Section 6
Water Conservation and Drought Management Recommendations [31 TAC §357.7(a)(11)]

The 2006 Brazos G Regional Water Plan (2006 Plan) includes water conservation and drought management recommendations pursuant to 31 Texas Administrative Code 357.7(a)11 and Texas Water Code 11.085. The guidelines require water user groups that obtain water from inter-basin transfers consider conservation as a water management strategy. There are several municipal water user groups in the Brazos G Area that benefit from interbasin transfers as listed in Table 6-1. A more detailed description of these interbasin transfers is included in Section 3.1.

Typically, water user groups address their goals and plans to conserve water in their Water Conservation Plan and identify factors used to initiate a drought response and actions to be taken as part of the response in a Drought Contingency Plan. The TCEQ provides guidance for Water Conservation and Drought Contingency Plans in 30 Texas Administrative Code Chapter 288, which requires entities applying for new water rights or an amendment to an existing water right to prepare and implement a water conservation/drought contingency plan to be submitted with their application. Furthermore, 30 TAC Chapter 288, requires "specific, quantified 5- and 10-year targets for water savings to be included in all water conservation plans to be submitted to the TCEQ no later than May 1, 2005."

The specific water conservation target savings for all entities in the Brazos G Area are not yet available and will not be included in the 2006 Plan. Targets identified in specific conservation plans for water user groups in the Brazos G Area should be included in future water planning efforts. The City of Abilene's Water Conservation and Drought Contingency Plan (WC&DCP) is included in Appendix J, along with the City of Waco's WC&DCP in Appendix K as example plans for two water user groups in the Brazos G Area.

6.1 Water Conservation

The Brazos G RWPG has considered water conservation and drought management measures for each water user group with a need (projected water shortage) in accordance with Regional Water Planning Guidelines. The Brazos G RWPG recommends water conservation for municipal and non-municipal entities.

Table 6-1.
Brazos G Municipal Water User Groups that Receive Water from Interbasin Transfers

Water User Group	*County*	*Water Supply*
Johnson County-Other	Johnson	Lake Granbury
City of Mexia	Limestone	Lake Mexia
City of Lampasas	Lampasas	Brazos River
Fisher County-Other	Fisher	Lake J B Thomas
City of Sweetwater	Nolan	Oak Creek Reservoir
City of Clyde	Callahan	Lake Clyde
City of Abilene	Taylor	Lake O H Ivie
Williamson County-Other	Williamson	Lake Austin
City of Cedar Park	Williamson	Lake Travis
City of Leander	Williamson	Lake Travis
City of Rotan	Fisher	Colorado River Municipal Water District (City of Snyder)

6.1.1 Municipal Water Conservation

The four largest municipal water users in the Brazos G Area (Waco, Abilene, College Station, and Round Rock) constitute approximately 25% of the regional municipal water demand. Abilene, College Station, and Round Rock have projected shortages during the planning period and have projected water usage ranging from 164 gallons per capita per day (gpcd) to 221 gpcd in 2010.

The Brazos G RWPG encourages all municipal entities in the region to conserve water, regardless of per capita consumption. The current Texas Water Development Board (TWDB) municipal water demand projections account for expected water savings due to implementation of the 1991 State Water-Efficient Plumbing Act. In September 2004, the Brazos G RWPG recommended additional water conservation of 21 gpcd by Year 2020 for water entities with a projected need (shortage) that also exceed 140 gallons per capita per day. Specific conservation measures are not recommended for each user group, as each entity should choose those conservation strategies that best fit their individual situation using Best Management Practices

(BMPs) described by the Water Conservation Implementation Task Force.[1] A discussion of municipal conservation water savings, program costs, and unit costs for the Brazos G Area are included in Section 4B.2.1.

6.1.2 Non-municipal Water Conservation

In February 2005, the Brazos G RWPG recommended that counties with projected needs (shortages) for irrigation or industrial users (manufacturing, steam electric, or mining) reduce their water demands by 3 percent by 2010, 5 percent by 2020, and 7 percent from 2030 to 2060 by using Best Management Practices identified by the Water Conservation Implementation Task Force.

There are six counties within the Brazos G Area with projected irrigation needs: Burleson, Eastland, Haskell, Knox, Nolan, and Shackelford. The total water savings for these six counties is greatest in Year 2030, with an expected savings of 8,674 acft. In 2060, the total expected water savings for these six counties is 8,027 acft/yr as shown in Table 6-2. There are multiple irrigation BMPs that irrigators can select from to attain this water savings, including furrow diking, low elevation spray applications (LESA), and low energy precision application (LEPA). The costs of these BMPs range from $96 to $449 per acft of water saved with a savings potential of 12,359 to 22,691 acft with 100 percent participation. A more detailed description of irrigation BMPs, costs, and water savings for the Brazos G Area are included in Section 4B.2.2.

There are 18 counties in the Brazos G Area with projected manufacturing needs: Bell, Bosque, Brazos, Burleson, Erath, Fisher, Grimes, Hill, Hood, Johnson, Lampasas, Limestone, McLennan, Nolan, Robertson, Somervell, Washington, and Williamson. The total water savings for these 18 counties after 7 percent water demand reduction in 2060 is 1,430 acft/yr (a 12% reduction in total regional manufacturing shortages) as shown in Table 6-3.

There are nine counties in the Brazos G Area with projected steam-electric needs: Bosque, Grimes, Johnson, Limestone, McLennan, Milam, Nolan, Palo Pinto, and Robertson. The total water savings for these nine counties after 7 percent water demand reduction in 2060 is 13,281 acft/yr (a 15% reduction in total regional steam-electric shortages) as shown in Table 6-4.

There are ten counties in the Brazos G Area with projected mining needs: Haskell, Hood, Johnson, Knox, Lampasas, Nolan, Somervell, Stephens, Taylor, and Williamson. The total water

[1] Texas Water Development Board, Water Conservation Best Management Practices Guide, November 2004.

savings for these nine counties after 7 percent water demand reduction in 2060 is 1,074 acft/yr (a 11% reduction in total regional mining shortages) as shown in Table 6-5.

Table 6-2.
Irrigation Water Conservation Savings

Counties with Irrigation Needs	Irrigation Shortages in 2060 (acft/yr)		Water Savings in 2060 (acft/yr)
	Before Conservation	After Conservation (Reducing Demand By 15 Percent)	
Burleson	(2,991)	(2,005)	986
Eastland	(9,257)	(8,110)	1,147
Haskell	(21,950)	(18,982)	2,968
Knox	(10,460)	(7,860)	2,600
Nolan	(2,566)	(2,251)	315
Shackelford	(81)	(70)	11
Total	**(47,305)**	**(39,278)**	**8,027**

There are multiple industrial BMPs identified by the Water Conservation Implementation Task Force, however data to quantify savings and costs is unavailable. The Brazos G RWPG recognizes that conservation savings and costs to implement industrial BMPs are facility specific and assumes that industrial users will implement those strategies that are practical, cost effective, and provide good water savings potential. A more detailed description of suggested industrial BMPs for the Brazos G Area is included in Section 4B.2.3.

Table 6-3.
Manufacturing Water Conservation Savings

Counties with Manufacturing Needs	Manufacturing Shortages in 2060 (acft/yr)		Water Savings in 2060 (acft/yr)
	Before Conservation	After Conservation	
Bell	(1,446)	(1,344)	102
Bosque	(1,300)	(1,184)	116
Brazos	(232)	(194)	38
Burleson	(98)	(72)	26
Erath	(40)	(32)	8
Fisher	(236)	(212)	24
Grimes	(189)	(158)	31
Hill	(53)	(43)	10
Hood	(15)	(12)	3
Johnson	(3,639)	(3,359)	280
Lampasas	(169)	(156)	13
Limestone	(69)	(64)	5
McLennan	(1,508)	(1,086)	422
Nolan	(239)	(143)	96
Robertson	(77)	(66)	11
Somervell	(7)	(6)	1
Washington	(199)	(155)	44
Williamson	(2,328)	(2,128)	200
Total	**(11,844)**	**(10,382)**	**1,430**

Table 6-4.
Steam-Electric Water Conservation Savings

Counties with Irrigation Needs	Steam-Electric Shortages in 2060 (acft/yr)		Water Savings in 2060 (acft/yr)
	Before Conservation	After Conservation	
Bosque	(8,223)	(7,386)	837
Grimes	(9,715)	(8,123)	1,592
Johnson	(1,200)	(1,116)	84
Limestone	(15,814)	(12,756)	3,058
McLennan	(34,016)	(30,650)	3,366
Milam	(8,200)	(7,080)	1,120
Nolan	(2,817)	(2,562)	255
Palo Pinto	(1,658)	(1,489)	169
Robertson	(8,284)	(5,484)	2,800
Total	**(90,267)**	**(76,986)**	**13,281**

Table 6-5.
Mining Water Conservation Savings

Counties with Irrigation Needs	Mining Shortages in 2060 (acft/yr)		Water Savings in 2060 (acft/yr)
	Before Conservation	After Conservation	
Haskell	(47)	(41)	6
Hood	(24)	(13)	11
Johnson	(315)	(284)	31
Knox	(3)	(1)	2
Lampasas	(23)	(14)	9
Nolan	(197)	(178)	19
Somervell	(85)	(67)	18
Stephens	(6,662)	(5938)	724
Taylor	(4)	None*	24
Williamson	(1,882)	(1,652)	230
Total	**(9,242)**	**(8,188)**	**1,074**

* Note: surplus of 20 acft exists after conservation.

6.2 Drought Management

All water supply entities and some major water right holders are required by Senate Bill 1 regulations to submit for approval to the Texas Commission for Environmental Quality (TCEQ) a Drought Contingency and Water Conservation Plan. These plans must detail the entities' plans to reduce water demand at times when the demand threatens the total capacity of the water supply delivery system or overall supplies are low (like during a drought). In accordance with 31 Texas Administrative Code 357.7(a)1, the 2006 Plan identifies: 1) factors to consider in determining whether to initiate a drought response; and 2) actions to be taken as part of the response by including model drought contingency plans for City of Abilene (Appendix J) and City of Waco (Appendix K). The Brazos River Authority continues to receive water conservation and drought management plans from regional water user groups.

The cities of Abilene and Waco are comparable in size and have different hydrologic conditions. The City of Waco depends upon essentially one water supply (Lake Waco), whereas the City of Abilene has multiple water sources. Lake Waco is a fairly drought resistant water supply, whereas the City of Abilene is experiencing a drought worse in severity than the drought of record. These two entities were selected to represent a range of different conservation and drought contingency approaches that may be applicable to other water user groups in the Brazos G Area.

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