

Item 3 – Five-year District Management Plan Update

At least once every five years, the District is required to update the District Management Plan inserting the most recently adopted Desired Future Conditions for all managed aquifers and any revisions to groundwater management strategies to be employed by the District. The Management Plan Committee Chairman, John Elliott, and I have decided on a schedule to accomplish this task for final TWDB approval no later than November 30, 2023. The suggested schedule is below.

April 4 - April 10 – Committee members review the red-lined plan making changes deemed necessary (completed)

April 13 – Place a discussion and possible action item on the board agenda for parts of the plan on which the committee has agreed (completed)

April 14 - May 8 – Committee continues to work on portions of the plan for approval by the Board (continued to review the sections on Subsidence and Compliance of 2021 Adopted DFCs). (completed)

May 11 – Place a discussion and possible action item on the board agenda for the remaining portions the plan not approved by the Board April 13th. (completed)

May 12 - June 5 – Committee continues to work on portions of the plan not already approved by the Board (if necessary). The GAM run for District values arrived June 1, 2023 and values have been placed in the plan for submission. (completed)

June 8 – Place a discussion and possible action item on the board agenda for final initial approval of the updated plan for submission to the TWDB for preapproval (completed)

June 9 – Send initially approved updated Management Plan to TWDB for preapproval. (completed)

The TWDB reviewed the plan submitted June 9, 2023 with a few required and suggested revisions. The revisions are attached.

It is the recommendation by the General Manager that the Board adopt the revised 2023 District Management Plan with the suggested and required revisions for submission to the Texas Water Development Board (TWDB) for final approval.

	K. Projected Water Supply Needs	
	L. Projected Water Management Strategies to Meet Future Supply Needs	
	M. Natural or Artificial Recharge of Groundwater Resources	
	1. Estimate of Amount of Recharge to the Groundwater Resources within the District	
	2. How Artificial Recharge of Groundwater within the District May be Increased	
6.	MANAGEMENT OF GROUNDWATER SUPPLIES	20
	A. Availability Goal	
	B. Historic Use	
	C. Pumping Limits	
	D. Beneficial Use	
	E. Well Spacing	
7.	METHODOLOGY TO TRACK DISTRICT PROGRESS IN ACHIEVING MANAGEMENT GOALS.....	21
8.	ACTIONS, PROCEDURES, PERFORMANCE, AND AVOIDANCE FOR DISTRICT IMPLEMENTATION OF MANAGEMENT PLAN	22
9.	MANAGEMENT GOALS AND OBJECTIVE	22
	A. Management Goals	
	1. Providing for the Most Efficient Use of Groundwater	
	2. Controlling and Preventing Waste of Groundwater	
	3. Controlling and Preventing Subsidence	
	4. Addressing Conjunctive Surface Water Management Issues	
	5. Addressing Natural Resource Issues that Impact the Use and Availability of Groundwater and that are Impacted by the Use of Groundwater	
	6. Addressing Drought Conditions	
	7. Promoting Water Conservation	
	8. Protecting Water Quality	
	9. Addressing the Adopted Desired Future Conditions	

C. Modeled Available Groundwater (TWDB Estimates – 2021)

Section 36.001 of the TWC defines modeled available groundwater (MAG) as “the amount of water that the Executive Administrator [of the TWDB] determines may be produced on an average annual basis to achieve a desired future condition established under §36.108.” Desired future condition (DFC) is defined in §36.001 of the TWC as “a quantitative description, adopted in accordance with §36.108 of the Texas Water Code, of the desired condition of the groundwater resources in a management area at one or more specified future times.” The District participates in the joint planning process in GMA 12, as defined per TWC §36.108, and established DFCs for aquifers within the District. MAG values are enumerated in Appendix D.

The TWDB’s MAG Estimates based on GMA 12 adopted DFCs: [GAM Run 21-017 MAG](#)

Carrizo

Modeled Available Groundwater for the Carrizo Aquifer summarized by county in GMA 12 for each decade between 2010 and 2070. Results are in ac-ft/yr.

County	2010	2020	2030	2040	2050	2060	2070
Brazos	1,196	864	1,444	2,023	2,603	3,183	3,763
Robertson	887	81	412	743	1,074	1,405	1,736

Calvert Bluff

Modeled Available Groundwater for the Calvert Bluff Aquifer summarized by county in GMA 12 for each decade between 2010 and 2070. Results are in ac-ft/yr.

County	2010	2020	2030	2040	2050	2060	2070
Brazos	0	0	0	0	0	0	0
Robertson	776	252	546	841	1,136	1,430	1,725

Simsboro

Modeled Available Groundwater for the Simsboro Aquifer summarized by county in GMA 12 for each decade between 2010 and 2070. Results are in ac-ft/yr.

County	2010	2020	2030	2040	2050	2060	2070
Brazos	35,086	37,282	42,709	48,137	53,565	58,993	64,421
Robertson	37,236	38,219	47,140	56,061	64,982	73,903	82,824

Hooper

Modeled Available Groundwater for the Hooper Aquifer summarized by county in GMA 12 for each decade between 2010 and 2070. Results are in ac-ft/yr.

County	2010	2020	2030	2040	2050	2060	2070
Brazos	0	0	0	0	0	0	0
Robertson	836	798	1,066	1,334	1,603	1,871	2,139

	To Queen City Aquifer from Queen City Aquifer equivalent units	33
	To Queen City Aquifer from Carrizo-Wilcox Aquifer	5
	To Queen City Aquifer from Reklaw confining unit	451
	From Queen City Aquifer to Weches confining unit	2,372
	To Queen City Aquifer from Sparta Aquifer	153
	From Queen City Aquifer to Brazos River Alluvium Aquifer**	6,262
	To Carrizo-Wilcox Aquifer from Carrizo-Wilcox equivalent units	2,149
	From Carrizo-Wilcox Aquifer to Reklaw confining unit	2,454
	From Carrizo-Wilcox Aquifer to the Queen City Aquifer	5
	From Carrizo-Wilcox Aquifer to Brazos River Alluvium Aquifer**	2,286

Source: TWDB GAM Run 23-009

* Estimated from the groundwater availability model for the Yegua-Jackson Aquifer.

** Estimated from the groundwater availability model for the Brazos River Alluvium Aquifer.

GAM Run 23-009 Flow Estimates

The same GAMs were used to develop the estimates of recharge from precipitation and other components of the aquifer water flow budgets as were used to develop the DFCs for the aquifers in the 2021 planning cycle with the exception that the GAM for the Central Portion of the Sparta, Queen City and Carrizo-Wilcox Aquifer released by the TWDB in 2018 was used to estimate the water flow budgets for the Sparta, Queen City and Carrizo-Wilcox aquifers. References regarding the GAMs used to develop the flow budgets are also given at the conclusion of TWDB report GAM Run 23-009 included as Appendix C.

I. Projected Surface Water Supply

Surface water is currently allocated by the Texas Commission on Environmental Quality (TCEQ) for the use and benefit of all people of the State. Anyone seeking a new water right must submit an application to the TCEQ. The TCEQ then determines whether or not the permit will be issued and permit conditions. The water right grants a certain quantity of water to be diverted and/or stored, a priority date, and other conditions, which may include a maximum diversion rate and in stream flow restrictions to protect existing water rights and environmental flows.

The Brazos River Authority (BRA) is the largest surface water right holder within the District, holding most of the rights to the water within the Brazos River Basin, including the water in Lake Limestone in northeast Robertson County. There are several water rights within the District consisting primarily of irrigation rights along the rivers, steam electric, and water for public supply rights for surface water. The BRA contracts raw water to various entities for long and short-term supplies for municipal, industrial, and agricultural irrigation uses.

K. Projected Water Supply Needs

The projected need for additional water supplies stated in the 2022 State Water Plan clearly indicates three primary areas of need; Agricultural irrigation, domestic/municipal use and potentially steam electric production. Each of these sectors faces their own hurdles and will meet their demand needs in different manners.

Agricultural irrigation will continue a pattern of conservation through best management practices. The industry is likely to use several methods to meet their needs including improved irrigation methods, dryland farming, crop selection and utilizing further development of available groundwater resources and potentially some surface water.

Municipalities and rural water supplier face decades of projected population increases. The water supply needs associated with the growth will likely be met using conservation methods including lowered gallons per day use per customer, aquifer storage and recovery, indirect and direct potable reuse projects, and further development of groundwater, with the available supply currently being assessed, and surface water resources.

Steam electric production in northern Robertson County could continue to grow, if it is cost competitive with other sources of electricity, due to the population growth throughout Texas and the favorable locations of the existing power plants with lignite deposits in close proximity or coal from out of state mines. Groundwater and surface water are readily available and likely sources of water to remedy any long-term needs.

The District has considered the future needs projects in the 2022 State Water Plan and believes that further development of groundwater and surface water resources along with conservation practices will meet the projected needs. Monitoring of large-scale production projects in GMA 12 will be an ongoing process.

Projected needs listed in the TWDB estimated historical water use (2022 State Water Plan data packet Appendix H) are primarily municipal. Municipal needs in Brazos County exist for the following water user groups (WUGs): Bryan, College Station, Wellborn SUD and Texas A&M University. From 2020 to 2070, the total needs in Brazos County are projected to increase from 100 to 33,389 ac-ft/yr.

Projected needs listed in the TWDB estimated historical water use (2022 State Water Plan data packet Appendix H) are primarily irrigation and a small amount attributable to municipal water demands. Irrigation water user group (WUG) combined with a small municipal need for Robertson County WSC increases from 2020 to 2070 in Robertson County from 12,932 to 18,502 ac-ft/yr.

Projected water supply needs, based on projections in the 2022 State Water Plan, are included in *Appendix B4*. Negative values (listed in red) indicate a projected water supply need, and the plan identifies recommended water strategies for these needs. An updated groundwater availability model (GAM) was developed by the TWDB in 2018 for the Sparta, Queen City and Carrizo-Wilcox aquifers and Brazos River Alluvium for the area encompassing the District and all of GMA 12. The GAM will be used to reassess and most likely result in an increase in the estimates of the availability of groundwater. The anticipated increase in the groundwater supply can be used to help address water supply needs.

L. Projected Water Management Strategies to Meet Future Supply Needs

Demand and supply data developed as part of the Region G planning process in 2022, District records, and GMA 12 planning efforts indicate that groundwater and surface water supplies should be adequate to meet the recommended strategies. There will be a need for infrastructure improvements to provide water at higher rates as water demands increase. However, if current conditions and projected needs from the State Water Plan are low, these shortages will be satisfied by further development of groundwater and surface water resources. While there seems to be sufficient water resources today to meet the 50-year planning horizon, large scale water development projects, both within the District and in neighboring districts, could alter available water supplies. Hydrogeological studies indicate that as groundwater production approaches the estimates of water demands being developed as part of the GMA 12 process, some older production wells in the Simsboro Sand may need to be replaced due to declining water levels and limited available drawdown. As part of its long-range management strategy, the District will review changes in aquifer utilization and well water level changes to help estimate appropriate future well construction and possible need for a change in the water management strategy. Some water management strategies, as given in the 2017 State Water Plan, are included in *Appendix B5*.

Projected water management strategies listed in the TWDB estimated historical water use (2022 state water plan data packet), and located in Brazos County are: Municipal Water Conservation (Bryan, College Station, Texas A&M University and Wellborn SUD), ASR (Bryan), Carrizo-Wilcox Groundwater Development (Bryan and College Station), Sparta Aquifer Development (Texas A&M University), Reuse DPR or Reuse (College Station and Bryan) and BRA System Operation-Surplus (Steam-Electric Power). From 2010 to 2070 the total water management strategies in Brazos County are projected to increase from 953 to 43,179 acre-feet per year.

Projected water management strategies listed in the TWDB estimated historical water use (2022 state water plan data packet), and located in Robertson County are: Municipal Water Conservation (Bremond, Hearne, Twin Creek WSC and Wellborn SUD), Carrizo-Wilcox Development (Robertson County WSC), Irrigation Water Conservation (Irrigation), and Purchase from Walnut Creek Mine-Reuse (Steam-Electric Power). From 2010 to 2070 the total water management strategies in Robertson County are projected to increase from 2,925 to 15,324 acre-feet per year.

permitted use will be a part of the Annual Report presented to the District Board of Directors.

- 2b. **Objective** – Evaluate District rules annually to determine whether any amendments are necessary to decrease the amount of waste within the District.
- **Performance Standard** – The District will include a discussion of the annual evaluation of District rules, and determination of whether any amendments to the rules are necessary to prevent waste of groundwater. The evaluation will be included in the Annual Report provided to the District Board of Directors.
- 2c. **Objective** – Provide information to the general public and schools within the District promoting water conservation, wise use of water, and the elimination and reduction of wasteful practices.
- **Performance Standard** – The District will include a page on the District’s web-site devoted to wise use of water and providing tips to help eliminate and reduce wasteful use of groundwater. The District will provide information to local school districts including providing Texas Education Agency approved water curriculum and in-school presentations to encourage wise use of water and understanding of the significance of aquifers to District residents.
3. **Controlling and Preventing Subsidence**
- 3a. **Objective** - The District will monitor changes in water levels in its monitoring wells with due consideration to the potential for land subsidence. At least once every three years, the District will assess the potential for land subsidence for areas where water levels have decreased more than 100 feet since the year 2000. The District will review the sections in “Identification of the Vulnerability of the Major and Minor Aquifers of Texas to Subsidence with Regard to Groundwater Pumping” report (TWDB Contract Number 1648302062, by LRE Water) when discussing subsidence within the Districts aquifers. Those aquifers can be found on page 4-5, 4-104, 4-187, 4-207, and 4-229 of the report at <http://www.twdb.texas.gov/groundwater/models/research/subsidence/subsidence.asp>. Data reviewed in the report suggests a resulting average third quartile Subsidence Risk Value (SVR) of 3 for the Carrizo-Wilcox, Queen City and Sparta aquifers. The Yegua-Jackson Aquifer is deemed to be at medium to high risk of subsidence over time. The Brazos River Alluvium Aquifer is seen to be at a medium SRV risk. These estimated values are at odds with what has been observed throughout the District with the geologic ages, sand and clay layering and thicknesses of the managed aquifers.
- **Performance Standard** – Within three years of the approval of this plan and every three years thereafter, the District will map any region where more than 100 feet of drawdown has occurred since the year 2000 and assess the potential for land subsidence. The results



BRAZOS VALLEY GROUNDWATER CONSERVATION DISTRICT

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A RESOLUTION OF THE
BRAZOS VALLEY GROUNDWATER CONSERVATION DISTRICT
ADOPTING AMENDMENTS TO ITS MANAGEMENT PLAN FOR SUBMITTAL
TO THE TEXAS WATER DEVELOPMENT BOARD FOR APPROVAL
No. 11-16-23.3

WHEREAS, the Brazos Valley Groundwater Conservation District (“District”) is charged by the Texas Legislature with providing for the conservation, preservation, protection, and prevention of waste of groundwater, and or groundwater resources in Brazos and Robertson counties, Texas, under §36.0015, Tex. Water Code;

WHEREAS, the District is authorized to make and enforce fair and impartial rules to manage groundwater resources as scientifically necessary to conserve and protect groundwater resources in the area under §36.101, Tex. Water Code;

WHEREAS, pursuant to §§36.1071 and 36.1072, Tex. Water Code, following notice and hearing, the District developed a comprehensive management plan that addresses the required management goals, as applicable and shall submit its Board-approved amendments to the Texas Water Development Board as provided under §36.1073, Tex. Water Code;

NOW, THEREFORE, BE IT RESOLVED BY THE BOARD OF DIRECTORS OF THE BRAZOS VALLEY GROUNDWATER CONSERVATION DISTRICT THAT

The District adopts the Brazos Valley Groundwater Conservation District Management Plan and submits it to the Texas Water Development Board for review and approval.

PASSED AND APPROVED this the 16th day of November 2023

BRAZOS VALLEY GROUNDWATER CONSERVATION DISTRICT

Stephen Cast, President

Jeff Kennedy, Secretary

John Elliott, Director

BOARD OF DIRECTORS:
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