



6

Consistency with Long Term
Protection of the State's
Water, Agricultural, and
Natural Resources



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6 Consistency with Long-Term Protection of the State's Water, Agricultural, and Natural Resources

The 2021 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 2021 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 2021 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).

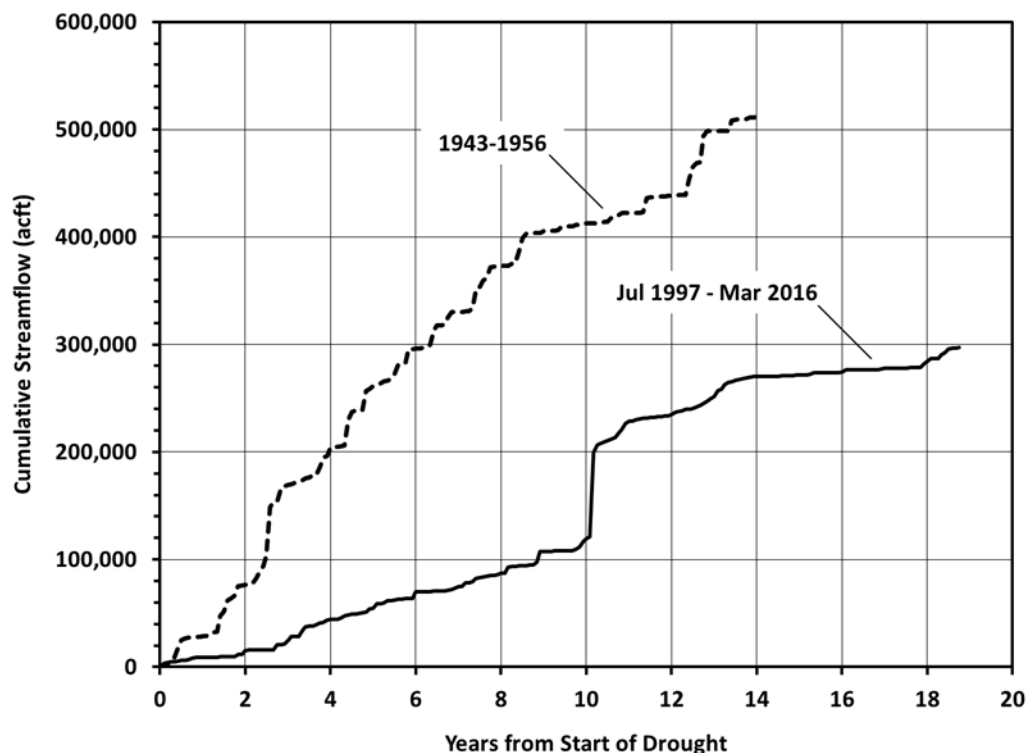
The 2021 Plan identifies actions and policies necessary to meet the Brazos G Area's near and long-term water needs by developing and recommending water management strategies to meet needs with reasonable cost, good water quality, and sufficient protection of agricultural and natural resources of the 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 2021 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 2021 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 2021 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

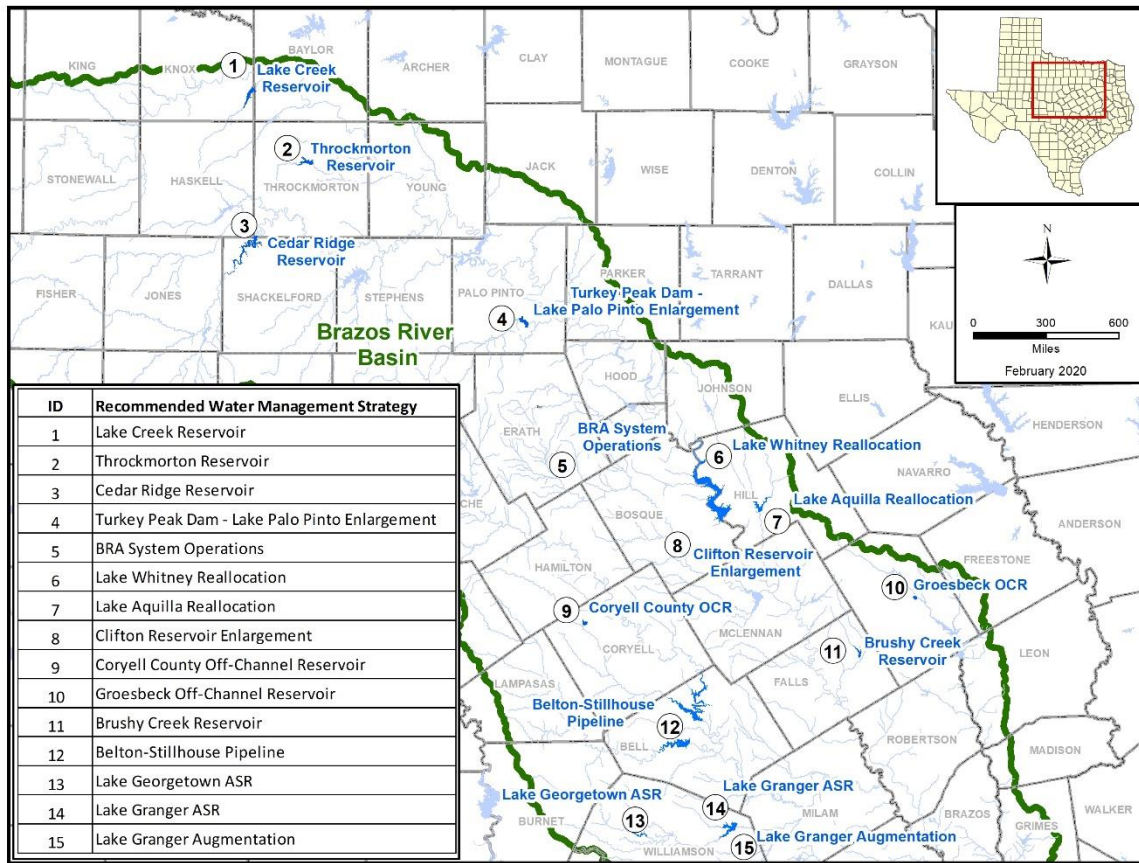
Sophisticated hydrologic models have been employed to quantify the cumulative effects of implementation of the 2021 Plan through the year 2070. Surface water effects were quantified using the TCEQ Brazos WAM Run 3 which, as per the TWDB planning guidelines, was the standard tool utilized to evaluate 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 2021 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.

Figure 6-2. Location of Recommended Water Management Strategies Included in the Cumulative Impacts Analysis



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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
BRA System Operations	BRA - Multiple
Lake Whitney Reallocation	BRA - Multiple
Lake Aquilla Reallocation	BRA – Multiple



Table 6-1. Recommended Water Management Strategies Included in the Cumulative Impacts Analysis

Recommended Water Management Strategy	WUG or WWP
Bosque County Regional Project – Clifton Reservoir Enlargement	BRA - Multiple
Coryell County Off-Channel Reservoir	BRA - Multiple
Groesbeck Off-Channel Reservoir	City of Groesbeck
Brushy Creek Reservoir	City of Marlin
Lake Belton to Lake Stillhouse Pipeline	BRA - Multiple
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	BRR170	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 2021 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 101,045 acft/yr by 2070. The greatest increase occurs in the Carrizo-Wilcox Aquifer where strategies involving groundwater development for Brazos G entities would increase pumping by about 24,720 acft/yr 2070 over what is considered to be existing supplies. In the Carrizo-Wilcox, strategies include an additional 21,469acft/yr of pumping by 2070. 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

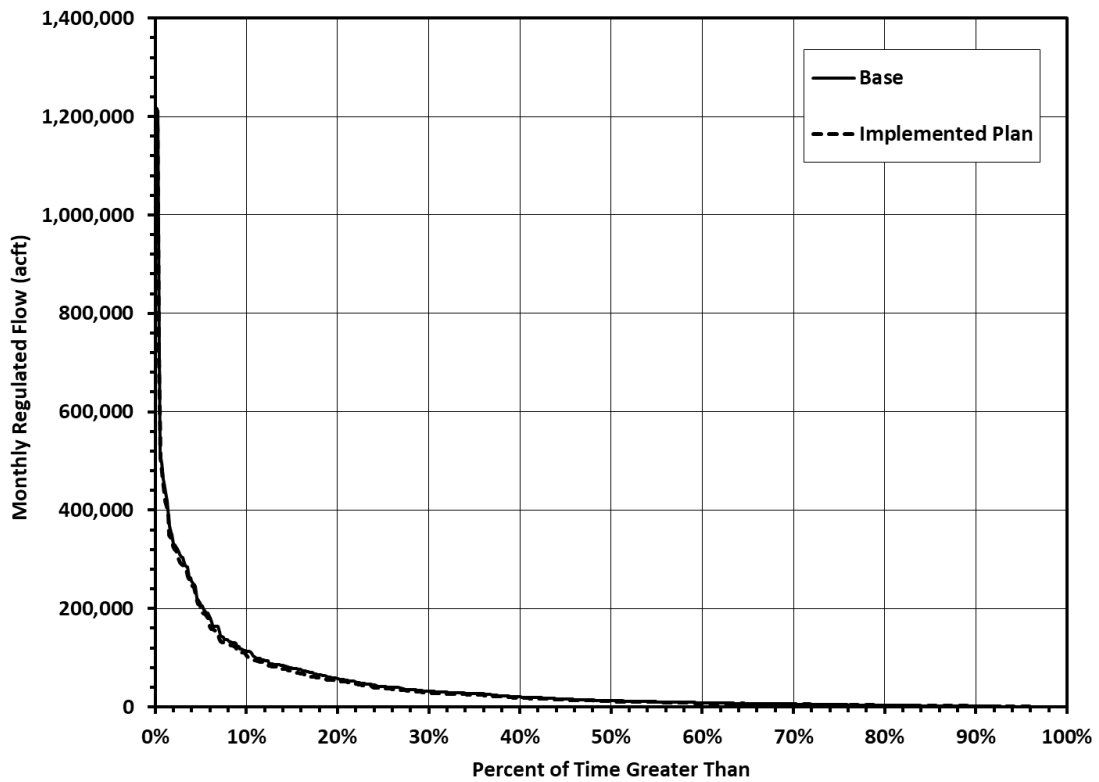
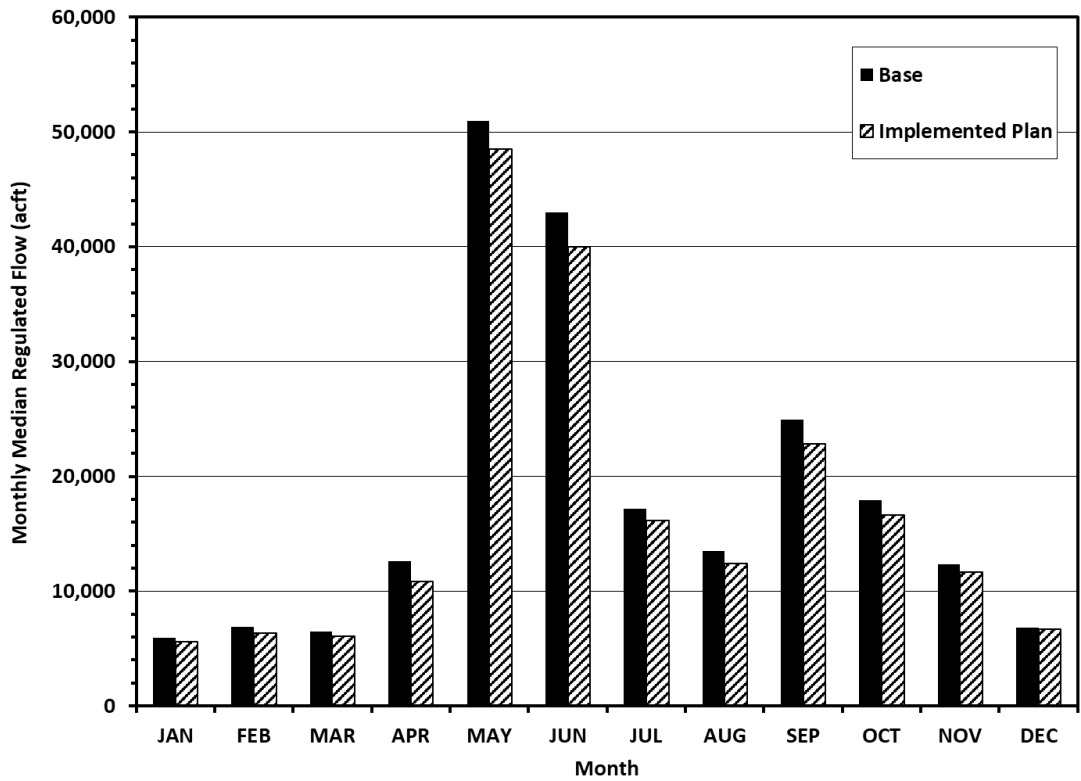




Figure 6-4. Effects of Plan Implementation on Streamflows – Brazos River near Glen Rose

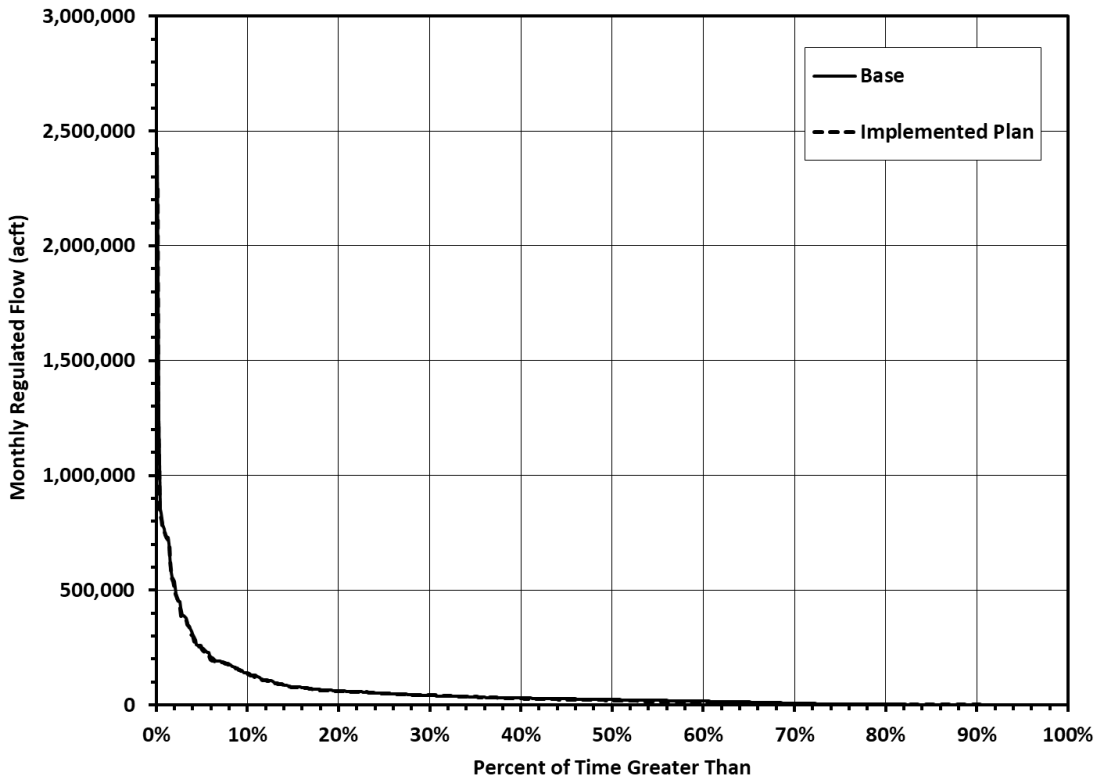
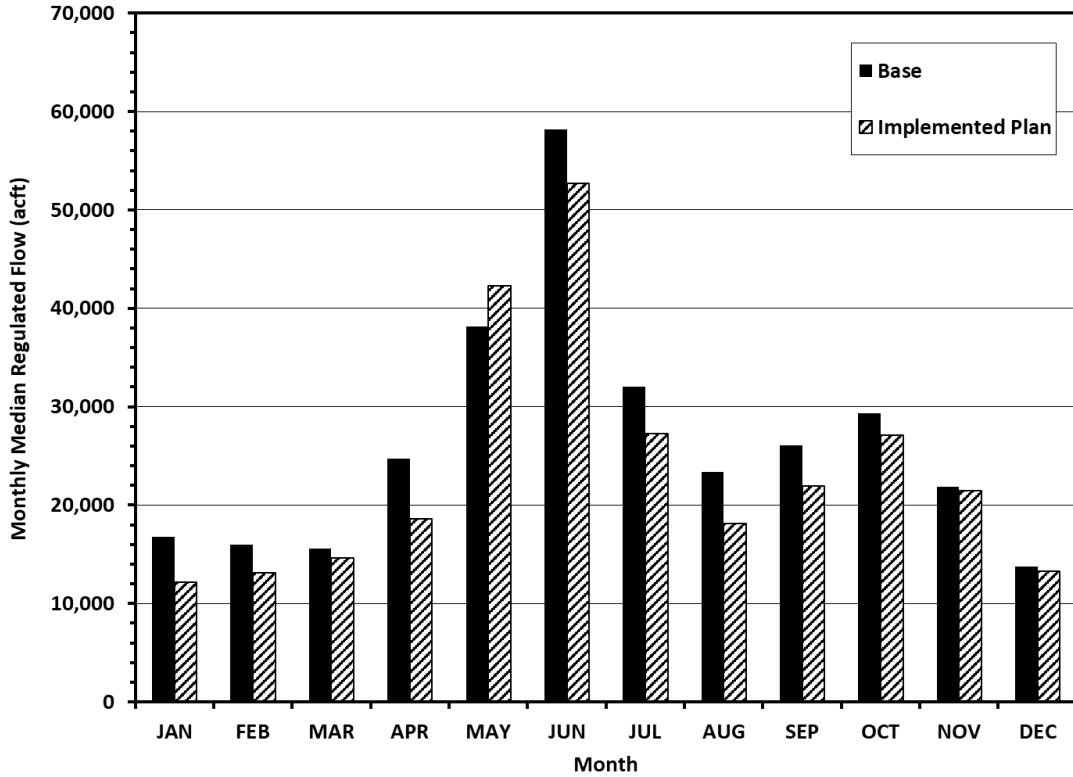


Figure 6-5. Effects of Plan Implementation on Streamflows – Brazos River near Aquilla

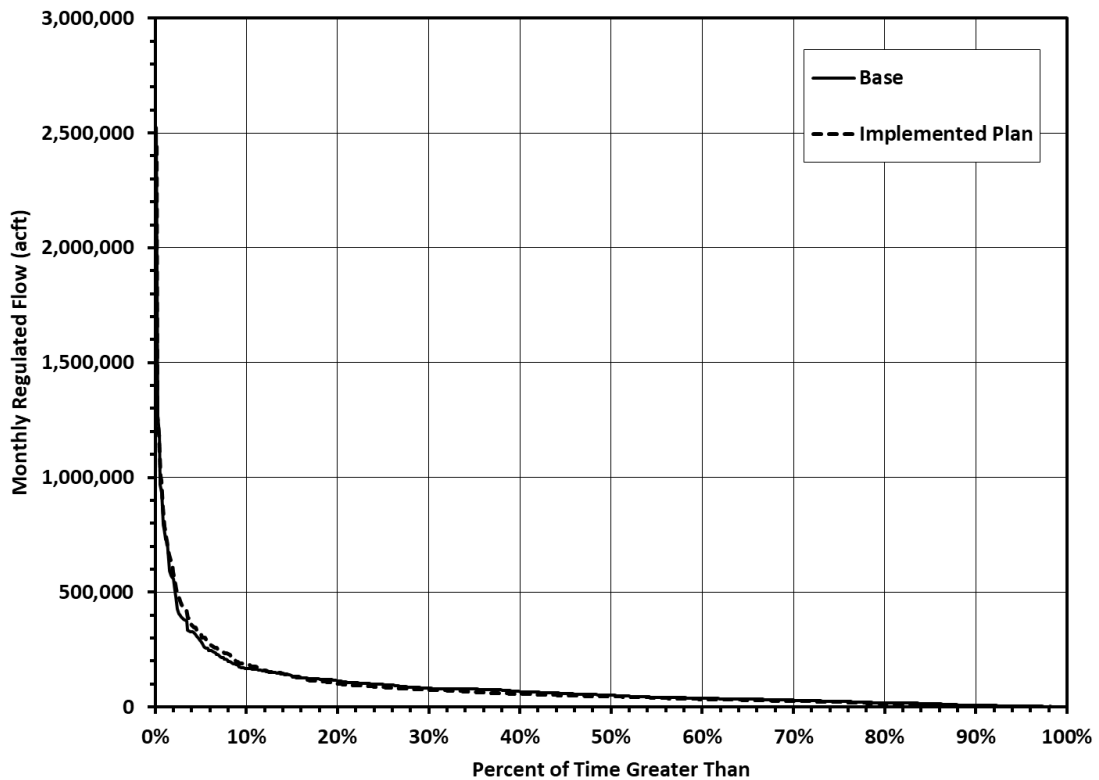
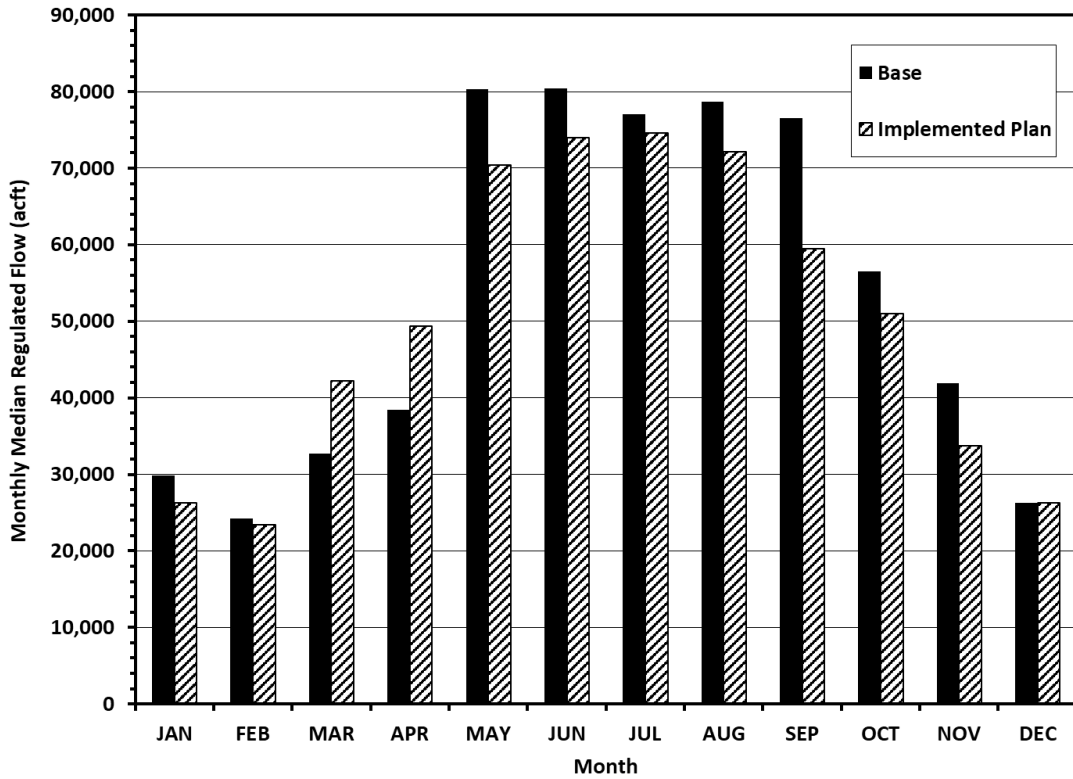




Figure 6-6. Effects of Plan Implementation on Streamflows – Bosque River near Waco

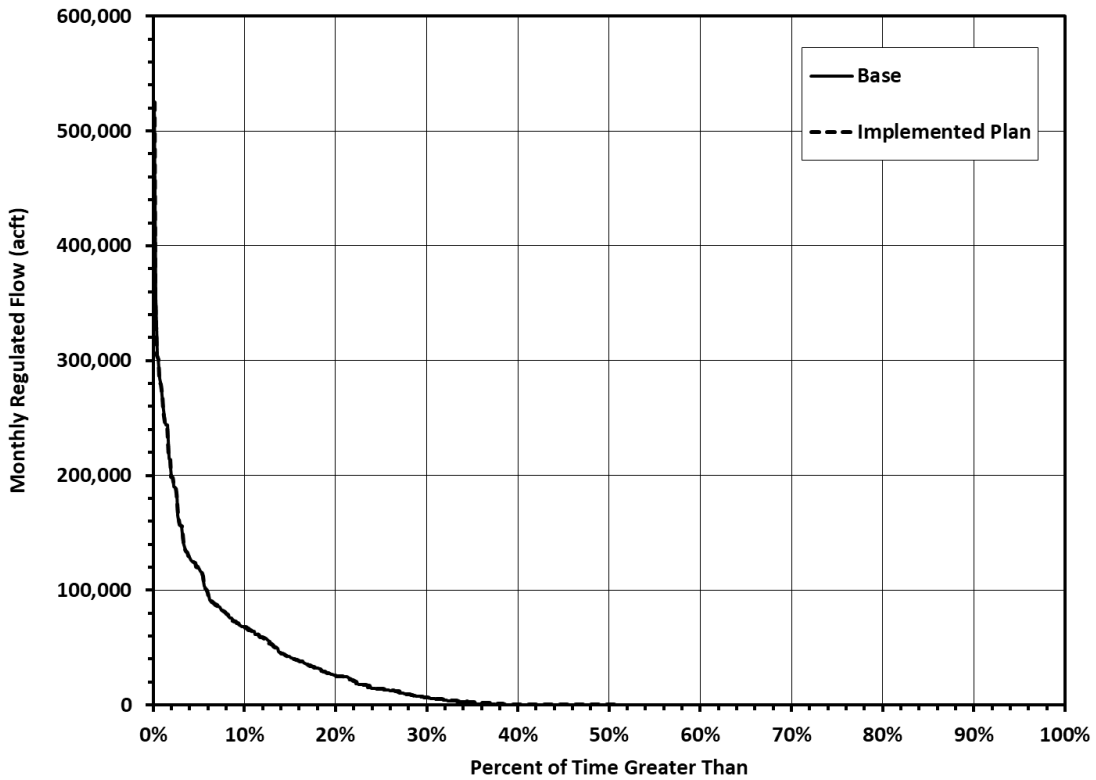
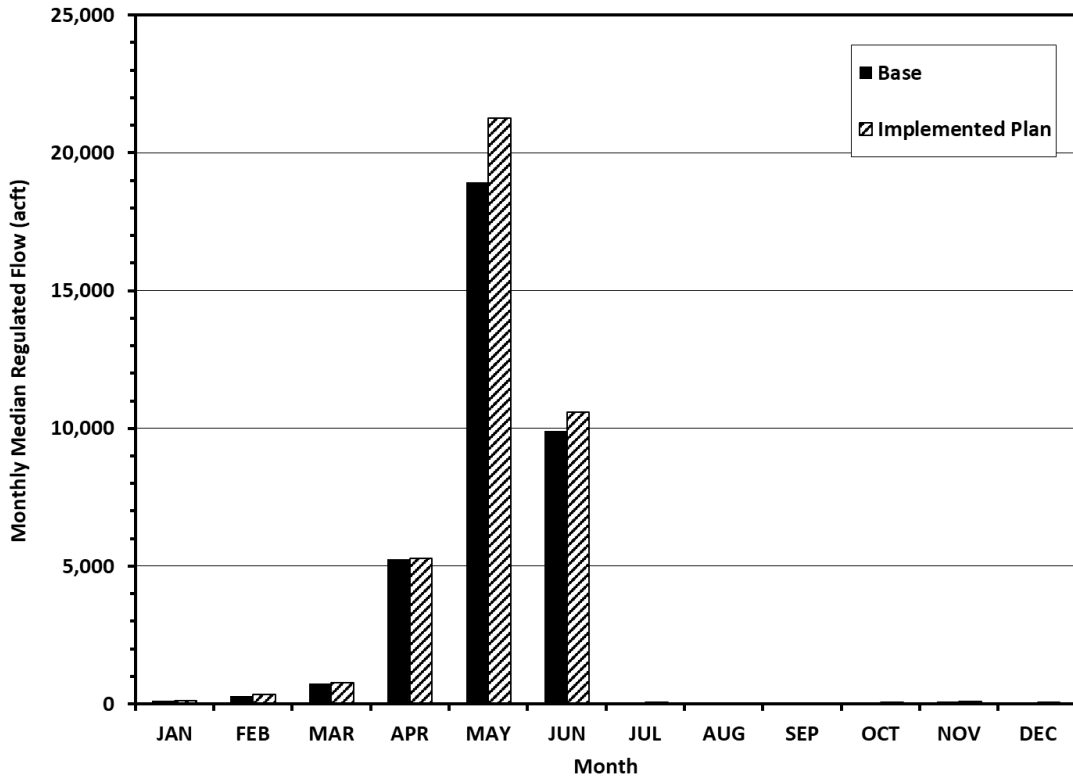


Figure 6-7. Effects of Plan Implementation on Streamflows – Little River near Cameron

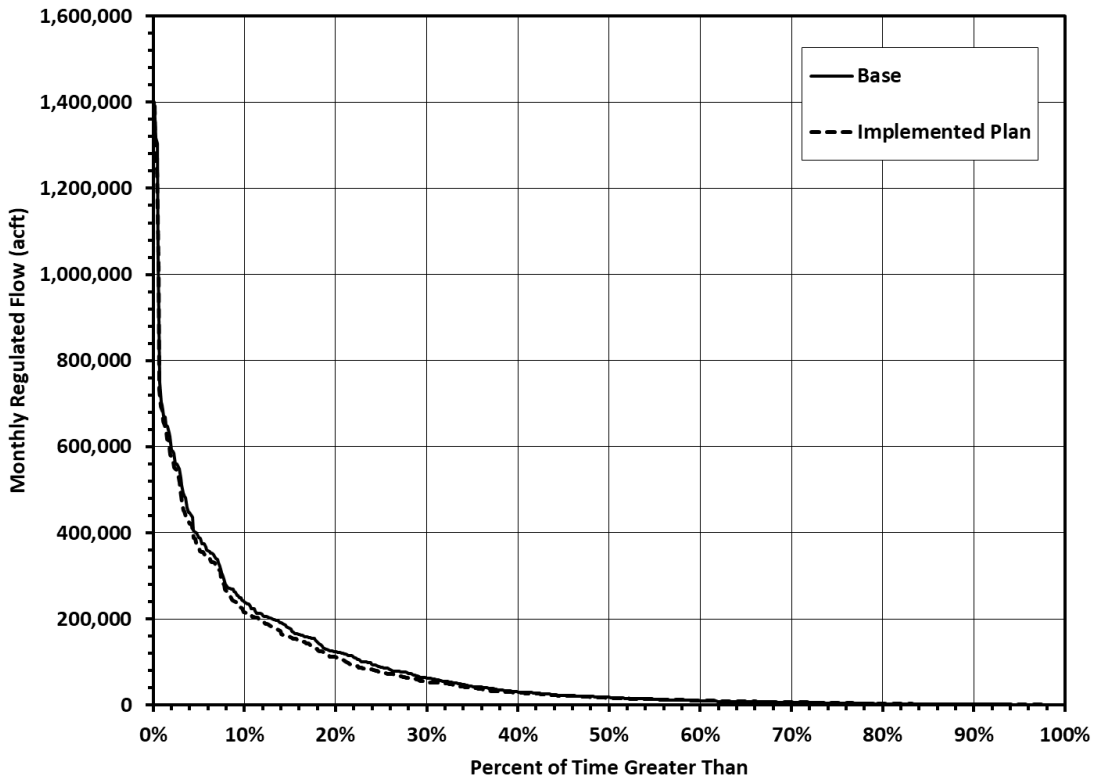
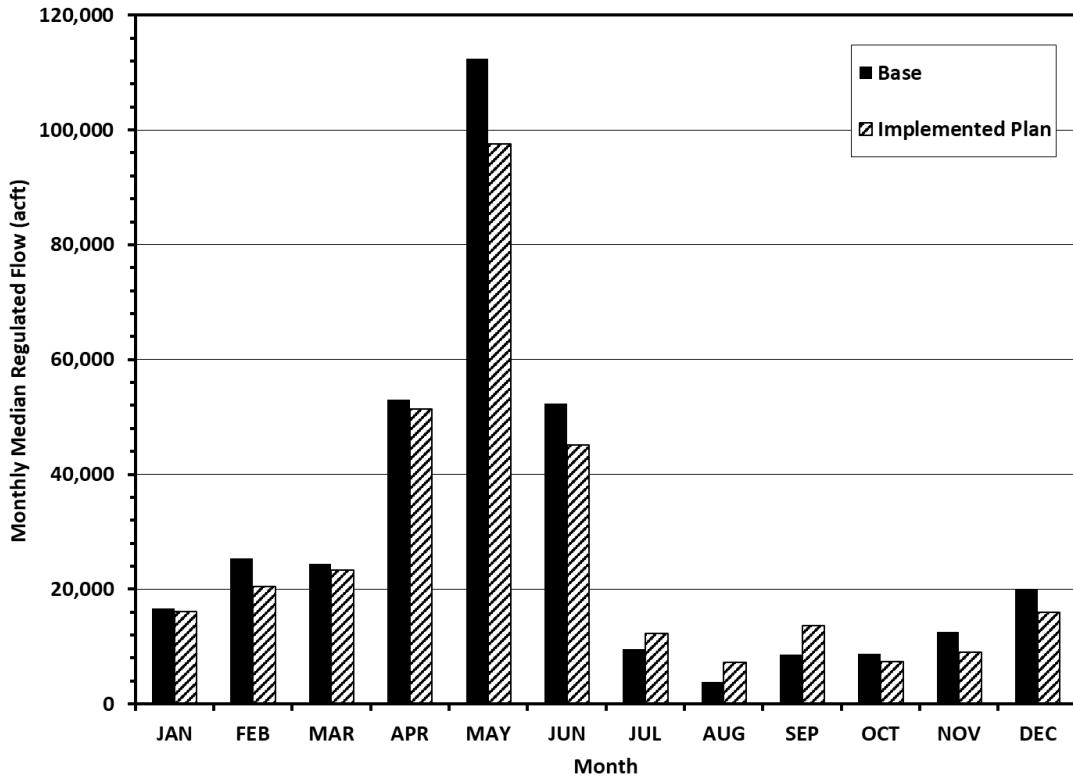




Figure 6-8. Effects of Plan Implementation on Streamflows – Brazos River near Bryan

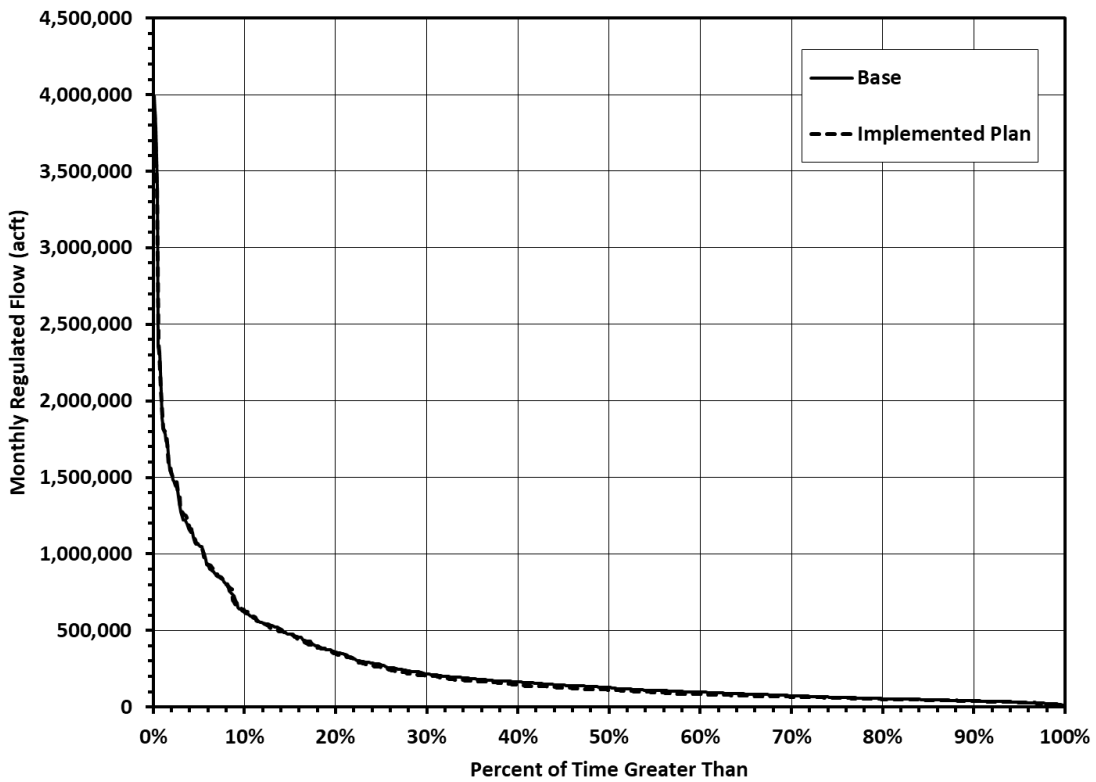
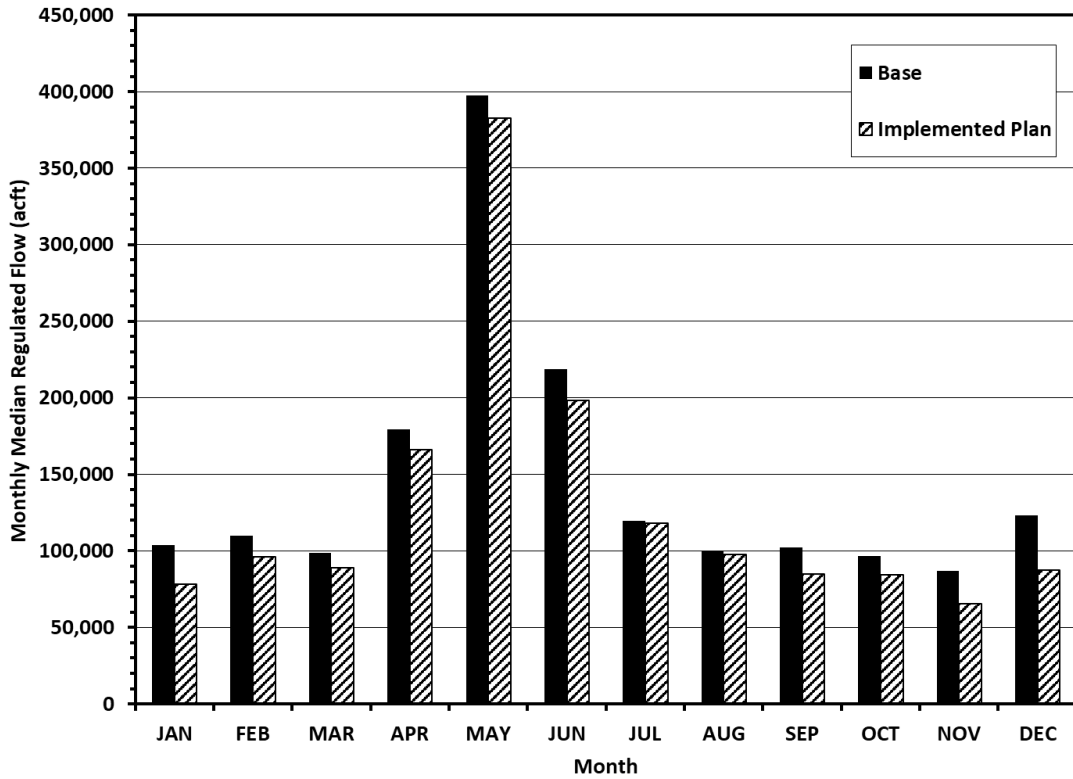


Figure 6-9. Effects of Plan Implementation on Streamflows – Brazos River near Hempstead

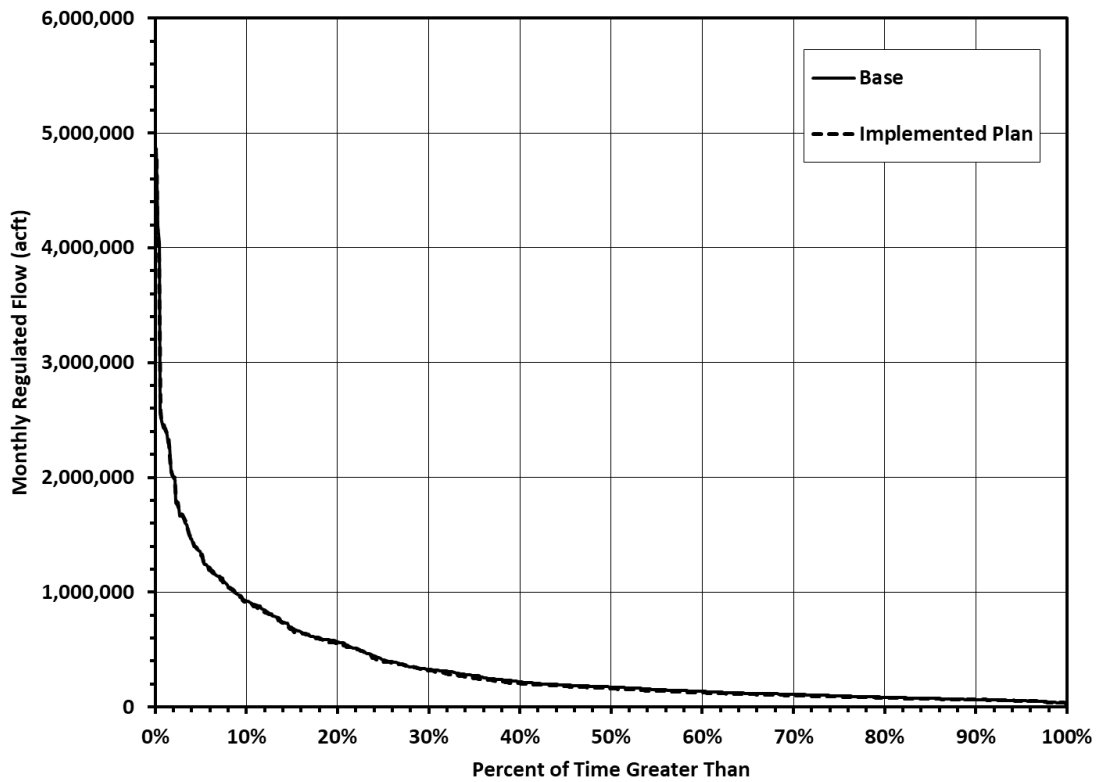
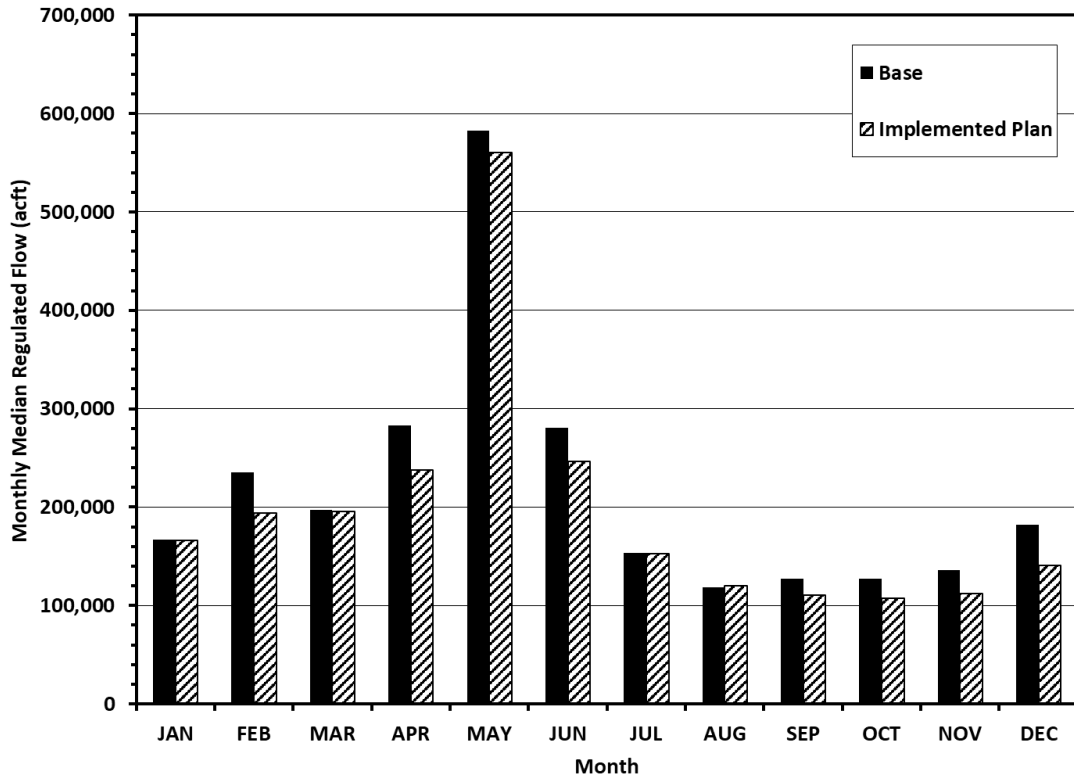




Figure 6-10. Effects of Plan Implementation on Streamflows – Brazos River at Richmond

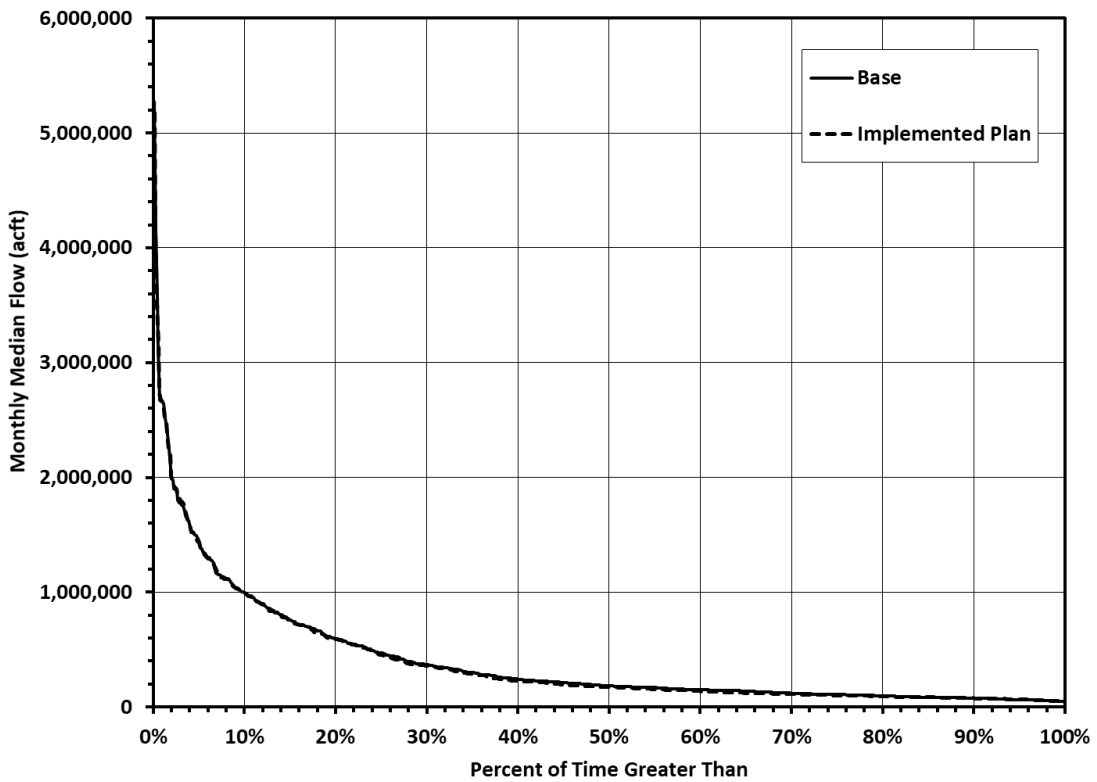
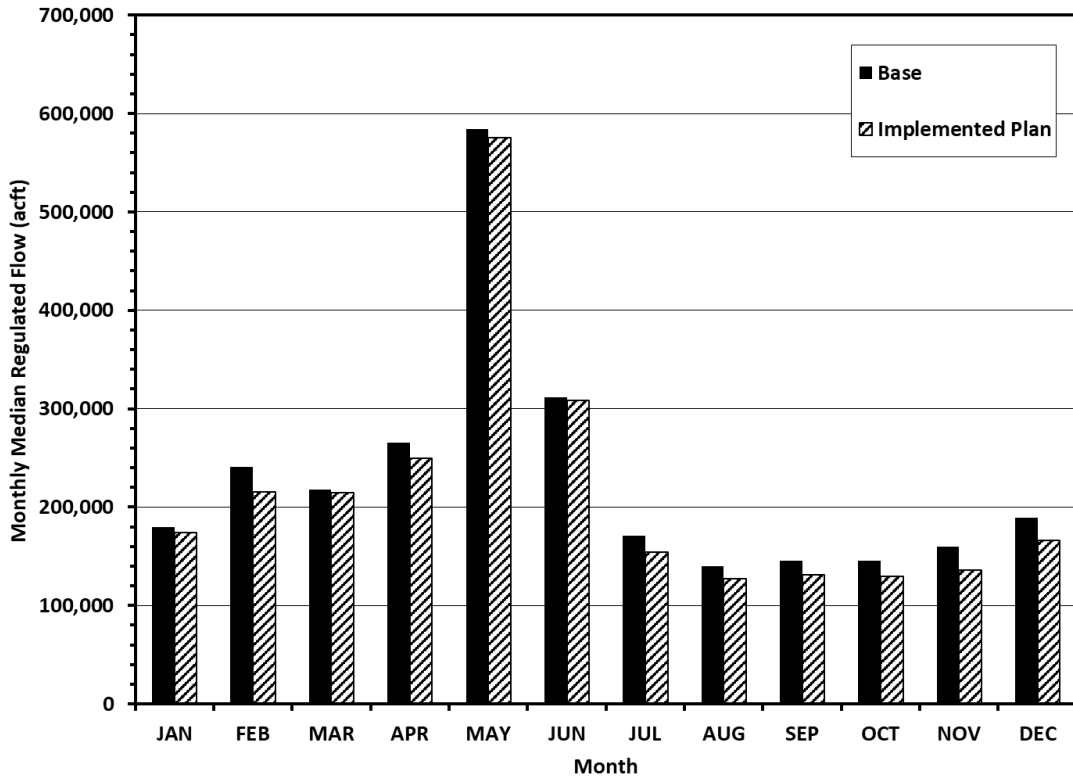
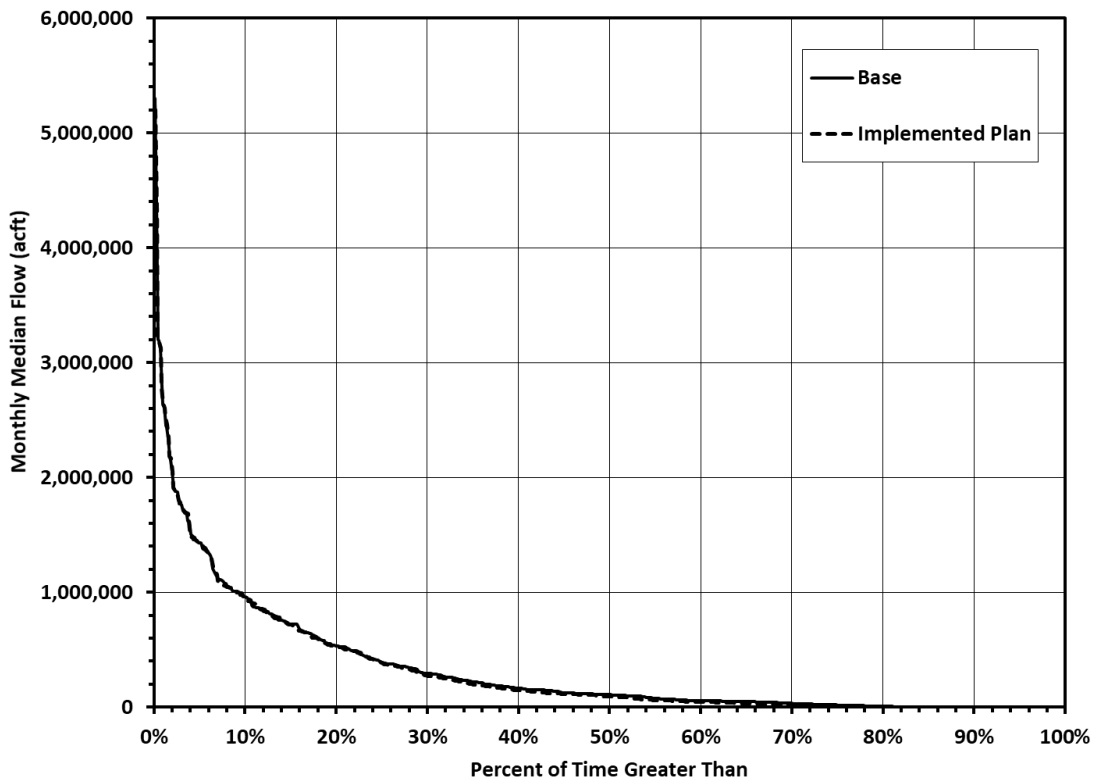
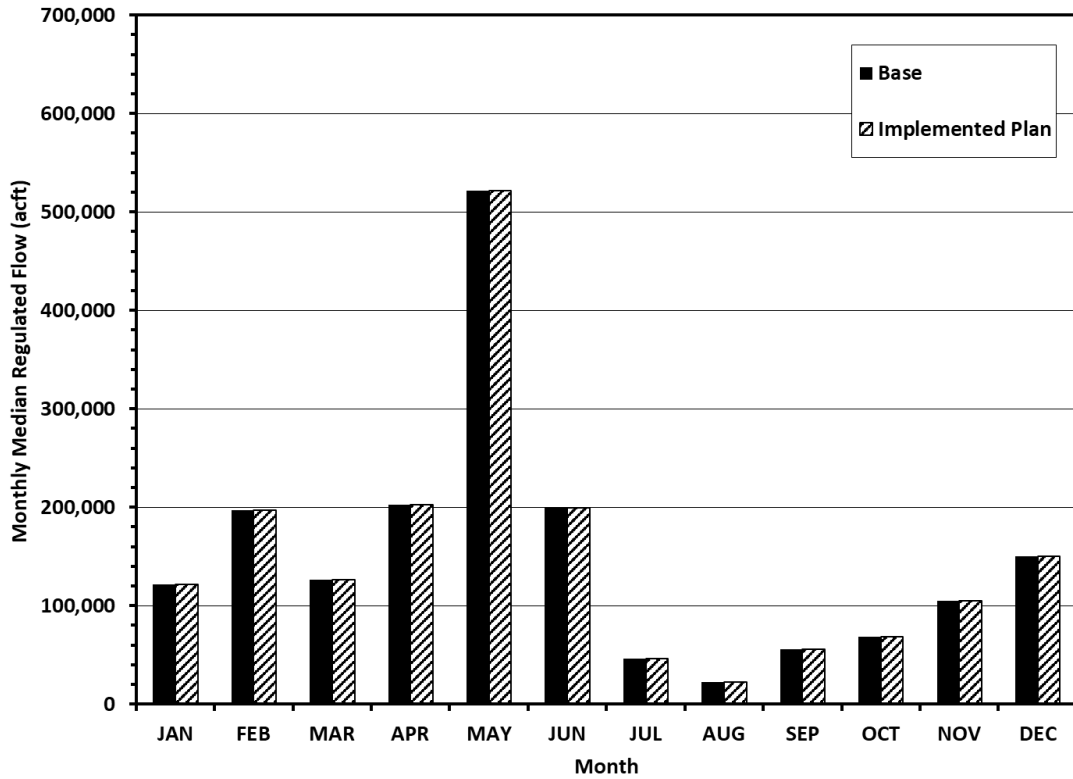


Figure 6-11. Effects of Plan Implementation on Streamflows – Brazos River at Gulf of Mexico



6.2 Summary of the Environmental Effects of the 2021 Brazos G Regional Water Plan

Overall, the strategies recommended in the 2021 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 2021 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 2021 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 WWP's 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 2021 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 2021 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, and
- 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, Grimes, Johnson, McLennan	Manufacturing (McLennan County) Steam-Electric (Brazos, Bell, Johnson and Grimes Counties) Municipal (Cities of Round Rock, Bryan, College Station, Cleburne, Waco, Bellmead, Lacy-Lakeview, Hewitt, Lorena, , Harker Heights, and Killeen and 439 WSC)	Indicator bacteria
Water Conservation	Varies	All municipal, industrial, and agricultural users with projected needs (shortages)*	Total dissolved solids, sulfates, and chlorides
<i>Interbasin Transfer of Surface Water from Lower Colorado River Basin (Region K)</i>			
BCRUA	Varies	Municipal (Leander, Liberty Hill, Round Rock and Cedar Park)	None identified
<i>New Reservoirs</i>			
Brushy Creek Reservoir	Falls	Municipal (City of Marlin)	None identified
Cedar Ridge Reservoir	Clear Fork	Municipal (City of Abilene)	None identified
Coryell County OCR	Coryell	Municipal (Gatesville 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)	Total dissolved solids, sulfates, and chlorides from Brazos River diversion
Throckmorton Reservoir	Throckmorton	Municipal (City of Throckmorton)	None identified
<i>Augmentation of Existing Surface Water Supplies</i>			
Lake Aquilla Reallocation	Hill	BRA	None identified
Lake Whitney Reallocation	Bosque/Hill	BRA	None identified

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
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)	None identified
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			
Blaine Aquifer	Stonewall, Knox	Mining (Stonewall, Knox counties); Irrigation (Knox County)	Chlorides and total dissolved solids
Brazos River Alluvium	McLennan	Mining, Irrigation	Chlorides and total dissolved solids
Carrizo-Wilcox Aquifer	Brazos, Lee, Robertson, Coryell, Erath, Falls, Limestone, Grimes	Mining (Limestone, Grimes counties); Irrigation (Robertson County); Municipal (West Brazos WSC, Tri-County SUD, Robertson County-Other, Bryan, Bistone MWSD, Heart of Texas)	Iron and manganese and temperature (deep wells only)
Dockum Aquifer	Fisher	Manufacturing; Mining	None identified



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
Edwards Aquifer	Bell, Nolan, Williamson	Irrigation (Williamson County); Manufacturing (Bell County); Mining (Bell and Nolan counties); Municipal (Bell County-Other, Brushy Creek MUD, Florence)	None
Trinity Aquifer	Bell, Bosque, Callahan, Comanche, Coryell, Erath, Hamilton, Hood, Somervell, McLennan, Lampasas, Eastland, Williamson	Mining (Callahan, Hamilton, Hood, Somervell, Comanche, Eastland, Coryell, Lampasas, Bell counties); Irrigation (Hamilton, Bosque, McLennan, Lampasas, Comanche, Eastland, Bell counties); Municipal (Bartlett, Florence, Comanche County-Other, Coryell County-Other, Erath County-Other, Hood County-Other)	Chlorides and total dissolved solids
Gulf Coast Aquifer	Grimes, Brazos, Washington	Manufacturing (Brazos and Washington County); Steam-Electric (Grimes County);	None identified
Seymour Aquifer	Knox	Irrigation	Chlorides and total dissolved solids
Sparta Aquifer	Burleson	Manufacturing; Mining	Iron and manganese
Woodbine Aquifer	Hill, Johnson	Mining (Hill and Johnson counties); Municipal (Godley, Rio Vista, Hill County-Other)	Chlorides, total dissolved solids, iron and manganese
Yegua-Jackson Aquifer	Brazos	College Station	Chlorides and total dissolved solids

*For municipal users with shortages, additional conservation was recommended only for WUGs exceeding 140 gallons per capita per day

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 WWP after September 4, 2019. However, those changes are unlikely to have made a significant difference in the TWDB's analysis.

6.5 Needs Left Unmet in the 2021 Brazos G Regional Water Plan

6.5.1 Municipal Needs Unmet in 2020

For a water management strategy or project to meet needs in the first planning decade (2020), TWDB guidance requires that it be possible to implement prior to January 2023. In the 2021 Brazos G Regional Water Plan, needs remain unmet in 2020 for several municipal water user groups because the water management strategies and projects recommended for them cannot come online prior to January 2023. These are shown in Table 6-4.

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 2023 for these municipal WUGs.

The BGRWPG does not recommend advanced water conservation in 2020 because the benefits of such conservation practices will not be readily apparent in such a short period of time, i.e., prior to 2023, and would be unrealistic to include as a recommended strategy. In addition, conservation savings alone would be unable to meet these projected needs in 2020.

The BGRWPG also 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, as does conservation. 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 2020 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 2021 Plan prior to development of the next initially prepared plan to address the unmet municipal needs. The 2021 Brazos G Regional Water Plan includes unmet municipal needs only in 2020. Any amendments would have to be accomplished and include strategies that would come online prior to 2023, and identification of those strategies is unlikely.

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 2021 Brazos G Regional Water Plan for the following reasons. Table 6-4 lists those unmet non-municipal needs.

Irrigation

- No economically viable supply can be developed.

Manufacturing

- Small need in 2020 only.

Mining

- No reasonable supply can be developed.
- Small need in 2020 or 2030 only.

Steam-Electric

- Small need in 2020 only.
- Water demand overstated due to shut down of facilities (Milam County).
- Plans for new generation facility abandoned (Hill County, Somervell County).

Table 6-4. Needs for WUGs Left Unmet in the 2021 Brazos G Regional Water Plan

County	Water User Group	Needs Left Unmet (acft/yr)					
		2020	2030	2040	2050	2060	2070
Municipal WUGs							
Stonewall	Aspermont	39					
McLennan	County-Other	222					
Williamson	County-Other	32					
Coryell	Fort Gates	260					
Coryell	Gatesville	1,041					
Bell and Williamson	Georgetown	10,307					
Young	Graham	1,457					
Limestone	Groesbeck	688					
Haskell	Haskell	477					
McLennan	Hewitt	480					
Williamson	Hutto	907					
Knox	Knox City	226					
Lampasas	Lampasas	128					
Palo Pinto	Mineral Wells	342					
Knox	Munday	242					
Brazos	Texas A&M University	99					
Throckmorton	Throckmorton	135					



Table 6-4. Needs for WUGs Left Unmet in the 2021 Brazos G Regional Water Plan

County	Water User Group	Needs Left Unmet (acft/yr)					
		2020	2030	2040	2050	2060	2070
Non-Municipal WUGs							
Comanche	Irrigation	14,114	12,382	11,707	11,739	11,707	11,738
Haskell	Irrigation	14,932	13,881	10,540	10,809	11,711	11,825
Knox	Irrigation	13,160	14,678	10,394	8,418	7,954	10,147
Nolan	Irrigation	7,890	7,659	7,428	7,428	7,428	7,428
Robertson	Irrigation	10,476	12,222	11,521	12,106	12,217	12,309
Stephens	Irrigation	86	83	80	80	80	80
Williamson	Irrigation				146	146	146
Bell	Manufacturing	123					
Bosque	Mining	360	414	207	188	152	141
Haskell	Mining	90	87	77	69	61	55
Hill	Mining	187					
Lee	Mining	1					
Limestone	Mining	6,849	6,271	6,016	6,457	6,891	7,467
Shackelford	Mining	336	501	309	201	95	16
Somervell	Mining		44				
Stephens	Mining	3,323	3,295	2,557	1,968	1,440	990
Taylor	Mining	245					
Williamson	Mining	4,567	5,493	6,407	7,515	8,656	9,962
Hill	Steam-Electric	4,120	4,120	4,120	4,120	4,120	4,120
Milam	Steam-Electric	32,254	32,254	32,254	32,254	32,254	32,254
Somervell	Steam-Electric	35,387	34,783	34,879	34,975	35,071	35,167
Total Municipal		17,082					
Total Irrigation		60,658	60,905	51,670	50,726	51,243	53,673
Total Manufacturing		123					
Total Mining		15,958	16,105	15,573	16,398	17,295	18,631
Total Steam-Electric		71,761	71,157	71,253	71,349	71,445	71,541
Total Brazos G		165,582	148,167	138,496	138,473	139,983	143,845

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