of Georgetown

Plan Element	2020	2030	2040	2050	2060	2070
Additional Demands from Strategies Recommended for Others						
Supply to Florence (acft/yr)	35	38	42	50	59	72
<i>Total Needs Including Recommended Strategies (acft/yr)</i>	<i>(10,307)</i>	<i>(16,229)</i>	<i>(21,071)</i>	<i>(26,278)</i>	<i>(31,597)</i>	<i>(37,476)</i>
Firm Up Supplies from BRA Contract						
Supply From Plan Element (acft/yr)	—	7,968	8,218	8,469	8,720	8,970
Annual Cost	—	—	—	—	—	—
Unit Cost (\$/acft)	—	—	—	—	—	—
Increase Water Treatment Capacity						
Supply From Plan Element (acft/yr)	—	17,000	17,000	17,000	17,000	17,000
Annual Cost	—	\$9,929,000	\$9,929,000	\$3,895,000	\$3,895,000	\$3,895,000
Unit Cost (\$/acft)	—	\$584	\$584	\$229	\$229	\$229
Lake Georgetown ASR						
Supply From Plan Element (acft/yr)	—	—	8,645	8,645	8,645	8,645
Annual Cost (\$/yr)	—	—	\$33,799,000	\$33,799,000	\$12,249,000	\$12,249,000
Unit Cost (\$/acft)	—	—	\$3,910	\$3,910	\$1,417	\$1,417
Reuse – Dove Springs						
Supply From Plan Element (acft/yr)	—	1,456	1,456	1,456	1,456	1,456
Annual Cost (\$/yr)	—	\$508,144	\$508,144	\$66,976	\$66,976	\$66,976
Unit Cost (\$/acft)	—	\$349	\$349	\$46	\$46	\$46
Alcoa Property Supply – Surface Water						
Supply From Plan Element (acft/yr)	—	—	—	—	4,772	10,669
Annual Cost (\$/yr)	—	—	—	—	\$5,936,368	\$4,150,241
Unit Cost (\$/acft)	—	—	—	—	\$1,244	\$389
Alternative: Purchase Additional BRA Supplies (Lake Whitney Reallocation)						
Alternative: Williamson County GW Supply – South Option						



5.36.8 City of Granger

Description of Supply

The City of Granger obtains its water supply from groundwater from the Trinity Aquifer. Based on the available groundwater supply, the City of Granger is projected to have a shortage beginning in 2050.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended for the City of Granger. Conservation was also considered; however, the entity’s current per capita use rate is below the selected target rate of 120 gpcd.

- a. BRA Supply (Lake Granger) through the East Williamson County Water Supply Project
 - Cost Source: Volume II
 - Date to be Implemented: 2050
 - Project Cost \$30,264,420 (total cost of project)
 - Unit Cost: \$235/acft

Table 5.36-8. Recommended Plan Costs by Decade for City of Granger

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	22	13	2	(14)	(33)	(56)
Conservation						
Supply From Plan Element (acft/yr)	—	—	—	—	—	—
Annual Cost (\$/yr)	—	—	—	—	—	—
<i>Projected Surplus/(Shortage) after Conservation</i>	22	13	2	(14)	(33)	(56)
BRA Supply (Lake Granger) through the EWCWSP						
Supply From Plan Element (acft/yr)	—	—	—	56	56	56
Annual Cost (\$/yr)	—	—	—	\$13,160	\$13,160	\$13,160
Unit Cost (\$/acft)	—	—	—	\$235	\$235	\$235

5.36.9 City of Hutto

Description of Supply

The City of Hutto obtains its water supply from Manville WSC, City of Taylor, and a groundwater system recently purchased from Heart of Texas Water Suppliers LLC. The current supply from the groundwater system is limited by the MAG in Williamson County.

Based on the available supplies, the City of Hutto is projected to have shortages through 2070.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended for the City of Hutto. Associated costs are included for each strategy. Conservation was considered; however, the entity’s current per capita use rate is below the selected target rate of 120 gpcd.

a. Williamson County Groundwater Supply – Milam County Supply Option

- Cost Source: Volume II
- Date to be Implemented: before 2030
- Project Cost: \$392,793,000
- Unit Cost: maximum of \$3,434/acft

b. Alcoa Property Supply in 2050-2070

Cost Source: Volume II

- Date to be Implemented: before 2050
- Project Cost: \$85,760,000
- Unit Cost: maximum of \$1,244/acft

Table 5.36-9. Recommended Plan Costs by Decade for City of Hutto

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	(907)	(3,046)	(3,304)	(5,437)	(8,596)	(10,703)
Conservation						
Supply From Plan Element (acft/yr)	—	—	—	—	—	—
Annual Cost (\$/yr)	—	—	—	—	—	—
<i>Projected Surplus/(Shortage) after Conservation</i>	(907)	(3,046)	(3,304)	(5,437)	(8,596)	(10,703)
Williamson County Groundwater Supply – South Option						
Supply From Plan Element (acft/yr)		3,046	3,304	3,304	3,304	3,304
Annual Cost (\$/yr)		\$10,459,964	\$11,345,936	\$11,345,936	\$11,345,936	\$11,345,936
Unit Cost (\$/acft)		\$3,434	\$832	\$832	\$832	\$832
Alcoa Property Supply						
Supply From Plan Element (acft/yr)	—	—	—	2,133	5,292	7,399
Annual Cost (\$/yr)	—	—	—	\$2,653,452	\$2,653,452	\$2,878,211
Unit Cost (\$/acft)	—	—	—	\$1,244	\$1,244	\$389



5.36.10 Jarrell-Schwertner WSC

Description of Supply

Jarrell-Schwertner WSC obtains its water supply from the Edwards-BFZ (Northern Segment) Aquifer, and Central Texas WSC. The WSC also has a contract with BRA for supplies from Stillhouse Hollow Lake. Jarrell-Schwertner WSC has contracted for 1,000 acft/yr of surface water supplies from the Brazos River Authority, which can supply 831 acft/yr in 2020 and 804 acft/yr in 2070, based on water availability analyses prescribed under water planning guidelines. Based on the available water supply, Jarrell-Schwertner WSC is projected to have a surplus throughout the planning period. This WUG is located in multiple counties (Williamson and Bell). The surplus/shortages shown represent the cumulative totals for Jarrell-Schwertner WSC.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB and in coordination with Region K, the following water management strategy is recommended for the Jarrell-Schwertner WSC. Conservation was considered; however, the entity's current per capita use rate is below the selected target rate of 120 gpcd.

- a. Firm up BRA Little River Supplies
 - Cost Source: Volume II
 - Date to be Implemented: before 2070
 - Project Cost: Costs borne by BRA
 - Unit Cost: Costs borne by BRA

Table 5.36-10. Recommended Plan Costs by Decade for Jarrell-Schwertner WSC

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	2,241	2,054	1,819	1,560	1,261	839
Conservation						
Supply From Plan Element (acft/yr)	—	—	—	—	—	—
Annual Cost (\$/yr)	—	—	—	—	—	—
<i>Projected Surplus/(Shortage) after Conservation</i>	1,520	1,384	1,221	1,046	845	562
Additional Demands from Strategies Recommended for Others						
Supply to Bartlett (acft/yr)	275	275	275	275	275	275
<i>Total Surplus/(Shortage) Including Recommended Strategies (acft/yr)</i>	1,245	1,109	946	774	570	287
Firm Up BRA Little River Supplies						
Supply From Plan Element (acft/yr)	—	174	180	185	191	196
Annual Cost (\$/yr)	—	—	—	—	—	—
Unit Cost (\$/acft)	—	—	—	—	—	—

5.36.11 Jonah Water SUD

Description of Supply

Jonah Water SUD obtains its water supply from groundwater from the Edwards-BFZ (Northern Segment) Aquifer, the City of Georgetown and a contract with the BRA for treated supply through the East Williamson County WTP. Based on the available groundwater and surface water supply, Jonah Water SUD is projected to have a surplus throughout the planning period.

5.36.12 City of Leander

Description of Supply

The City of Leander is located in Williamson and Travis (Region K) County and obtains its water supply from groundwater from the Edwards-BFZ (Northern Segment) Aquifer and contracts with the Lower Colorado River Authority for water from the Highland Lakes (Lake Travis and Lake Buchanan). Based on the available groundwater and surface water supply, the City of Leander is projected to have a shortage through the year 2070. Leander is a participant in the Brushy Creek RUA project with Cedar Park and Round Rock and will obtain future supplies from the Highland Lakes. Balance and strategies in Table 5.36-11 represent the portion of Leander in Brazos G.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB and in coordination with Region K, the following water management strategy is recommended for the City of Leander. Conservation was considered; however, the entity's current per capita use rate is below the selected target rate of 120 gpcd.

- a. Brushy Creek RUA Water Supply Project
 - Cost Source: Volume II
 - Date to be Implemented: 2020
 - Project Cost \$142,218,800 (city's portion of project shared with Liberty Hill)
 - Unit Cost: \$1,321/acft
- b. Contract Amendment with LCRA or Redistribution of Supplies through BCRUA
 - Cost Source: Volume II
 - Date to be Implemented: 2070
 - Project Cost: None. Existing infrastructure assumed sufficient
 - Unit Cost: \$844/acft



Table 5.36-11. Recommended Plan Costs by Decade for the City of Leander

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	(1,364)	(5,130)	(8,258)	(10,881)	(14,576)	(19,041)
Conservation						
Supply From Plan Element (acft/yr)	—	—	—	—	—	—
Annual Cost (\$/yr)	—	—	—	—	—	—
<i>Projected Surplus/(Shortage) after Conservation</i>	(1,364)	(5,130)	(8,258)	(10,881)	(14,576)	(19,041)
Brushy Creek RUA Water Supply Project						
Supply From Plan Element (acft/yr) ¹	17,600	17,600	17,600	17,600	17,600	17,600
Annual Cost (\$/yr)	\$23,249,600	\$23,249,600	\$15,523,200	\$15,523,200	\$15,523,200	\$15,523,200
Unit Cost (\$/acft)	\$1,321	\$1,366	\$882	\$882	\$882	\$882
Contract Amendment with LCRA (Region K)						
Supply From Plan Element (acft/yr)	—	—	—	—	—	1,441
Annual Cost (\$/yr)	—	—	—	—	—	\$1,216,204
Unit Cost (\$/acft)	—	—	—	—	—	\$844

1- The total supply from the strategy is 24,000 acft/y of which the City is currently using 6,400 acft/yr.

5.36.13 Liberty Hill

Description of Supply

The City of Liberty Hill obtains its water supply from groundwater from the Trinity Aquifer and a contract with the City of Georgetown. They also have a BRA contract for 600 acft/yr out of the Highland Lakes (HB1437). Liberty Hill is a participant in the Brushy Creek RUA project with Leander, Cedar Park and Round Rock and will obtain future supplies from the Highland Lakes. The City of Liberty Hill is projected to have a shortage through the year 2070. Conservation and advanced conservation were considered; however, the entity's current per capita use rate is below the selected target rate of 120 gpcd in 2070.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB and in coordination with Region K, the following water management strategy is recommended for the City of Leander.

- a. Brushy Creek RUA Water Supply Project
- Cost Source: Volume II
 - Date to be Implemented: 2020
 - Project Cost \$4,848,400 (city's portion of project shared with Leander)
 - Unit Cost: \$1,32/acft

Table 5.36-12. Recommended Plan Costs by Decade for the City of Liberty Hill

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	(90)	(90)	(90)	(90)	(90)	(90)
Conservation						
Supply From Plan Element (acft/yr)	—	—	—	—	—	—
Annual Cost (\$/yr)	—	—	—	—	—	—
<i>Projected Surplus/(Shortage) after Conservation</i>	(90)	(90)	(90)	(90)	(90)	(90)
Brushy Creek RUA Water Supply Project						
Supply From Plan Element (acft/yr)	600	600	600	600	600	600
Annual Cost (\$/yr)	\$792,600	\$792,600	\$529,200	\$529,200	\$529,200	\$529,200
Unit Cost (\$/acft)	\$1,321	\$1,321	\$882	\$882	\$882	\$882

5.36.14 Manville WSC

Manville WSC is mostly located in Travis County (Region K); however a portion of the service area is in Williamson County. The WSC obtains its water supply from groundwater from the Edwards and Trinity Aquifers as well as other minor aquifers. No shortages are projected for Manville WSC in Brazos G. The full water plan for Manville WSC is discussed in the 2021 Region K Plan. Water Conservation is recommended.

Table 5.36-13. Recommended Plan Costs by Decade for Manville WSC

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	1,151	794	439	24	2	0
Conservation						
Supply From Plan Element (acft/yr)	—	172	293	335	396	474
Annual Cost (\$/yr)	—	\$96,320	\$164,080	\$187,600	\$221,760	\$265,440
<i>Projected Surplus/(Shortage) after Conservation</i>	1,151	966	732	359	398	474

5.36.15 Paloma Lake MUD 1

Paloma Lake MUD 1 receives its water supply from a “needs met” contract with the City of Round Rock. Based on the available supplies, Paloma Lake MUD 1 is projected to have adequate supplies through the year 2070. No change in water supply is recommended. Conservation was considered; however, the entity’s current per capita use rate is below the selected target rate of 120 gpcd.

5.36.16 Paloma Lake MUD 2

Paloma Lake MUD 2 receives its water supply from a “needs met” contract with the City of Round Rock. Based on the available supplies, Paloma Lake MUD 2 is projected to have adequate supplies through the year 2070. No change in water supply is recommended. Conservation was considered; however, the entity’s current per capita use rate is below the selected target rate of 120 gpcd.

5.36.17 City of Pflugerville

The City of Pflugerville obtains its supply from the Edwards (BFZ) Aquifer in Region K and from the Lower Colorado River Authority. No shortages are projected for the City of Pflugerville. The majority of the City is located in Region K and more details about supplies, needs and strategies are discussed in the 2021 Region K Plan. Conservation is recommended for Pflugerville in the 2021 Brazos G Plan. The City has informed Brazos G that a recently-completed planning effort has identified that the City should pursue purchasing water from the City of Round Rock on an interim (5-years) basis and construct an intake on Brushy Creek to divert wastewater effluent discharged from the Brushy Creek Wastewater Treatment Plant to Lake Pflugerville for subsequent treatment and use at the City’s existing water treatment plant. Use of this wastewater in the Colorado River Basin would provide “no net loss” credits associated with the HB 1437 legislation authorizing sale of Colorado River Basin supplies to entities in the Brazos River Basin (see Volume II, Section 9.3). Ultimately, the City would construct a parallel pipeline from the Colorado River and purchase additional supplies from the Lower Colorado River Authority, as well as expand its existing water treatment plant.

Table 5.36-14. Recommended Plan Costs by Decade for Pflugerville

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	5	5	6	6	7	10
Conservation						
Supply From Plan Element (acft/yr)	0	4	4	5	6	8
Annual Cost (\$/yr)	—	\$2,000	\$2,000	\$3,000	\$3,000	\$4,000
<i>Projected Surplus/(Shortage) after Conservation</i>	5	9	10	11	13	18

5.36.18 City of Round Rock

The City of Round Rock obtains its water supply from groundwater from the Edwards-BFZ (Northern Segment) Aquifer and contracts with the Brazos River Authority for water from Lake Georgetown and Stillhouse Hollow Reservoir. The City of Round Rock has contracted for 24,854 acft/yr of surface water supplies from the Brazos River Authority, which can supply 20,658 acft/yr in 2020 and 19,976 acft/yr in 2070, based on water availability analyses prescribed under water planning guidelines. In addition the city utilizes reuse supplies and receives out of region supply from LCRA. Based on the available groundwater and surface water supply and existing contractual demands, the City of Round Rock is projected to have a shortage from 2030 through 2070.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to meet water needs for the City of Round Rock.

- a. Conservation
 - Cost Source: Volume II
 - Date to be Implemented: before 2030
 - Annual Cost: maximum of \$2,814,560
 - Unit Cost: \$560 / acft
- b. Firm up BRA Little River Supplies
 - Cost Source: Volume II
 - Date to be Implemented: before 2030
 - Project Cost: Costs borne by BRA
 - Unit Cost: Costs borne by BRA
- c. Brushy Creek RUA Water Supply Project
 - Cost Source: Volume II
 - Date to be Implemented: Before 2030
 - Project Cost: \$107,826,043 (city's portion)
 - Unit Cost: \$768 / acft
- d. Alternative: Alcoa Property Supplies
 - Cost Source: Volume II
 - Date to be Implemented: by 2030
 - Total Project Cost: \$133,150,000
 - Unit Cost: maximum of \$1,245/acft

e. Alternative: Williamson County Groundwater – South Option

Cost Source: Volume II

Date to be Implemented: by 2030

Total Project Cost: \$392,793,000

Unit Cost: maximum of \$3,434/acft

Table 5.36-15. Recommended Plan Costs by Decade for City of Round Rock

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	2,064	(2,762)	(8,830)	(16,038)	(16,280)	(16,566)
Conservation						
Supply From Plan Element (acft/yr)	—	1,935	4,192	5,026	4,972	4,951
Annual Cost (\$/yr)	—	\$1,083,040	\$2,347,520	\$2,814,560	\$2,784,320	\$2,772,560
<i>Projected Surplus/(Shortage) after Conservation</i>	2,064	(827)	(4,638)	(11,012)	(11,308)	(11,615)
Additional Demands from Strategies Recommended for Others						
Supply to County-Other (acft/yr)	780	—	—	—	—	—
<i>Total Surplus/(Shortage) Including Recommended Strategies (acft/yr)</i>	1,284	(827)	(4,638)	(11,012)	(11,308)	(11,615)
Firm Up BRA Little River Supplies						
Supply From Plan Element (acft/yr)	—	4,333	4,469	4,605	4,741	4,878
Annual Cost	—	—	—	—	—	—
Unit Cost (\$/acft)	—	—	—	—	—	—
Brushy Creek RUA Project						
Supply From Plan Element (acft/yr)	17,647	17,510	17,374	17,238	17,102	16,965
Annual Cost	\$13,552,896	\$13,447,680	\$9,312,464	\$9,239,568	\$9,166,672	\$9,093,240
Unit Cost (\$/acft)	\$768	\$768	\$536	\$536	\$536	\$536

5.36.19 Sonterra MUD

Sonterra MUD obtains its water supply from groundwater from Edwards BFZ Aquifer and surface water from the Brazos River Authority. Based on the available supplies, Sonterra MUD is projected to have adequate supplies through the year 2070. No change in water supply is recommended. Conservation was considered; however, the entity’s current per capita use rate is below the selected target rate of 120 gpcd. Note that Sonterra MUD has recently begun utilizing supply from the East Williamson County Regional Water System to improve water quality to its customers. Those supplies are not reflected in this plan.

5.36.20 City of Taylor

Description of Supply

The City of Taylor obtains its water supply from a contract with the Brazos River Authority for water from Lake Granger through the East Williamson County WTP. No shortages are projected for the City of Taylor. The Brazos River Authority has set aside 13,000 acft/yr of surface water supplies for the City of Taylor and other entities supplied from the East Williamson County Water System, which can supply 10,805 acft/yr in 2020 and 10,499 acft/yr in 2070, based on water availability analyses prescribed under water planning guidelines.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended for the City of Taylor.

a. Conservation

- Cost Source: Volume II
- Date to be Implemented: before 2020
- Annual Cost: maximum of \$323,680 in 2070
- Unit Cost: \$560/acft

b. Firm Up BRA Little River Supplies

- Cost Source: Volume II
- Date to be Implemented: before 2020
- Annual Cost: Costs borne by BRA
- Unit Cost: Costs borne by BRA

Table 5.36-16. Recommended Plan Costs by Decade for the City of Taylor

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	0	0	0	0	0	0
Conservation						
Supply From Plan Element (acft/yr)	—	215	466	490	530	578
Annual Cost (\$/yr)	—	\$120,400	\$260,960	\$274,400	\$296,800	\$323,680
<i>Projected Surplus/(Shortage) after Conservation</i>	0	215	466	490	530	578
Firm Up BRA Little River Supplies						
Supply From Plan Element (acft/yr)	—	2,226	2,337	2,409	2,480	2,551
Annual Cost (\$/yr)	—	—	—	—	—	—
Unit Cost (\$/acft)	—	—	—	—	—	—



5.36.21 Walsh Ranch MUD

Description of Supply

Walsh Ranch MUD receives its water supply from a “needs met” contract with the City of Round Rock. Based on the available supplies, Walsh Ranch MUD is projected to have adequate supplies through the year 2070. No change in water supply is recommended. Based on gpcd, conservation is recommended as a water management strategy.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended for Walsh Ranch MUD.

- a. Conservation
 - Cost Source: Volume II
 - Date to be Implemented: before 2030
 - Annual Cost: maximum of \$41,218 in 2070
 - Unit Cost: \$560/acft

Table 5.36-17. Recommended Plan Costs by Decade for Walsh Ranch MUD

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	0	0	0	0	0	0
Conservation						
Supply From Plan Element (acft/yr)	—	16	32	48	61	74
Annual Cost (\$/yr)	—	\$8,976	\$18,052	\$26,768	\$34,090	\$41,218
<i>Projected Surplus/(Shortage) after Conservation</i>	0	16	32	48	61	74

5.36.22 Williamson County MUD 9

Description of Supply

Williamson County MUD 9 obtains its water supply from the City of Round Rock. While the contract will supply enough water to meet the needs of Williamson County MUD 9, conservation is recommended to reduce the demand.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended for Williamson County MUD 9.

- a. Conservation
 - Cost Source: Volume II
 - Date to be Implemented: before 2030
 - Annual Cost: maximum of \$95,115 in 2070
 - Unit Cost: \$560/acft

Table 5.36-18. Recommended Plan Costs by Decade for Williamson County MUD 9

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	0	0	0	0	0	0
Conservation						
Supply From Plan Element (acft/yr)	—	45	90	131	169	170
Annual Cost (\$/yr)	—	\$25,423	\$50,281	\$73,161	\$94,866	\$95,115
<i>Projected Surplus/(Shortage) after Conservation</i>	0	45	90	131	169	170

5.36.23 Williamson County MUD 10

Description of Supply

Williamson County MUD 10 obtains its water supply from the City of Round Rock. While the contract will supply enough water to meet the needs of Williamson County MUD 10, conservation is recommended to reduce the demand.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended for Williamson County MUD 10.

- a. Conservation
 - Cost Source: Volume II
 - Date to be Implemented: before 2030
 - Annual Cost: maximum of \$145,999 in 2070
 - Unit Cost: \$560/acft



Table 5.36-19. Recommended Plan Costs by Decade for Williamson County MUD 10

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	0	0	0	0	0	0
Conservation						
Supply From Plan Element (acft/yr)	—	65	126	182	233	261
Annual Cost (\$/yr)	—	\$36,128	\$70,774	\$102,053	\$130,288	\$145,999
<i>Projected Surplus/(Shortage) after Conservation</i>	0	0	0	0	0	0

5.36.24 Williamson County MUD 11

Description of Supply

Williamson County MUD 11 obtains its water supply from the City of Round Rock. While the contract will supply enough water to meet the needs of Williamson County MUD 11, conservation is recommended to reduce the demand.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended for Williamson County MUD 11.

a. Conservation

- Cost Source: Volume II
- Date to be Implemented: before 2030
- Annual Cost: maximum of \$148,771 in 2070
- Unit Cost: \$560/acft

Table 5.36-20. Recommended Plan Costs by Decade for Williamson County MUD 11

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	0	0	0	0	0	0
Conservation						
Supply From Plan Element (acft/yr)	—	73	142	206	264	266
Annual Cost (\$/yr)	—	\$40,648	\$79,533	\$115,348	\$147,872	\$148,771
<i>Projected Surplus/(Shortage) after Conservation</i>	0	0	0	0	0	0

5.36.25 Williamson County WSID 3

Williamson County WSID 3 obtains its water supply from Manville WSC. Based on the available supplies, Williamson County WSID 3 is projected to have adequate supplies through the year 2070. No change in water supply is recommended. Conservation was considered; however, the entity's current per capita use rate is below the selected target rate of 120 gpcd.

5.36.26 Williamson-Travis Counties MUD 1

Williamson-Travis Counties MUD 1 has demand in Williamson and Travis (Region K) counties and obtains its water supply from the City of Cedar Park. Surpluses are projected through the year 2070 and no changes in water supply are recommended. Conservation was considered; however, the entity's current per capita use rate is below the selected target rate of 120 gpcd.

5.36.27 County-Other

Description of Supply

Entities in Williamson County-Other obtain water supply from groundwater from the Trinity and Edwards (BFZ) Aquifers as well as other minor aquifers. Williamson County-Other also obtains a portion of its water supply from the City of Round Rock, the City of Taylor, City of Austin, and run-of-river rights. A portion of County-Other demand is located in the Region K portion of Williamson County. Entities in Williamson County Other have contracted for 310 acft/yr of surface water supplies from the Brazos River Authority, which can supply 258 acft/yr in 2020 and 249 acft/yr in 2070, based on water availability analyses prescribed under water planning guidelines. Based on the available groundwater and surface water supply, Williamson County-Other is projected to have a shortage from 2020 through year 2070. Balance and strategies represented in Table 5.36-21 represent the cumulative totals for Williamson County-Other in both regions.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, and in coordination with Region K, the following water management strategies are recommended for Williamson County - Other.

a. Conservation

- Cost Source: Volume II
- Date to be Implemented: before 2020
- Unit Cost: \$560/acft
- Annual Cost: maximum of \$2,397,334 in 2070

- b. Firm Up BRA Little River Supplies
 - Cost Source: Volume II
 - Date to be Implemented: 2030
 - Annual Cost: Costs borne by BRA
 - Unit Cost: Costs borne by BRA
- c. Purchase Supply from Round Rock

Supplies would be purchased by entities located proximate to Round Rock's service area. As future supplies are developed, these connections can revert to emergency connections and not be used for regular water supply.

 - Cost Source: Volume II
 - Date to be Implemented: 2020
 - Annual Cost: maximum of \$2,443,248
 - Unit Cost: maximum of \$912/acft
- d. Purchase from SAWS Vista Ridge Project (Region L)
 - Cost Source: Volume II
 - This project will contract to purchase 5,700 acft/yr from the Vista Ridge Project sponsored by the San Antonio Water System.
 - Date to be Implemented: 2030
 - Annual Cost:
 - Unit Cost: \$2,416/acft
- e. Williamson County Groundwater Supply – South Option (purchase from BRA)
 - Cost Source: Volume II
 - Date to be Implemented: 2040
 - Project Cost: \$661,246,000
 - Unit Cost: maximum of \$1,703/acft
- f. Lake Whitney Reallocation (Purchase from BRA)

These are project costs for intake, water treatment plant, pump station, and pipeline, but do not include BRA's costs for the reallocation water management strategy.

 - Cost Source: Volume II
 - Date to be Implemented: 2060
 - Project Cost: \$306,683,000
 - Unit Cost: maximum of \$1,617/acft

Table 5.36-21. Recommended Plan Costs by Decade for Williamson County – Other

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	(780)	1,461	(3,627)	(8,231)	(23,882)	(37,798)
Conservation						
Supply From Plan Element (acft/yr)	—	288	948	1,390	2,923	4,281
Annual Cost (\$/yr)	—	\$161,462	\$530,658	\$778,376	\$1,636,995	\$2,397,334
<i>Projected Surplus/(Shortage) after Advanced Conservation</i>	(780)	1,749	(2,679)	(6,841)	(20,959)	(33,517)
Firm Up BRA Little River Supplies						
Supply From Plan Element (acft/yr)	—	54	56	57	59	61
Annual Cost (\$/yr)	—	—	—	—	—	—
Unit Cost (\$/acft)	—	—	—	—	—	—
Purchase Supply from Round Rock						
Supply From Plan Element (acft/yr)	780	—	—	—	—	—
Annual Cost (\$/yr)	\$711,360	—	—	—	—	—
Unit Cost (\$/acft)	\$912	—	—	—	—	—
Purchase from SAWS Vista Ridge (Region L)						
Supply From Plan Element (acft/yr)	—	5,700	5,700	5,700	5,700	5,700
Annual Cost (\$/yr)	—	\$13,771,200	\$13,771,200	\$13,771,200	\$13,771,200	\$13,771,200
Unit Cost (\$/acft)	—	\$2,416	\$2,416	\$2,416	\$2,416	\$2,416
Williamson County Groundwater Supply – South Option (Purchase BRA Supply)						
Supply From Plan Element (acft/yr)	—	—	2,679	2,679	2,679	2,679
Annual Cost (\$/yr)	—	—	\$206,283	\$206,283	\$206,283	\$206,283
Unit Cost (\$/acft)	—	—	\$77	\$77	\$77	\$77
Lake Whitney Reallocation (Purchase BRA Supply)						
Supply From Plan Element (acft/yr)	—	—	—	—	12,000	26,000
Annual Cost (\$/yr)	—	—	—	—	\$19,404,000	\$42,042,000
Unit Cost (\$/acft)	—	—	—	—	\$1,617	\$1,617



5.36.28 Manufacturing

Williamson County Manufacturing entities obtain water supply from groundwater from the Edwards-BFZ (Northern Segment) Aquifer and the Trinity Aquifer, as well as from several municipal WUGs, including Cedar Park, Georgetown, Round Rock, and Taylor. Based on the available supplies, Williamson County Manufacturing is projected to have adequate supplies through the year 2070, and no change in water supply is recommended.

5.36.29 Steam-Electric

There is no Steam-Electric demand or supply in Williamson County.

5.36.30 Mining

Description of Supply

Williamson County Mining obtains its water supply from groundwater from the Edwards-BFZ (Northern Segment) Aquifer and the Trinity Aquifer, and a small portion from the City of Round Rock. Based on the available supplies, Williamson County Mining is projected to have a shortage through the year 2070.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to meet water needs for Williamson County-Mining. Associated costs are included for each strategy.

- a. Conservation
 - Cost Source: Volume II
 - Date to be Implemented: before 2030
 - Annual Cost: not determined
- b. Leave Needs Unmet
 - Cost Source: Cost of not meeting needs – see Appendix G
 - Date to be Implemented: before 2030

Table 5.36-22. Recommended Plan Costs by Decade for Williamson County – Mining

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	(4,722)	(5,804)	(6,921)	(8,112)	(9,339)	(10,743)
Conservation						
Supply From Plan Element (acft/yr)	155	313	516	599	685	783
Annual Cost (\$/yr)	ND	ND	ND	ND	ND	ND
<i>Projected Surplus/(Shortage) after Conservation (acft/yr)</i>	(4,567)	(5,491)	(6,405)	(7,513)	(8,654)	(9,960)
Leave Needs Unmet (acft/yr)	(4,567)	(5,491)	(6,405)	(7,513)	(8,654)	(9,960)

ND – Not determined. Costs to implement industrial conservation technologies will vary based on each location.

5.36.31 Irrigation

Description of Supply

Williamson County Irrigation is supplied by groundwater from the Trinity and Edwards Aquifers and surface water from run of the river water rights. Williamson County Irrigation has contracted for 15 acft/yr of surface water supplies from the Brazos River Authority, which can supply 12 acft/yr in 2020 and 12 acft/yr in 2070, based on water availability analyses prescribed under water planning guidelines. Irrigation is projected to have shortages beginning in 2020.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to meet water needs for Williamson County-Irrigation.

- a. Conservation
 - Cost Source: Volume II, Chapter 2
 - Date to be Implemented: before 2030
 - Annual Cost: maximum of \$32,730
 - Unit Cost: \$1,404/acft
- b. Firm Up BRA Little River Supplies
 - Cost Source: Volume II
 - Date to be Implemented: before 2030
 - Project Cost: Costs borne by BRA
 - Unit Cost: Costs borne by BRA
- c. Groundwater Development – Edwards Aquifer

Groundwater supplies from the Edwards Aquifer are available under the MAG in 2020-2040, but are not available after 2040.

- Cost Source: Volume II
 - Date to be Implemented: before 2020
 - Project Cost: \$675,000
 - Unit Cost: maximum of \$331 acft/yr
- d. Leave Needs Unmet
 - Cost Source: Cost of not meeting needs – see Appendix G
 - Date to be Implemented: 2050 - 2070



Table 5.36-23. Recommended Plan Costs by Decade for Williamson County – Irrigation

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	(172)	(172)	(172)	(172)	(172)	(172)
Conservation						
Supply From Plan Element (acft/yr)	10	17	23	23	23	23
Annual Cost (\$/yr)	\$14,040	\$14,027	\$23,379	\$33,421	\$33,421	\$33,421
<i>Projected Surplus/(Shortage) after Conservation (acft/yr)</i>	(162)	(155)	(149)	(149)	(149)	(149)
Firm Up BRA Little River Supplies						
Supply From Plan Element (acft/yr)	—	3	3	3	3	3
Annual Cost (\$/yr)	—	—	—	—	—	—
Unit Cost (\$/acft)	—	—	—	—	—	—
Groundwater Development – Edwards Aquifer						
Supply From Plan Element (acft/yr)	172	155	149	—	—	—
Annual Cost (\$/yr)	\$56,932	\$51,305	\$49,319	—	—	—
Unit Cost (\$/acft)	\$331	\$331	\$52	—	—	—
Leave Needs Unmet (acft/yr)				(149)	(149)	(149)

ND – Not determined.

5.36.32 Livestock

Livestock water supply is projected to meet demands through 2070 and no changes in water supply are recommended.

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5.37 Young County Water Supply Plan

Table 5.37-1 lists each water user group in Young County and their corresponding surplus or shortage in years 2040 and 2070. A brief summary of the water user groups and the plan for the selected water user are presented in the following subsections.

Table 5.37-1. Young County Surplus/(Shortage)

Water User Group	Surplus/(Shortage)		Comment
	2040 (acft/yr)	2070 (acft/yr)	
Baylor SUD	1	1	Projected surplus
Fort Belknap WSC	(51)	(93)	Projected shortage - see plan below.
City of Graham	(1,769)	(2,434)	Projected shortage - see plan below.
County-Other	48	9	Projected surplus
Manufacturing	50	68	Projected surplus
Steam-Electric	0	0	No projected surplus or shortage
Mining	(115)	8	Projected shortage - see plan below.
Irrigation	(456)	(456)	Projected shortage - see plan below.
Livestock	0	0	Projected shortage - see plan below.

5.37.1 Baylor SUD

The service area for Baylor SUD includes areas of Baylor, Archer, Throckmorton, Knox, and Young Counties. Only a portion of the service area within Knox, Throckmorton, and Young Counties is located within the Brazos G region. Baylor SUD is not projected to experience supply shortages through the planning period and no change in water supply is recommended by Brazos G, although Region B recommends that additional groundwater supplies be developed. Conservation is recommended to reduce the entity's usage to less than the selected goal of 140 gpcd. Conservation volumes shown here are the "Brazos G sponsored" portions, and include some conservation savings that are applied in Region B. Note that the Region B Plan also includes a small volume of conservation savings beginning in 2020 that are not shown here.

Table 5.37-2. Recommended Plan Costs by Decade for Baylor SUD

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	0	0	1	1	1	1
Conservation						
Supply From Plan Element (acft/yr)	—	23	45	68	76	76
Annual Cost (\$/yr)	—	\$12,880	\$25,200	\$38,080	\$42,560	\$42,560
<i>Projected Surplus/(Shortage) after Conservation (acft/yr)</i>	0	23	46	69	77	77

5.37.2 Fort Belknap WSC

Description of Supply

Fort Belknap WSC obtains its water supply through purchases of treated surface water under contract from the City of Graham, which is projected to provide 419 acft/yr of available supply. This WUG is located in multiple counties (Young, Palo Pinto, Throckmorton, and Stephens). The quantities shown in Table 5.37-1 represents the cumulative totals for Fort Belknap WSC. Water supply shortages are projected for Fort Belknap WSC throughout the planning period.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended to meet the projected water shortage for Fort Belknap WSC. Conservation was also considered, but the entity's usage is less than the selected goal of 140 gpcd.

- a. Purchase Additional Water from City of Graham:
 - Strategy requires implementation of New Throckmorton Reservoir (see City of Throckmorton) project and Treated Water Purchase and Conveyance project (see City of Graham)
 - Cost Source: Volume II
 - Date to be Implemented: before 2030
 - Unit Cost: \$880/acft
 - Annual Cost: \$83,600

Table 5.37-3. Recommended Plan Costs by Decade for Fort Belknap WSC

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	(37)	(47)	(51)	(62)	(77)	(93)
Conservation						
Supply From Plan Element (acft/yr)	—	—	—	—	—	—
Annual Cost (\$/yr)	—	—	—	—	—	—
<i>Projected Surplus/(Shortage) after Conservation (acft/yr)</i>	(37)	(47)	(51)	(62)	(77)	(93)
Purchase Additional Water from City of Graham						
Supply From Plan Element (acft/yr)	95	95	95	95	95	95
Annual Cost (\$/yr)	\$83,600	\$83,600	\$83,600	\$83,600	\$83,600	\$83,600
Unit Cost (\$/acft)	\$880	\$880	\$880	\$880	\$880	\$880

5.37.3 City of Graham

Description of Supply

The City of Graham obtains its water supply through diversions of surface water from Lake Graham and Lake Eddleman authorized under water rights held by the City; these diversions are projected to provide 1,275 acft/yr in available supply at the beginning of the planning period and then decreasing to 675 acft/yr at the end. The City also contracts with the Brazos River Authority to purchase raw surface water which is projected to provide 1,000 acft/yr of water supply, based on water availability analyses prescribed under water planning guidelines. The City contracts to sell treated and raw water supply to Fort Belknap WSC, the City of Newcastle and Graham-East WSC which comprise a portion of the Young County-Other WUG, the City of Bryson which comprises a portion of Jack County-Other, and Young County Manufacturing and Steam-Electric entities. Supply shortages are projected during the planning period.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended to meet the projected water shortage for the City of Graham. Conservation is recommended to reduce usage to a goal of 140 gpcd. Needs remain unmet in 2020. These needs will only occur during a drought equivalent or worse than the drought of record. While not a strategy recommended by the Brazos G RWPG, the impacts of the unmet needs can be mitigated through demand management in the event of a serious drought prior to the recommended strategies coming online.

- a. Conservation
 - Cost Source: Volume II
 - Date to be Implemented: before 2030
 - Annual Cost: \$677,600 in 2070
 - Unit Cost: \$560/acft
- b. Treated Water Purchase and Conveyance (from Throckmorton)
 - Strategy requires implementation of New Throckmorton Reservoir
 - Cost Source: Volume II
 - Date to be Implemented: before 2030
 - Project Cost: \$30,875,000
 - Unit Cost: maximum \$2,520/acft

Table 5.37-4. Recommended Plan Costs by Decade for the City of Graham

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	(1,362)	(1,582)	(1,769)	(1,982)	(2,208)	(2,434)
Conservation						
Supply From Plan Element (acft/yr)	—	231	463	708	962	1,210
Annual Cost (\$/yr)	—	\$129,360	\$259,280	\$396,480	\$538,720	\$677,600
<i>Projected Surplus/(Shortage) after Conservation (acft/yr)</i>	(1,362)	(1,351)	(1,306)	(1,274)	(1,246)	(1,224)
Additional Needs in Recommended Strategies for Others						
Increase Contract to Fort Belknap WSC (acft/yr)	(95)	(95)	(95)	(95)	(95)	(95)
<i>Projected Surplus/(Shortage) Including Recommended Strategies</i>	(1,457)	(1,446)	(1,401)	(1,369)	(1,341)	(1,319)
Treated Water Purchase and Conveyance from Throckmorton (New Throckmorton Reservoir)						
Supply From Plan Element (acft/yr)	—	1,500	1,500	1,500	1,500	1,500
Annual Cost (\$/yr)	—	\$3,780,000	\$3,780,000	\$1,608,000	\$1,608,000	\$1,608,000
Unit Cost (\$/acft)	—	\$2,520	\$2,520	\$1,072	\$1,072	\$1,072

5.37.4 County-Other

Entities in Young County-Other obtain their water supply through groundwater production from the Cross Timbers Aquifer and through purchases of treated surface water from the City of Graham. Supplies available through local groundwater production are projected at 200 acft/yr, while purchased supply availability ranges from 175 acft/yr at the beginning of the planning period to 214 acft/yr at the end. No future shortages are projected and no changes in water supply are recommended. Conservation was also considered; however, entity's usage is less than the selected goal of 140 gpcd.

5.37.5 Manufacturing

Young County Manufacturing is supplied through purchases of treated surface water under contract from the City of Graham and the City of Olney and through purchases of groundwater produced by entities in Young County-Other. No shortages are projected and no changes in water supply are recommended.

5.37.6 Steam-Electric

Young County Steam-Electric entities obtain their water supply through purchases of raw surface water under contract from the City of Graham and the Brazos River Authority. No shortages are projected and no changes in water supply are recommended.

5.37.7 Mining

Description of Supply

Mining in Young County obtains water supply through local groundwater production from the Seymour and Cross Timbers Aquifers. Supply shortages are projected during the planning the period.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following plan is recommended for Young County Mining. Associated costs are included for each strategy. Conservation is recommended. Conservation is recommended.

- a. Conservation
 - Cost Source: Volume II
 - Date to be Implemented: before 2030
 - Annual Cost: not determined
- b. Groundwater Development – Cross Timbers Aquifer
 - Cost Source: Volume II
 - Date to be Implemented: before 2030
 - Project Cost: \$514,000
 - Unit Cost: maximum of \$227/acft

Table 5.37-5. Recommended Plan Costs by Decade for Young County – Mining

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	(106)	(195)	(115)	(70)	(24)	8
Conservation						
Supply From Plan Element (acft/yr)	6	14	14	11	7	5
Annual Cost (\$/yr)	ND	ND	ND	ND	ND	ND
<i>Projected Surplus/(Shortage) after Conservation (acft/yr)</i>	(100)	(181)	(101)	(59)	(17)	13
Groundwater Development – Cross Timbers Aquifer						
Supply From Plan Element (acft/yr)	181	181	181	181	181	181
Annual Cost (\$/yr)	\$41,000	\$41,000	\$5,000	\$5,000	\$5,000	\$5,000
Unit Cost (\$/acft)	\$227	\$227	\$28	\$28	\$28	\$28

ND – Not determined. Costs to implement industrial conservation technologies will vary based on each location

5.37.8 Irrigation

Description of Supply

Irrigation in Young County obtains water supply through groundwater production from the Cross Timbers and Seymour Aquifers, and through purchases of Cross Timbers groundwater sourced from Region B. Supply projections show shortages for Irrigation in Young County throughout the planning period.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following plan is recommended for Young County Irrigation. Associated costs are included for each strategy. Conservation is recommended.

- a. Conservation
 - Cost Source: Volume II
 - Date to be Implemented: before 2030
 - Annual Cost: maximum of \$7,304
 - Unit Cost: \$963/acft
- b. Groundwater Development – Cross Timbers Aquifer
 - Cost Source: Volume II
 - Date to be Implemented: before 2030
 - Project Cost: \$540,000
 - Unit Cost: \$102/acft

Table 5.37-6. Recommended Plan Costs by Decade for Young County – Irrigation

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	(456)	(456)	(456)	(456)	(456)	(456)
Conservation						
Supply From Plan Element (acft/yr)	15	25	35	35	35	35
Annual Cost (\$/yr)	\$14,323	\$23,872	\$33,421	\$33,421	\$33,421	\$33,421
<i>Projected Surplus/(Shortage) after Conservation (acft/yr)</i>	(441)	(431)	(421)	(421)	(421)	(421)
Groundwater Development – Cross Timbers Aquifer						
Supply From Plan Element (acft/yr)	450	450	450	450	450	450
Annual Cost (\$/yr)	\$46,000	\$46,000	\$8,000	\$8,000	\$8,000	\$8,000
Unit Cost (\$/acft)	\$102	\$102	\$18	\$18	\$18	\$18

5.37.9 Livestock

Description of Supply

Livestock water supply in Young County is obtained primarily through local stock surface water impoundments. Livestock water supply is projected to meet demands through 2070, however groundwater development is recommended.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following plan is recommended for Young County Livestock. Associated costs are included for each strategy.

- a. Groundwater Development – Cross Timbers Aquifer
 - Cost Source: Volume II
 - Date to be Implemented: before 2030
 - Project Cost: \$151,000
 - Unit Cost: maximum of \$1,091/acft

Table 5.37-7. Recommended Plan Costs by Decade for Young County – Livestock

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	0	0	0	0	0	0
Conservation						
Supply From Plan Element (acft/yr)	—	—	—	—	—	—
Annual Cost (\$/yr)	—	—	—	—	—	—
<i>Projected Surplus/(Shortage) after Conservation (acft/yr)</i>	0	0	0	0	0	0
Groundwater Development – Cross Timbers Aquifer						
Supply From Plan Element (acft/yr)	11	11	11	11	11	11
Annual Cost (\$/yr)	\$12,000	\$12,000	\$1,000	\$1,000	\$1,000	\$1,000
Unit Cost (\$/acft)	\$1,091	\$1,091	\$91	\$91	\$91	\$91

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5.38 Wholesale Water Provider Supply Plans

Table 5.38-1 lists each wholesale water provider that is not also a WUG in the Brazos G Area and its corresponding surplus or shortage in years 2040 and 2070. A brief summary of the wholesale water provider (WWP) and the plan for the selected WWPs are presented in the following sub chapters. For each wholesale water provider with a projected shortage, a water supply plan has been developed and is presented in the following sub chapters. **Note that shortages shown reflect full contractual commitments compared to existing supplies.**

Table 5.38-1. Wholesale Water Provider Surplus/(Shortage)

Wholesale Water Provider	Surplus/(Shortage) ^{1,2}		Comment
	2040 (acft/yr)	2070 (acft/yr)	
Brazos River Authority (Lake Aquilla System)	997	(503)	Projected shortage – see plan below
Brazos River Authority (Little River System)	(45,246)	(49,386)	Projected shortage – see plan below
Brazos River Authority (Main Stem System) ³	0	0	No projected surplus or shortage – see plan below
Aquilla Water Supply District	1	(262)	Projected shortage – see plan below
Bell County WCID No. 1	6,056	(4,805)	Projected shortage – see plan below
Bluebonnet WSC	(317)	(453)	Projected shortage – see plan below
Central Texas WSC	342	144	Projected surplus – see plan below
Eastland County WSD	(955)	(1,045)	Projected shortage – see plan below
FHLM WSC	0	0	See plan below
North Central Texas MWA	(1,752)	(1,797)	Projected shortage – see plan below
Palo Pinto County MWD No. 1	(2,186)	(2,806)	Projected shortage – see plan below
Salt Fork Water Quality Corporation	0	0	See plan below
Upper Leon River MWD	708	602	Projected surplus – see plan below
West Central Texas MWD	1,823	1,523	Projected shortage – see plan below

1 - From Chapter 4.3 – Water Needs for Wholesale Water Providers

2 - Shortages shown above often include shortages from other WWPs. The shortages shown for individual WWPs should not be summed to a regional total.

3 - Includes demands from Region H.

5.38.1 Brazos River Authority (Lake Aquilla System)

Description of Supply

The Brazos River Authority (Lake Aquilla System) obtains water supply from Lake Aquilla. Based on the available surface water supply and contractual demands, the Lake Aquilla System is projected to have a surplus of 1,997 acft/yr in the year 2020 decreasing to a

shortage of 503 acft/yr by year 2070. Chapter 3 includes additional information on contracts and water supplies for the Lake Aquilla System. While the supply from Lake Aquilla is not adequate in 2060 and 2070 to meet the total contractual obligations, the supply is sufficient to meet all of the projected water demands of customers of the Lake Aquilla System and no change in water supply is recommended. Contractual demands and supplies are shown in Table 5.38-2.

Table 5.38-2. Supplies and Demands for the BRA Lake Aquilla System

	2020	2030	2040	2050	2060	2070
Existing Contractual Sales						
Cleburne	5,300	5,300	5,300	5,300	5,300	5,300
Hillco WSC	150	150	150	150	150	150
Aquilla WSD	5,953	5,953	5,953	5,953	5,953	5,953
Total Existing Demands	11,403	11,403	11,403	11,403	11,403	11,403
Total Supply	13,400	12,900	12,400	11,900	11,400	10,900
<i>Projected Surplus/(Shortage) (acft/yr)</i>	1,997	1,497	997	497	(3)	(503)

Water Supply Plan

Brazos G recommends that BRA pursue reallocation of a portion of the Lake Aquilla flood control storage to conservation storage. Working within the planning criteria established by the Brazos G RWPG, the following water supply plan is recommended for the Lake Aquilla System:

- a. Lake Aquilla Reallocation
 - Cost Source: Volume II
 - Date to be Implemented: Before 2060
 - Annual Cost: \$2,158,000
 - Unit Cost: Max of \$869/acft

Table 5.38-3. Recommended Plan Costs by Decade for the BRA Lake Aquilla System

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	1,997	1,497	997	497	(3)	(503)
Lake Aquilla Reallocation						
Supply From Plan Element (acft/yr)					2,483	2,483
Annual Cost (\$/yr)					\$2,158,000	\$2,158,000
Unit Cost (\$/acft)					\$869	\$869

5.38.2 Brazos River Authority (Little River System)

Description of Supply

The Brazos River Authority Little River System obtains its water supply from Lake Proctor, Lake Belton, Stillhouse Hollow Reservoir, Lake Georgetown, and Lake Granger. Based on the available surface water supply, existing contractual commitments and recommended water management strategies, the Brazos River Authority Little River System is projected to have a shortage of 42,486 acft/yr in the year 2040 and 49,386 acft/yr in the year 2070. Shortages for the BRA Little River System are based on a comparison of supplies and current contractual commitments, not projected demands for those entities holding contracts with the BRA. Contractual demands and supplies are shown in Table 5.38-4.

Supplies from Lake Granger are allocated to meet BRA system demands, except for 13,000 acft/yr specifically allocated to the East Williamson County Water Treatment Plant (EWCWTP), which supplies water to the City of Taylor and is intended to supply other entities in eastern Williamson County and Bell County. Currently, between 3,279 acft/yr and 4,729 acft/yr of that supply is allocated to meet the demands of the City of Taylor and its wholesale customers, 2,136 acft/yr for Jarrell-Schwertner WSC in addition to another 1,000 acft/yr contract Jarrell-Schwertner WSC holds, and 2,744 acft/yr for Sonterra MUD. The remaining supply from the EWCWTP is available for other users as a water management strategy. Chapter 3 includes additional information on contracts and water supplies for the Little River System.

Note that the shortages shown are based on full contractual commitments. Actual full use of those contracts is unlikely to occur until later years of the planning period and the shortages shown are more likely to occur later than shown here.

Table 5.38-4. Supplies and Demands for the BRA Little River System

Plan Element	2020	2030	2040	2050	2060	2070
Existing Contractual Demands	251,643	251,643	251,643	251,643	251,643	251,643
Supply Sources						
Lake Proctor	13,300	12,660	12,020	11,380	10,740	10,100
Lake Belton	100,257	100,257	100,257	100,257	100,257	100,257
Lake Stillhouse Hollow	66,400	66,120	65,840	65,560	65,280	65,000
Lake Georgetown	11,600	11,580	11,560	11,540	11,520	11,500
Lake Granger	17,600	17,160	16,720	16,280	15,840	15,400
Total Existing Supplies	209,157	207,777	206,397	205,017	203,637	202,257
<i>Projected Surplus/(Shortage) (acft/yr)</i>	<i>(42,486)</i>	<i>(43,866)</i>	<i>(45,246)</i>	<i>(46,626)</i>	<i>(48,006)</i>	<i>(49,386)</i>

Note: Highland Lakes supplies (25,000 acft/yr) and contracts (22,128 acft/yr) pursuant to HB 1437 are not shown.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG, the following water supply plan is recommended to meet the projected shortages for BRA's Little River System. Needs for full contractual commitments remain unmet in 2020. These needs will only occur during a drought equivalent or worse than the drought of record. While not a strategy recommended by the Brazos G RWPG, the impacts of the unmet needs can be mitigated through demand management in the event of a serious drought prior to the recommended strategies coming online that will firm up supplies from the BRA to their contractual customers.

- a. Sell Remaining Highland Lakes Supplies to County-Other entities
 - Cost Source: Volume II
 - Date to be Implemented: before 2020
 - Total Project Cost: \$0
 - Unit Cost: Max of \$145/acft in 2020
- b. Lake Granger ASR
 - Cost Source: Volume II
 - Date to be Implemented: before 2020
 - Total Project Cost: \$99,820,000 (sum of 3 phases)
 - Unit Cost: Max of \$1,291/acft in 2030
- c. Belton to Stillhouse Pipeline – this strategy is for operational purposes and does not provide additional supply. For planning rules purposes, it is assumed to make 5,000 acft/yr available to Georgetown's contracted supply.
 - Cost Source: Volume II
 - Date to be Implemented: Before 2030
 - Total Project Cost: \$67,993,000
 - Unit Cost: not applicable
- d. Lake Granger Augmentation Phase II

This strategy would overdraft Lake Granger and supplement supplies with an annual average of 15,920 acft/yr of groundwater from Milam, Burleson and/or Lee Counties (Williamson County groundwater supply project north or south option, or Milam County GW) (57,281 acft/yr maximum groundwater in a single year).

 - Cost Source: Volume II
 - Date to be Implemented: 2030
 - Total Project Cost: \$845,564,000
 - Unit Cost: Max of \$1,631/ acft in 2020



e. Williamson County Groundwater Supply – South Option

- Cost Source: Volume II
- Date to be Implemented: 2030
- Total Project Cost: \$415,016,000
- Unit Cost: Max of \$1,631/ acft in 2030

Table 5.38-5. Recommended Plan Costs by Decade for the BRA Little River System

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	(42,286)	(43,866)	(45,246)	(46,626)	(48,006)	(49,386)
Sell Remaining Highland Lakes Supply						
Supply From Plan Element (acft/yr)	2,872	2,872	2,872	2,872	2,872	2,872
Annual Cost (\$/yr)	\$832,880	\$832,880	\$832,880	\$832,880	\$832,880	\$832,880
Unit Cost (\$/acft)	\$145	\$145	\$145	\$145	\$145	\$145
Lake Granger ASR						
Supply From Plan Element (acft/yr)	—	7,600	11,900	11,900	11,900	11,900
Annual Cost (\$/yr)	—	\$6,493,000	\$14,090,000	\$14,090,000	\$5,898,000	\$5,898,000
Unit Cost (\$/acft)	—	\$854	\$1,184	\$1,184	\$496	\$496
Belton to Stillhouse Pipeline						
Supply From Plan Element (acft/yr)	—	5,000	5,000	5,000	5,000	5,000
Annual Cost (\$/yr)	—	\$6,545,000	\$6,545,000	\$1,761,000	\$1,761,000	\$1,761,000
Unit Cost (\$/acft)	—	\$1,309	\$1,309	\$352	\$352	\$352
Lake Granger Augmentation – Phase II						
Supply From Plan Element (acft/yr)	—	46,265	46,265	46,265	46,265	46,265
Annual Cost (\$/yr)	—	\$75,462,000	\$75,462,000	\$24,411,000	\$24,411,000	\$24,411,000
Unit Cost (\$/acft)	—	\$1,631	\$1,631	\$528	\$528	\$528
Williamson County Groundwater Supply – South Option						
Supply From Plan Element (acft/yr)	—	46,265	46,265	46,265	46,265	46,265
Annual Cost (\$/yr)	—	\$75,462,000	\$75,462,000	\$24,411,000	\$24,411,000	\$24,411,000
Unit Cost (\$/acft)	—	\$1,631	\$1,631	\$528	\$528	\$528

5.38.3 Brazos River Authority (Main Stem/Lower Basin System)

Description of Supply

The Brazos River Authority (Main Stem/Lower Basin System) obtains water supply from Possum Kingdom Reservoir, Lake Granbury, Lake Whitney, Lake Somerville, and Lake Limestone, and the BRA's System Operations Permit. Based on the available surface water supply, the Brazos River Authority Main Stem/Lower Basin System is projected to meet the projected contractual demands on the BRA Main Stem/Lower Basin System from Region O, Region H, Region C and Brazos G. Chapter 3 includes additional information on contracts and water supplies for the Main Stem/Lower Basin System. Contractual demands and supplies are summarized in Table 5.38-6. System yield modeling indicates that the full System Operations yield exceeds the contractual demands but is constrained for regional planning to meet just the contractual demands shown in Table 5.38-6.

Actual full use of the contracts shown is unlikely to occur until later years of the planning period. In addition to the System Operations Permit, the BRA has a System Order that allows BRA to divert from each individual reservoir an annual amount greater than the reservoir's authorized diversion and assign the difference to another reservoir in the system. While this does not increase the authorized supply from the BRA system, it provides operational flexibility within the BRA's system.

Table 5.38-6. Supplies and Demands for the BRA Main Stem/Lower Basin System

Plan Element	2020	2030	2040	2050	2060	2070
Contractual Demands						
System/Lakeside – Region O	961	961	961	961	961	961
System/Lakeside – Region C	1,600	1,600	1,600	1,600	1,600	1,600
System/Lakeside – Brazos G	213,504	213,504	213,504	213,504	213,504	213,504
System/Lakeside – Region H	163,450	163,450	163,450	163,450	163,450	163,450
System Operations – Brazos G	15,211	15,211	15,211	15,211	15,211	15,211
System Operations – Region H	79,785	79,785	79,785	79,785	79,785	79,785
Total Existing Contractual Demands	474,511	474,511	474,511	474,511	474,511	474,511
Supply Sources						
Possum Kingdom Reservoir	152,100	151,220	150,340	149,460	148,580	147,700
Lake Granbury	59,400	58,380	57,360	56,340	55,320	54,300
Lake Whitney	18,336	18,336	18,336	18,336	18,336	18,336
Lake Somerville	42,200	41,540	40,880	40,220	39,560	38,900
Lake Limestone	64,000	62,440	60,880	59,320	57,760	56,200
System Operations	138,475	142,595	146,715	150,835	154,955	159,075



Table 5.38-6. Supplies and Demands for the BRA Main Stem/Lower Basin System

Plan Element	2020	2030	2040	2050	2060	2070
Total Existing Supplies	474,511	474,511	474,511	474,511	474,511	474,511
<i>Projected Surplus/(Shortage) (acft/yr)</i>	0	0	0	0	0	0
Additional Demands from Strategies Recommended for Others						
Supply to Williamson County- Other (acft/yr)					12,000	26,000
<i>Total Needs Including Recommended Strategies (acft/yr)</i>	0	0	0	0	(12,000)	(26,000)

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG, the following water supply plan is recommended to meet the projected shortages for the BRA Main Stem System:

a. Lake Whitney Reallocation

This strategy would reallocate storage in Lake Whitney from hydropower to other uses and would develop a total of 38,480 acft/yr of additional supply to the BRA. Williamson County-Other users will likely need up to 26,000 acft/yr by 2070.

- Cost Source: Volume II
- Date to be Implemented: before 2050
- Total Project Cost: \$36,689,000
- Unit Cost: \$70/acft
- This includes the reallocation of the power pool and unpermitted storage below elevation 520 ft-msl. Additionally, the supply from Lake Whitney

Table 5.38-7. Recommended Plan Costs by Decade for the BRA Main Stem System

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	0	0	0	0	(12,000)	(26,000)
Lake Whitney Reallocation						
Supply From Plan Element (acft/yr)				38,480	38,480	38,480
Annual Cost (\$/yr)				\$2,679,000	\$2,679,000	\$148,000
Unit Cost (\$/acft)				\$70	\$70	\$3
Alternative: Lake Whitney Overdrafting with Off-Channel Reservoir						
Supply From Plan Element (acft/yr)				5,200	5,200	5,200
Annual Cost (\$/yr)				\$12,879,000	\$12,879,000	\$79,000
Unit Cost (\$/acft)				\$2,477	\$2,477	\$1,125

5.38.4 Aquilla Water Supply District

Description of Supply

Aquilla WSD obtains raw water from Lake Aquilla through a contract with the BRA. The district supplies treated water to five wholesale customers. Chapter 3 includes additional information on contracts and water supplies for Aquilla WSD. Based on contractual commitments, a shortage is projected in 2020 for the District due to a short-term contract with Hillsboro and in 2070 due to sedimentation reducing the yield of Lake Aquilla. However, the water demands of the five wholesale customers are substantially less than the contractual obligations of the District, and no change in water supply is recommended.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended to meet the projected water shortage for Aquilla WSD. Needs for full contractual commitments remain unmet in 2020, but this will not result in unmet needs for contractual customers.

- a. BRA to firm up supplies through Lake Aquilla reallocation
 - Cost Source: Cost borne by BRA
 - Date to be Implemented: Before 2060
 - Total Project Cost: Cost borne by BRA
 - Unit Cost: \$0/acft

Table 5.38-8. Recommended Plan Costs by Decade for Aquilla WSD

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	(559)	1	1	1	1	(262)
BRA to Firm Up Supplies through Lake Aquilla Reallocation						
Supply From Plan Element (acft/yr)						262
Annual Cost (\$/yr)						\$0
Unit Cost (\$/acft)						\$0

5.38.5 Bell County WCID No. 1

Description of Supply

Bell County WCID No. 1 obtains its water supply from Lake Belton through BRA contracts (62,509 acft/yr). The district’s freshwater customers have year 2070 projected demands of 53,055 acft/yr that the District would be required to meet, compared to the district’s total supply from the BRA of 50,241 acft/yr (the full 62,509 acft/yr is not currently firm, based on water availability analyses prescribed under water planning guidelines). Chapter 4 includes additional information on contracts and water supplies for Bell County WCID No.1. Therefore, the district has needs projected for its customers starting in 2060 based on

contractual commitments and in 2070 based on its customers' actual projected demands. BRA strategies for the Little River System will firm up contracts to provide the full amount of supply during drought of record conditions, therefore no change in water supply is recommended for Bell County WCID No. 1.

The District has entered into a contract to supply reuse supply to the City of Killeen. Bell County WCID is pursuing TCEQ Reclaimed Water Type I permits to utilize treated wastewater from wastewater treatment plants (WWTP) 1 and 2 and the South WWTP. The District has evaluated several wastewater reuse options as part of its Master Plan update. The reuse portion of the Master Plan identifies both near-term potential customers as well as other future customers that would utilize the total available reuse supply generated through the District's regional wastewater system.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended to meet the projected water shortage for Bell County WCID No.1. Needs for full contractual commitments remain unmet in 2020. These needs will only occur during a drought equivalent or worse than the drought of record. While not a strategy recommended by the Brazos G RWPG, the impacts of the unmet needs can be mitigated through demand management in the event of a serious drought prior to the recommended strategies coming online that will firm up supplies from the BRA.

- a. Firm up Supplies through BRA Little River System Strategies
 - Cost Source: Volume II
 - Date to be Implemented: 2020
 - Total Project Cost: borne by BRA
 - Unit Cost: already contracted supplies
- b. Water Treatment Plant Expansion (Lake Belton)
 - Cost Source: Volume II
 - Date to be Implemented: 2030
 - Total Project Cost: \$28,964,000
 - Unit Cost: maximum of \$1,116/acft
- c. New Water Treatment Plant (Lake Stillhouse Hollow) (under construction in 2020)
 - Cost Source: Volume II
 - Date to be Implemented: before 2030
 - Total Project Cost: \$93,404,000
 - Unit Cost: maximum of \$1,172/acft

Table 5.38-9. Recommended Plan Costs by Decade for Bell County WCID No.1

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	13,118	9,777	6,056	2,424	(1,197)	(4,805)
Firm up Supplies through BRA Little River System Strategies						
Supply From Plan Element (acft/yr)		10,896	11,239	11,582	11,925	12,268
Annual Cost (\$/yr)		\$0	\$0	\$0	\$0	\$0
Unit Cost (\$/acft)		\$0	\$0	\$0	\$0	\$0
Water Treatment Plan Expansion (Lake Belton)						
Supply From Plan Element (acft/yr)		1,680	1,680	1,680	3,360	3,360
Annual Cost (\$/yr)		\$1,875,000	\$1,875,000	\$856,000	\$2,731,000	\$2,731,000
Unit Cost (\$/acft)		\$1,116	\$1,116	\$510	\$813	\$813
New Water Treatment Plant (Lake Stillhouse Hollow)						
Supply From Plan Element (acft/yr)		9,521	9,521	9,521	9,521	9,521
Annual Cost (\$/yr)		\$11,159,000	\$11,159,000	\$4,587,000	\$4,587,000	\$4,587,000
Unit Cost (\$/acft)		\$1,172	\$1,172	\$482	\$482	\$482

Reuse Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to meet the projected reuse water demands for Bell County WCID No.1:

- a. North Reuse
 - Cost Source: Volume II, Chapter 3
 - Date to be Implemented: 2020
 - Total Project Cost: \$12,146,000
 - Unit Cost: Max of \$765 / acft in 2020
- b. South Reuse
 - Cost Source: Volume II, Chapter 3
 - Date to be Implemented: 2020
 - Total Project Cost: \$6,529,000
 - Unit Cost: Max of \$930 / acft in 2020



Table 5.38-10. Recommended Plan Costs by Decade for Bell County WCID No. 1 for Reuse Supplies

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	(2,693)	(2,693)	(2,693)	(2,693)	(2,693)	(2,693)
Bell County WCID #1-North Reuse (Volume II, Chapter 3)						
Supply From Plan Element (acft/yr)		1,945	1,945	1,945	1,945	1,945
Annual Cost (\$/yr)		\$1,472,625	\$456,225	\$456,225	\$456,225	\$456,225
Unit Cost (\$/acft)		\$765	\$237	\$237	\$237	\$237
Bell County WCID #1-South Reuse (Volume II, Chapter 3)						
Supply From Plan Element (acft/yr)		748	748	748	748	748
Annual Cost (\$/yr)		\$696,000	\$150,000	\$150,000	\$150,000	\$150,000
Unit Cost (\$/acft)		\$930	\$201	\$201	\$201	\$201

5.38.6 Bluebonnet Water Supply Corporation

Description of Supply

Bluebonnet Water Supply Corporation (WSC) obtains raw water from Lake Belton through contracts with the BRA totaling 8,301 acft; however, the firm supply of those contracts is 6,900 in 2020, and decreases over the planning period, based on water availability analyses prescribed under water planning guidelines. The WSC has projected shortages starting in 2020 based on contractual commitments. However, the BRA contractual amount, if firm, would be sufficient to meet all of Bluebonnet’s contractual commitments. Based on actual projected customer demands, however, there is sufficient supply to meet all projected demands of Bluebonnet’s customers. BRA strategies for the Little River System will firm up contracts to provide the full amount of supply during drought of record conditions and no change in water supply is recommended. Chapter 4 includes additional information on contracts and water supplies for Bluebonnet WSC.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended to meet the projected water shortages for Bluebonnet WSC. Needs for full contractual commitments remain unmet in 2020. These needs will only occur during a drought equivalent or worse than the drought of record. While not a strategy recommended by the Brazos G RWPG, the impacts of the unmet needs can be mitigated through demand management in the event of a serious drought prior to the recommended strategies coming online that will firm up supplies from the BRA.

- a. Firm up Supplies through BRA Little River System Strategies
 - Cost Source: Volume II
 - Date to be Implemented: 2020
 - Total Project Cost: borne by BRA
 - Unit Cost: already contracted supplies

Table 5.38-11. Recommended Plan Costs by Decade for Bluebonnet WSC

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	(225)	(271)	(317)	(362)	(408)	(453)
Firm up Supplies through BRA Little River System Strategies						
Supply From Plan Element (acft/yr)		1,447	1,493	1,538	1,584	1,629
Annual Cost (\$/yr)		\$0	\$0	\$0	\$0	\$0
Unit Cost (\$/acft)		\$0	\$0	\$0	\$0	\$0

5.38.7 Central Texas Water Supply Corporation

Description of Supply

Central Texas WSC obtains its water supply from Lake Stillhouse Hollow through contracts with the BRA totaling 12,045 acft; however, the firm supply of those contracts is 10,011 in 2020, decreasing to 9,681 acft/yr in 2070, based on water availability analyses prescribed under water planning guidelines. Central Texas WSC also has recently constructed two wells in the Trinity Aquifer in Bell County that are counted as current supply as they will be online prior to 2020. Based on the available surface water and groundwater supply, currently contracted supplies, and projected demands for its current customers, Central Texas WSC is not projected to have shortages through 2070, assuming that all demands can be treated and delivered through current infrastructure. Chapter 4 includes additional information on contracts and water supplies for Central Texas WSC.

BRA strategies for the Little River System will firm up contracts to provide full amount of supply during drought of record.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to meet the projected water shortage for Central Texas WSC.

- a. Firm up of Supplies through BRA Little River System Strategies
 - Cost Source: Volume II
 - Date to be Implemented: 2020
 - Total Project Cost: borne by BRA
 - Unit Cost: already contracted supplies

Table 5.38-12. Recommended Plan Costs by Decade for Central Texas WSC

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	474	408	342	276	210	144
Firm up of Supplies through BRA Little River System Strategies						
Supply From Plan Element (acft/yr)		2,100	2,166	2,232	2,298	2,364
Annual Cost (\$/yr)		\$0	\$0	\$0	\$0	\$0
Unit Cost (\$/acft)		\$0	\$0	\$0	\$0	\$0

5.38.8 FHLM Water Supply Corporation

Description of Supply

Various utilities in Falls, Hill, Limestone and McLennan Counties are dealing with elevated levels of arsenic in groundwater supplies and several have been pursuing water management strategies through FHLM WSC. FHLM WSC has recently contracted with the BRA for 1,934 acft/yr that will eventually be used by member utilities to either replace or blend with existing groundwater supplies. FHLM WSC is also currently negotiating a water supply agreement with the City of Waco on behalf of EOL WSC and Axtel WSC, although the details of the potential agreement are not available. The projects to supply EOL and Axtel from the City of Waco are shown as water management strategies for those WUGs in the McLennan County section of this plan.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to meet future water demands for FHLM WSC participants.

a. BRA System Operations Supply

- Cost Source: Volume II
- Date to be Implemented: 2030
- Total Project Cost: \$95,792,000 (2015 FHLM Regional Water Facility Planning Study)
- Unit Cost: \$4,496 acft/yr (treated water cost delivered to customers)

Table 5.38-13. Recommended Plan Costs by Decade for FHLM WSC

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	0	0	0	0	0	0
BRA System Operations Supply						
Supply From Plan Element (acft/yr)		1,934	1,934	1,934	1,934	1,934
Annual Cost (\$/yr)		\$8,696,000	\$8,696,000	\$2,688,260	\$2,688,260	\$2,688,260
Unit Cost (\$/acft)		\$4,496	\$4,496	\$1,390	\$1,390	\$1,390

5.38.9 Eastland County WSD

Eastland County WSD obtains its water supply from Lake Leon and Eastland Lake and provides water to the Cities of Eastland and Ranger, and to manufacturing interests in Eastland County. The supplies from these two sources are not sufficient to meet the District’s contractual commitments but are ample to meet the projected demands for Eastland and Ranger, which are only about 20 percent of the contractual supplies. No changes in water supply are recommended. Chapter 4 includes additional information on contracts and water supplies for Eastland County WSD.

5.38.10 North Central Texas Municipal Water Authority

Description of Supply

North Central Texas MWA owns and obtains its water supply from Millers Creek Reservoir. Based on the available surface water supply, shortages are expected through 2070. Chapter 4 includes additional information on contracts and water supplies for North Central Texas Municipal Water Authority.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to meet the projected water shortage for the North Central Texas MWA. Needs for full contractual commitments remain unmet in 2020. These needs will only occur during a drought equivalent or worse than the drought of record. While not a strategy recommended by the Brazos G RWPG, the impacts of the unmet needs can be mitigated through demand management in the event of a serious drought prior to the recommended strategies coming online that will firm up supplies from the BRA.



a. Lake Creek Reservoir

- Cost Source: Volume II
 - Project requires a subordination agreement with the BRA, which is dependent on the BRA obtaining the System Operations permit
- Date to be Implemented: 2030
- Total Project Cost: \$259,001,000
- Unit Cost: \$1,657/acft

Table 5.38-14. Recommended Plan Costs by Decade for North Central Texas MWA

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage)</i> <i>(acft/yr)</i>	(1,722)	(1,737)	(1,752)	(1,767)	(1,782)	(1,797)
Lake Creek Reservoir						
Supply From Plan Element (acft/yr)		12,900	12,900	12,900	12,900	12,900
Annual Cost (\$/yr)		\$21,377,000	\$21,377,000	\$9,511,000	\$9,511,000	\$5,280,000
Unit Cost (\$/acft)		\$1,657	\$1,657	\$737	\$737	\$409

5.38.11 Palo Pinto County Municipal Water District No. 1

Description of Supply

Palo Pinto County Municipal Water District owns and operates Lake Palo Pinto, which is used to supply water to entities in Palo Pinto and Parker Counties. A portion of its supply is used in Region C. The district has rights to 18,500 acft/yr for municipal and steam electric power uses. Treated water is supplied to the City of Mineral Wells (and its customers) and Lake Palo Pinto Area Water Supply Corporation. Projected demands based on contractual commitments indicate shortages through 2070. However, based on projected customer demands associated with Mineral Wells (limited to contractual maximums), there will only be a supply shortage of 310 acft/yr in 2070. Chapter 4 includes additional information on contracts and water supplies for Palo Pinto County MWD No.1.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to meet the projected water shortage for the Palo Pinto County Municipal Water District No.1. Needs for full contractual commitments remain unmet in 2020. These needs will only occur during a drought equivalent or worse than the drought of record. While not a strategy recommended by the Brazos G RWPG, the impacts of the unmet needs can be mitigated through demand management in the event of a serious drought prior to the recommended strategies coming online that will firm up supplies from the BRA.

- a. Lake Palo Pinto Expansion (Turkey Peak Dam)
 - Cost Source: Volume II
 - Date to be Implemented: 2030
 - Total Project Cost: \$102,530,000 (includes \$8,000,000 already expended for completed studies and legal assistance)
 - Unit Cost: Max of \$989 / acft in 2020

Table 5.38-15. Recommended Plan Costs by Decade for Palo Pinto County Municipal Water District No.1

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	(1,751)	(1,991)	(2,186)	(2,397)	(2,608)	(2,806)
Lake Palo Pinto Expansion (Turkey Peak Dam)						
Supply From Plan Element (acft/yr)		6,000	6,000	6,000	6,000	6,000
Annual Cost (\$/yr)		\$5,935,000	\$5,935,000	\$796,000	\$796,000	\$796,000
Unit Cost (\$/acft)		\$989	\$989	\$133	\$133	\$133

5.38.12 Salt Fork Water Quality Corporation

Description of Supply

The Salt Fork Water Quality Corporation (SFWQC) was formed to develop a project to reduce salinity in the Brazos River Basin by constructing a series of wells to intercept highly saline water that emerges in a series of seeps and springs in the upper Brazos Basin. The SFWQC is pursuing a project to develop the series of wells, desalt the water captured by the wells, make commercial application of the resulting salt and sell the fresh water produced to municipal utilities in the area. This water management strategy is evaluated in Volume II as the Upper Basin Chloride Control Project. The project would develop up to 949 acft/yr of fresh water that could be used by Jayton, Aspermont and the White River Municipal Water District (at Spur in Region O).

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG, the following water supply plan is recommended to meet the projected shortages for the BRA Main Stem System:

- a. Upper Basin Chloride Control Project
 - Cost Source: Volume II
 - Date to be Implemented: before 2030
 - Total Project Cost: \$106,537,000
 - Unit Cost: \$6,527 for fresh water supply developed. Cost benefits result from reduced treatment costs downstream. Cost benefits range from \$65/acft in the upper basin to zero in the lower basin.

Table 5.38-16. Recommended Plan Costs by Decade for the Salt Fork Water Quality Corporation

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	0	0	0	0	0	0
Upper Basin Chloride Control Project						
Supply From Plan Element (acft/yr)	—	949	949	949	949	949
Annual Cost (\$/yr) ¹	—	\$6,194,000	\$6,194,000	\$0	\$0	\$0
Unit Cost (\$/acft)	—	\$6,527	\$6,527	N/A	N/A	N/A

1 – Project consultants have prepared a pro forma analysis indicating that revenue from salt sales would cover all O&M costs after debt service is retired.

5.38.13 Upper Leon River Municipal Water District (MWD)

Description of Supply

Upper Leon River MWD obtains its water supply through a contract with the Brazos River Authority for 6,437 acft/yr of water from Lake Proctor; however the firm supply of those contracts is 5,350 acft/yr in 2020 and decreases to 5,174 acft/yr by 2070, based on water availability analyses prescribed under water planning guidelines. The MWD has projected surpluses throughout the planning period. BRA strategies for the Little River System will firm up contracts to provide the full amount of supply during drought of record conditions. Chapter 4 includes additional information on contracts and water supplies for Upper Leon River MWD.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended to meet the projected water shortage for Upper Leon River MWD.

- a. Firm up Supplies through BRA Little River System Strategies
 - Cost Source: Volume II
 - Date to be Implemented: 2020
 - Total Project Cost: borne by BRA
 - Unit Cost: already contracted supplies
- b. Trinity Groundwater from Pecan Orchard
 - Cost Source: Intended Use Plan Budget submitted to TWDB in support of DWSRF Application
 - Date to be Implemented: 2020
 - Total Project Cost: \$5,347,000
 - Unit Cost: \$319/acft

Table 5.38-17. Recommended Plan Costs by Decade for Upper Leon River MWD

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	778	743	708	672	637	602
Firm up Supplies through BRA Little River System Strategies						
Supply From Plan Element (acft/yr)		1,122	1,157	1,193	1,228	1,263
Annual Cost (\$/yr)		\$0	\$0	\$0	\$0	\$0
Unit Cost (\$/acft)		\$0	\$0	\$0	\$0	\$0
Trinity Groundwater from Pecan Orchard						
Supply From Plan Element (acft/yr)	2,040	2,040	2,040	2,040	2,040	2,040
Annual Cost (\$/yr)	\$447,433	\$447,433	\$203,327	\$203,327	\$203,327	\$203,327
Unit Cost (\$/acft)	\$319	\$319	\$100	\$100	\$100	\$100

5.38.14 West Central Texas Municipal Water District

Description of Supply

West Central Texas MWD owns and obtains its water supply from Hubbard Creek Reservoir. Based on the available surface water supply constrained to a 2-year safe yield estimate, West Central Texas MWD is projected to have surplus supplies throughout the planning period. Chapter 4 includes additional information on contracts and water supplies for West Central Texas MWD.

Table 5.38-18. Supplies and Demands for the West Central Texas Municipal Water District

	2020	2030	2040	2050	2060	2070
Existing Contractual Sales						
Abilene	13,077	13,077	13,077	13,077	13,077	13,077
Albany	1,400	1,400	1,400	1,400	1,400	1,400
Anson	1,600	1,600	1,600	1,600	1,600	1,600
Breckenridge	1,900	1,900	1,900	1,900	1,900	1,900
Total Existing Demands	17,977	11,403	11,403	11,403	11,403	11,403
Total Supply	20,000	19,900	19,800	19,700	19,600	19,500
<i>Projected Surplus/(Shortage) (acft/yr)</i>	2,023	1,923	1,823	1,723	1,623	1,523



Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended to supplement water supplies for West Central Texas MWD.

a. BRA System Operations Supply

The District is in the process of negotiating a contract to purchase 774 acft/yr from the Brazos River Authority’s System Operations supply.

- Cost Source: Volume II
- Date to be Implemented: before 2020
- Total Project Cost: Infrastructure already exists
- Unit Cost: \$76.50/acft

Table 5.38-19. Recommended Plan Costs by Decade for West Central Texas MWD

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	2,023	1,923	1,823	1,723	1,623	1,523
BRA System Operations Supply						
Supply From Plan Element (acft/yr)	774	774	774	774	774	774
Annual Cost (\$/yr)	\$59,211	\$59,211	\$59,211	\$59,211	\$59,211	\$59,211
Unit Cost (\$/acft)	\$76.50	\$76.50	\$76.50	\$76.50	\$76.50	\$76.50

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5.39 Water Conservation Recommendations

Regional water planning guidelines require each regional water planning group to consider water conservation to meet projected shortages. The Brazos G RWPG adopted the following water conservation recommendations for the 2021 Plan which are further described in Volume II, Section 2.

- Municipal water user groups (WUGs) with per capita rates exceeding 140 gallons per person per day (gpcd) were recommended to reduce per capita consumption by 1% annually through 2070 until a 140 gpcd rate is attained. This recommendation applies to all municipal water user groups with and without projected water supply needs (shortages). For WUGs in Williamson County, a more aggressive conservation goal of 120 gpcd by 2070 is recommended. Conservation can be achieved through a variety of best management practices, many of which are listed in Section 2 of Volume II.
- Irrigation water user groups with identified needs were recommended to reduce water use by 3% by 2020, 5% by 2030, and 7% from 2040-2070. A list of best management practices is included in Volume II, Section 2.
- Manufacturing and mining water user groups with identified needs were recommended to reduce water use by 3% by 2020, 5% by 2030, and 7% from 2040-2070. A list of best management practices is included in Volume II, Section 2.
- Conservation recommendations were not made for steam-electric users due to the widely differing water use amongst the different facilities.
- Conservation recommendations were not made for livestock water user groups.

Expected savings from the above water conservation recommendations can be seen for each water user group in the preceding individual county and WWP plans (Sections 5.1 through 5.38) and in Volume II, Section 2.

The Brazos G RWPG suggests that WUGs in the region review the lists of BMPs and look to identify WUGs at a relevant size with similar water supply type and consider voluntary implementation of those best management practices, if applicable.

TCEQ has prepared model water conservation plans (WCPs) for municipal public water suppliers, wholesale providers, industrial and mining entities, and agricultural users to provide guidance and suggestions to entities with regard to the preparation of water conservation plans. Not all items in the model plan will apply to every system's situation, but the overall model plan can be used as a starting point for most entities. For WUGs wishing to develop a new WCP, Brazos G suggests considering best management practices from local water conservation plans for entities similar in size, as discussed previously, in addition to the TCEQ Model WCPs. The TCEQ model water conservation plans can be found on TCEQ's website at the following link:

https://www.tceq.texas.gov/permitting/water_rights/wr_technical-resources/conserved.html

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