

NOTICE OF OPEN MEETING

BRAZOS G REGIONAL WATER PLANNING GROUP

10:00 a.m. February 12, 2020
Brazos River Authority Central Office 4600
Cobbs Drive, Waco, Texas 76710

AGENDA

1. CALL MEETING TO ORDER
2. INVOCATION
3. NOTICE OF MEETING
4. ATTENDANCE AND ANNOUNCEMENTS
5. PUBLIC INPUT - Public questions and comments on agenda items or water planning issues *(limited to 5 minutes each; public must fill out a 'Request to Speak' form prior to the discussion of the agenda item)*
6. PROGRAM
 - 6.1. Report and possible discussion on report from Texas Water Development Board (TWDB) staff.
 - 6.2. Report and possible discussion on Brazos G Sub-Regional Meetings.
 - 6.3. Discussion and possible action on HDR planning tasks.
 - 6.3.1. Presentation on updated water management strategy evaluations.
 - 6.3.2. Discussion and possible action regarding utilization of supplies from the Brazos River Alluvial Aquifer as a water management strategy.
 - 6.3.3. Discussion and possible action on Water User Group and Wholesale Water Provider plans.
 - 6.3.4. Discussion and possible action on leaving water needs unmet.
 - 6.3.5. Presentation, discussion and possible action regarding analysis of the impacts of the plan.
 - 6.3.6. Discussion and possible action on other HDR planning tasks.
 - 6.3.7. Presentation of the timeline to develop the 2021 Brazos G Regional Water Plan.
 - 6.4. Report and possible discussion on updates from other regional water planning groups (Regions B, C, F, H, K, L & O).
 - 6.5. Report and possible discussion on Groundwater Management Area (GMA) activities.
 - 6.6. Report and possible discussion on agency communication and information.
 - 6.7. Discussion and possible action on report by Brazos G Administrator.
 - 6.8. Report and possible action on report from Brazos G Chair.
7. DISCUSSION AND POSSIBLE ACTION ON NEW BUSINESS TO BE CONSIDERED AT NEXT MEETING
8. CONFIRMATION OF NEXT MEETING DATE
9. ADJOURN

Agenda items may be considered, deliberated and/or acted upon in a different order than set forth above.

Meeting agendas and materials are available online at www.brazosqwater.org
For additional information, please contact
STEVE HAMLIN @ 254-761-3172, Brazos River Authority, Administrative Agent



BRAZOS G REGIONAL WATER PLANNING GROUP

February 12, 2020

10:00 A.M.

**Brazos River Authority Central Office
4600 Cobbs Drive, Waco, Texas 76710**

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- 5. PUBLIC INPUT**

2



6.1. Report and possible discussion from Texas Water Development Board staff.

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Region G TWDB Update 02-12-2020

1. Interregional Planning Council

- The Board appointed the IPC at the January 16th Board Meeting
- Anticipate an in-person meeting will be organized with members of the IPC the near future

2. Potential Interregional Conflicts in the 2021 RWPs

- Interregional conflicts made by RWPGs must be provided in writing to the TWDB Executive Administrator and the other affected RWPG within 60 days of the IPP deadline for submittal
- For more information, please visit http://www.twdb.texas.gov/waterplanning/rwp/education/RWP_Interregional_Conflict.pdf

3. Administratively Complete IPPs

- IPPs are due to the TWDB by March 3, 2020.
- TWDB will provide comments within 120 days.
- Upon receipt of the IPPs, TWDB staff will “close” the state water planning database (DB22)

4. Voting Member Travel Funds

- RWPGs are allowed to submit a budget memorandum to shift expenses in your existing budget for voting member travel

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Regional Water Planning in Texas: Interregional Conflict

What is an interregional conflict?

An interregional conflict exists when

- more than one regional water plan (RWP) includes the same source of water supply for identified and quantified recommended water management strategies (WMS) and there is insufficient water available to implement such WMSs; or
- in the instance of a recommended WMS proposed to be supplied from a different regional water planning area, the regional water planning group (RWPG) with the location of the strategy has studied the impacts of the recommended WMS on its economic, agricultural, and natural resources and demonstrated to the Texas Water Development Board (TWDB) Board members (Board) that there is a potential for a substantial adverse effect on the region as a result of those impacts.

What coordination should be undertaken prior to identification of a potential interregional conflict?

During the development of their Initially Prepared Plan (IPP)—draft plan—all RWPGs are encouraged by the TWDB to coordinate with neighboring regions and to proactively identify and work cooperatively to avoid potential interregional conflicts.

The TWDB's state water planning database, which contains data from the RWPs, will be a key tool in identifying potential conflicts associated with over-allocations of sources. The TWDB may use this database and information submitted by RWPGs on their methodologies to analyze water availability to identify areas that may warrant additional interregional coordination. If such areas are identified by the TWDB, certain RWPGs may specifically be asked by the TWDB to share information on technical approaches and data development with neighboring regions prior to submitting their IPP to the TWDB.

This sharing of information may be in the form of formal or informal coordination between the RWPG technical consultants, joint RWPG subcommittee meetings, or joint RWPG meetings, for example.

TWDB staff will conduct final water source over-allocation analyses as part of the agency's review of IPPs and final RWPs and notify RWPGs.

Additionally, RWPGs are encouraged to include tabulated quantified information associated with evaluations of feasible (including recommended) WMSs in one place within the RWP to aid RWPG members, other RWPGs, the public, and TWDB staff in understanding and reviewing RWPs.

How does an RWPG identify a potential interregional conflict?

Within 60 days of the submission of IPPs to the TWDB's Executive Administrator (EA), the RWPGs shall submit in writing to the EA and the other affected RWPG the identification of potential interregional conflicts. The RWPG identifying the potential conflict must provide the following information:

- Identification of the specific recommended WMS from another RWPG's IPP.
- A statement of why the RWPG considers there to be an interregional conflict.
- Any other information available to the RWPG that is relevant to the Board's decision.

The RWPGs shall seek to resolve conflicts with other RWPGs and shall promptly and actively participate in any TWDB sponsored efforts to resolve interregional conflicts.

What process does the TWDB follow when a potential interregional conflict has been identified?

Upon receiving an assertion of an interregional conflict, the EA will review the materials submitted

OCTOBER 2019

by the RWPG and take a recommendation on the potential conflict to the Board.

If the Board determines that an interregional conflict exists, the EA may use the following process to commence resolution of the conflict:

- Notify the affected RWPGs of the nature of the interregional conflict.
- Request affected RWPGs to appoint a representative or representatives authorized to negotiate on behalf of the RWPG and notify the EA in writing of the appointment.
- Request affected RWPGs' assistance in resolving the conflict.
- Negotiate resolutions of conflicts with RWPGs as determined by the EA.

If negotiated resolutions are successful and confirmed by the RWPG Chairs or designated representatives, the interregional conflict will be considered resolved.

In the event the negotiation is unsuccessful, the EA may take the following steps:

- Determine a proposed recommendation for resolution of the conflict.
- Provide notice of intent to hold a public hearing on proposed recommendations for resolution of the conflict.
- Hold a public hearing on the proposed recommendation for resolution of the conflict.
- Make a recommendation to the Board for resolution of the conflict.

The Board shall consider the EA's recommendation and any written statements by a designated representative for each affected RWPG and determine the resolution of the conflict. The Board's decision is final and not appealable. The EA shall notify affected RWPGs of the Board's decision and shall direct changes to the affected RWPGs.

What steps must an RWPG take following a Board decision on conflict resolution?

In accordance with Texas Water Code § 16.053(h)(6) and direction from the TWDB, each RWPG involved will be required to prepare revisions to their respective plans and hold, after notice, at least one public hearing at a central location readily accessible to the public within their respective regional water planning areas.

The RWPGs shall consider all public and Board comments; prepare, revise, and adopt their respective plans; and submit their plans to the Board for approval and inclusion in the state water plan.

What if an interregional conflict cannot be resolved before regional water plans are finalized?

In the event that the Board has not resolved an interregional conflict early enough to allow an involved RWPG to modify and adopt its final RWP by the statutory deadline, all RWPGs involved in the conflict shall proceed with adoption of their RWP by excluding the relevant recommended WMS and all language relevant to the conflict.

Each RWPG involved must also add language to the RWP explaining the unresolved interregional conflict and acknowledging that the RWPG may be required to revise or amend its RWP in accordance with a negotiated or Board resolution of an interregional conflict.

Additional Resources

31 Texas Administrative Code, Regional Water Planning Rules, §357.10 (16), §357.50 (d), (e), and (f) (5), and §357.62:

[https://texreg.sos.state.tx.us/public/readtac\\$ext.VIEWTAC?tac_view=4&ti=31&pt=10&ch=357&rl=Y](https://texreg.sos.state.tx.us/public/readtac$ext.VIEWTAC?tac_view=4&ti=31&pt=10&ch=357&rl=Y)

Texas Water Code, §16.053 (h) (5), (6), and (7) (A):
<https://statutes.capitol.texas.gov/Docs/WA/htm/WA.16.htm#16.053>

For additional information, please call 512-936-2387 or visit

www.twdb.texas.gov/waterplanning/rwp/index.asp.



6.2. Report and possible discussion on Brazos G Sub-Regional Meetings.

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Upper Region – Abilene

- 9 Stakeholders
 - 2 Water District
 - 1 State Representative's staff
 - 5 Municipalities
 - 1 General Public
- 7 Brazos G members

Central Region- Waco

- 13 Stakeholders
 - 3 Water Authorities
 - 7 Municipalities
 - 3 General Public
- 4 Brazos G members

Lower Region- College Station

- 12 Stakeholders
 - 3 from Water Authorities
 - 1 State Senator's staff
 - 1 Texas Dept. of Agriculture
 - 5 Municipalities
 - 2 General Public
- 3 Brazos G members


Brazos G Sub-Regional Meetings

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- 6.3. Discussion and possible action on HDR planning tasks.
 - 6.3.1. Presentation on updated water management strategy evaluations.
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 - 6.3.3. Discussion and possible action on Water User Group and Wholesale Water Provider plans.
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Evaluations of New Reservoirs
Agenda Item 6.3.1

February 12, 2020



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The slide features a map of Texas in the top left corner with a light blue highlighted area in the central-eastern part of the state. The background is divided into four quadrants: top-left is dark grey, top-right is light grey, bottom-left is red, and bottom-right is white. The title and agenda item are in the white quadrant, along with the date, logos for HDR and Brazos G, and a small copyright notice.

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Reservoir Site Evaluations

- Only updates from previous evaluations – 2001, 2006, 2011 and/or 2016 Plans
 - Supply update
 - Cost update
 - Check/confirm impacts to habitat and threatened/endangered species
- WUGs identified are preliminary only
- 2021 Brazos G Plan report sections will contain more detail



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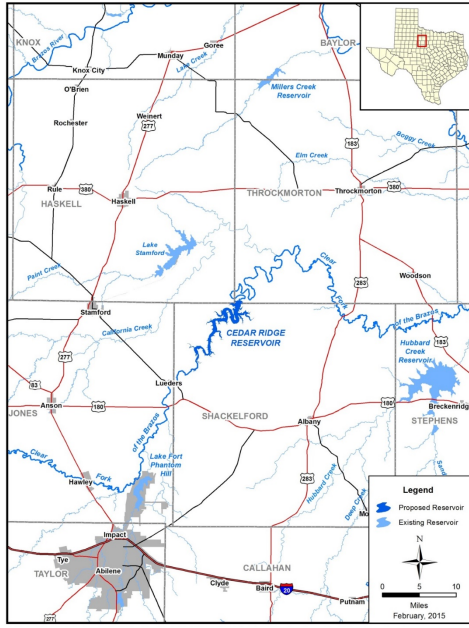
Strategy Evaluation Considerations

- Supply Availability – Brazos WAM Run 3
 - Subject to SB3 Environmental Flows
- Environmental Impacts
 - Flow Changes
 - Habitat / Species Impacts
 - Cultural Resources Impacts
- Cost - September 2018 Dollars
 - Structural
 - Land Acquisition
 - Relocations
 - Mitigation
 - Engineering
 - Annual
 - Power Costs \$0.08/kW-hr
 - Debt Service – 3.5% for 40 years
 - Operation and Maintenance
 - Compensation for subordination agreements (if applicable)



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Cedar Ridge Reservoir



- Water right permit pending at TCEQ
- Corps of Engineers permitting initiated
- Proposed location: Shackelford County
- Potential WUGs to receive water: Abilene and wholesale customers

Reservoir Characteristics

Capacity	227,127 acft
Surface Area	6,635 acres



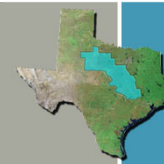
11

Cedar Ridge Reservoir

- Project facilities other than reservoir
 - 21.1 MGD intake and pump station
 - 42 in dia., 29 mile pipeline to Abilene WTP

Reservoir Cost Estimate Summary

Total Capital Costs	\$159,070,000
Total Project Cost	\$283,646,000
Annual Cost	\$19,187,000
Available Project Yield	22,500 acft/yr
Annual Unit Cost of Water	\$853 /acft



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QUESTIONS?



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Brazos River Alluvial Aquifer Supplies

Agenda Item 6.3.2

February 12, 2020



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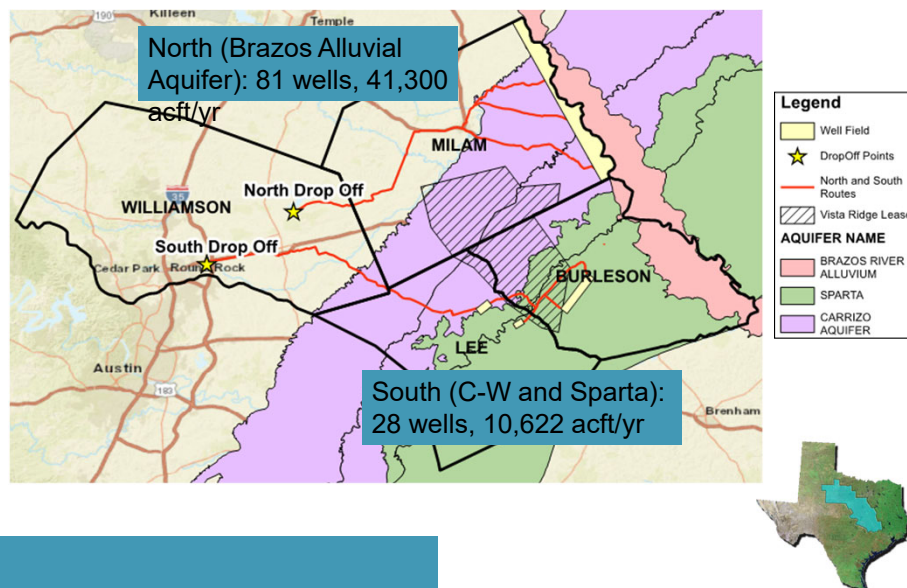
Background: Brazos River Alluvial Aquifer as a Supply

- Large Williamson County needs (limited Williamson County supplies)
- Zero MAG remaining from Carrizo-Wilcox Aquifer in Milam County
- Two groundwater options identified to meet Williamson County needs
 - South Option – Sparta and C-W Aquifers in Lee and Burleson Counties (10,622 acft/yr)
 - North Option – Brazos River Alluvial Aquifer in Milam County (41,300 acft/yr)
- Third option: leave Milam County Steam-Electric needs unmet
 - Milam County Carrizo-Wilcox groundwater option (14,000 acft/yr available under MAG)
- Opposition expressed to North Option during subregional meetings
 - Brazos River Alluvial Aquifer in hydraulic connection to Brazos River
 - Use of alluvial aquifer decreases flows in the Brazos River
 - Will reduce water available to lower basin interests
- Questions for discussion:
 1. Utilize North Option as a recommended or alternative strategy?
 2. If yes, at what supply volume?



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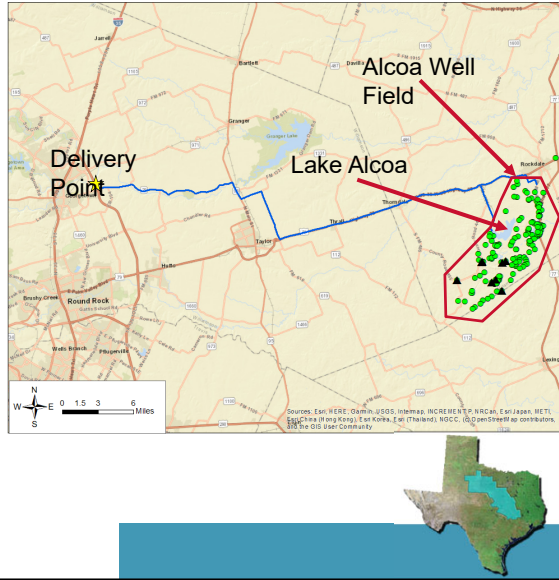
Potential GW Supplies to Meet Needs



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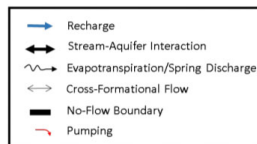
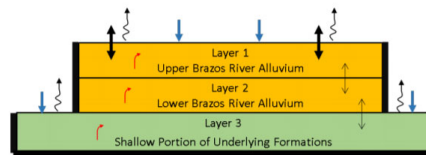
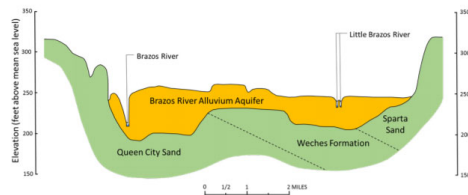
ALCOA WILLIAMSON COUNTY PROJECT

- GW supply from existing wells
 - 33,600 acft/yr permitted
 - 14,006 – 17,529 acft/yr available (MAG limits)
- SW Supply
 - 14,000 acft/yr - Lake Alcoa
 - 650 acft/yr – Little River
 - 4,019 acft/yr – BRA contract
- Three Options Evaluated
 1. 14,000 acft/yr GW only
 2. 18,600 acft/yr SW only
 3. 32,600 acft/yr SW and GW



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Conceptual Model of the Brazos River Alluvium Aquifer



TWDB, 2016 GAM Report



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Brazos River Alluvium Aquifer MAG

- Calibrated historical model extended from 2012 to 2070
 - Used historical average recharge and average streamflow for 2013 to 2070
 - Pumping distribution based on 2012 pumping
 - Pumping amounts adjusted uniformly to achieve the desired future conditions
- DFC: Decrease average saturated thickness by 5 feet by 2070 (Milam County)
- Large MAG: > 40,000 acft/yr
- Because of modeling limitations, is MAG reliable?



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Recommendation

- Needs to be met after other recommended strategies:

Georgetown:	590
Hutto:	10,703
County-Other:	25,138
BRA:	49,386
Total:	85,817 acft/yr in 2070

- Strategies available:

Milam County GW:	14,000
Alcoa SW:	18,600
Willco GW South:	10,600
Lk. Granger Aug:	46,265
Lk. Granger GW:	< 15,920 > Granger augmentation project utilizes GW supplies
Total:	73,545 acft/yr in 2070

- Potential maximum use of Brazos River Alluvial Aquifer: **12,272 acft/yr**



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Recommendation

- Utilize the Brazos River Alluvial Aquifer as a source of supply to meet needs in Williamson County only to the extent needed to meet municipal needs remaining after the following strategies are recommended:
 - Milam County Carrizo-Wilcox Aquifer (14,000 acft/yr)
 - Leave Milam County steam-electric needs unmet
 - Alcoa surface water supplies (18,600 acft/yr)
 - Leave Milam County steam-electric needs unmet
 - Williamson County South GW Option (10,622 acft/yr)
 - Lake Granger Augmentation (conjunctive use)
 - 46,265 acft/yr of additional supply
 - Utilizes annual average of 15,920 acft/yr of groundwater (maximum 57,281 single year)




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Discussion





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WUG and WWP Plans

Agenda Item 6.3.3

February 12, 2020





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Draft Plans for WUGs and WWPs

- Draft WUG plans posted on Brazos G website and presented at three subregional meetings
 - Some costs missing
 - Some "strawman" strategies
- Post subregional meetings
 - Modifications to several WUG plans due to input from subregional meetings
 - City of Bryan ASR now recommended strategy, received preferences for reuse strategies
 - Discussions with Gatesville – population projections exaggerated, and demands too high
 - Discussion with College Station – revise groundwater strategy to utilize Carrizo-Wilcox Aquifer
 - Refined City of Abilene supplies/demands, but no change in recommended strategies
 - WCTMWD to supply Stephens and Eastland County Mining
 - Fort Griffin SUD has BRA contract (353 acft/yr) – change recommended strategy
 - Refined Williamson County plan based on BRA plan
 - Coordination with Region F and Region C consultants over shared supplies and strategies
 - Missing costs filled in
 - Draft WWP plans developed



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Remaining Questions

- Brazos River Alluvial Aquifer as a source of supply for Williamson County?
- Brazos River Authority Main Stem Supplies
 - Sum of yields plus System Operations Supply less than contracts
 - BRA modeling tools show that all contracts are firm
 - Increase supply available from System Operations to meet contractual obligations
 - Coordinate with TWDB after IPP submitted
- City of Gatesville solution?
 - Maintain strategy, but characterize it as a Coryell County strategy?
 - Leave needs unmet with explanation?



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Discussion



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5.38 Wholesale Water Provider Supply Plans

Table 5.38-1 lists each wholesale water provider that is not also a WUG in the Brazos G Area and its corresponding surplus or shortage in years 2040 and 2070. A brief summary of the wholesale water provider (WWP) and the plan for the selected WWPs are presented in the following sub chapters. For each wholesale water provider with a projected shortage, a water supply plan has been developed and is presented in the following sub chapters. **Note that shortages shown reflect full contractual commitments compared to existing supplies.**

Table 5.38-1. Wholesale Water Provider Surplus/(Shortage)

Wholesale Water Provider	Surplus/(Shortage) ^{1,2}		Comment
	2040 (acft/yr)	2070 (acft/yr)	
Brazos River Authority (Lake Aquilla System)	997	(503)	Projected shortage – see plan below
Brazos River Authority (Little River System)	(45,246)	(49,386)	Projected shortage – see plan below
Brazos River Authority (Main Stem System) ³	0	0	Supply equals demand – see plan below
Aquilla Water Supply District	1	(262)	Projected shortage – see plan below
Bell County WCID No. 1	6,056	(4,805)	Projected shortage – see plan below
Bluebonnet WSC	(317)	(453)	Projected shortage – see plan below
Central Texas WSC	342	144	Projected surplus – see plan below
Eastland County WSD	(955)	(1,045)	Projected shortage – see plan below
FHLM WSC	XX	XX	Projected shortage – see plan below
North Central Texas MWA	(1,752)	(1,797)	Projected shortage – see plan below
Palo Pinto County MWD No. 1	(2,186)	(2,806)	Projected shortage – see plan below
Salt Fork Water Quality Corporation	XX	XX	Projected shortage – see plan below
Upper Leon MWD	708	602	Projected surplus – see plan below
West Central Texas MWD	1,900	1,600	Projected shortage – see plan below

1 - From Chapter 4.3 – Water Needs for Wholesale Water Providers
 2 - Shortages shown above often include shortages from other WWPs. The shortages shown for individual WWPs should not be summed to a regional total.
 3 - Includes demands from Region H.

Commented [DD1]: Add as a new WWP?

Commented [DD2]: Add as a new WWP?

5.38.1 Brazos River Authority (Lake Aquilla System)

Description of Supply

The Brazos River Authority (Lake Aquilla System) obtains water supply from Lake Aquilla. Based on the available surface water supply and contractual demands, the Lake Aquilla System is projected to have a surplus of 1,997 acft/yr in the year 2020 decreasing to a shortage of 503 acft/yr by year 2070. Chapter 3 includes additional information on contracts and water supplies for the Lake Aquilla System. While the supply from Lake Aquilla is not adequate in 2060 and 2070 to meet the total contractual obligations, the

supply is sufficient to meet all of the projected water demands of customers of the Lake Aquilla System and no change in water supply is recommended. Contractual demands and supplies are shown in Table 5.38-2.

Table 5.38-2. Supplies and Demands for the BRA Lake Aquilla System

	2020	2030	2040	2050	2060	2070
Existing Contractual Sales						
Cleburne	5,300	5,300	5,300	5,300	5,300	5,300
Hillco WSC	150	150	150	150	150	150
Aquilla WSD	5,953	5,953	5,953	5,953	5,953	5,953
Total Existing Demands	11,403	11,403	11,403	11,403	11,403	11,403
Total Supply	13,400	12,900	12,400	11,900	11,400	10,900
<i>Projected Surplus/(Shortage) (acft/yr)</i>	<i>1,997</i>	<i>1,497</i>	<i>997</i>	<i>497</i>	<i>(3)</i>	<i>(503)</i>

Water Supply Plan

Brazos G recommends that BRA pursue reallocation of a portion of the Lake Aquilla flood control storage to conservation storage. Working within the planning criteria established by the Brazos G RWPG, the following water supply plan is recommended for the Lake Aquilla System:

☞ Lake Aquilla Reallocation

- Cost Source: Volume II
- Date to be Implemented: Before 2060
- Annual Cost: \$2,158,000
- Unit Cost: Max of \$869/acft

Table 5.38-3. Recommended Plan Costs by Decade for the BRA Lake Aquilla System

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	<i>1,997</i>	<i>1,497</i>	<i>997</i>	<i>497</i>	<i>(3)</i>	<i>(503)</i>
Lake Aquilla Reallocation						
Supply From Plan Element (acft/yr)					2,483	2,483
Annual Cost (\$/yr)					\$2,158,000	\$2,158,000
Unit Cost (\$/yr)					\$869	\$869

5.38.2 Brazos River Authority (Little River System)

Description of Supply

The Brazos River Authority Little River System obtains its water supply from Lake Proctor, Lake Belton, Stillhouse Hollow Reservoir, Lake Georgetown, and Lake Granger. Based

on the available surface water supply, existing contractual commitments and recommended water management strategies, the Brazos River Authority Little River System is projected to have a shortage of 42,486 acft/yr in the year 2040 and 49,386 acft/yr in the year 2070. Shortages for the BRA Little River System are based on a comparison of supplies and current contractual commitments, not projected demands for those entities holding contracts with the BRA. Contractual demands and supplies are shown in Table 5.38-4.

Supplies from Lake Granger are allocated to meet BRA system demands, except for 13,000 acft/yr specifically allocated to the East Williamson County Water Treatment Plant (EWCWTP), which supplies water to the City of Taylor and is intended to supply other entities in eastern Williamson County and Bell County. Currently, between 3,279 acft/yr and 4,729 acft/yr of that supply is allocated to meet the demands of the City of Taylor and its wholesale customers, 2,136 acft/yr for Jarrell-Schwertner WSC in addition to another 1,000 acft/yr contract Jarrell-Schwertner WSC holds, and 2,744 acft/yr for Sonterra MUD. The remaining supply from the EWCWTP is available for other users as a water management strategy. Chapter 3 includes additional information on contracts and water supplies for the Little River System.

Note that the shortages shown are based on full contractual commitments. Actual full use of those contracts is unlikely to occur until later years of the planning period and the shortages shown are more likely to occur later than shown here.

Table 5.38-4. Supplies and Demands for the BRA Little River System

Plan Element	2020	2030	2040	2050	2060	2070
Existing Contractual Demands	251,643	251,643	251,643	251,643	251,643	251,643
Supply Sources						
Lake Proctor	13,300	12,660	12,020	11,380	10,740	10,100
Lake Belton	100,257	100,257	100,257	100,257	100,257	100,257
Lake Stillhouse Hollow	66,400	66,120	65,840	65,560	65,280	65,000
Lake Georgetown	11,600	11,580	11,560	11,540	11,520	11,500
Lake Granger	17,600	17,160	16,720	16,280	15,840	15,400
Total Existing Supplies	209,157	207,777	206,397	205,017	203,637	202,257
<i>Projected Surplus/(Shortage) (acft/yr)</i>	<i>(42,486)</i>	<i>(43,866)</i>	<i>(45,246)</i>	<i>(46,626)</i>	<i>(48,006)</i>	<i>(49,386)</i>

Note: Highland Lakes supplies (25,000 acft/yr) and contracts (22,128 acft/yr) pursuant to HB 1437 are not shown.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG, the following water supply plan is recommended to meet the projected shortages for BRA's Little River System:

☒ Lake Granger Augmentation Phase I (Trinity Wells)

Supply from this strategy is zero in the 2021 Brazos G Plan due to the MAG for the Trinity Aquifer in Williamson County being allocated fully to existing users.

- Cost Source: Volume II
 - Date to be Implemented: 2020
 - Total Project Cost: \$96,685,000 (includes expansion of EWCRWTP, treated water pipeline and pump station)
- b. Sell Remaining Highland Lakes Supplies to County-Other entities
- Cost Source: Volume II
 - Date to be Implemented: before 2020
 - Total Project Cost: \$0
 - Unit Cost: Max of \$76.50/acft in 2020
- c. Lake Granger ASR
- Cost Source: Volume II
 - Date to be Implemented: before 2020
 - Total Project Cost: \$99,820,000 (sum of 3 phases)
 - Unit Cost: Max of \$1,291/acft in 2030
- d. Belton to Stillhouse Pipeline – this strategy is for operational purposes and does not provide additional supply
- Cost Source: Volume II
 - Date to be Implemented: Before 2020
 - Total Project Cost: \$38,069,000
 - Unit Cost: not applicable
- e. Lake Granger Augmentation Phase II
- This strategy would overdraft Lake Granger and supplement supplies with an annual average of 15,920 acft/yr of groundwater from Milam, Burleson and/or Lee Counties (Williamson County groundwater supply project north or south option, or Milam County GW) (57,281 acft/yr maximum groundwater in a single year).
- Cost Source: Volume II
 - Date to be Implemented: before 2020
 - Total Project Cost: \$845,564,000
 - Unit Cost: Max of \$1,632/ acft in 2020

Table 5.38-5. Recommended Plan Costs by Decade for the BRA Little River System

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	(42,286)	(43,866)	(45,246)	(46,626)	(48,006)	(49,386)
Lake Granger Augmentation – Phase I (Trinity Wells)						

Table 5.38-5. Recommended Plan Costs by Decade for the BRA Little River System

Plan Element	2020	2030	2040	2050	2060	2070
Supply From Plan Element (acft/yr)	0	0	0	0	0	0
Annual Cost (\$/yr)	\$11,271,000	\$11,271,000	\$11,271,000	\$11,271,000	\$11,271,000	\$11,271,000
Unit Cost (\$/yr)	ND	ND	ND	ND	ND	ND
Sell Remaining Highland Lakes Supply						
Supply From Plan Element (acft/yr)	2,872	2,872	2,872	2,872	2,872	2,872
Annual Cost (\$/yr)	\$219,708	\$219,708	\$219,708	\$219,708	\$219,708	\$219,708
Unit Cost (\$/yr)	\$76.50	\$76.50	\$76.50	\$76.50	\$76.50	\$76.50
Lake Granger ASR						
Supply From Plan Element (acft/yr)	3,200	7,600	11,900	11,900	11,900	11,900
Annual Cost (\$/yr)	8,130,000	\$6,493,000	\$14,090,000	\$14,090,000	\$5,898,000	\$5,898,000
Unit Cost (\$/yr)	\$2,541	\$854	\$1,184	\$1,184	\$496	\$496
Belton to Stillhouse Pipeline						
Supply From Plan Element (acft/yr)	—	—	—	—	—	—
Annual Cost (\$/yr)	\$6,545,000	\$6,545,000	\$6,545,000	\$6,545,000	\$6,545,000	\$6,545,000
Unit Cost (\$/yr)	NA	NA	NA	NA	NA	NA
Lake Granger Augmentation – Phase II						
Supply From Plan Element (acft/yr)	46,265	46,265	46,265	46,265	46,265	46,265
Annual Cost (\$/yr)	\$75,502,000	\$75,502,000	\$24,451,000	\$24,451,000	\$24,451,000	\$24,451,000
Unit Cost (\$/yr)	\$1,632	\$1,632	\$529	\$529	\$529	\$529

5.38.3 Brazos River Authority (Main Stem/Lower Basin System)

Description of Supply

The Brazos River Authority (Main Stem/Lower Basin System) obtains water supply from Possum Kingdom Reservoir, Lake Granbury, Lake Whitney, Lake Somerville, and Lake Limestone, and the BRA’s System Operations Permit. Based on the available surface water supply, the Brazos River Authority Main Stem/Lower Basin System is projected to meet the projected contractual demands on the BRA Main Stem/Lower Basin System from Region O, Region H, Region C and Brazos G. Chapter 3 includes additional information on contracts and water supplies for the Main Stem/Lower Basin System. Contractual demands and supplies are summarized in Table 5.38-6. System yield modeling indicates that the full System Operations yield exceeds the contractual demands, but is constrained for regional planning to meet just the contractual demands shown in Table 5.38-6.

Actual full use of the contracts shown is unlikely to occur until later years of the planning period. In addition to the System Operations Permit, the BRA has a System Order that allows BRA to divert from each individual reservoir an annual amount greater than the reservoir’s authorized diversion and assign the difference to another reservoir in the

system. While this does not increase the authorized supply from the BRA system, it provides operational flexibility within the BRA's system.

Table 5.38-6. Supplies and Demands for the BRA Main Stem/Lower Basin System

Plan Element	2020	2030	2040	2050	2060	2070
Contractual Demands						
System/Lakeside – Region O	961	961	961	961	961	961
System/Lakeside – Region C	1,600	1,600	1,600	1,600	1,600	1,600
System/Lakeside – Brazos G	213,504	213,504	213,504	213,504	213,504	213,504
System/Lakeside – Region H	163,450	163,450	163,450	163,450	163,450	163,450
System Operations – Brazos G	15,211	15,211	15,211	15,211	15,211	15,211
System Operations – Region H	79,785	79,785	79,785	79,785	79,785	79,785
Total Existing Contractual Demands	474,511	474,511	474,511	474,511	474,511	474,511
Supply Sources						
Possum Kingdom Reservoir	152,100	151,220	150,340	149,460	148,580	147,700
Lake Granbury	59,400	58,380	57,360	56,340	55,320	54,300
Lake Whitney	18,336	18,336	18,336	18,336	18,336	18,336
Lake Somerville	42,200	41,540	40,880	40,220	39,560	38,900
Lake Limestone	64,000	62,440	60,880	59,320	57,760	56,200
System Operations	138,475	142,595	146,715	150,835	154,955	159,075
Total Existing Supplies	474,511	474,511	474,511	474,511	474,511	474,511
<i>Projected Surplus/(Shortage) (acft/yr)</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG, the following water supply plan is recommended to meet the projected shortages for the BRA Main Stem System:

3. **Upper Basin Chloride Control Project**

- Cost Source: Volume II
- Date to be Implemented: before 2030
- Total Project Cost: \$106,537,000
- Unit Cost: \$6,527 for fresh water supply developed. Cost benefits result from reduced treatment costs downstream. Cost benefits range from \$65/acft in the upper basin to zero in the lower basin.

Commented [DD3]: Need to change to SFWQC after they are made a WWP

Table 5.38-7. Recommended Plan Costs by Decade for the BRA Main Stem System

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	0	0	0	0	0	0
Upper Basin Chloride Control Project						
Supply From Plan Element (acft/yr)	—	949	949	949	949	949
Annual Cost (\$/yr) ¹	—	\$6,194,000	\$6,194,000	\$0	\$0	\$0
Unit Cost (\$/yr)	—	\$6,527	\$6,527	N/A	N/A	N/A
Alternative: Lake Whitney Overdrafting with Off-Channel Reservoir						
Supply From Plan Element (acft/yr)				5,200	5,200	5,200
Annual Cost (\$/yr)				\$12,879,000	\$12,879,000	\$79,000
Unit Cost (\$/yr)				\$2,477	\$2,477	\$1,125
Alternative: Lake Whitney Hydropower Reallocation						
Supply From Plan Element (acft/yr)				38,480	38,480	38,480
Annual Cost (\$/yr)				\$2,679,000	\$2,679,000	\$148,000
Unit Cost (\$/yr)				\$70	\$70	\$3
1 – Project consultants have prepared a pro forma analysis indicating that revenue from salt sales would cover all O&M costs.						

5.38.4 Aquilla Water Supply District

Description of Supply

Aquilla WSD obtains raw water from Lake Aquilla through a contract with the BRA. The district supplies treated water to five wholesale customers. Chapter 3 includes additional information on contracts and water supplies for Aquilla WSD. Based on contractual commitments, a shortage is projected in 2020 for the District due to a short term contract with Hillsboro and in 2070 due to sedimentation reducing the yield of Lake Aquilla. However, the water demands of the five wholesale customers are substantially less than the contractual obligations of the District, and no change in water supply is recommended.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended to meet the projected water shortage for Aquilla WSD.

☒. BRA to firm up supplies through Lake Aquilla reallocation

- Cost Source: Cost borne by BRA
- Date to be Implemented: Before 2060
- Total Project Cost: Cost borne by BRA
- Unit Cost: \$0/acft

Table 5.38-8. Recommended Plan Costs by Decade for Aquilla WSD

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	(559)	1	1	1	1	(262)
BRA to Firm Up Supplies through Lake Aquilla Reallocation						
Supply From Plan Element (acft/yr)						262
Annual Cost (\$/yr)						\$0
Unit Cost (\$/yr)						\$0

5.38.5 Bell County WCID No. 1

Description of Supply

Bell County WCID No. 1 obtains its water supply from Lake Belton through BRA contracts (62,509 acft/yr). The district’s fresh water customers have year 2070 projected demands of 53,055 acft/yr that the District would be required to meet, compared to the district’s total supply from the BRA of 50,241 acft/yr (the full 62,509 acft/yr is not currently firm). Chapter 4 includes additional information on contracts and water supplies for Bell County WCID No.1. Therefore, the district has needs projected for its customers starting in 2060 based on contractual commitments and in 2070 based on its customers’ actual projected demands. BRA strategies for the Little River System will firm up contracts to provide the full amount of supply during drought of record conditions, therefore no change in water supply is recommended for Bell County WCID No. 1.

The District has entered into a contract to supply reuse supply to the City of Killeen. Bell County WCID is pursuing TCEQ Reclaimed Water Type I permits to utilize treated wastewater from wastewater treatment plants (WWTP) 1 and 2 and the South WWTP. The District has evaluated several wastewater reuse options as part of its Master Plan update. The reuse portion of the Master Plan identifies both near-term potential customers as well as other future customers that would utilize the total available reuse supply generated through the District’s regional wastewater system.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended to meet the projected water shortage for Bell County WCID No.1.

a. Firm up Supplies through BRA Little River System Strategies

- Cost Source: Volume II
- Date to be Implemented: 2020
- Total Project Cost: borne by BRA
- Unit Cost: already contracted supplies

b. Water Treatment Plant Expansion

- Cost Source: Volume II
- Date to be Implemented: 2020
- Total Project Cost: \$20,376,000
- Unit Cost: \$906/acft

Table 5.38-9. Recommended Plan Costs by Decade for Bell County WCID No.1

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	13,118	9,777	6,056	2,424	(1,197)	(4,805)
Firm up Supplies through BRA Little River System Strategies						
Supply From Plan Element (acft/yr)	10,554	10,896	11,239	11,582	11,925	12,268
Annual Cost (\$/yr)	\$0	\$0	\$0	\$0	\$0	\$0
Unit Cost (\$/yr)	\$0	\$0	\$0	\$0	\$0	\$0
Water Treatment Plan Expansion						
Supply From Plan Element (acft/yr)	1,680	1,680	1,680	1,680	3,360	3,360
Annual Cost (\$/yr)	\$1,522,000	\$1,522,000	\$681,000	\$681,000	\$2,203,000	\$2,203,000
Unit Cost (\$/yr)	\$906	\$906	\$405	\$405	\$656	\$656

Reuse Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to meet the projected reuse water demands for Bell County WCID No.1:

a. North Reuse

- Cost Source: Volume II, Chapter 3
- Date to be Implemented: 2020
- Total Project Cost: \$12,146,000
- Unit Cost: Max of \$765 / acft in 2020

b. South Reuse

- Cost Source: Volume II, Chapter 3
- Date to be Implemented: 2020
- Total Project Cost: \$6,529,000
- Unit Cost: Max of \$930 / acft in 2020

Table 5.38-10. Recommended Plan Costs by Decade for Bell County WCID No. 1 for Reuse Supplies

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	(2,693)	(2,693)	(2,693)	(2,693)	(2,693)	(2,693)

Table 5.38-10. Recommended Plan Costs by Decade for Bell County WCID No. 1 for Reuse Supplies

Plan Element	2020	2030	2040	2050	2060	2070
Bell County WCID #1-North Reuse (Volume II, Chapter 3)						
Supply From Plan Element (acft/yr)	1,945	1,945	1,945	1,945	1,945	1,945
Annual Cost (\$/yr)	\$1,472,625	\$1,472,625	\$456,225	\$456,225	\$456,225	\$456,225
Unit Cost (\$/yr)	\$765	\$765	\$237	\$237	\$237	\$237
Bell County WCID #1-South Reuse (Volume II, Chapter 3)						
Supply From Plan Element (acft/yr)	748	748	748	748	748	748
Annual Cost (\$/yr)	\$696,000	\$696,000	\$150,000	\$150,000	\$150,000	\$150,000
Unit Cost (\$/yr)	\$930	\$930	\$201	\$201	\$201	\$201

5.38.6 Bluebonnet Water Supply Corporation

Description of Supply

Bluebonnet Water Supply Corporation (WSC) obtains raw water from Lake Belton through contracts with the BRA totaling 8,301 acft; however the firm supply of those contracts is 6,900 in 2020, and decreases over the planning period. The WSC has projected shortages starting in 2020 based on contractual commitments. However, the BRA contractual amount, if firm, would be sufficient to meet all of Bluebonnet’s contractual commitments. Based on actual projected customer demands, however, there is sufficient supply to meet all projected demands of Bluebonnet’s customers. BRA strategies for the Little River System will firm up contracts to provide the full amount of supply during drought of record conditions and no change in water supply is recommended. Chapter 4 includes additional information on contracts and water supplies for Bluebonnet WSC.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended to meet the projected water shortages for Bluebonnet WSC:

☒ Firm up Supplies through BRA Little River System Strategies

- Cost Source: Volume II
- Date to be Implemented: 2020
- Total Project Cost: borne by BRA
- Unit Cost: already contracted supplies

Table 5.38-11. Recommended Plan Costs by Decade for Bluebonnet WSC

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	(225)	(271)	(317)	(362)	(408)	(453)

Table 5.38-11. Recommended Plan Costs by Decade for Bluebonnet WSC

Plan Element	2020	2030	2040	2050	2060	2070
Firm up Supplies through BRA Little River System Strategies						
Supply From Plan Element (acft/yr)	1,401	1,447	1,493	1,538	1,584	1,629
Annual Cost (\$/yr)	\$0	\$0	\$0	\$0	\$0	\$0
Unit Cost (\$/yr)	\$0	\$0	\$0	\$0	\$0	\$0

5.38.7 Central Texas Water Supply Corporation

Description of Supply

Central Texas WSC obtains its water supply from Lake Stillhouse Hollow through contracts with the BRA totaling 12,045 acft; however the firm supply of those contracts is 10,011 in 2020, decreasing to 9,681 acft/yr in 2070. Central Texas WSC also has recently constructed two wells in the Trinity Aquifer in Bell County that are counted as current supply as they will be online prior to 2020. Based on the available surface water and groundwater supply, currently contracted supplies, and projected demands for its current customers, Central Texas WSC is not projected to have shortages through 2070, assuming that all demands can be treated and delivered through current infrastructure. Chapter 4 includes additional information on contracts and water supplies for Central Texas WSC.

BRA strategies for the Little River System will firm up contracts to provide full amount of supply during drought of record.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to meet the projected water shortage for Central Texas WSC.

☒ Firm up of Supplies through BRA Little River System Strategies

- Cost Source: Volume II
- Date to be Implemented: 2020
- Total Project Cost: borne by BRA
- Unit Cost: already contracted supplies

Table 5.38-12. Recommended Plan Costs by Decade for Central Texas WSC

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	474	408	342	276	210	144
Firm up of Supplies through BRA Little River System Strategies						
Supply From Plan Element (acft/yr)	2,034	2,100	2,166	2,232	2,298	2,364
Annual Cost (\$/yr)	\$0	\$0	\$0	\$0	\$0	\$0
Unit Cost (\$/yr)	\$0	\$0	\$0	\$0	\$0	\$0

5.38.8 Eastland County WSD

Eastland County WSD obtains its water supply from Lake Leon and Eastland Lake and provides water to the Cities of Eastland and Ranger, and to manufacturing interests in Eastland County. The supplies from these two sources are not sufficient to meet the District’s contractual commitments, but are ample to meet the projected demands for Eastland and Ranger, which are only about 20 percent of the contractual supplies. No changes in water supply are recommended. Chapter 4 includes additional information on contracts and water supplies for Eastland County WSD.

5.38.9 North Central Texas Municipal Water Authority

Description of Supply

North Central Texas MWA owns and obtains its water supply from Millers Creek Reservoir. Based on the available surface water supply, shortages are expected through 2070. Chapter 4 includes additional information on contracts and water supplies for North Central Texas Municipal Water Authority.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to meet the projected water shortage for the North Central Texas MWA.

☒. Lake Creek Reservoir

- Cost Source: Volume II
 - Project requires a subordination agreement with the BRA, which is dependent on the BRA obtaining the System Operations permit
- Date to be Implemented: 2020
- Total Project Cost: \$259,001,000
- Unit Cost: \$1,657 / acft

Table 5.38-13. Recommended Plan Costs by Decade for North Central Texas MWA

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	(1,722)	(1,737)	(1,752)	(1,767)	(1,782)	(1,797)
Lake Creek Reservoir						
Supply From Plan Element (acft/yr)	12,900	12,900	12,900	12,900	12,900	12,900
Annual Cost (\$/yr)	\$21,377,000	\$21,377,000	\$9,511,000	\$9,511,000	\$9,511,000	\$5,280,000
Unit Cost (\$/yr)	\$1,657	\$1,657	\$737	\$737	\$737	\$409

5.38.10 Palo Pinto County Municipal Water District No. 1

Description of Supply

Palo Pinto County Municipal Water District owns and operates Lake Palo Pinto, which is used to supply water to entities in Palo Pinto and Parker Counties. A portion of its supply is used in Region C. The district has rights to 18,500 acft/yr for municipal and steam electric power uses. Treated water is supplied to the City of Mineral Wells (and its customers) and Lake Palo Pinto Area Water Supply Corporation. Projected demands based on contractual commitments indicate shortages through 2070. However, based on projected customer demands associated with Mineral Wells (limited to contractual maximums), there will only be a supply shortage of 310 acft/yr in 2070. Chapter 4 includes additional information on contracts and water supplies for Palo Pinto County MWD No.1.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to meet the projected water shortage for the Palo Pinto County Municipal Water District No.1.

☒. Lake Palo Pinto Expansion (Turkey Peak Dam)

- Cost Source: Volume II
- Date to be Implemented: 2020
- Total Project Cost: \$102,530,000 (includes \$8,000,000 already expended for completed studies and legal assistance)
- Unit Cost: Max of \$989 / acft in 2020

Table 5.38-14. Recommended Plan Costs by Decade for Palo Pinto County Municipal Water District No.1

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	(1,751)	(1,991)	(2,186)	(2,397)	(2,608)	(2,806)
Lake Palo Pinto Expansion (Turkey Peak Dam)						
Supply From Plan Element (acft/yr)	6,000	6,000	6,000	6,000	6,000	6,000
Annual Cost (\$/yr)	\$5,935,000	\$5,935,000	\$796,000	\$796,000	\$796,000	\$796,000

Table 5.38-14. Recommended Plan Costs by Decade for Palo Pinto County Municipal Water District No.1

Plan Element	2020	2030	2040	2050	2060	2070
Unit Cost (\$/yr)	\$989	\$989	\$133	\$133	\$133	\$133

5.38.11 Upper Leon Municipal Water District

Description of Supply

Upper Leon MWD obtains its water supply through a contract with the Brazos River Authority for 6,437 acft/yr of water from Lake Proctor; however the firm supply of those contracts is 5,350 acft/yr in 2020 and decreases to 5,174 acft/yr by 2070. The WSD has projected surpluses throughout the planning period. BRA strategies for the Little River System will firm up contracts to provide the full amount of supply during drought of record conditions. Chapter 4 includes additional information on contracts and water supplies for Upper Leon MWD.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended to meet the projected water shortage for Upper Leon MWD.

- a. Firm up Supplies through BRA Little River System Strategies
 - Cost Source: Volume II
 - Date to be Implemented: 2020
 - Total Project Cost: borne by BRA
 - Unit Cost: already contracted supplies
- b. Trinity Groundwater from Pecan Orchard
 - Cost Source: Intended Use Plan Budget submitted to TWDB in support of DWSRF Application
 - Date to be Implemented: 2020
 - Total Project Cost: \$5,347,000
 - Unit Cost: \$319/acft

Table 5.38-15. Recommended Plan Costs by Decade for Upper Leon MWD

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	778	743	708	672	637	602
Firm up Supplies through BRA Little River System Strategies						
Supply From Plan Element (acft/yr)	1,087	1,122	1,157	1,193	1,228	1,263
Annual Cost (\$/yr)	\$0	\$0	\$0	\$0	\$0	\$0

Table 5.38-15. Recommended Plan Costs by Decade for Upper Leon MWD

Plan Element	2020	2030	2040	2050	2060	2070
Unit Cost (\$/yr)	\$0	\$0	\$0	\$0	\$0	\$0
Trinity Groundwater from Pecan Orchard						
Supply From Plan Element (acft/yr)	2,040	2,040	2,040	2,040	2,040	2,040
Annual Cost (\$/yr)	\$447,433	\$447,433	\$203,327	\$203,327	\$203,327	\$203,327
Unit Cost (\$/yr)	\$319	\$319	\$100	\$100	\$100	\$100

5.38.12 West Central Texas Municipal Water District

Description of Supply

West Central Texas MWD owns and obtains its water supply from Hubbard Creek Reservoir. Based on the available surface water supply constrained to a 2-year safe yield estimate, West Central Texas MWD is projected to have surplus supplies throughout the planning period. Chapter 4 includes additional information on contracts and water supplies for West Central Texas MWD.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategy is recommended to supplement water supplies for West Central Texas MWD.


5. BRA System Operations Supply

The District is in the process of negotiating a contract to purchase 774 acft/yr from the Brazos River Authority’s System Operations supply.

- Cost Source: Volume II
- Date to be Implemented: before 2020
- Total Project Cost: Infrastructure already exists
- Unit Cost: \$76.50/acft

Table 5.38-16. Recommended Plan Costs by Decade for West Central Texas MWD



Plan Element	2020	2030	2040	2050	2060	2070
Projected Surplus/(Shortage) (acft/yr)	2,100	2,000	1,900	1,800	1,700	1,600
BRA System Operations Supply						
Supply From Plan Element (acft/yr)	774	774	774	774	774	774
Annual Cost (\$/yr)	\$59,211	\$59,211	\$59,211	\$59,211	\$59,211	\$59,211
Unit Cost (\$/yr)	\$76.50	\$76.50	\$76.50	\$76.50	\$76.50	\$76.50



Unmet Needs

Agenda Item 6.3.4

February 12, 2020




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Rationale for Leaving Needs Unmet

- Irrigation
 - No economically viable supply can be developed
- Mining
 - Source of need difficult to identify
 - No reasonable supply can be developed
 - Small need in 2020 or 2030 only
- Manufacturing
 - Small need in 2020 only
- Steam-Electric
 - Small need in 2020 only
 - Plans for new generation facility abandoned (Hill County, Somervell County)
 - Demands overstated (Hood County)
- Livestock
 - Small need in 2020 only



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Suggested Needs Left Unmet

County	Water User Group	Needs Left Unmet (acft/yr)					
		2020	2030	2040	2050	2060	2070
Bosque	Mining	747	801	594	575	539	528
Brazos	Steam-Electric ^A	1	—	—	—	—	—
Burleson	Manufacturing ^A	2	—	—	—	—	—
Comanche	Irrigation	14,114	13,541	12,903	12,972	12,976	13,044
Haskell	Mining	90	87	77	69	61	55
Haskell	Irrigation	14,932	13,881	10,540	10,809	11,711	11,825
Hill	Steam-Electric	4,120	4,120	4,120	4,120	4,120	4,120
Hill	Mining	187	—	—	—	—	—
Hood	Steam-Electric	13,082	13,618	14,153	14,689	15,225	15,760
Knox	Irrigation	13,160	14,678	10,394	8,418	7,954	10,117
Limestone	Mining	6,849	6,271	6,016	6,457	6,891	7,467
Nolan	Irrigation	6,572	6,341	6,110	6,110	6,110	6,110
Robertson	Steam-Electric	12,490	13,919	14,866	15,896	17,325	18,754
Shackelford	Mining	336	501	309	201	95	16
Somervell	Steam-Electric	43,334	45,586	47,838	50,089	52,341	54,592
Somervell	Mining	—	98	—	—	—	—
Stephens	Mining	3,323	3,295	2,557	1,968	1,440	990
Stephens	Irrigation	80	80	80	80	80	80
Williamson	Mining	4,722	5,492	6,405	7,513	8,654	9,960
Williamson	Irrigation	172	155	149	—	—	—
Young	Livestock	111	—	—	—	—	—




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Discussion





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Consistency with Long Term Protection of State's Water, Agriculture, and Natural Resources
Agenda Item 6.3.5

February 12, 2019


 

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Protection of State's Resources

- Addressed in Section 6 of the Plan
- Plan must be consistent with protection of State's:
 - Water resources
 - Groundwater
 - Surface water
 - Agricultural resources
 - Natural resources



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Protection of Water Resources – Groundwater

- No recommended groundwater strategies increase pumpage beyond MAG
- Projected groundwater conditions are expected to be within the DFC



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Protection of Water Resources – Surface Water

- Cumulative Effects Analysis
 - Quantifies hydrologic effects of recommended strategies
 - Utilizes TCEQ Brazos WAM (Run 3) – Required for evaluation of surface water strategies
 - Streamflows compared with and without implemented plan at selected locations throughout Brazos River Basin



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Protection of Water Resources – Surface Water

- Baseline Condition (TCEQ Brazos WAM Run 3)
 - Existing water rights including BRA System Operations permit
 - Permitted storages and diversions
 - No return flows

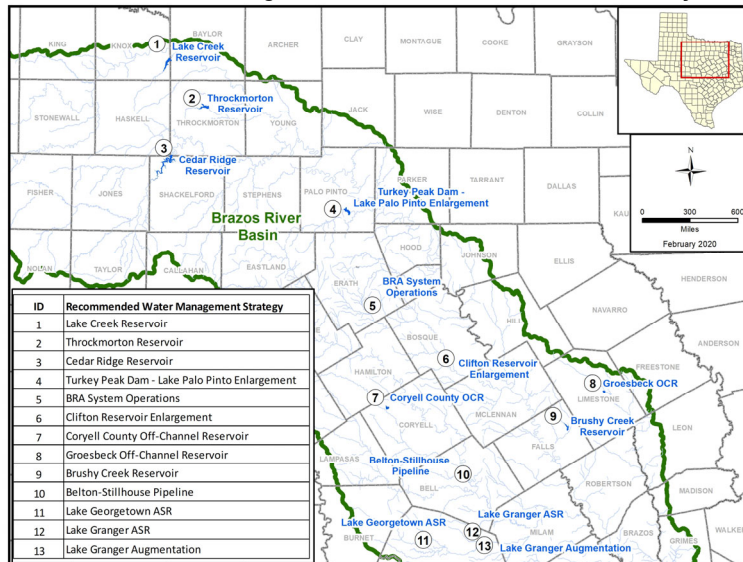
- Implementation Condition
 - Baseline Condition plus recommended water management strategies that would further impact streamflows
 - Reuse projects not included because return flows not included in the WAM for evaluation of surface water strategies



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Protection of Water Resources – Surface Water

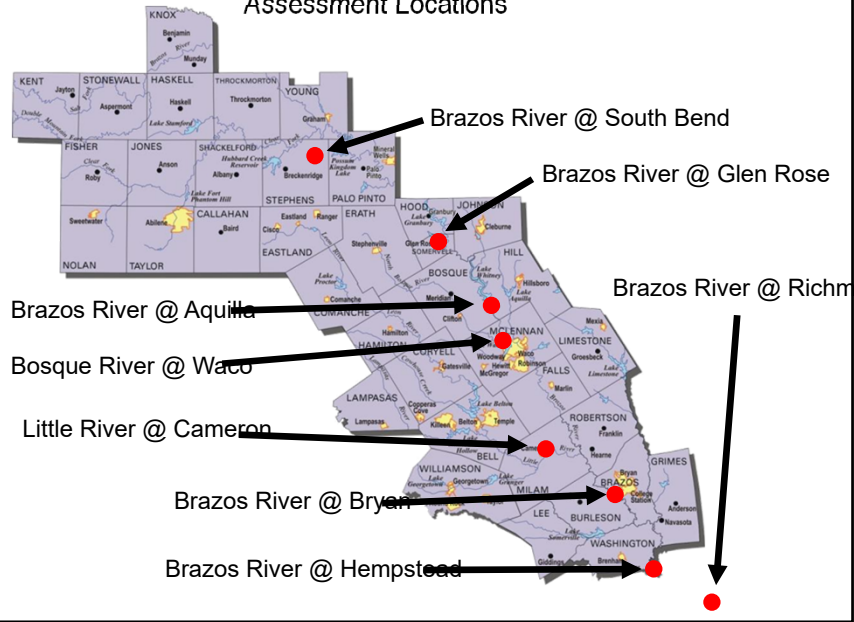
Recommended Strategies Included in Cumulative Effects Analysis



36

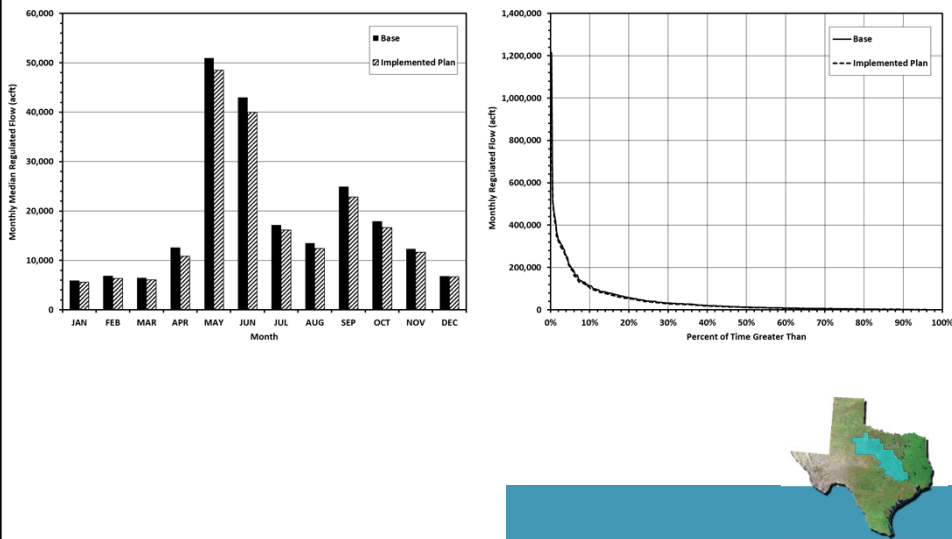
Protection of Water Resources – Surface Water

Assessment Locations



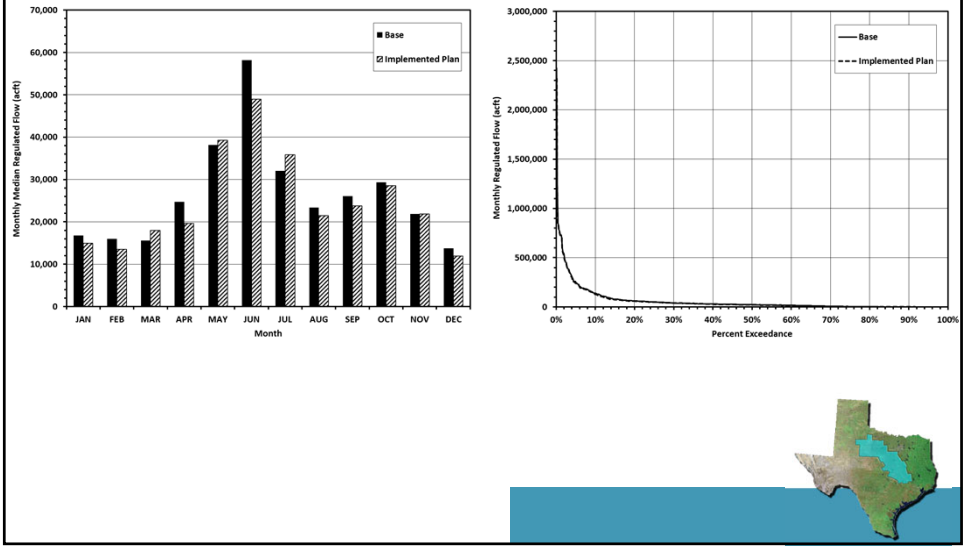
37

Protection of Water Resources – Surface Water Brazos River at South Bend



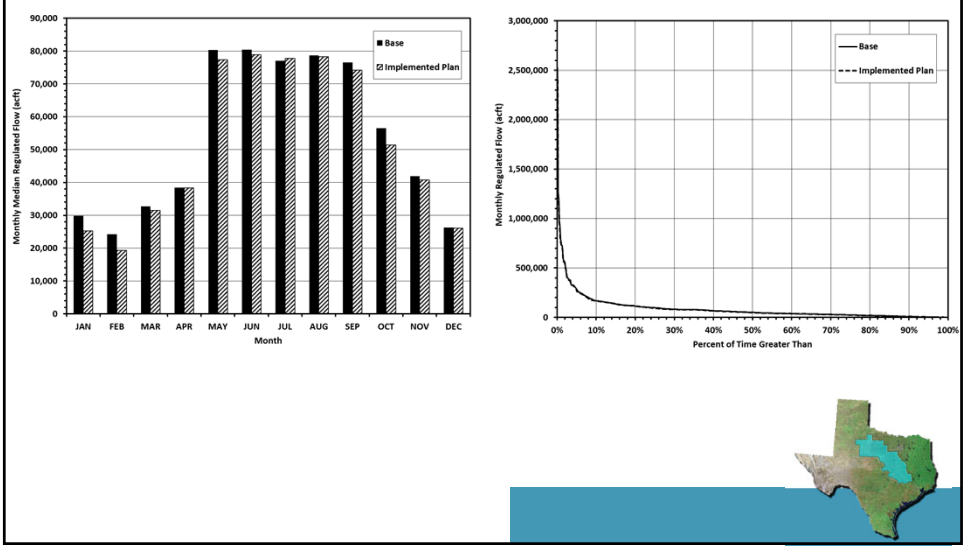
38

Protection of Water Resources – Surface Water Brazos River at Glenn Rose



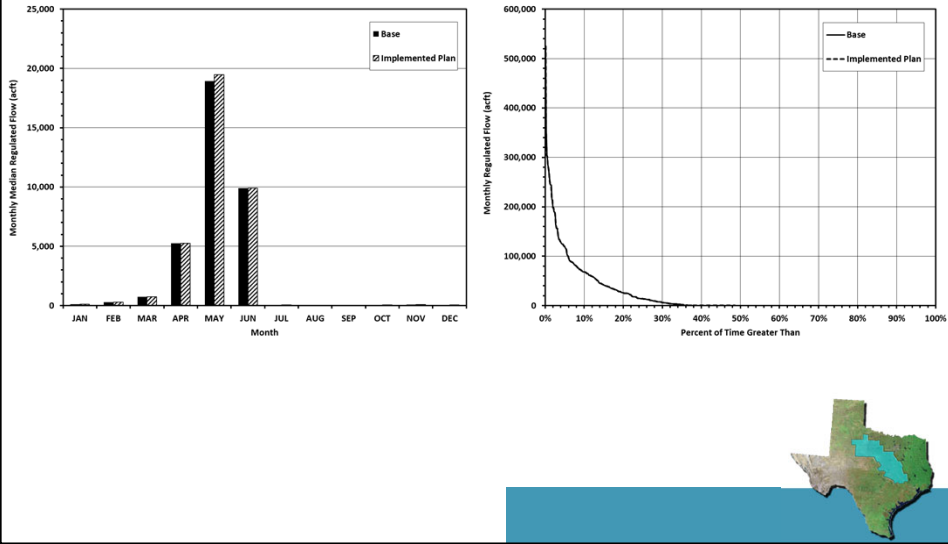
39

Protection of Water Resources – Surface Water Brazos River at Aquilla



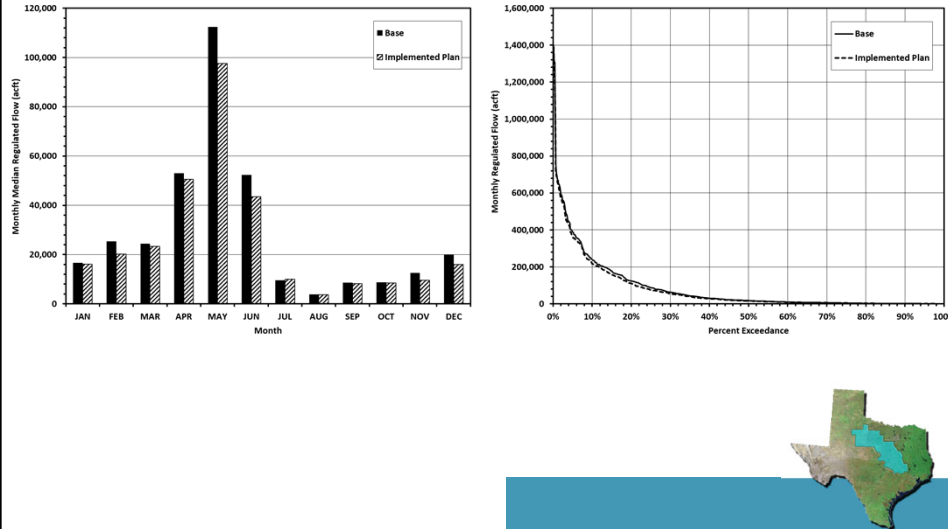
40

Protection of Water Resources – Surface Water Bosque River at Waco



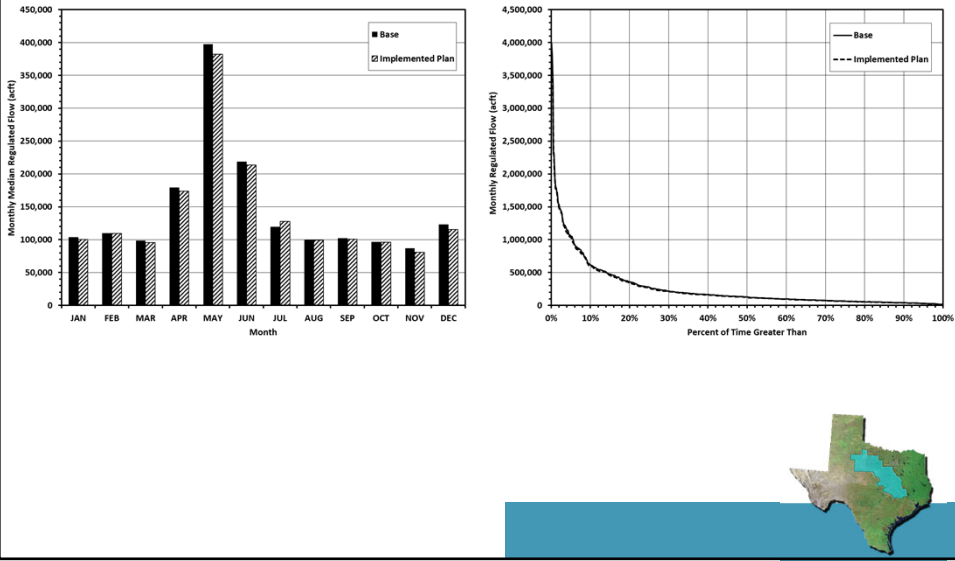
41

Protection of Water Resources – Surface Water Little River at Cameron



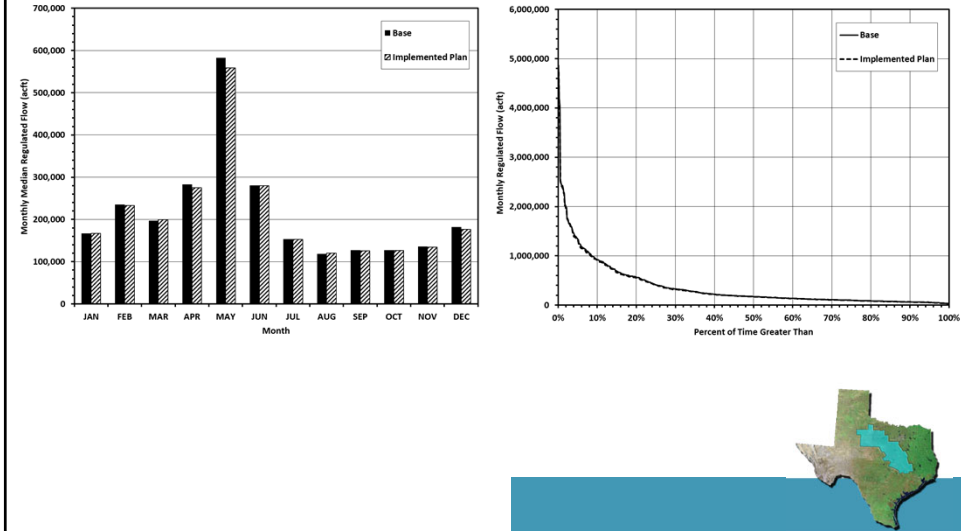
42

Protection of Water Resources – Surface Water Brazos River at Bryan



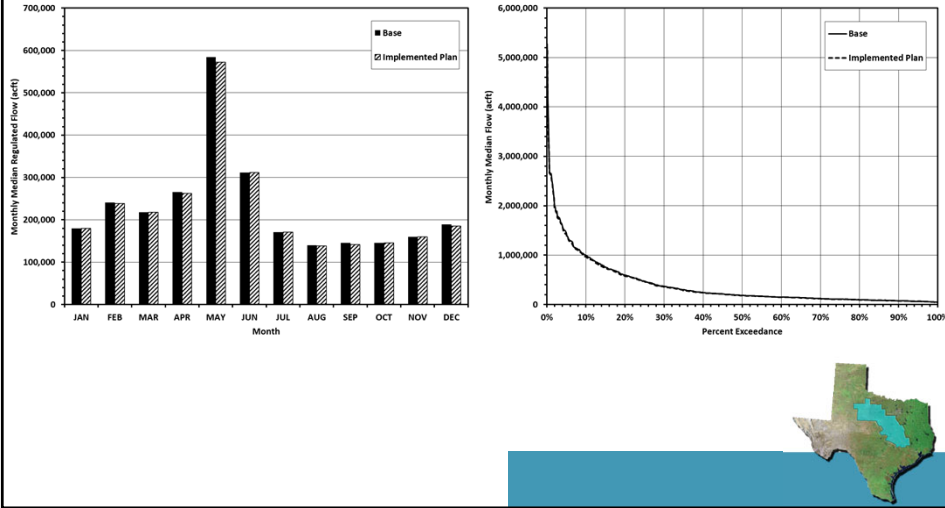
43

Protection of Water Resources – Surface Water Brazos River at Hempstead



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Protection of Water Resources – Surface Water Brazos River at Richmond



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Protection of Water Resources – Surface Water

Cumulative Effects Summary

- Comparison of flow frequency curves shows the impacts to streamflow from implementation of plan are not significant at assessment locations.
- Many locations exhibit slightly larger flows with implementation of plan due the altering of releases from upstream reservoirs as part of the BRA System Operations.

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Protection of Agricultural Resources

- Impacts occur from redistribution of water from rural and agricultural areas to urban areas.
- Carrizo-Wilcox pumping from Lee and Milam Counties to Williamson County may lower artesian levels and increase cost to pump in rural and agricultural areas.
- Remaining recommended strategies do not include transferring significant quantities of water needed by rural and agricultural users.



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Protection of Natural Resources

- Water quality concerns will need to be overcome before a strategy can be used as a supply.
- Strategy evaluations catalogue potential impacts of projects
 - Threatened and endangered species in vicinity
 - Acreages of wildlife habitat quantified
 - Acreages of agricultural land quantified
- Strategies formulated to avoid unnecessary impacts



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QUESTIONS?



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Other HDR Planning Tasks


Agenda Item 6.3.6

February 12, 2020



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Schedule to Develop the 2021 Brazos G Plan

Agenda Item 6.3.7

February 12, 2020





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Working Schedule for the 2021 Planning Cycle

- [February 12 Brazos G RWPG Meeting](#)
 - Key decisions before finalizing plan
 - Discuss questions regarding draft WUG and WWP Plans
- [February 13 – 21: finalize remaining report sections](#)
- [February 26 Brazos G RWPG Meeting](#)
 - Adopt Initially Prepared Plan
- [March 3, 2020 – Submit Initially Prepared Plan to TWDB](#)
 - March – Distribute IPP
 - Spring – Public/agency comment period
 - April 29 – [Public Hearing](#) on IPP; presentation on economic impacts of not meeting needs
 - May/June – Public comment period following public hearing
 - July/Aug – Address comments & finalize plan
 - September – [Brazos G RWPG Meeting](#) – adopt Final Plan
- [October 14, 2020 – Submit Final Plan](#)



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6.4. Report and possible discussion on updates from other regional planning groups (Regions B,C,F,H,K,L &O).

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6.5. Report and possible discussion on Groundwater Management Area activities.

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6.6. Report and possible discussion on agency communication and information.

55



6.7. Discussion and possible action on report by Brazos G Administrator.

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6.8. Report and possible discussion from Brazos G Chair.

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- 7. DISCUSSION AND POSSIBLE ACTION ON NEW BUSINESS TO BE CONSIDERED AT NEXT MEETING**
- 8. CONFIRMATION OF NEXT MEETING DATE**
- 9. ADJOURN**

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