CHAPTER 6 CONSISTENCY WITH LONG-TERM PROTECTION OF THE STATE'S WATER, AGRICULTURAL, AND NATURAL RESOURCES

The 2026 Plan is consistent with long-term protection of the state's water resources, agricultural resources, and natural resources and is developed based on guidance principles outlined in the Texas Administrative Code Chapter 358 – State Water Planning Guidelines. The 2026 Plan was produced with an understanding of the importance of orderly development, management, and conservation of water resources and is consistent with all laws applicable to water use for the state and regional water planning areas. Furthermore, the plan was developed according to principles governing surface water and groundwater rights. Availability of water for new surface water supplies considered environmental flow needs as defined by the environmental flow standards adopted in the Brazos Basin and incorporated into the Texas Commission on Environmental (TCEQ) Brazos Water Availability Model (WAM Run 3), and protection of existing water rights. For groundwater, the 2026 Plan recognizes principles for groundwater management in Texas, and estimates of groundwater availability take into the Modeled Available Groundwater (MAG) as determined by the Texas Water Development Board (TWDB).

The 2026 Plan identifies actions and policies necessary to meet the Brazos G Area's near and long-term water needs by developing and recommending water management strategies to meet needs with reasonable cost, good water quality, and sufficient protection of agricultural and natural resources of the state. The Brazos G Regional Water Planning Group (RWPG) has recommended water management strategies that consider the public interest of the state, wholesale water providers, protection of existing water rights, and opportunities that encourage voluntary transfers of water resources while balancing economic, social, and ecological viability. When needs could not be met economically with water management strategies, a socioeconomic impact analysis was performed to estimate the economic loss associated with not meeting these needs. This analysis is shown in the final plan in (Appendix G).

The 2026 Plan considers environmental information resulting from site-specific studies and ongoing development of water projects when evaluating water management strategies. Cumulative effects of water management strategies on Brazos River instream flows and inflows to the Gulf of Mexico were considered, as documented later in this chapter. A list of endangered and threatened species in the Brazos G Area for each county was obtained from the U.S. Fish and Wildlife Service and possible impacts to these species and/or their habitats were considered for each water management strategy evaluated.

The 2026 Plan consists of initiatives to respond to continuing drought conditions in the western part of the region, and makes use of relatively low-impact strategies such as reuse of wastewater return flows and the Brazos River Authority's System Operations to increase supplies. As a further drought protection provision, the Brazos G RWPG adopted use of safe yield analyses for purposes of determining water supply for municipal supply reservoirs upstream of Possum Kingdom Reservoir. The use of safe yield analyses anticipates that a future drought may occur that is greater in severity than the worst drought of record and reserves a certain amount of water in storage (i.e., a 6-month, or 1- or 2-year supply) for such

an event. Use of safe yield in the upper Brazos Basin is justified based on the severity of the recent drought. Figure 6.1 presents the cumulative gaged streamflow for the USGS gage located on the Clear Fork of the Brazos River near Nugent, TX. The figure shows how flows during the recent drought beginning in 1997 are significantly less than those of the previous drought of record (1950's drought). When the recent drought cumulative streamflows are compared to the 1950s droughts at the 14 years mark from the beginning of the drought, total streamflow is 53 percent of the total streamflow for the 1950s. Additionally, the duration of the recent drought is more than 4 years longer than the 1950s drought.

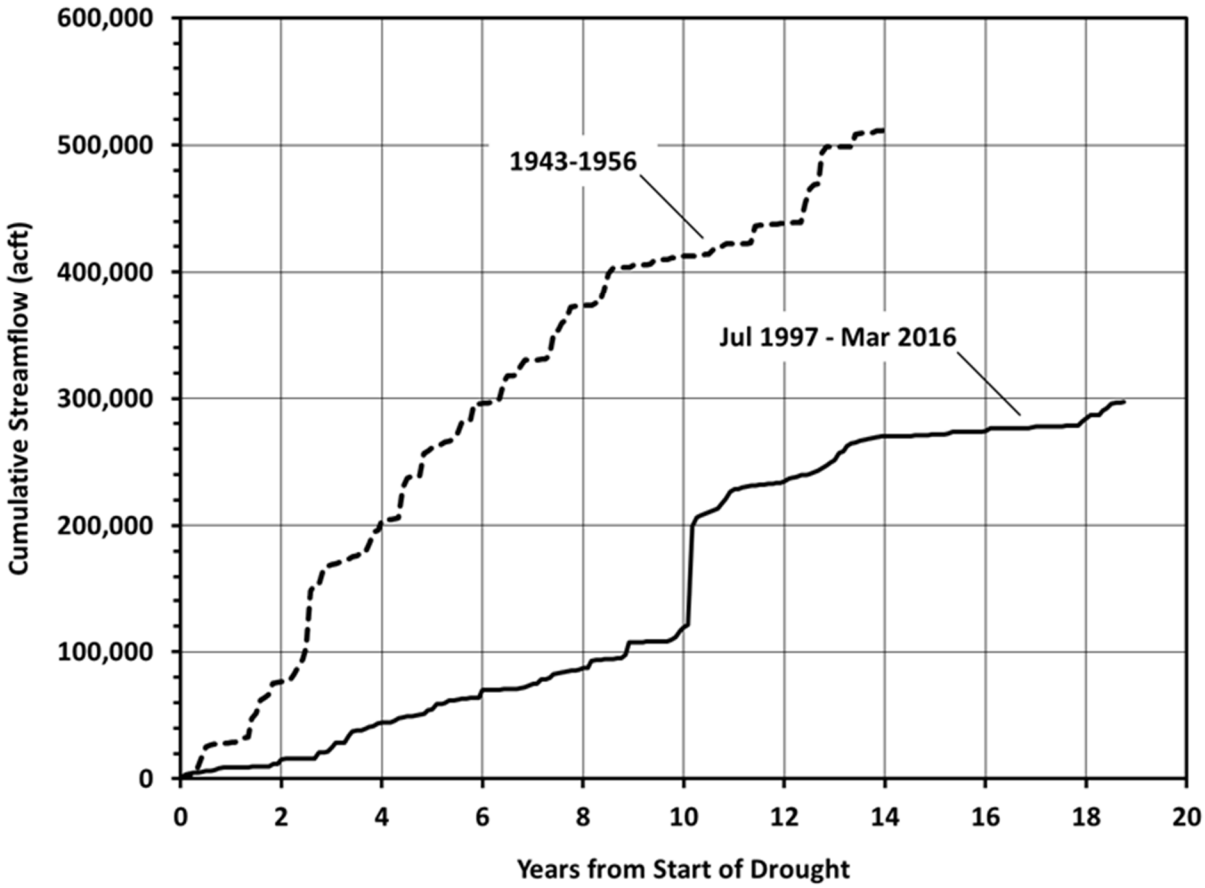


Figure 6.1 Cumulative Gaged Flows at Clear Fork of the Brazos near Nugent

The Brazos G RWPG conducted numerous meetings during the 2026 planning cycle, which were open to the public, and decisions were based on accurate, objective, and reliable information. The Brazos G RWPG coordinated water planning activities with local, regional and state agencies, and was committed to facilitating the initiatives and addressing the concerns of local and regional entities.

The Brazos G RWPG developed policy recommendations regarding State water policy after extensive consideration and deliberation, and these are presented in Chapter 8 of this report. The Brazos G RWPG considered recommendations of stream segments with unique ecological value by Texas Parks and Wildlife and sites of unique value for construction of reservoirs. At this time, the Brazos G RWPG recommends that no stream segments be designated as unique; and recommends that reservoir sites be recommended as unique if recommended as water management strategies and not previously recommended as unique (Chapter 8).

Other than small watercraft used primarily for recreation on lakes and rivers, the BGRWPA includes no use of water for navigation. No water management strategy considered by the BGRWPG will affect navigation, either in the BGRWPA or in adjacent regions.

6.1 Cumulative Hydrologic Effects of Implementing the Brazos G Regional Water Plan

The following sections describe in more detail the hydrologic effects of the recommended water management strategies on surface water and groundwater resources.

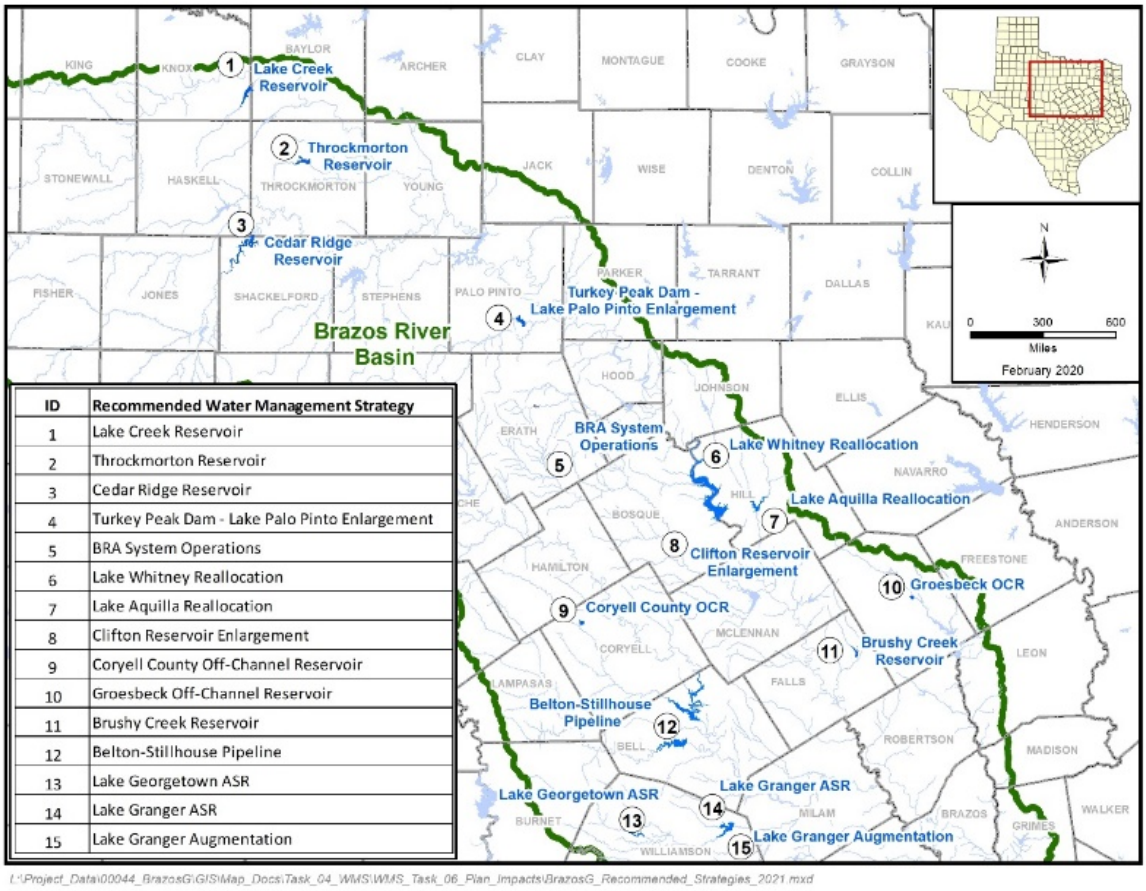
6.1.1 Surface Water

Sophisticated hydrologic models have been employed to quantify the cumulative effects of implementation of the 2026 Plan through the year 2080. Surface water effects were quantified using the TCEQ Brazos WAM Run 3 which, as per the TWDB planning guidelines, was the standard tool utilized to evaluate surface water strategies in the region. The Brazos WAM Run 3 assumptions include no return flows (unless included as a specific component to a strategy), as-permitted diversions and reservoir contents, BRA System Operations, and the environmental flow standards adopted by the TCEQ for the Brazos Basin.

The cumulative effects of the plan can be quantified by comparing conditions prior to implementation of the plan (base condition) to conditions with the plan in place. The base condition against which to compare conditions with the plan in place was streamflow computed by the Brazos WAM under the Run 3 assumptions.

The conditions with the plan in place include the base condition assumptions, with the addition of any recommended strategies that could measurably affect streamflows, i.e., those that result in development of additional water supply. The recommended water management strategies, shown in Figure 6.2 and listed in Table 6.1, were incorporated into the model. Specific strategies not included in the analysis are direct reuse projects, conservation, strategies transferring water from one entity to another through new or increased purchases, and development of additional groundwater. The base condition assumes full utilization of water rights, and conservation or transfers of water will not impact the assumption of full utilization of water rights. Surface water/groundwater interactions are difficult to quantify, but reductions in streamflow due to increased utilization of groundwater resources are expected to be small. As a result, the Control of Naturally Occurring Salinity recommended strategy in the upper Brazos River Basin is not anticipated to significantly impact streamflow and is not included in the cumulative effects analysis.

The cumulative effects of the 2026 Plan on streamflows were evaluated at the eight locations presented in Table 6.2. Each selected location is located in the Brazos G portion of the Brazos River Basin, except the Brazos River at Richmond site. This location was included in the analysis to illustrate the impacts of Brazos G strategies on the lower part of the basin.



ID	Recommended Water Management Strategy
1	Lake Creek Reservoir
2	Throckmorton Reservoir
3	Cedar Ridge Reservoir
4	Turkey Peak Dam - Lake Palo Pinto Enlargement
5	BRA System Operations
6	Lake Whitney Reallocation
7	Lake Aquilla Reallocation
8	Clifton Reservoir Enlargement
9	Coryell County Off-Channel Reservoir
10	Groesbeck Off-Channel Reservoir
11	Brushy Creek Reservoir
12	Belton-Stillhouse Pipeline
13	Lake Georgetown ASR
14	Lake Granger ASR
15	Lake Granger Augmentation

Figure 6.2 Location of Recommended Water Management Strategies Included in the Cumulative Impacts Analysis

Table 6.1 Recommended Water Management Strategies Included in the Cumulative Impacts Analysis

Recommended Water Management Strategy	WUG or WWP
Lake Creek Reservoir	North Central Texas Municipal Water Authority
Throckmorton Reservoir	City of Throckmorton
Cedar Ridge Reservoir	City of Abilene
Turkey Peak Dam – Lake Palo Pinto Enlargement	Palo Pinto County MWD No.1
Lake Whitney Reallocation	BRA - Multiple
Lake Aquilla Reallocation	BRA – Multiple
Bosque County Regional Project – Clifton Reservoir Enlargement	BRA - Multiple
Coryell County Off-Channel Reservoir	BRA - Multiple
Groesbeck Off-Channel Reservoir	City of Groesbeck

Recommended Water Management Strategy	WUG or WWP
Brushy Creek Reservoir	City of Marlin
Lake Georgetown Aquifer Storage and Recovery	BRA - Multiple
Lake Granger Aquifer Storage and Recovery	BRA - Multiple
Lake Granger Augmentation	BRA - Multiple

Table 6.2 Locations for Evaluating the Effects of Recommended Strategies on Streamflow and Inflows to the Brazos River Estuary

Location	WAM Control Point Identifier	Region Location (G/H)
Brazos River at South Bend	BRSB23	G
Brazos River near Glen Rose	BRGR30	G
Brazos River near Aquilla	BRAQ33	G
Bosque River near Waco	BOWA40	G
Little River near Cameron	LRCA58	G
Brazos River near Bryan	BRBR59	G
Brazos River near Hempstead	BRHE68	H
Brazos River at Richmond	BRRI70	H
Brazos River at Gulf of Mexico	BRGM73	H

Strategies requiring a new water right permit were simulated junior to all other appropriations in the Brazos River Basin including the BRA System Operations Permit. It was assumed during evaluation of most of the strategies that some form of priority calls agreement would be required between the BRA and the entity developing a new water supply project to more fully realize the yield potential of a project. These agreements were not included for new strategies in the cumulative impacts analysis, unless the entity sponsoring a strategy already has an agreement with the BRA. In all cases, the priorities of BRA's existing rights were honored, as simulated under system operations.

The existing priority calls agreements with the BRA and other water right holders were considered in this model run. The inclusion or exclusion of the subordination agreements does not affect the resulting streamflows at the selected locations in a substantive manner.

The cumulative effects of the recommended water management strategies on regulated streamflow were evaluated by comparing descriptive streamflow statistics for the base condition with those from the plan condition at the selected evaluation locations.

Figure 6.3 through Figure 6.11 present these comparisons for regulated streamflow at each of the evaluation locations. Regulated flow is the total streamflow remaining in the stream after all existing water rights have been exercised and other water management activities have taken place. It represents the total flow passing a location (control point) after all water rights have appropriated the flows to which they are entitled.

Many locations exhibit slightly larger median monthly flows with the implementation of the 2026 Plan than with the base condition. This is due primarily to altering of releases being made from upstream BRA reservoirs as part of the BRA System Operations due to the implementation of the recommended strategies.

The Brazos River near South Bend is the only location where the median streamflow would decrease in every month from the base conditions with the full implementation of the plan. These reductions are the result of the implementation of the Cedar Ridge, Lake Creek, and Throckmorton Reservoirs. The largest decrease would occur in April at 17% with all other months decreasing less than 10%. However, the streamflow frequency plot shows that the overall change to the flow regime is minor.

The Brazos River near Aquilla location shows decreases in median streamflow for 9 of the 12 months. The range of differences at this location is a 29% decrease in September to a 23% increase in March. Again, these differences are primarily attributed to the alteration of BRA System Operations reservoir releases and have a minor impact to the overall flow regime as shown in the streamflow frequency figure. The Bosque River near Waco location controls a relatively small watershed compared to the other locations investigated in this analysis. Changes associated with this location are relatively negligible. The Little River near Cameron location reflects changes from projects recommended for implementation in the Little River watershed, specifically the Lake Granger ASR and Augmentation strategies and the Lake Georgetown ASR strategy. While monthly median flows exhibit increases up to 46% in August, little difference is apparent in the overall frequency of flows.

The four most downstream locations, Brazos River near Bryan, Brazos River near Hempstead, Brazos River at Richmond, and the Brazos River at the Gulf of Mexico are all located on the main stem of the Brazos River and the changes in streamflow at these locations show similar trends. These locations are located downstream in the basin and downstream from the majority of the recommended water management strategies. These locations have the potential to be impacted by the implementation of any of the proposed strategies. New reservoir and diversion projects will tend to reduce streamflow at these locations, while alterations in the BRA System Operations tends to increase streamflows as releases from upstream reservoirs pass these locations to satisfy demands at downstream locations. The Bryan location shows decreases in median streamflow for all 12 months by as much as 41% and Hempstead sees 11 months with decrease in median streamflow by as much as 30%. At the Richmond location, all 12 months have a decrease in median flow by as much as 18%. As with the middle and upper basin streamflow locations, there is little difference in the overall frequency of flows at the lower basin locations. The Brazos River at the Gulf of Mexico location shows very little change in streamflow as streamflow at this location is already heavily regulated by industrial water rights located upstream.

Overall the cumulative effects of the implemented plan will have a slight to modest effect on streamflows in the Brazos Basin with both increases and decreases. Locations below new reservoirs or reservoirs with augmented supplies will generally experience reduced streamflows; although generally not to a significant level, and the detrimental effects of these reductions can be minimized with proper consideration of reservoir pass-through requirements to maintain flows necessary to meet the needs of the environment. In summary, none of the locations will experience significantly different streamflows with implementation of the recommended water management strategies in the 2021 Plan.

6.1.2 Groundwater

Recommended water management strategies involving additional development of groundwater would increase total groundwater usage by entities in the Brazos G Area by slightly more than 140,046 acft/yr by 2080. The greatest increase occurs in the Carrizo-Wilcox Aquifer where strategies involving groundwater development for Brazos G entities would increase pumping by about 93,181 acft/yr 2080 over what is considered to be existing supplies. In the Carrizo-Wilcox, strategies include an additional 74,581 acft/yr of pumping by 2080. Overall, the amount of groundwater identified for water management strategies is rather modest in comparison to the amount from all the other water management strategies. However, the development of groundwater is likely to be concentrated in a few areas, which could experience noticeable declines in groundwater levels. However, none of the strategies increase projected groundwater pumpage beyond the Modeled Available Groundwater (MAG) established by county and aquifer. Thus, projected groundwater conditions are expected to be within the Desired Future Conditions (DFC) and within a range that the local groundwater conservation districts consider manageable.

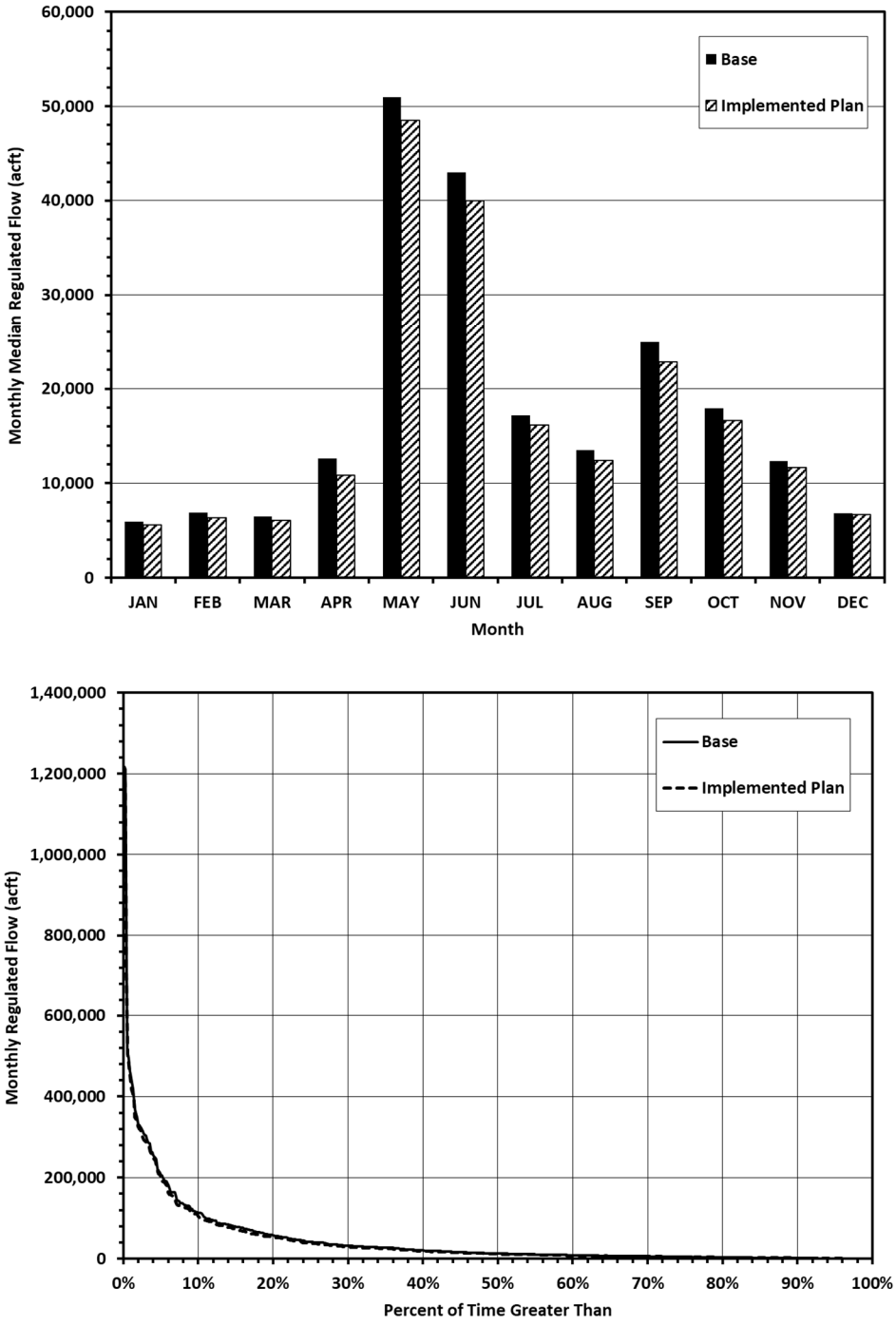


Figure 6.3 Effects of Plan Implementation on Streamflows – Brazos River at South Bend

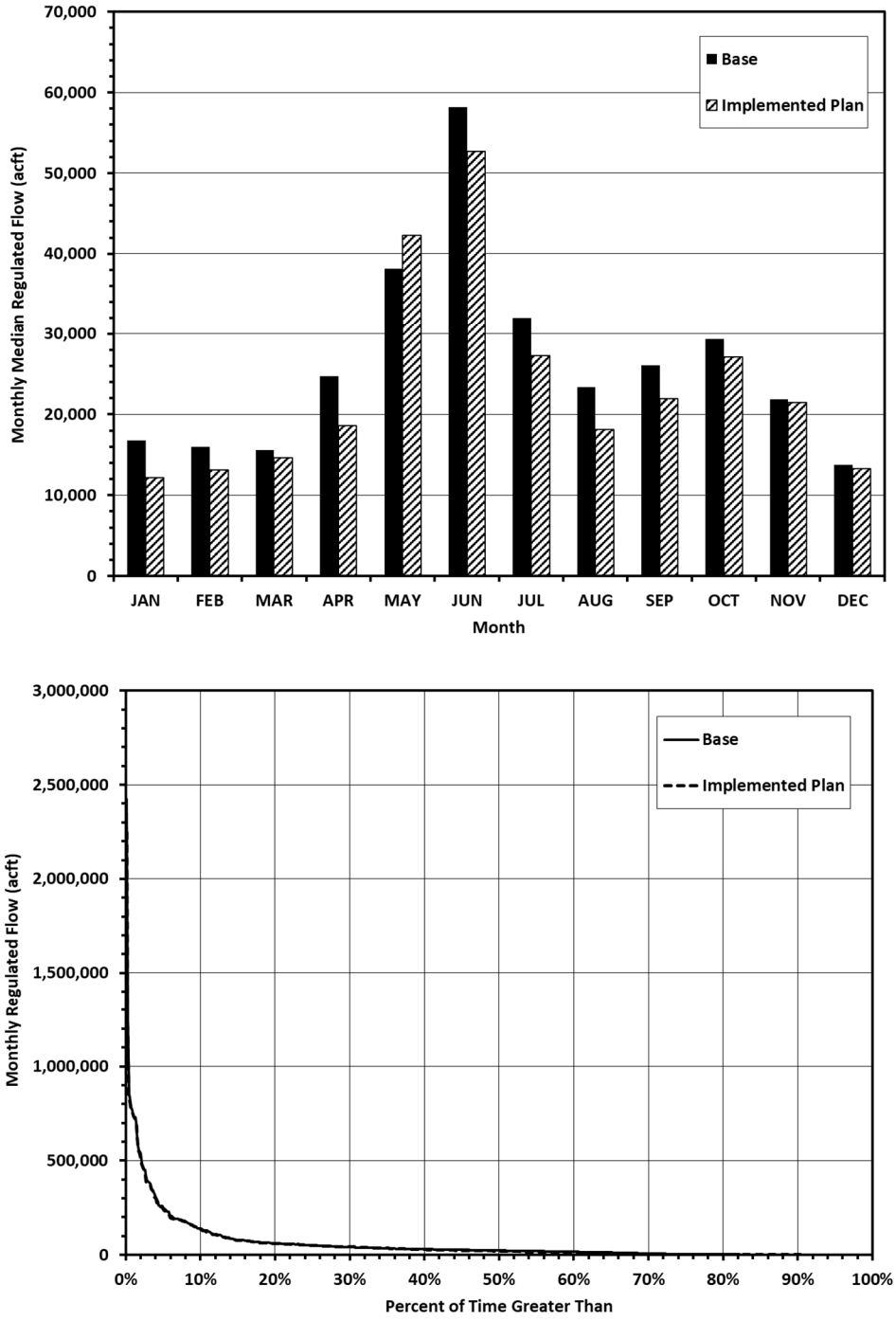


Figure 6.4 Effects of Plan Implementation on Streamflows – Brazos River near Glen Rose

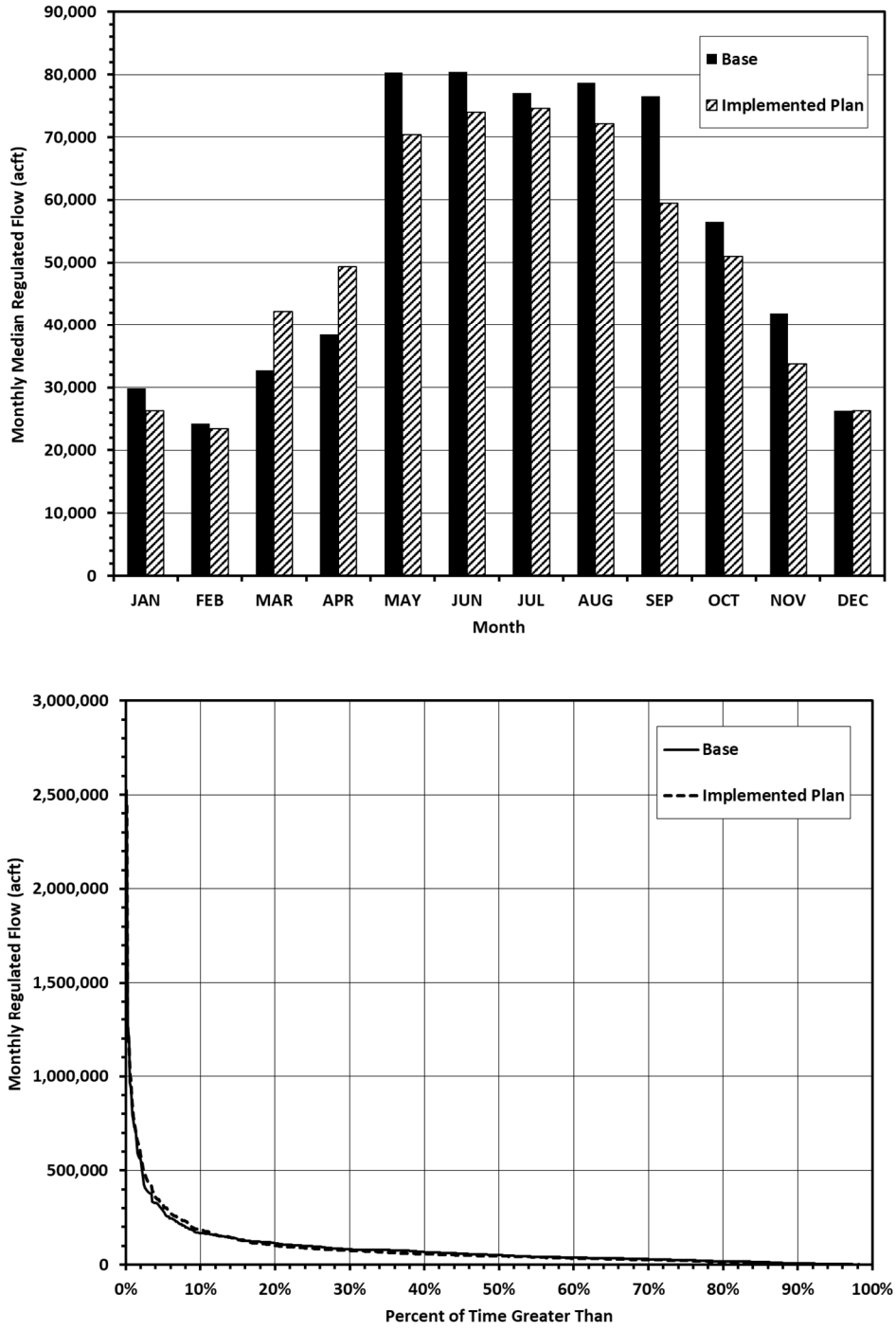


Figure 6.5 Effects of Plan Implementation on Streamflows – Brazos River near Aquilla

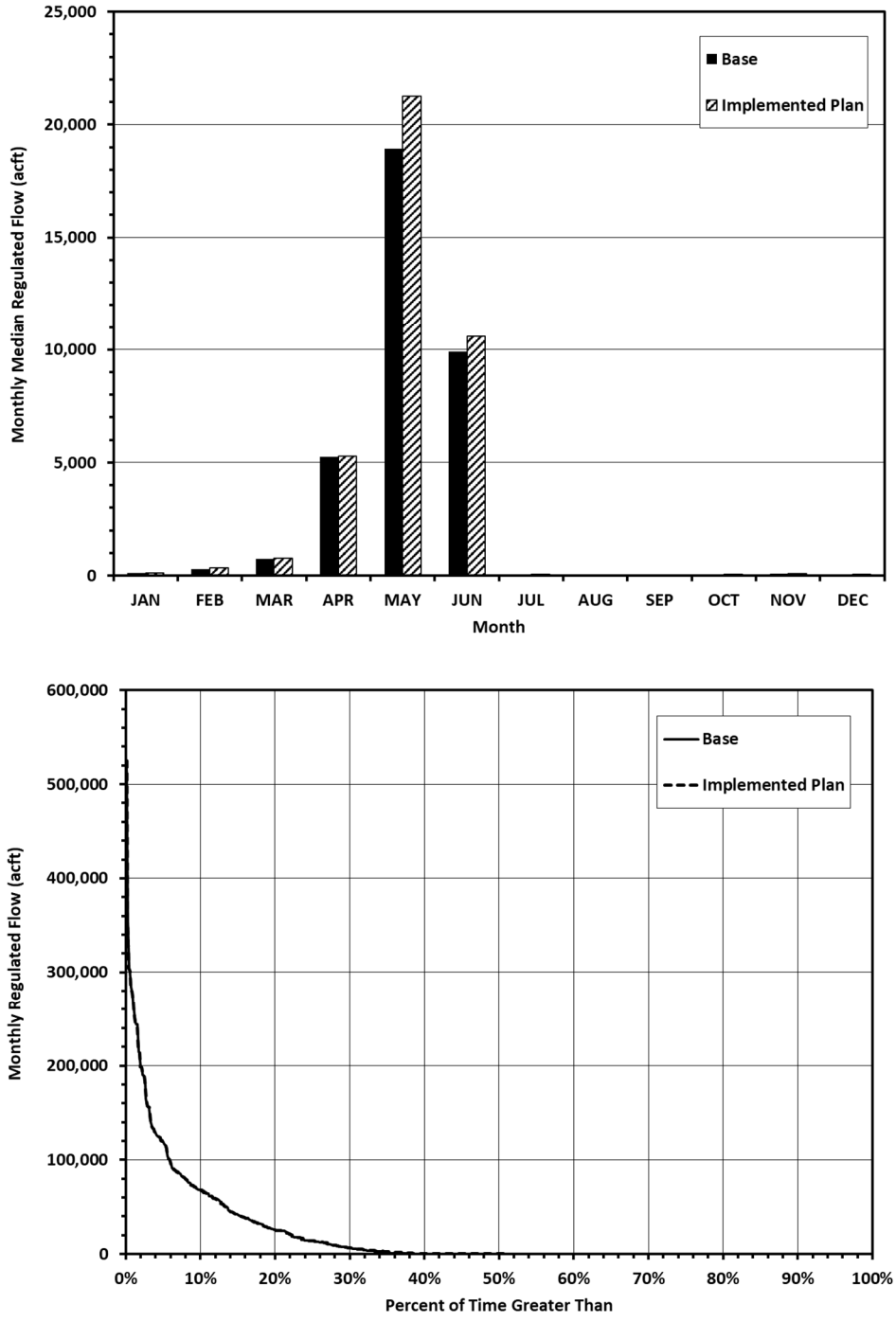


Figure 6.6 Effects of Plan Implementation on Streamflows – Bosque River near Waco

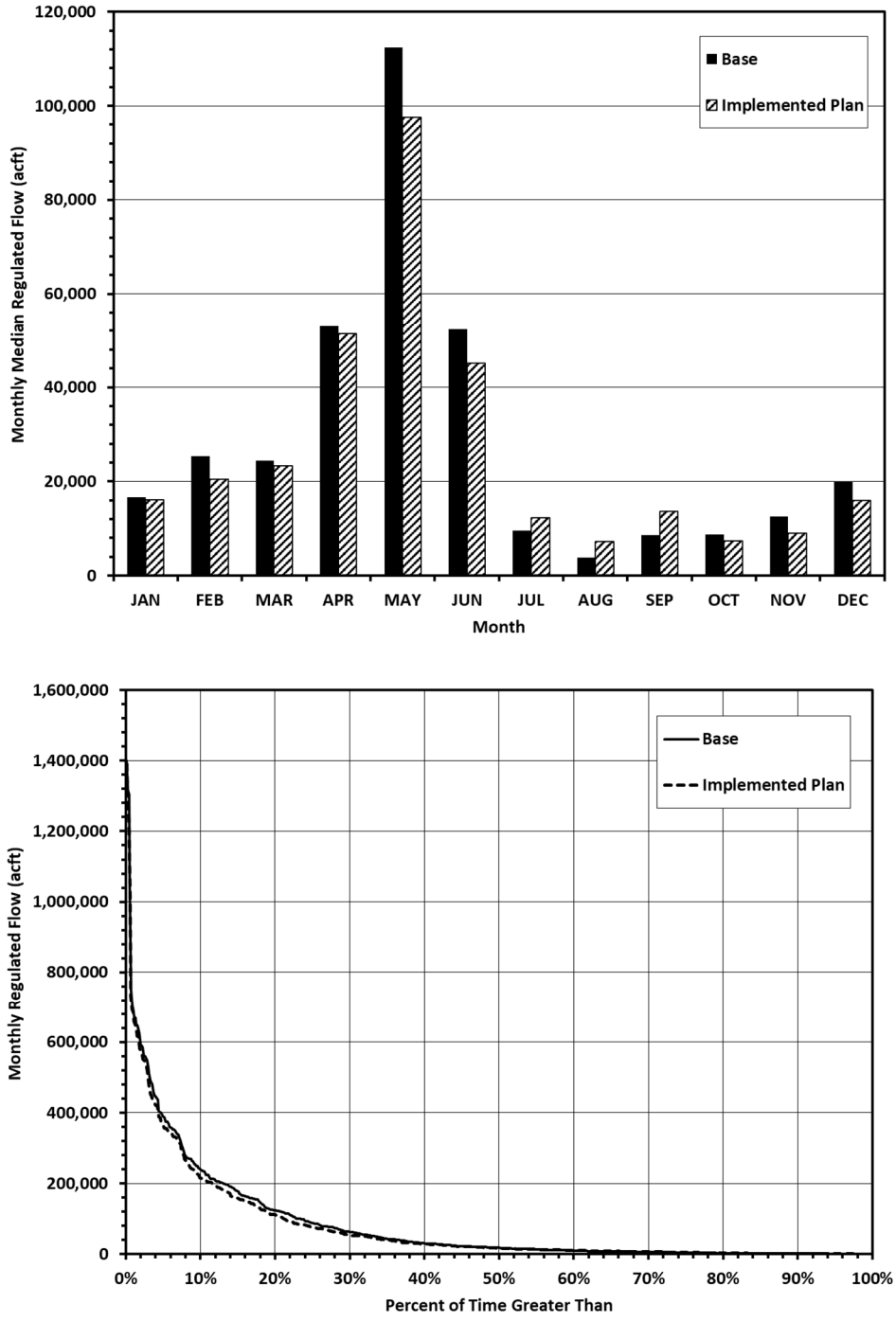


Figure 6.7 Effects of Plan Implementation on Streamflows – Little River near Cameron

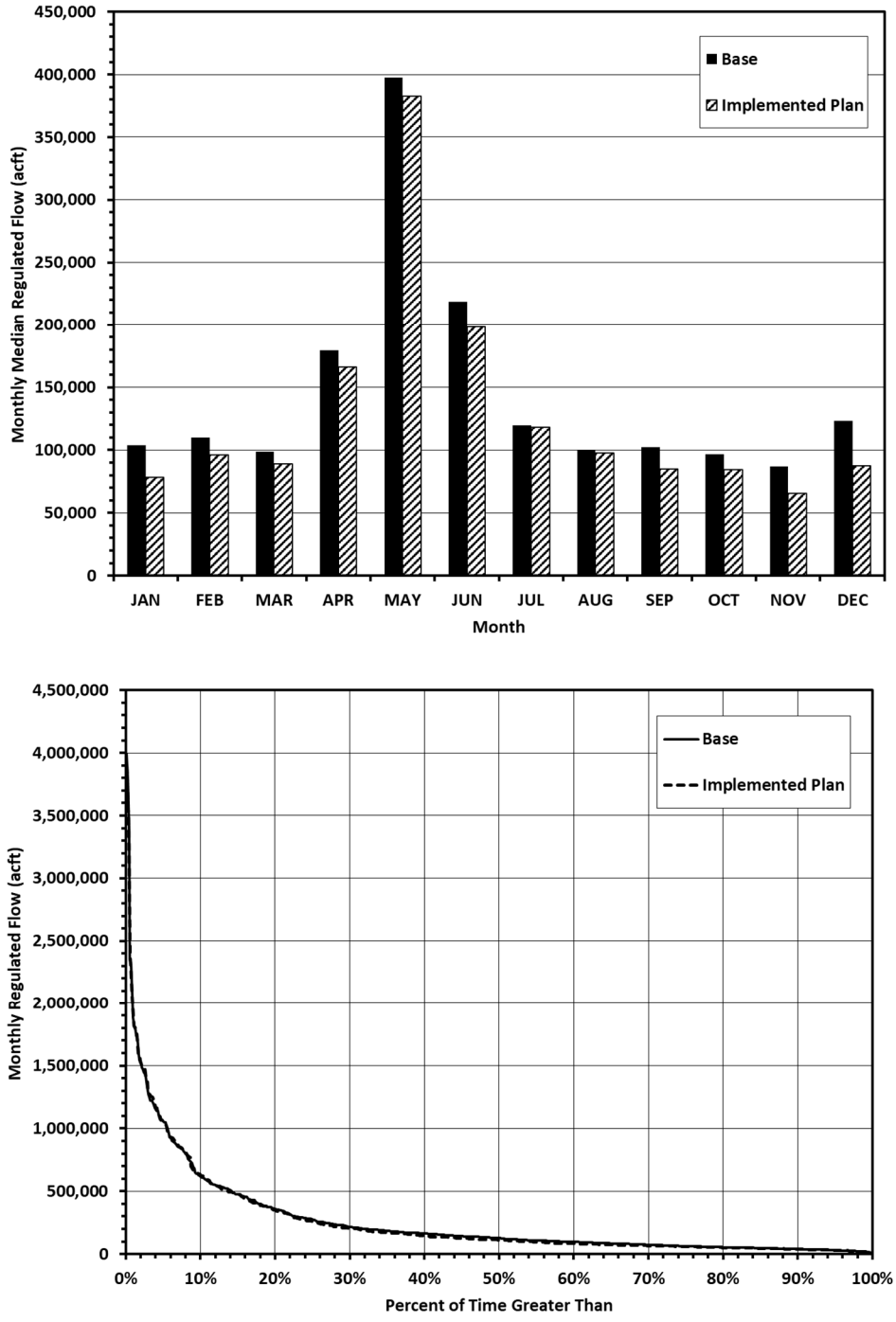


Figure 6.8 Effects of Plan Implementation on Streamflows – Brazos River near Bryan

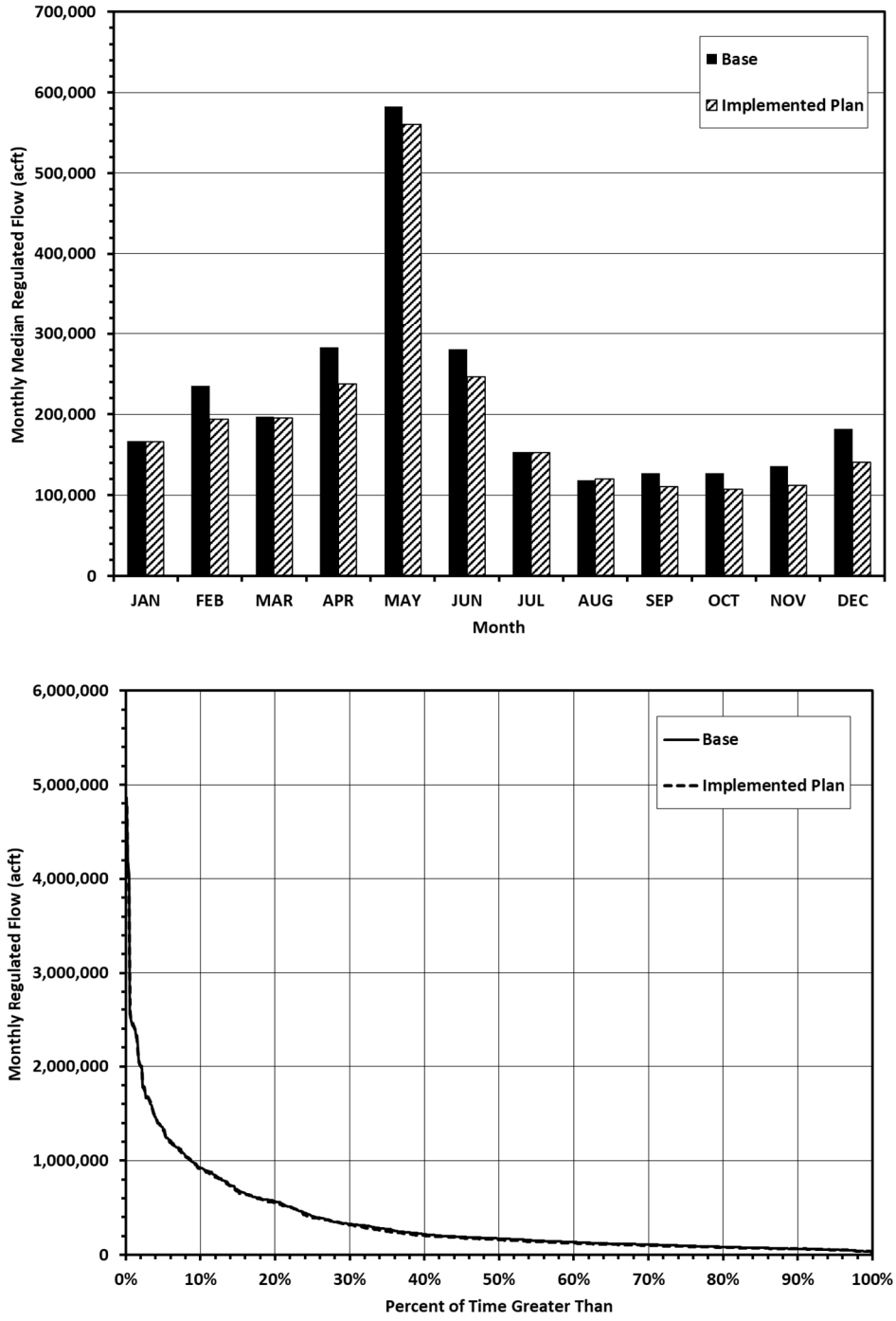


Figure 6.9 Effects of Plan Implementation on Streamflows – Brazos River near Hempstead

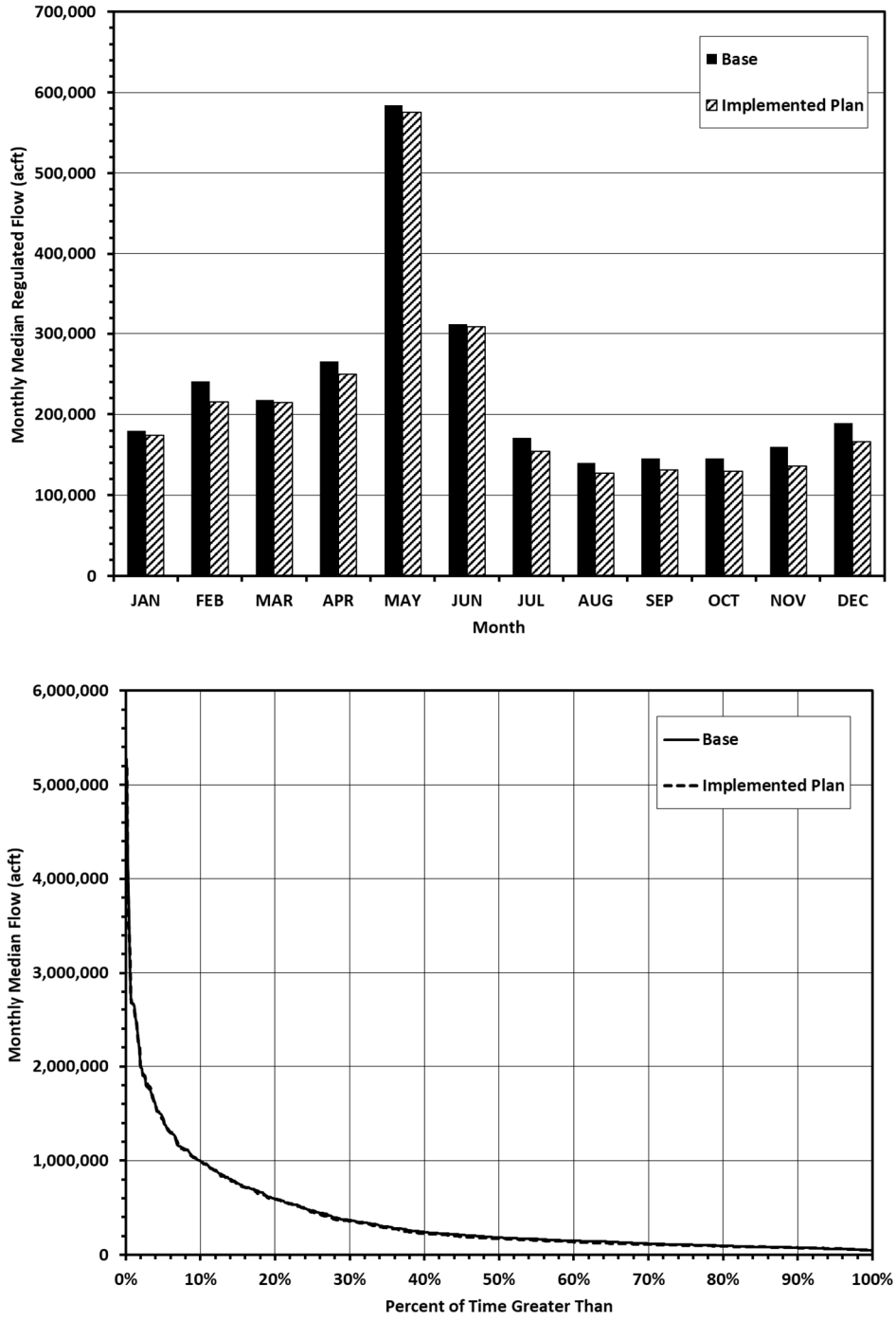


Figure 6.10 Effects of Plan Implementation on Streamflows – Brazos River at Richmond

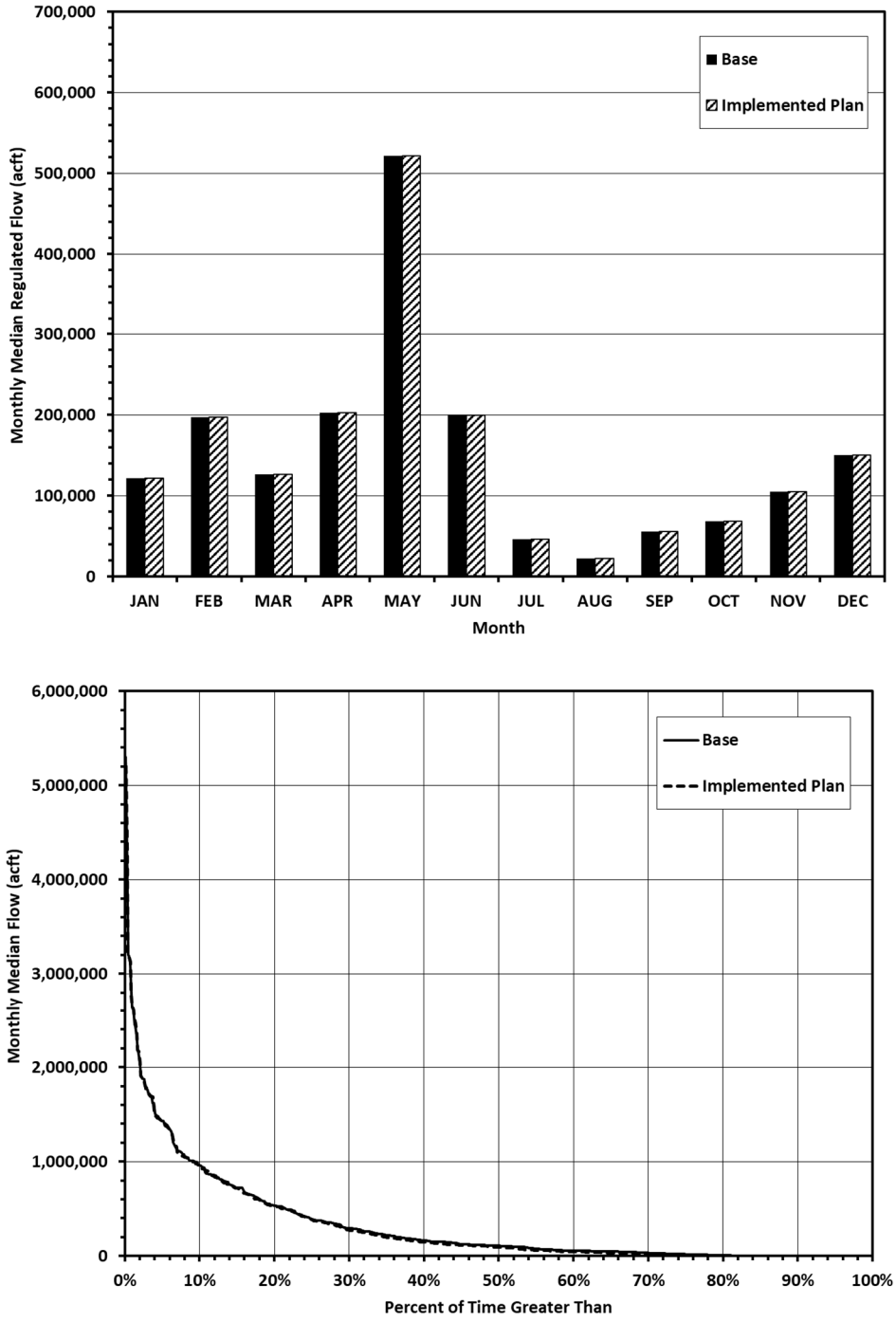


Figure 6.11 Effects of Plan Implementation on Streamflows – Brazos River at Gulf of Mexico

6.2 Summary of the Environmental Effects of the 2026 Brazos G Regional Water Plan

Overall, the strategies recommended in the 2026 Plan will have limited negative effects on the environment. The largest localized impacts will be from new reservoirs. New reservoirs recommended as strategies in the 2026 Plan (Lake Creek Reservoir, Cedar Ridge Reservoir, Throckmorton Reservoir, Lake Palo Pinto Enlargement, Clifton Reservoir Enlargement, Coryell County Off-Channel Reservoir, City of Groesbeck Off-Channel, and Brushy Creek Reservoir) will inundate more than 12,600 acres, reducing wildlife habitat, bottomland hardwood forestland and cultivated farmland as documented in the individual strategy evaluations (Volume II). Permitting for these projects will require mitigation land of at least equal ecological value, reducing the negative environmental consequences of the projects. Streamflows immediately downstream from these projects will decrease, but permit requirements will also specify reservoir pass-through flows necessary to maintain ecological health in the downstream receiving stream.

Many elements of the 2026 Plan augment existing resources and delay or eliminate the need for new constructed projects. For example, the BRA's System Operations will make better use of existing reservoir facilities and make available additional supply that previously would have only been made available through construction of a major water supply project. Utilization of water from the Colorado River Basin's Highland Lakes System in Williamson County reduces the need for new major water supply projects to serve Williamson County needs. The utilization of reuse water by several WUGs and WWPs will extend supplies and could delay the need for new raw water projects. Augmentation of Lake Granger through conjunctive use with an Aquifer Storage and Recovery (ASR) project maximizes the use of the existing reservoir facility.

Overall the strategies recommended in the 2026 Plan maximize use of existing resources and reduce the need for several large, costly reservoir projects, minimizing impacts to the environment.

6.3 Impacts of Recommended Water Management Strategies on Key Parameters of Water Quality and Moving Water from Rural and Agricultural Areas

The guidelines for 2026 Regional Water Plans include describing major impacts of recommended water management strategies on key parameters of water quality identified by the regional water planning group and consideration of third party social and economic impacts associated with voluntary redistribution of water from rural and agricultural areas.

6.3.1 Impacts of Water Management Strategies on Key Parameters of Water Quality

The Brazos G RWPG has identified the following eleven key parameters of water quality to consider for recommended water management strategies:

- Chlorides.
- Sulfates.
- Total Dissolved Solids (TDS).

- Total Suspended Solids (TSS).
- Dissolved Oxygen.
- pH Range.
- Indicator Bacteria (Escherichia coli or fecal coliform).
- Temperature.
- Nitrates.
- Total Phosphorous.
- Total Nitrogen- ammonia.

The selection of key water quality parameters is based on Texas Surface Water Quality Standards Chapter 307, current water quality concerns identified in the Brazos River Authority's Basin Highlights Report, water user concerns expressed during Brazos G RWPG meetings, and regional water quality studies. Total Phosphorous and Total Nitrogen were selected based on nutrient concerns in the North Bosque Watershed and will be considered throughout the Brazos G Area.

The major impacts of recommended water management strategies on key parameters of water quality were identified by the Brazos G RWPG pursuant to Texas Administrative Code Chapter 357-Regional Water Planning Guidelines. The recommended water management strategies for the Brazos G Area and effects of the key water quality parameters are presented in Table 6-3.

Water quality concerns affecting existing supplies are described in greater detail in Chapter 3.3, which also includes a summary of special water quality studies and activities in the Brazos River Basin. These identified water quality concerns present challenges that may need to be overcome before a water management strategy can be used as a water supply. For water quality parameters that cannot be fully addressed due to lack of available information or inconclusive water quality studies, the Brazos G RWPG recommends further studies prior to implementing a water management strategy.

6.3.2 Impacts of Voluntary Redistribution of Water from Rural and Agricultural Areas

Several opportunities for voluntary redistribution exist for the Brazos G Area, such as supplying groundwater from the Carrizo-Wilcox Aquifer in Lee County to water users in Milam County. If there is increased groundwater pumping it could result in lowering of artesian levels in the Carrizo-Wilcox Aquifer and, consequently, may increase costs to pump water for water supply for rural and agricultural users.

The remaining water management strategies recommended to meet water needs (Chapter 5) do not include transferring significant quantities of water needed by rural and agricultural users and, therefore, are not considered to impact them.

Table 6.3 Summary of Water Management Strategies, Potential Water Quality Concerns, and WUGs Potentially Affected

Recommended WMS	Project Origination	Beneficiaries of Project	Potential Water Quality Concerns Affecting Use of Supply
Treated Effluent Reuse	Bell, Brazos, Johnson, McLennan, Williamson	Manufacturing (Bell and McLennan Counties) Mining (Johnson and McLennan Counties) Steam-Electric (Brazos and Johnson Counties); Municipal (Cities of Bryan, College Station, Cleburne, Waco, Bellmead, Lacy-Lakeview, Hewitt, Lorena, Harker Heights, Killeen, Brushy Creek MUD, Cedar Park, Cleburne, Georgetown and 439 WSC)	Indicator bacteria
Water Conservation	Varies	All municipal, industrial, and agricultural users with projected needs (shortages)*	Total dissolved solids, sulfates, and chlorides
Interbasin Transfer of Surface Water from Lower Colorado River Basin (Region K)			
BCRUA	Varies	Municipal (Leander, Liberty Hill, Round Rock, Florence, County-Other [Williamson], Corix Utilities and Cedar Park)	None identified
New Reservoirs			
Brushy Creek Reservoir	Falls	Municipal (City of Marlin)	None identified
Cedar Ridge Reservoir	Clear Fork	Municipal (City of Abilene, County-Other [Taylor], Merkel, Potosi WSC, Roscoe, Steamboat WSC, Sweetwater, The Bitter Creek WSC and Tye); Irrigation (Taylor County) Manufacturing (Nolan County); Mining (Nolan and Taylor Counties)	None identified
Clifton Lake	Bosque	Municipal (City of Clifton, Meridian, Valley Mills, Childress Creek WSC and County-Other [Bosque])	
Coryell County OCR	Coryell	Municipal (Gatesville, Flat WSC, County-Other [Coryell] and Multi-County WSC)	None identified
Groesbeck OCR	Limestone	Municipal (City of Groesbeck)	None identified
Lake Creek Reservoir	Throckmorton and Baylor	Municipal (North Central Texas Municipal Water Authority, Haskell, Knox City and Munday)	Total dissolved solids, sulfates, and chlorides from Brazos River diversion
Throckmorton Reservoir	Throckmorton	Municipal (City of Throckmorton and Graham)	None identified
Wheeler Branch OCR	Somervell	Municipal (Somervell County Water District, Glen Rose and County-Other [Somervell]); Steam-Electric (Somervell)	

Recommended WMS	Project Origination	Beneficiaries of Project	Potential Water Quality Concerns Affecting Use of Supply
Augmentation of Existing Surface Water Supplies			
Lake Aquilla Reallocation	Hill	BRA	None identified
Lake Whitney Reallocation	Bosque/Hill	BRA	None identified
Lake Granger ASR	Williamson	BRA	Increasing trends in sulfates, chlorides, elevated nutrients, and sedimentation from total suspended solids
Lake Granger Augmentation	Williamson	BRA	Increasing trends in sulfates, chlorides, elevated nutrients, and sedimentation from total suspended solids
Lake Georgetown ASR	Williamson	BRA	Increasing trends in sulfates, chlorides, elevated nutrients, and sedimentation from total suspended solids
Turkey Peak Dam – Lake Palo Pinto Enlargement	Palo Pinto	Municipal (Palo Pinto County MWD No. 1, Santo SUD, Count-Other [Palo Pinto] and Mineral Wells); Irrigation (Palo Pinto County)	None identified
Bryan ASR	Brazos	Municipal (City of Bryan)	
College Station ASR	Brazos	Municipal (City of College Station)	
Johnson County ASR	Johnson	Municipal (Johnson County SUD)	
McLennan County ASR	McLennan	Municipal (City of Mart, Waco and North Bosque WSC)	
System Approaches			
BRA System Operations	Varies	Manufacturing (Bosque and Hill Counties); Steam/Electric (Bosque and Somervell Counties); Municipal (Bell County WCID #1, Bosque County-Other, Brandon-Irene WSC, City of Hillsboro, White Bluff community WS and Woodrow-Osceola WSC)	Chlorides, total dissolved solids, total suspended solids, and nutrients
Lake Belton-Lake Stillhouse Pipeline	Bell	BRA	None identified
Groundwater Development			

Recommended WMS	Project Origination	Beneficiaries of Project	Potential Water Quality Concerns Affecting Use of Supply
Blaine Aquifer	Stonewall, Knox, Fisher, Nolan	Mining (Stonewall, Knox counties); Irrigation (Knox County); Municipal (The Bitter Creek WSC)	Chlorides and total dissolved solids
Brazos River Alluvium	McLennan	Mining, Irrigation	Chlorides and total dissolved solids
Carrizo-Wilcox Aquifer	Brazos, Lee, Robertson, Limestone, Milam, Burleson, Williamson, Bell, Burnet	Mining (Lee county); Manufacturing (Limestone County); Steam Power (Limestone); Municipal (Robertson County-Other, Bryan, Bistone MWSD, Hutto, Georgetown, College Station, Southwest Milam WSC, Rockdale, Robertson County WSM, Milam County-Other, Mexia)	Iron and manganese and temperature (deep wells only)
Dockum Aquifer	Fisher	Manufacturing; Mining	None identified
Edwards Aquifer	Bell, Nolan, Williamson	Irrigation (Bell and Williamson Counties); Manufacturing (Bell and Nolan Counties); Mining (Bell and Nolan counties); Municipal (Roscoe)	None
Trinity Aquifer	Bell, Bosque, Comanche, Coryell, Erath, Hamilton, Hood, Somervell, McLennan, Eastland, Williamson, Falls, Hill, Johnson, Palo Pinto	Mining (Hood, Somervell, Comanche, Eastland, Coryell, Bell, Palo Pinto counties); Manufacturing (Erath, Hamilton counties); Irrigation (Hamilton, Bosque, McLennan, Palo Pinto counties); Municipal (Bartlett, Comanche County-Other, Coryell County-Other, Erath County-Other, Hill County-Other, Hood County-Other, McLennan County-Other, Williamson County-Other, Acton MUD, Axtell WSC, Bell County WCID 2, Bethesda WSC, Brandon Irene WSC, Chalk Bluff WSC, Crawford, Double Diamond Utilities, East Crawford WSC, Gholson WSC, Godley, Gordon, Highland Park WSC, Itasca, Johnson County SUD, Levi WSC, Lipan, Parker WSC, Spring Valley WSC, Stephenville, Strawn, Tolar, Woodrow Osceola WSC, Woodway)	Chlorides and total dissolved solids
Gulf Coast Aquifer	Grimes, Washington, Lampasas	Irrigation (Grimes County); Manufacturing (Washington County); Mining (Grimes and Washington Counties); Municipal (Brenham, Central Washington County WSC, Corix Utilities and Grimes County-Other)	None identified
Seymour Aquifer	Kent, Jones, Fisher	Municipal (Kent County-Other, Jones County-Other, Fisher County-Other)	Chlorides and total dissolved solids
Sparta Aquifer	Burleson, Brazos, Grimes, Robertson	Manufacturing (Burleson County); Mining (Brazos County); Municipal (Wickson Creek SUD)	Iron and manganese

Recommended WMS	Project Origination	Beneficiaries of Project	Potential Water Quality Concerns Affecting Use of Supply
Woodbine Aquifer	Hill, Johnson	Irrigation (Hill County); Municipal (Hill County-Other, Bethesda WSC, Chatt WSC, Grandview, Johnson County SUD)	Chlorides, total dissolved solids, iron and manganese
Yegua-Jackson Aquifer	Brazos, Robertson	Mining (Brazos County); Municipal (Brazos County-Other, Willborn SUD)	Chlorides and total dissolved solids
College Station GW Desal	Brazos	College Station	
Cross Timbers Aquifer	Throckmorton, Young	Municipal (Young County-Other); Irrigation (Throckmorton and Young Counties); Livestock (Young County); Manufacturing (Young County); Mining (Throckmorton and Young Counties)	
Williamson County GW – South Option	Williamson, Bell, Coryell	Williamson County-Other, Elm Creek WSC, Hutto, Round Rock	
Texas A&M Sparta Aquifer	Brazos	Texas A&M University	
Queen City Aquifer	Burleson, Milam	Manufacturing (Burleson); Mining (Milam)	
Marble Falls Aquifer	Lampasas	Irrigation	
Falls County – Brazos River Alluvium	Falls	County-Other	
Lee County - GW	Lee	County-Other	

Note:
(1) For municipal users with shortages, additional conservation was recommended only for WUGs exceeding their target GPCDs, which is 140 GPCD for most WUGs and 120 GPCD for selected WUGs in Williamson County.

6.4 Social and Economic Impacts of Not Meeting Projected Water Needs

Section 357.7(4) of the rules for implementing Senate Bill 1 requires that the social and economic impacts of not meeting regional water supply needs be evaluated by regional water planning groups. The Texas Water Development Board (TWDB) has provided technical assistance by conducting the required analysis for the Brazos G Area using a methodology similar to that used for other regions.

The purpose of this element of Senate Bill 1 planning is to provide an estimate of the social and economic importance of meeting projected water needs or, conversely, to provide estimates of potential costs of not meeting the projected needs of each WUG. The social and economic effects of not meeting a projected water need can be viewed as the potential benefit to be gained from implementing a strategy to meet the particular need. The summation of all the impacts provides a view of the ultimate magnitude of the economic impacts of not meeting all the projected needs.

The analysis conducted by the TWDB is summarized in a report included in Appendix G. Note that the needs upon which the TWDB analysis is based are those needs identified in the water planning database as of September 4, 2019. Needs have changed in a few instances since that date as estimates of supplies and contractual commitments were refined during the planning process based on information provided by WUGs and WWPs after September 4, 2019. However, those changes are unlikely to have made a significant difference in the TWDB's analysis.[The socioeconomic report will not be available after the IPP. This section will be updated as part of the final RWP adoption.]

6.5 Needs Left Unmet in the 2026 Brazos G Regional Water Plan

Table 6.4 and Table 6.5 summarizes the needs left unmet for the Brazos G primary WUGs, by water use category and by WUGs. Additional details are discussed in Sections 6.5.1 and 6.5.2.

6.5.1 Municipal Needs Unmet in 2030

For a regional water plan to be approved by the TWDB with any unmet municipal needs, Texas Administrative Code 357.50(j)(1-3) states that the regional water planning group includes adequate justification, including the following requirements:

> *"(1) documents that the RWPG considered all potentially feasible WMSs, including Drought Management WMSs and contains an explanation why additional conservation and/or Drought Management WMSs were not recommended to address the need;"*

The BGRWPG identified no potentially feasible strategies that could be implemented prior to 2030, i.e., the first planning decade, for these municipal WUGs. The BGRWPG has already recommended advance water conservation for WUGs with baseline GPCDs higher than their associated targets as water conservation is likely a chapter alternative for many WUGs than acquiring new supplies.

The BGRWPG does not recommend Drought Management as a recommended water management strategy to meet needs. Drought management measures reduce water demands during times of drought, and do not make more efficient use of existing resources. Applying drought management measures is

equivalent to not meeting the projected water demands, per our explanation in Chapter 7 (section 7.6), and the BGRWPG prefers to show the needs projected for municipal WUGs in 2030 as not being met during a drought equivalent to the drought of record rather than artificially showing them as met by reducing demands during drought.

> *"(2) describes how, in the event of a repeat of the Drought of Record, the municipal WUGs associated with the unmet need shall ensure the public health, safety, and welfare in each Planning Decade that has an unmet need; and"*

While the BGRWPG does not recommend Drought Management as a water management strategy to meet projected needs for municipal WUGs, the BGRWPG recognizes that such measures will be implemented by utilities as outlined in their individual Drought Contingency Plans. These measures can prolong supply and reduce impacts to communities by limiting water use to only essential water uses in order to protect public health, safety and welfare.

The Brazos G Area is vast with many relatively isolated communities with limited water supply alternatives. If Drought Management were to be recommended, this could provide a false sense of security that "needs are met", when, in actuality, projected water demands would not be met. In the event of a drought worse than the drought of record, this approach could further imperil a community because the benefits of drought management have already been realized in the plan and there are no additional management strategies that can be employed in response to the drought.

> *"(3) explains whether there may be occasion, prior to development of the next IPP, to amend the RWP to address all or a portion of the unmet need."*

There will be limited opportunity or need to amend the 2026 Plan prior to development of the next initially prepared plan to address the unmet municipal needs. The 2026 Brazos G Regional Water Plan includes unmet municipal needs in all planning decades as well as the percentage of demand left unmet in 2030. Any amendments would have to be accomplished and include strategies that would come online prior to 2030, which is 4 years after the adoption of the 2026 RWP. Therefore, the identification of those strategies by the Brazos G RWPG is unlikely. However, entities in Brazos G Regional Planning Area can either contact the Brazos G RWPG for additional assistance or develop their own strategies to mee their needs.

6.5.2 Non-Municipal Needs Unmet

The Brazos G RWPG has opted to leave certain projected needs unmet for some county-aggregated non-municipal WUGs in the 2026 Brazos G Regional Water Plan for the following reasons. Table 6.5 lists those unmet non-municipal needs.

- Irrigation
  - No economically viable supply can be developed.
- Livestock
  - Small need in 2030 only.
- Manufacturing
  - Small need in 2030 only.
- Mining

- » No reasonable supply can be developed.
- » Mining customers are encouraged to explore reuse options to address their supply shortfalls. However, the BGRWPG does not provide individual WMSs for mining customers due to the absence of a sponsor. It is expected that mining customers will develop their own reuse strategies as the need arises.

- Steam-Electric
  - » No reasonable supply can be developed.

Table 6.4 Needs Left Unmet for Brazos G Primary WUGs by Use Category

WUG Type	Needs left Unmet (ac-ft/yr)						Percent of Overall Demands left Unmet in 2030
	2030	2040	2050	2060	2070	2080	
Municipal	27,096	52,337	86,055	108,681	132,173	175,899	5%
Irrigation	44,627	39,788	35,495	32,729	34,748	34,996	14%
Livestock	805	805	839	878	914	949	2%
Manufacturing	1,169	1,241	1,973	2,093	2,211	2,342	7%
Mining	7,734	7,474	7,401	7,537	6,679	6,791	28%
Steam Electric Power	15,163	15,910	12,811	14,762	16,716	18,702	10%
Total Brazos G WUGs	**96,594**	**117,555**	**144,574**	**166,680**	**193,441**	**239,679**	**9%**

Note: Draft values are subject to change and represent WUG as a whole, including splits outside of Brazos G. All Brazos G primary WUGs are included in the sum above.

Table 6.5 Needs for WUGs Left Unmet in the 2026 Brazos G Regional Water Plan

WUG Type	WUG Name	Counties	Needs left Unmet (ac-ft/yr)				
			2030	2040	2050	2060	20
Municipal	Bell County WCID 3	Bell	132	401	894	1,387	1,5
Municipal	Belton	Bell	0	0	0	270	3
Municipal	Benjamin	Knox	21	19	9	11	
Municipal	Bethesda WSC	Tarrant, Johnson	157	143	396	392	2
Municipal	Bistone Municipal Water Supply District	Limestone	0	10	73	57	2
Municipal	Brandon Irene WSC	Navarro, Hill	52	40	13	0	
Municipal	Brushy Creek MUD	Williamson	13	7	5	5	
Municipal	Bryan	Brazos	0	0	0	0	
Municipal	Burleson	Tarrant, Johnson	88	158	133	366	4
Municipal	Cedar Park	Williamson, Travis	1,035	919	391	391	3
Municipal	Cego-Durango WSC	Falls	0	6	34	58	8
Municipal	Central Texas College District	Bell, Coryell	145	128	111	93	7
Municipal	Copperas Cove	Coryell, Lampasas	0	1,026	2,374	3,253	3,0
Municipal	Corix Utilities Texas Inc	Mitchell, Lampasas, Washington, Blanco, Burnet, Colorado, Llano, Matagorda, Mills, San Saba	810	830	898	967	1,0
Municipal	County-Other, Bell	Bell	0	86	120	58	
Municipal	County-Other, Comanche	Comanche	1	0	0	0	
Municipal	County-Other, Erath	Erath	0	0	0	0	
Municipal	County-Other, Falls	Falls	31	0	0	0	
Municipal	County-Other, Grimes	Grimes	199	229	255	265	2
Municipal	County-Other, Hill	Hill	127	134	153	175	1
Municipal	County-Other, Hood	Hood	539	1,024	1,900	2,759	3,1
Municipal	County-Other, Jones	Jones	85	30	0	0	
Municipal	County-Other, Knox	Knox	2	2	1	1	
Municipal	County-Other, Lee	Lee	5	2	0	0	
Municipal	County-Other, McLennan	McLennan	0	169	214	232	2
Municipal	County-Other, Nolan	Nolan	18	14	7	0	
Municipal	County-Other, Robertson	Robertson	45	19	0	0	
Municipal	County-Other, Washington	Washington	1	1	1	0	
Municipal	County-Other, Williamson	Williamson	4,786	11,220	15,021	14,688	14,
Municipal	County-Other, Young	Young	20	31	44	62	7
Municipal	Cross Country WSC	Bosque, McLennan	0	0	0	0	
Municipal	Double Diamond Utilities	Hill, Johnson, Palo Pinto	381	310	273	232	1

WUG Type	WUG Name	Counties	Needs left Unmet (ac-ft/yr)				
			2030	2040	2050	2060	20
Municipal	Elm Creek WSC	Bell, Coryell, McLennan	95	115	109	84	5
Municipal	Eula WSC	Callahan	114	118	122	126	13
Municipal	Florence	Williamson	74	84	94	104	11
Municipal	Fort Belknap WSC	Stephens, Throckmorton, Young	0	0	0	17	2
Municipal	Fort Griffin SUD	Shackelford, Stephens, Throckmorton	9	5	5	4	
Municipal	Georgetown	Bell, Williamson, Burnet	0	16,727	39,571	51,198	62,
Municipal	Gholson WSC	Hill, McLennan	0	0	49	0	
Municipal	Godley	Johnson	0	0	0	0	2
Municipal	Gordon	Erath, Palo Pinto	26	4	0	0	
Municipal	Graham	Young	1,356	1,097	253	89	
Municipal	Haskell	Haskell	538	473	0	0	
Municipal	Hilco United Services	Ellis, Bosque, Hill	1,013	924	889	925	9
Municipal	Hog Creek WSC	Bosque, McLennan	91	52	12	0	
Municipal	Hutto	Williamson	752	0	266	1,703	4,4
Municipal	Itasca	Hill	1	1	1	1	
Municipal	Jarrell-Schwertner	Bell, Williamson	2,938	3,625	4,058	4,502	4,9
Municipal	Johnson County SUD	Tarrant, Johnson	559	383	748	1,020	9
Municipal	Jonah Water SUD	Williamson	1,690	3,273	5,212	7,824	10,
Municipal	Killeen	Bell	0	0	0	0	6
Municipal	Knox City	Knox	163	138	0	0	
Municipal	Leander	Williamson, Travis	1,019	100	530	48	1,1
Municipal	Levi WSC	Falls, McLennan	89	104	112	105	1
Municipal	Mexia	Limestone	767	729	685	657	6
Municipal	Mineral Wells	Parker, Palo Pinto	0	0	0	0	
Municipal	Multi County WSC	Coryell, Hamilton, Lampasas	4	5	5	5	
Municipal	Munday	Knox	202	183	0	0	
Municipal	Paloma Lake MUD 1	Williamson	128	134	137	138	13
Municipal	Paloma Lake MUD 2	Williamson	103	108	110	111	1
Municipal	Post Oak SUD	Navarro, Hill, Limestone	183	122	72	44	3
Municipal	Prairie Hill WSC	Limestone, McLennan	256	242	243	255	2
Municipal	Rio Vista	Hill, Johnson	1	1	1	1	
Municipal	Round Rock	Williamson, Travis	804	1,037	1,268	1,316	1,3
Municipal	Santo SUD	Parker, Hood, Palo Pinto	7	11	16	20	2
Municipal	Somervell County Water District	Somervell	661	504	308	139	1
Municipal	Sonterra MUD	Williamson	936	2,267	3,843	5,551	7,4
Municipal	Staff WSC	Eastland, Stephens	0	0	0	0	
Municipal	Stephenville	Erath	0	0	0	0	1
Municipal	Taylor	Williamson	0	901	2,461	3,911	5,5
Municipal	Texas A&M University	Brazos	3,392	1,103	0	0	

WUG Type	WUG Name	Counties	Needs left Unmet (ac-ft/yr)				
			2030	2040	2050	2060	20
Municipal	Texas State Technical College	McLennan	139	0	0	0	
Municipal	The Grove WSC	Bell, Coryell	0	0	1	2	
Municipal	Thorndale	Milam	63	78	96	113	12
Municipal	Throckmorton	Throckmorton	84	71	0	0	
Municipal	Wellborn SUD	Brazos, Robertson	0	0	0	796	1,0
Municipal	Wickson Creek SUD	Brazos, Grimes, Robertson	0	0	125	20	18
Municipal	Williamson County MUD 11	Williamson	106	505	974	1,487	2,0
Municipal	Williamson County WSID 3	Williamson, Travis	40	155	359	643	9
Irrigation	Irrigation, Comanche	Comanche	7,129	6,477	5,841	5,832	5,8
Irrigation	Irrigation, Grimes	Grimes	8	4	1	1	
Irrigation	Irrigation, Hamilton	Hamilton	0	0	0	3	
Irrigation	Irrigation, Haskell	Haskell	6,562	5,283	4,387	4,262	4,2
Irrigation	Irrigation, Johnson	Johnson	229	217	207	207	20
Irrigation	Irrigation, Knox	Knox	8,629	8,165	7,267	4,758	6,7
Irrigation	Irrigation, McLennan	McLennan	111	9	0	0	
Irrigation	Irrigation, Nolan	Nolan	9,287	9,056	8,441	8,199	8,0
Irrigation	Irrigation, Robertson	Robertson	11,219	9,741	8,536	8,652	8,7
Irrigation	Irrigation, Stephens	Stephens	87	84	81	81	8
Irrigation	Irrigation, Taylor	Taylor	1,008	410	410	410	41
Irrigation	Irrigation, Williamson	Williamson	209	203	195	195	19
Irrigation	Irrigation, Young	Young	149	139	129	129	12
Livestock	Livestock, Comanche	Comanche	784	784	784	784	78
Livestock	Livestock, Palo Pinto	Palo Pinto	0	0	34	73	10
Livestock	Livestock, Somervell	Somervell	21	21	21	21	2
Manufacturing	Manufacturing, Comanche	Comanche	0	0	0	0	
Manufacturing	Manufacturing, Coryell	Coryell	1	1	1	1	
Manufacturing	Manufacturing, Eastland	Eastland	0	0	0	0	
Manufacturing	Manufacturing, Erath	Erath	15	10	3	0	
Manufacturing	Manufacturing, Lampasas	Lampasas	37	45	49	58	6
Manufacturing	Manufacturing, Limestone	Limestone	220	223	226	234	24
Manufacturing	Manufacturing, Nolan	Nolan	9	8	8	9	
Manufacturing	Manufacturing, Palo Pinto	Palo Pinto	18	19	20	21	2
Manufacturing	Manufacturing, Taylor	Taylor	49	76	775	804	83
Manufacturing	Manufacturing, Williamson	Williamson	820	859	891	966	1,0

WUG Type	WUG Name	Counties	Needs left Unmet (ac-ft/yr)				
			2030	2040	2050	2060	20
Mining	Mining, Burleson	Burleson	3,384	3,273	3,161	3,161	3,1
Mining	Mining, Eastland	Eastland	222	235	220	235	2
Mining	Mining, Haskell	Haskell	4	4	4	4	
Mining	Mining, Limestone	Limestone	2,923	2,892	2,858	2,878	1,9
Mining	Mining, Somervell	Somervell	833	898	959	1,031	1,0
Mining	Mining, Taylor	Taylor	368	172	199	228	2
Steam Electric Power	Steam-Electric Power, Limestone	Limestone	989	1,173	1,904	2,594	3,2
Steam Electric Power	Steam-Electric Power, Robertson	Robertson	4,900	5,084	0	0	
Steam Electric Power	Steam-Electric Power, Somervell	Somervell	8,664	9,020	10,248	11,535	12,
Steam Electric Power	Steam-Electric Power, Young	Young	610	633	659	633	5

Note: Draft values are subject to change and represent WUG as a whole, including splits outside of Brazos G. All Brazos G primary WUGs are included in the sum above.

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