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)[1]		Comment
	2040 (acft/yr)	2070 (acft/yr)	
City of Bryan	(5,533)	(26,578)	Projected shortage – see Chapter 5.38
City of College Station	(7,372)	(8,401)	Projected shortage – see plan below
Texas A & M University	7,323	7,344	Projected surplus
Wellborn SUD	(358)	(2,524)	Projected shortage – see plan below
Wickson Creek SUD	1,502	366	Projected surplus
County-Other	424	28	Projected surplus
Manufacturing	(1,219)	(2,116)	Projected shortage – see plan below
Steam-Electric	(197)	(121)	Projected shortage – see plan below
Mining	(1,433)	(814)	Projected shortage – see plan below
Irrigation	(8,473)	(5,321)	Projected shortage – see plan below
Livestock	0	0	Demand equals supply

1 – From Tables C-5 and C-6, Appendix C – Comparison of Water Demands with Water Supplies to Determine Needs.

5.3.1 City of Bryan

The recommended water supply plan for the City of Bryan is included in Chapter 5.38 with the wholesale water providers.

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 Aquifer. The city's utility does not provide service to the entire city limits. Portions of the city demand are currently served by City of Bryan and Wellborn SUD. The city also provides water supply for Brazos County Manufacturing. Shortages are projected beginning in year 2020 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.

a. Conservation
    - Cost Source: Volume II, Chapter 2
    - Date to be Implemented: 2020
    - Annual Cost: maximum of $2,335,000 in 2070
    - Unit Cost: $474/acft
b. Groundwater Development – Yegua-Jackson Aquifer
    - Cost Source: Volume II, Chapter 9.2
    - Date to be Implemented: 2020
    - Project Cost: $32,957,000
    - Unit Cost: $656/acft
c. College Station Reuse
    - Cost Source: Volume II, Chapter 3
    - Date to be Implemented: 2020
    - Project Cost: $1,705,000
    - Unit Cost: $1,680/acft
d. College Station ASR
    - Cost Source: Volume II, Chapter 10.2
    - Date to be Implemented: 2020
    - Project Cost: $63,850,000
    - Unit Cost: $3,069/acft
e. Alternative: BRA System Operation
    - Cost Source: Volume II, Chapter 7.11
        - Dependent on BRA being granted System Operations permit from TCEQ
    - Date to be Implemented: 2020
    - Project Cost: $37,109,000
    - Unit Cost: $1,065/acft assuming wholesale water rate plus transmission
f. Alternative: College Station Direct Potable Reuse
    - Cost Source: Volume II, Chapter 3
    - Date to be Implemented: 2020
    - Project Cost: $56,192,000
    - Unit Cost: $3,484/acft

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

Plan Element	2020	2030	2040	2050	2060	2070
Projected Surplus/(Shortage) (acft/yr)	*(4,973)*	*(8,024)*	*(7,372)*	*(7,673)*	*(8,085)*	*(8,401)*
Conservation						
Supply From Plan Element (acft/yr)	679	2,585	3,465	3,823	4,332	4,926
Annual Cost ($/yr)	$322,000	$1,225,000	$1,642,000	$1,812,000	$2,053,000	$2,335,000
Projected Surplus/ (Shortage) after Conservation (acft/yr)	*(4,295)*	*(5,438)*	*(3,907)*	*(3,850)*	*(3,753)*	*(3,475)*
College Station Reuse Project						
Supply From Plan Element (acft/yr)	103	103	103	103	103	103
Annual Cost ($/yr)	$173,000	$173,000	$30,000	$30,000	$30,000	$30,000
Unit Cost ($/acft)	$1,680	$1,680	$291	$291	$291	$291
Projected Surplus/ (Shortage) after Conservation (acft/yr)	*(4,192)*	*(5,335)*	*(3,804)*	*(3,747)*	*(3,650)*	*(3,372)*
Groundwater Development – Yegua-Jackson Aquifer						
Supply From Plan Element (acft/yr)	4,452	5,565	5,565	5,565	5,565	5,565
Annual Cost ($/yr)	$2,923,000	$3,499,000	$1,572,000	$1,231,000	$1,231,000	$1,231,000
Unit Cost ($/acft)	$656	$629	$282	$221	$221	$221
College Station ASR Project						
Supply From Plan Element (acft/yr)	2,800	2,800	2,800	2,800	2,800	2,800
Annual Cost ($/yr)	$8,592,000	$8,592,000	$3,249,000	$3,249,000	$3,249,000	$3,249,000
Unit Cost ($/acft)	$3,068	$3,068	$1,160	$1,160	$1,160	$1,160
Alternative: BRA System Operation						
Supply From Plan Element (acft/yr)	6,000	6,000	6,000	6,000	6,000	6,000
Annual Cost ($/yr)	$6,390,000	$6,390,000	$3,282,000	$3,282,000	$3,282,000	$3,282,000
Unit Cost ($/acft)	$1,065	$1,065	$547	$547	$547	$547
Alternative: College Station Direct Potable Reuse						
Supply From Plan Element (acft/yr)	2,800	2,800	2,800	2,800	2,800	2,800
Annual Cost ($/yr)	$9,755,000	$9,755,000	$5,053,000	$5,053,000	$5,053,000	$5,053,000
Unit Cost ($/acft)	$3,484	$3,484	$1,805	$1,805	$1,805	$1,805

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 Aquifers. This 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 strategies are recommended for Texas A&M University. Associated costs are included for each strategy.

a. Conservation

- Cost Source: Volume II, Chapter 2
- Date to be Implemented: 2020
- Annual Cost: $1,255,000 in 2070
- Unit Cost: $470/acft

Table 5.3-3. Recommended Plan Costs by Decade for Texas A&M University

Plan Element	2020	2030	2040	2050	2060	2070
Projected Surplus/(Shortage) (acft/yr)	*5,253*	*6,760*	*7,323*	*7,340*	*7,343*	*7,344*
Conservation						
Supply From Plan Element (acft/yr)	416	942	1,418	1,869	2,289	2,670
Annual Cost ($/yr)	$196,000	$443,000	$666,000	$878,000	$1,076,000	$1,255,000
Projected Surplus/(Shortage) after Conservation (acft/yr)	*5,669*	*7,701*	*8,741*	*9,209*	*9,632*	*10,014*

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 shortages beginning in 2040.

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 Wellborn SUD. Associated costs are included for each strategy.

a. Conservation

- Cost Source: Volume II, Chapter 2
- Date to be Implemented: 2020
- Annual Cost: $335,000 in 2070
- Unit Cost: $470/acft

b. Expand Water Treatment Plant (2 MGD)

- Cost Source: Volume II, Chapter 12

- Date to be Implemented: 2040
- Project Cost: $13,153,000
- Unit Cost: Max of $912 (2020)

Table 5.3-4. Recommended Plan Costs by Decade for Wellborn SUD

Plan Element	2020	2030	2040	2050	2060	2070
Projected Surplus/(Shortage) (acft/yr)	*451*	*106*	*(358)*	*(1,010)*	*(1,728)*	*(2,524)*
Conservation						
Supply From Plan Element (acft/yr)	78	279	508	563	633	713
Annual Cost ($/yr)	$37,000	$131,000	$239,000	$265,000	$297,000	$335,000
Projected Surplus/ (Shortage) after Conservation (acft/yr)	*529*	*385*	*150*	*(447)*	*(1,095)*	*(1,811)*
Expand Water Treatment Plant (2 MGD)						
Supply From Plan Element (acft/yr)	—	—	2,240	2,240	2,240	2,085
Annual Cost ($/yr)	—	—	$2,042,000	$2,042,000	$941,000	$941,000
Unit Cost ($/acft)	—	—	$912	$912	$420	$420

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 and Carrizo Aquifers. 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 current per capita use rate is below the selected target rate of 140 gpcd.

5.3.6 County-Other

Brazos County-Other entities obtain water supply from groundwater from the Carrizo and Sparta 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 WUGs current per capita use rate is below the selected target rate of 140 gpcd.

5.3.7 Manufacturing

Water supply for manufacturing in Brazos County is obtained from nearby WUGs and Sparta wells operated by the manufacturing entity. Manufacturing is projected to have a shortage of water beginning in the 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 Manufacturing. Associated costs are included for each strategy.

a. Conservation
   - Cost Source: Volume II, Chapter 2
   - Date to be Implemented: before 2020
   - Annual Cost: not determined

b. Groundwater Development – Gulf Coast Aquifer
   - Cost Source: Volume II, Chapter 12.1
   - Date to be Implemented: 2020
   - Project Cost: $8,932,000
   - Unit Cost: $1,815

c. Purchase from Texas A&M University

   While Texas A&M University has ample groundwater supplies to provide water to manufacturing interests, the university may have no intention of providing those supplies. Alternatives include purchase of water from College Station, Bryan, Wellborn SUD or Wickson SUD. Whichever entities do provide supply, the source most likely will be from the Carrizo-Wilcox Aquifer System, which is the primary supply for entities in this region.
   - Cost Source: Volume II, Chapter 12
   - Date to be Implemented: 2020
   - Project Cost: Not enough information to cost delivery
   - Unit Cost: $977/acft (Texas A&M wholesale rate only)

Table 5.3-5. Recommended Plan Costs by Decade for Brazos County – Manufacturing

Plan Element	2020	2030	2040	2050	2060	2070
Projected Surplus/(Shortage) (acft/yr)	*(1,800)*	*(886)*	*(1,219)*	*(1,513)*	*(1,802)*	*(2,116)*
Conservation						
Supply From Plan Element (acft/yr)	74	139	218	238	259	281
Annual Cost ($/yr)	ND	ND	ND	ND	ND	ND
Projected Surplus/(Shortage) after Conservation (acft/yr)	*(1,726)*	*(747)*	*(1,001)*	*(1,275)*	*(1,543)*	*(1,835)*
Groundwater Development – Gulf Coast Aquifer						
Supply From Plan Element (acft/yr)	530	530	530	530	530	530
Annual Cost ($/yr)	$961,727	$961,727	$248,727	$248,727	$248,727	$248,727
Unit Cost ($/acft)	$1,815	$1,815	$469	$469	$469	$469
Purchase Water from Texas A&M University						
Supply From Plan Element (acft/yr)	1,200	300	500	800	1,100	1,400
Annual Cost ($/yr)	$1,172,400	$293,100	$488,500	$781,600	$1,074,700	$1,367,800
Unit Cost ($/acft)	$977	$977	$977	$977	$977	$977

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

5.3.8 Steam-Electric

Description of Supply

Supplies for Steam-Electric demand in Brazos County are obtained through groundwater from the Sparta Aquifer and Bryan Utilities Lake. Brazos County Steam-Electric is projected to have shortages beginning in year 2020 and continuing through year 2070.

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.

a. Conservation:

- Date to be Implemented: 2020
- Annual Cost: Not determined

b. Purchase reuse water from the City of Bryan at Bryan Utilities Lake:

- Cost Source: Volume II, Chapter 3
- Date to be Implemented: 2020
- Project Cost: $8,989,000
- Unit Cost:$1547/acft

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

Plan Element	2020	2030	2040	2050	2060	2070
Projected Surplus/(Shortage) (acft/yr)	*(271)*	*(151)*	*(197)*	*(49)*	*(142)*	*(121)*
Conservation						
Supply From Plan Element (acft/yr)	15	20	32	22	28	27
Annual Cost ($/yr)	ND	ND	ND	ND	ND	ND
Projected Surplus/(Shortage) after Conservation (acft/yr)	*(256)*	*(131)*	*(165)*	*(27)*	*(114)*	*(94)*
Reuse Supply from City of Bryan						
Supply From Plan Element (acft/yr)	256	131	165	27	114	94
Annual Cost ($/yr)	$396,032	$202,657	$50,160	$8,208	$34,656	$28,576
Unit Cost ($/acft)	$1,547	$1,547	$304	$304	$304	$304
Projected Surplus/(Shortage) after Reuse(acft/yr)	—	—	—	—	—	—

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

5.3.9 Mining

Description of Supply

There are currently no water supplies allocated to Mining operations in Brazos County. 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 Brazos County-Mining. Associated costs are included for each strategy.

a. Conservation

- Cost Source: Volume II, Chapter 2
- Date to be Implemented: 2020
- Annual Cost: not determined

b. Leave needs unmet

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

Table 5.3-7. Recommended Plan Costs by Decade for Brazos County – Mining

Plan Element	2020	2030	2040	2050	2060	2070
Projected Surplus/(Shortage) (acft/yr)	*(1,088)*	*(1,610)*	*(1,433)*	*(1,144)*	*(923)*	*(814)*
Conservation						
Supply From Plan Element (acft/yr)	33	81	100	80	65	57
Annual Cost ($/yr)	ND	ND	ND	ND	ND	ND
Projected Surplus/(Shortage) after Conservation (acft/yr)	*(1,055)*	*(1,530)*	*(1,333)*	*(1,064)*	*(858)*	*(757)*
Leave Needs Unmet						
Supply From Plan Element (acft/yr)	1,100	1,600	1,400	1,100	900	800
Annual Cost ($/yr)	—	—	—	—	—	—
Unit Cost ($/acft)	—	—	—	—	—	—

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

5.3.10 Irrigation

Description of Supply

Brazos County Irrigation is supplied by Sparta, Gulf Coast, Yegua-Jackson and Brazos River Alluvium groundwater and from run-of-river diversion rights from the Brazos River and contracts with BRA. Shortages are projected for irrigation beginning 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-Irrigation. Associated costs are included for each strategy.

a. Conservation

- Cost Source: Volume II, Chapter 2
- Date to be Implemented: 2020
- Annual Cost: maximum of $380,000 in 2040
- Unit Cost: $230/acft

b. BRA System Operations

- Cost Source: Volume II, Chapter 7.11
  - Dependent on BRA being granted System Operations permit from TCEQ
- Date to be Implemented: 2020
- Project Cost: Infrastructure assumed sufficient
- Unit Cost: $65.65/acft

Table 5.3-8. Recommended Plan Costs by Decade for Brazos County – Irrigation

Plan Element	2020	2030	2040	2050	2060	2070
Projected Surplus/(Shortage) (acft/yr)	*(10,934)*	*(9,669)*	*(8,473)*	*(7,340)*	*(6,256)*	*(5,321)*
Conservation						
Supply From Plan Element (acft/yr)	782	1,240	1,652	1,572	1,496	1,431
Annual Cost ($/yr)	$180,000	$285,000	$380,000	$362,000	$344,000	$329,000
Projected Surplus/(Shortage) after Conservation (acft/yr)	*(10,152)*	*(8,430)*	*(6,822)*	*(5,768)*	*(4,760)*	*(3,891)*
BRA System Operation						
Supply From Plan Element (acft/yr)	10,200	8,500	6,900	5,800	4,800	3,900
Annual Cost ($/yr)	$669,630	$558,025	$452,985	$380,770	$315,120	$256,035
Unit Cost ($/acft)	$65.65	$65.65	$65.65	$65.65	$65.65	$65.65

5.3.11 Livestock

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