Groundwater Management Plan

Draft Version for the Updated 2022 Plan

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1.0 DISTRICT MISSION

The Post Oak Savannah Groundwater Conservation District (POSGCD) mission is to adopt and enforce Rules consistent with State law and based on best available science, which provide for the conservation, preservation, protection, recharging, and prevention of waste of groundwater, while supporting the ownership of groundwater and the owner's right to assign or produce that property.

2.0 TIME PERIOD OF THIS PLAN

This plan will become effective upon adoption by the POSGCD Board of Directors ("Board") and approval as administratively complete by the Texas Water Development Board. The plan will remain in effect for five (5) years after the date of certification, and thereafter until a revised plan is adopted and approved.

3.0 BACKGROUND

The POSGCD was created in Milam and Burleson counties by HB 1784, 77th Legislature, 2001, and a local confirmation election in November 2002 in both counties. These elections were in accordance with Sections 36.017, 36.018, and 36.019, of the Water Code, and Section 41.001, of the Election Code. POSGCD was codified as Chapter 8865 of Special District Local Laws Code.

The purpose of HB 1784 was to provide a locally controlled groundwater district to conserve and preserve groundwater, protect groundwater users, protect and recharge groundwater, prevent pollution or waste of groundwater in the central Carrizo-Wilcox area, control subsidence caused by withdrawal of water from the groundwater reservoirs in that area, and regulate the transport of water out of the boundaries of the districts. The POSGCD has ten directors, with five from each county. It does not have the power to tax and receives all of its revenue from fees imposed on municipal/commercial pumpers and transporters of groundwater.

The POSGCD is a member of Groundwater Management Area (GMA) 12 and GMA 8, whose areal extents are shown in **Figure 1**. To help establish desired future conditions (DFCs) for the relevant aquifers within the boundaries of GMA 12 and GMA 8, POSGCD will consider groundwater availability models (GAMs) and other data or information. This information can also be found on the Districts website at https://posgcd.halff.com/Map/Public.

4.0 GROUNDWATER RESOURCES

Located within the District's boundaries are portions of the Trinity, Wilcox, Carrizo, Queen City, Sparta, Yegua/Jackson, and the Brazos River Alluvium aquifers. **Figure 2** shows the locations of the outcrops of these aquifers based on the surface geology mapped by Barnes (1992), Young and others (2018), Deeds and others (2010), and Shah and Houston (2007). In Figure 2, the outcrop area for the Carrizo Aquifer includes the outcrop area associated with the Reklaw Formation and the outcrop area for the Queen City Aquifer includes the outcrop area associated with the Weches Formation. Within the District, the Trinity Aquifer does not outcrop and is overlaid primarily by the Midway Formation. **Table 4-1** provides the area associated with each aquifer outcrop.

Table 4-1 Aquifer Outcrop Areas in the District.

Aquifer and/or Geologic Formation	Outcrop Area (square miles)
Midway Formation	346
Wilcox	348
Carrizo/Reklaw	70
Queen City/Weches	159
Sparta	76
Cook Mountain/Yegua-Jackson /Catahoula	321
Brazos River Alluvium	161
Shallow Alluvium	215
Total	1,699

1. **Northern Trinity Aquifer**. The northern Trinity Aquifer is located in the northwest corner of Milam County. The Trinity Aquifer comprises five geological formations considered to be relevant aquifers by GMA 8. These geologic formations are the Paluxy, Glen Rose, Travis Peak, Hensell, and Hosston aquifers. The top and bottom surfaces for these geological formations are defined by the Updated Northern Trinity and Woodbine Aquifers GAM (Kelley and others, 2014).
2. **Wilcox Aquifer.** The Wilcox Aquifer is a regional aquifer system. The outcrop of the Wilcox Aquifer forms a southwest to northeast trending belt through central Milam County; the downdip portion of the Wilcox Aquifer underlies southern Milam County and all of Burleson County. Freshwater exists in the Wilcox Aquifer in both Milam and Burleson counties. The Wilcox Aquifer comprises three geological formations: the Hooper, Simsboro, and Calvert Bluff formations. The Upper Wilcox Aquifer is associated with the Calvert Bluff Formation. The Middle Wilcox Aquifer is associated with the Simsboro Formation. The Lower Wilcox Aquifer is associated with the Hooper Formation.
3. **Carrizo Aquifer.** The Carrizo Aquifer is a regional aquifer system that occurs throughout most of the District. The outcrop of the Carrizo Aquifer has a southwest to northeast orientation through southern Milam County. The confined portion of the Carrizo Aquifer underlies southern Milam County and all of Burleson County. Freshwater exists in the Carrizo Aquifer in both Milam and Burleson counties. The aquifer is a source of groundwater for numerous domestic wells and several large public water supply systems. The areal extent of the Carrizo Aquifer is described by the GAM for the Central portion for the Sparta, Queen City, and Carrizo Wilcox Aquifer (Young and others, 2018).
4. **Queen City.** The Queen City Aquifer outcrops across a 5- to 8-mile-wide zone that is generally aligned along the Milam-Burleson County line. The aquifer extends down dip in Burleson County and is a source of groundwater for domestic wells and some public water supply wells. Freshwater exists in the Queen City Aquifer in both Milam County and Burleson County. The areal extent of the Queen City Aquifer is described by the GAM for the Central portion for the Sparta, Queen City, and Carrizo Wilcox aquifers (Young and others, 2018).
5. **Sparta Aquifer.** The Sparta Aquifer outcrops across a 3- to 5-mile-wide zone trending southwest- northeast just north of Highway 21 in Burleson County. The Sparta extends downdip to the southeast throughout much of Burleson County. Like the Queen City Aquifer, the Sparta is used for numerous domestic water wells and some small public water supply systems in the District. Freshwater exists in the Sparta Aquifer in Burleson County. The areal extent of the Sparta Aquifer is described by the GAM for the Central portion for the Sparta, Queen City, and Carrizo Wilcox aquifers (Young and others, 2018).

6. **Yegua/Jackson Aquifer.** The Yegua/Jackson Aquifer outcrops across a 6- to 10-mile-wide zone trending southwest-northeast south of Highway 21 in Burleson County. The Yegua/Jackson Aquifer extends down-dip to the southeast through much of Burleson County. The Yegua/Jackson Aquifer includes to all four geologic units the upper Yegua, the lower Yegua, the upper Jackson, and the lower Jackson . In Burleson County, the Yegua/Jackson Aquifer provides small to moderate amounts of freshwater to domestic and irrigation wells and to a few public water systems. The areal extent of the Yegua-Jackson Aquifer is described by the Yegua/Jackson GAM (Deeds and others, 2010).
7. **Brazos River Alluvium Aquifer.** The Brazos River Alluvium Aquifer is comprised of floodplain and terrace deposits of the Brazos River along the eastern boundary of Milam and Burleson counties. The Brazos River Alluvium Aquifer occurs only as an unconfined aquifer in POSGCD, and the majority of it exists in Burleson County. The Brazos River Alluvium supplies freshwater to many irrigation wells and several domestic wells. For the most part, the water discharges from the alluvium mainly through flow to the Brazos River, evapotranspiration, and production by wells. The areal extent of the Brazos River Alluvium Aquifer is described by the Brazos River Alluvium GAM (Ewing and Jigmond, 2016).
8. **Shallow Alluvium Aquifers.** Shallow alluvium aquifers have not been completely mapped across POSGCD. The aquifers represent floodplain and terrace deposits near major tributaries to the Brazos River. These aquifers are generally less than 30 feet thick, are characterized by mixtures of coarse sands and fine-grain materials, and are often well connected hydrologically to nearby streams. The areal extent of these aquifers are denoted by alluvium deposits in the Bureau of Economic Geology map of surface geology (Proctor and others, 1974).

5.0 MANAGEMENT ZONES AND MANAGEMENT AREAS

The District is divided into groundwater management zones and management areas for the purpose of evaluating and managing groundwater resources recognizing the different characteristics and anticipated future development of the aquifers in the District. Each of the District Management Zone are associated with a minor or major aquifer for which the TWDB has developed a Groundwater Availability Model (GAM). For the Sparta, Queen City, Carrizo, Calvert Bluff, Simsboro, and Hooper aquifers, the District has partitioned each of the aquifers' Management Zones into two or more Management Areas.

Within each Management Zone, the District will establish and enforce Rules related to spacing of wells, the maximum allowable production of groundwater per acre of land located over an aquifer, require permits for production, regulate drawdown and provide for a reduction in the maximum allowable production and permitted production of groundwater per acre of land based on the different surface and subsurface characteristics and different evaluation and monitoring within the Management Zones.

The Management Zones and Management Areas are as follows:

1. **Brazos River Alluvium Management Zone.** This management zone is located along the eastern boundaries of the District in Milam and Burleson counties and is coterminous with the boundaries of the Brazos River Alluvium (Shah and Houston, 2007). Figure 2 shows the areal extent of the Brazos River Alluvium Management Zone represented in the Brazos River Alluvium GAM (Ewing and Jigmond, 2016). This management zone extends to the bottom of the water bearing alluvial sediments associated with the Brazos River Alluvium.
2. **Trinity Management Zone.** This management zone includes the northern Trinity Aquifer, which is located beneath the footprint of the Midway outcrop shown in Figure 2.
3. **Sparta Management Zone.** The Sparta Management Zone includes all of the water-bearing formations of the Sparta Aquifer found in the District. **Figure 3** shows the areal extent of the

Sparta Management Zone and the two areas that comprise it: Sparta Management Area 1 and Sparta Management Area 2.

4. **Queen City Management Zone.** The Queen City Management Zone includes all of the water-bearing formations of the Queen City Aquifer found in the District. **Figure 4** shows the areal extent of the Queen City Management Zone and the two areas that comprise it: Queen City Management Area 1 and Queen City Management Area 2.
5. **Carrizo Management Zone.** The Carrizo Management Zone includes all of the water-bearing formations of the Carrizo Aquifer found in the District. **Figure 5** shows the areal extent of the Carrizo Management Zone and the three areas that comprise it: Carrizo Management Area 1, Carrizo Management Area 2, and Carrizo Management Area 3.
6. **Calvert Bluff Management Zone.** The Calvert Bluff Management Zone includes all of the water-bearing formations of the Calvert Bluff Formation found in the District. **Figure 6** shows the areal extent of the Calvert Bluff Management Zone and the three areas that comprise it: Calvert Bluff Management Area 1, Calvert Bluff Management Area 2, and Calvert Bluff Management Area 3.
7. **Simsboro Management Zone.** The Simsboro Management Zone includes all of the water-bearing formations of the Simsboro Formation found in the District. **Figure 7** shows the areal extent of the Simsboro Management Zone and the three areas that comprise it: Simsboro Management Area 1, Simsboro Management Area 2, and Simsboro Management Area 3.
8. **Hooper Management Zone.** The Hooper Management Zone includes all of the water-bearing formations of the Hooper Formation found in the District. **Figure 8** shows the areal extent of the Hooper Management Zone and the three areas that comprise it: Hooper Management Area 1, Hooper Management Area 2, and HooperManagement Area 3.
9. **Yegua/Jackson Management Zone.** This zone includes the outcrop and downdip portions of the geologic units of the Yegua and the Jackson formations of the Yegua/Jackson Aquifer, which occur in the southern portion of Burleson County.

6.0 MANAGEMENT OF GROUNDWATER SUPPLIES

The District will evaluate and monitor groundwater conditions and regulate production consistent with this plan and the District Rules. Production will be regulated, as needed, to conserve groundwater, and protect groundwater users, in a manner not to unnecessarily and adversely limit production or impact the economic viability of the public, landowners and private groundwater users. In consideration of the importance of groundwater to the economy and culture of the District, the District will identify and engage in activities and practices that will permit groundwater production and, as appropriate, protect the aquifer and groundwater in accordance with this Management Plan and the District's rules. A monitoring well network will be maintained to monitor aquifer conditions within the District. The District will use the monitoring data to support regular assessments of changes in groundwater supply, changes in aquifer water levels, and groundwater storage conditions. The District will report on changes in those conditions, as appropriate, in public meetings of the Board or public announcements. The District will undertake investigations, and cooperate with third-party investigations, of the groundwater resources within the District, and the results of the investigations will be made available to the public upon being presented at a meeting of the Board.

The District will adopt rules to regulate groundwater withdrawals by means of well spacing and production limits as appropriate to implement this Plan. In making a determination to grant a permit or limit groundwater withdrawals, the District will consider the available evidence and, as appropriate and applicable, weigh the public benefit against the individual needs and hardship.

The factors that the District may consider in making a determination to grant a drilling and operating or operating permit or limit groundwater withdrawals will include:

The District Rules and the purpose of the Rules of the District;

1. The equitable distribution of the resource;
2. The economic hardship resulting from grant or denial of a permit, or the terms prescribed by the permit;
3. This Management Plan, the District DFCs as adopted in Joint Planning under Tex. Water Code, Sec. 36.108; the District PDLs, and
4. The potential effect the permit may have on the aquifer, and groundwater users.

The transport of groundwater out of the District will be regulated by the District according to the Rules of the District.

In pursuit of the District's mission of protecting the groundwater resources, the District may require adjustment of groundwater withdrawals in accordance with the Rules, including 5 year reviews, and Management Plan. To achieve this purpose, the District may, at the Board's discretion after notice and hearing, amend or revoke any permit for non-compliance, or reduce the production authorized by permit for the purpose of protecting the aquifer and groundwater availability. The determination to seek the amendment of a permit will be based on aquifer conditions observed by the District as stated in the District's rules. The determination to seek revocation of a permit will be based on compliance and non-compliance with the District's rules and regulations. The District will enforce the terms and conditions of permits and the rules of the District, as necessary, by fine and enjoining the permit holder in a court of competent jurisdiction as provided for in Texas Water Code (TWC) Ch. 36.102.

A plan to cope with the effects of water supply deficits due to climatic or other conditions will be developed by the District and will be adopted by the Board after notice and hearing. In developing the plan, the District will consider all relevant factors, including, but not limited to, the economic effect of conservation measures upon all water resource user groups, the local implications of the degree and effect of changes in water storage conditions, the unique hydrogeologic conditions of the aquifers within the District and the conditions under which to implement the plan.

The District will employ reasonable and necessary technical resources, at its disposal, to evaluate the groundwater resources available within the District and to determine the effectiveness of regulatory or conservation measures. A public or private user may appeal to the Board for discretion in enforcement of actions taken by the Board, on grounds of adverse economic hardship or unique local conditions. The exercise of discretion by the Board shall not be construed as limiting the power of the Board.

7.0 DESIRED FUTURE CONDITIONS

The District shall participate in the joint planning process in GMAs 8 and 12 as defined per TWC §36.108, including establishment of DFCs for management areas within the District. In its evaluation of possible DFCs, the District will consider results from GAMs, scientific reports, and the conditions of the aquifer within the management zones.

1. **DFCs Adopted by GMA 12.** The District's DFCs in GMA 12 are provided in **Tables 7-1**, **7-2**, and **7-3** from the 2022 Joint Planning cycles. GMA 12's explanatory report (DB Stephens and others, 2022) documents the development of the DFCs.

   For the Queen City, Sparta, Carrizo and Wilcox aquifers (Table 7-1), the DFCs are based on simulations using the TWDB GAM for the Central Portion of the Sparta, Queen City and Carrizo-

Wilcox aquifers (Young and others, 2018; 2020). These DFCs are average drawdowns from January 2011 to December 2069.

For the Yegua-Jackson Aquifer (Table 7-2), the DFCs are based on simulations using the TWDB GAM for the Yegua-Jackson Aquifer (Deeds and others, 2010). These DFCs are average drawdowns from January 2010 to December 2069.

For the Brazos River Alluvium Aquifer (Table 7-3), the DFCs are based on simulations using the TWDB GAM for the Brazos River Alluvium (Ewing and Jigmond, 2016). These DFCs are average drawdowns from January 2010 to December 2069.

Table 7-1 Adopted DFCs for the Queen City, Sparta, Carrizo and Wilcox aquifers

Aquifer	2021 Joint Planning Average Drawdown (ft) between January 2011 and December 2069
Sparta	32
Queen City	30
Carrizo	146
Calvert Bluff (Upper Wilcox)	156
Simsboro (Middle Wilcox)	278
Hooper (Lower Wilcox)	178

Table 7-2 Adopted DFCs for the Yegua-Jackson Aquifer

Aquifer	2021 Joint Planning Average Drawdown between January 2010 and December 2069 (ft)
Yegua-Jackson	61

Table 7-3 Adopted DFCs for the Brazos River Alluvium Aquifer

County	2021 Joint Planning
	Average Decrease in Saturated Thickness between January 2010 and December 2069 (ft)
Milam in GMA 12	5
Burleson in GMA 12	6

2. **DFCs Adopted by GMA 8.** On the date of this Plan's adoption, the District did not have any permitted wells in the portion of the Brazos River Alluvium Aquifer and the Trinity Aquifer in GMA 8. For the purpose of this Plan, the District considers the portion of the Brazos River Alluvium Aquifer within GMA 8 as a non-relevant aquifer. The District will not monitor water levels in the GMA 8 portion of the Brazos River Alluvium until the GMA 8 portion of the Brazos River Alluvium is deemed as a relevant aquifer by the District. The District does not plan to monitor water levels in the Trinity Aquifer until there is at least one permitted well that pumps from the Trinity Aquifer.
3. The District's DFCs for the Trinity Aquifer are provided in **Table 7-4** for the 2021 Joint Planning cycle. These DFCs are average drawdowns for a 71-year period that begins January 2010 and ends December 2080. The average drawdowns are for areas covered by each aquifer in Milam County as defined by the stratigraphy provided by the TWDB GAM for the Northern Trinity Aquifer (Kelley and others, 2014). GMA 8's explanatory report (WSP and others, 2022) documents the development of the Trinity Aquifer DFCs.

Table 7-4 Adopted DFCs for the Trinity Aquifer

Aquifer	2021 Joint Planning
	Average Drawdown between January 2010 and December 2080 (ft)
Glen Rose	241
Travis Peak	412
Hensell	261
Hosston	412

Protective Drawdown Limits (PDLs) for Shallow Management Zone Water Levels For several management areas, the District has adopted a Protective Drawdown Limit (PDL), which represents an average drawdown across the management area measured from January 2011 to December 2070. The PDLs were adopted to improve the District's ability to manage and regulate water level change across the portion of the District's aquifers where the majority of wells are located. The PDLs were developed using the same GAM run used by GMA 12 to develop the DFCs for each of Management Zones. The PDLs are therefore considered to be physical compatible with all the DFCs adopted by GMA 12. **Table 7-5** lists the PDLs for selected management areas , which are shown in Figures 3 to 8.

Table 7-5 Protective Drawdown Limits for Average Drawdown for the Shallow Management Zones

Aquifer	Average Drawdown Measured from January 2010 to December 2070	
	Management Area 1	Management Area 2
Sparta	28	N/A
Queen City	19	N/A
Carrizo	75	175
Calvert Bluff	88	223
Simsboro	91	335
Hooper	210	N/A

8.0 MODELED AVAILABLE GROUNDWATER

Based on DFCs adopted by GMA 8 and GMA 12, the TWDB is required by TWC § 36.108 9(o) to provide the District with a modeled available groundwater (MAG) for each DFC. **Table 8-1** lists the MAGs received by the District from the TWDB based on DFCs from the 2016 planning cycle. The TWDB has not yet provided GMA 8 nor GMA 12 with revised MAGs based on DFCs from the 2021 joint planning cycle.

Several significant changes are anticipated in the MAGs calculated by the TWDB for the 2022 joint planning cycle from the MAGs calculated for the 2016 joint planning cycles. With regard to implementation of its Rules, the District will consider the MAGs in Table 8-1 and the estimated MAGs in **Table 8-2** until the TWDB determines the District's MAGs for the 2022 joint planning cycle. Table 8-2 provides an estimate of the MAGs that were determined from the GAM runs submitted to the TWDB as part of GMA 12's Explanatory Report (D.B. Stephens & Associates, 2022; Walker, 2022) for the 2021 joint planning cycle.

Table 8-1 Modeled Available Groundwater Values Calculated by the TWDB based on the DFCs adopted by GMA 8 and 12 for the 2016 Joint Planning Cycle*

GAM	Aquifer	Modeled Available Groundwater in acre-ft/year (AFY) based on TWDB GAM runs					
		2020	2030	2040	2050	2060	2070[3]
Brazos River Alluvium	GMA 8: Declared a Non-Relevant Aquifer	N/A	N/A	N/A	N/A	N/A	N/A
	GMA 12: Milam and Burleson County[1]	142,742	138,270	137,714	137,520	137,416	137,351
Aquifers in Trinity GAM	Glen Rose[2]	0	0	0	0	0	0
	Hensell[2]	0	0	0	0	0	0
	Hosston[2]	0	0	0	0	0	0
	Subtotal	0	0	0	0	0	0
Aquifers in the Queen City/ Sparta GAM	Sparta[1]	16,721	19,616	22,167	24,282	24,291	24,292
	Queen City[1]	469	504	504	504	504	504
	Carrizo[1]	34,560	35,616	37,427	40,211	41,167	41,167
	Calvert Bluff[1]	1,036	1,036	1,036	1,036	1,036	1,036

GAM	Aquifer	Modeled Available Groundwater in acre-ft/year (AFY) based on TWDB GAM runs					
		2020	2030	2040	2050	2060	2070[3]
	Simsboro [1]	38,470	37,900	40,042	46,028	48,503	48,503
	Hooper [1]	2,960	4,139	4,433	4,433	4,422	4,422
	Subtotal	94,216	98,811	105,609	116,494	119,923	119,924
Yegua-Jackson Aquifer	Yegua-Jackson Aquifer[1]	14,544	12,576	12,564	12,478	12,326	10,200
	TOTAL	251,502	249,657	255,887	266,492	269,665	267,475

[1] GAM Run 17-030 (Wade and Ballew, 2017)
[2] GAM Run 17-029 MAG (Shi, 2018)
[3] Model year is 2069 for the MAGs calculated for the aquifers in the Queen City/Sparta GAM
NA – not applicable

Table 8-2 Modeled Available Groundwater Values Calculated by the TWDB based on the DFCs adopted by GMA 8 and 12 for the 2021 Joint Planning Cycle*

GAM	Aquifer	Modeled Available Groundwater in acre-ft/year (AFY) based on TWDB GAM runs					
		2020	2030	2040	2050	2060	2070[3]
Brazos River Alluvium	GMA 8: Declared a Non-Relevant Aquifer	N/A	N/A	N/A	N/A	N/A	N/A
	GMA 12: Milam and Burleson County[1]	63,634	63,582	63,573	63,568	63,565	63,564
Aquifers in Trinity GAM	Glen Rose[2]	0	0	0	0	0	0
	Hensell[2]	0	0	0	0	0	0
	Hosston[2]	0	0	0	0	0	0
	Subtotal	0	0	0	0	0	0
Aquifers in the Queen City/ Sparta GAM	Sparta[1]	1,237	2,840	3,131	3,437	3,760	4,105
	Queen City[1]	513	4,438	5,110	5,885	6,785	7,839
	Carrizo[1]	11,209	17,263	17,486	17,715	17,955	18,206
	Calvert Bluff[1]	2,179	2,940	3,302	3,710	4,175	4,706
	Simsboro [1]	29,953	65,539	74,832	78,742	79,071	79,422
	Hooper [1]	1,806	2,026	2,264	2,523	2,809	3,126
	Subtotal	46,897	95,046	106,125	112,012	114,555	117,404
Yegua-Jackson Aquifer	Yegua-Jackson Aquifer[1]	1,094	5,315	7,004	7,004	7,000	6058
	TOTAL	111,625	163,943	176,702	182,584	185,120	187,026

9.0 WATER WELL INVENTORY

The District will assign permitted wells to a management zone and to an aquifer based on the location of the well's screen or well depth using the Rules of the District. If no well screen information is available, then a permitted well will be assigned to a management zone and to an aquifer based on the total depth of the well. The District will use the best available science to determine the top and bottom surfaces of aquifers that will be used to determine aquifer(s) assignments to wells. The aquifer surfaces will be defined based on the District's evaluation of the aquifer information from the GAMs, geophysical logs, and hydrogeologic reports. The assignment of the permitted well will be made at the time of permit. The District will assign exempt wells to a management zone and to an aquifer based on available information for the exempt well. The District will use the aquifer assignments to help track the permitted pumping and production for each aquifer and for each management zone.

10.0 GROUNDWATER MONITORING

The District will maintain a monitoring well network that will be used by the District to obtain measured water levels. Groundwater monitoring will be designed to monitor changes in groundwater conditions over time. The District encourages well owners to volunteer wells to be used as part of the monitoring network. The District will accept wells into, or replace an existing well in, the monitoring network. The selection process will consider the well proximity to other monitoring wells, to permitted and exempt wells, to streams, and to geographic and political boundaries. If no suitable well locations can be found to meet the monitoring objectives in a specific aquifer or management zone, the District may evaluate the benefits of converting an oil and gas well to a water well, drilling and installing a new well, or using modeled water levels for that area until such time as a suitable well can be obtained for monitoring.

The District shall perform groundwater monitoring. The monitoring of the wells will be performed under the direction of the general manager, by trained personnel using a Standard Operating Procedure adopted by the District. The District may coordinate with the neighboring groundwater conservation districts for the purpose of supplementing its monitoring data and of improving the consistency in the collection, management, and analysis of hydrogeological data in GMA 12.

11.0 THRESHOLD LEVELS AND ANALYSIS OF GROUNDWATER LEVEL DATA

The District shall use threshold levels to help achieve its DFCs and to conserve and preserve groundwater availability and protect groundwater users. The District shall administer separate threshold levels for each management zone based on the Rules of the District. As part of its evaluation and determinations, the District may also consider the pumping-induced impacts to groundwater resources, including production occurring outside of the District. The District will consider threshold levels based on one or more of the following metrics: estimated total annual production, measured water level change, and predicted water level change.

Among the factors to be considered to guide the District's actions are evaluating thresholds for declines in water levels established in the District's Rules. District actions which can be initiated if a threshold level has been exceeded include: additional aquifer studies to collect and analyze additional information, a re-evaluation of the Management Plan or rules, and/or a change in the Management Plan or rules.

12.0 PRODUCTION AND SPACING OF WELLS

The maximum allowable permitted production and spacing of all wells within the District will be regulated by the District according to the Rules of the District. Well spacing and the rate of production of the well will be dependent on the management zone and the aquifer associated with the well, and other factors included in the Rules of the District. In order to achieve a balance between production and conservation of groundwater resources, the District will establish criteria for evaluating whether the impacts from an aggregate of wells associated with one or more operating permits to be unreasonable. Among the factors that the District will used to evaluate unreasonable impacts is land subsidence, degradation of water quality, reduction of saturated aquifer thickness, and reduction of pressure head in a well.

13.0 ACTIONS, PROCEDURES, PERFORMANCE AND AVOIDANCE FOR PLAN IMPLEMENTATION

The District will implement this plan and utilize it as a guide for the ongoing evaluation, and the planning and establishing, of priorities for all District conservation and regulatory activities. All programs, permits and related operations of the District, and any additional planning efforts in which the District may participate will be consistent with this plan.

The District will adopt rules relating to the permitting of wells, the production and transport of groundwater and reducing permitted production. The rules adopted by the District shall be adopted pursuant to TWC Chapter 36 and provisions of this plan. All rules will be adhered to and enforced. The promulgation and enforcement of the rules will be based on technical data recommended by competent professionals and accepted by the Board. Please follow the link to the most current District Rules, https://posgcd.org/wp-content/uploads/2022/07/Rules.Amended.05102022.pdf.

The District shall treat all citizens equally. Citizens may apply to the District for a variance in enforcement of the rules on grounds of adverse economic effect or unique local conditions. In granting a variance to any rule, the Board shall consider the potential for adverse effect on adjacent landowners and the aquifer(s). The exercise of discretion by the Board shall not be construed as limiting the power of the Board.

The District will endeavor to cooperate with other agencies in the implementation of this plan and the management of groundwater supplies within the District. All activities of the District will be undertaken in a spirit of cooperation and coordination with the appropriate state, regional and local agencies.

14.0 METHODOLOGY FOR TRACKING DISTRICT PROGRESS IN ACHIEVING MANAGEMENT GOALS

The general manager of the District will prepare and present to the Board an annual report on the District's performance and accomplishment of the management goals and objectives. The presentation of the report will occur during the first or second monthly Board meeting following each fiscal year, beginning after the adoption and certification of this plan. The report will include the number of instances in which activities specified in the management objectives was engaged in during the fiscal year. The

Board will maintain the adopted report on file, for public inspection, at the District's offices. This methodology will apply to all management goals contained within this plan.

15.0 AQUIFER STORAGE AND RECOVERY PROJECTS

An Aquifer Storage and Recovery (ASR) project involves the injection of water into a geological formation for subsequent recovery and beneficial use. The District acknowledges that ASR projects can help to improve the overall management of water resources in GMA 12. However, the District also recognizes that poorly designed and instrumented ASR project can be operated in such a manner as to adversely affect the production capacity of existing wells located near the ASR project. As ASR projects are identified, the District will coordinate with the Texas Commission on Environmental Quality to provide data and/or technical expertise that could assist with the evaluation of the proposed ASR project.

16.0 CONJUNCTIVE USE AND CONJUNCTIVE WATER MANAGEMENT

The Texas Water Code §36.001 defines conjunctive use as the combined use of groundwater and surface water sources that optimizes the beneficial characteristics of each source. Conjunctive water use can be considered as the coordinated use of surface water and groundwater to maximum the firm yield. An offspring to conjunctive water use is conjunctive water management. Conjunctive water management engages the principles of conjunctive water use, where surface water and groundwater are used in combination to improve water availability and reliability but also include important components of groundwater management.(Dudley and Fulton, 2005). Examples of conjunctive water management projects includes aquifer storage and recovery, managed aquifer recharge, and joint management of surface water and groundwater supplies. The District encourages permit applicants to include an aspect of conjunctive water management. Among the potential benefits of conjunctive water management is improved reliability of local water supply, increased firm yield from water supplies, reduced groundwater overdraft, increased flood protection, and improved environmental conditions.

17.0 MANAGEMENT GOALS, OBJECTIVES, & PERFORMANCE STANDARDS

17.1 Efficient Use of Groundwater

Management Objectives:

1. The District will maintain a monitoring well network with at least 300 monitoring wells to provide coverage across management zones and aquifers within the District. The District will measure water levels at the monitoring well locations at least once every calendar year. A written analysis of the water level measurements from the monitoring wells will be made available through a presentation to the Board of the District at least once every year.
2. The District will provide educational leadership to citizens within the District concerning this subject. The activity will be accomplished annually through at least one printed publication, such as a brochure, and public speaking at service organizations and public schools as provided for in the District's Public Education Program.

Performance Standards:

1. Maintain a monitoring well network and its criteria, and measure at least 300 monitoring wells at least once every calendar year.
2. Number of monitoring wells measured annually by the District.
3. Written report presented to the Board to document that water levels at these monitoring wells have been measured a minimum of once each year.
4. The number of publications and speaking appearances by the District each year under the District's Public Education Program.

17.2 Controlling and Preventing Waste of Groundwater.

Management Objectives:

1. The District will provide educational leadership to citizens within the District concerning this subject. The activity will be accomplished annually through at least one printed publication, such as a brochure, and public speaking at service organizations and public schools as provided for in the District's Public Education Program. During years when District revenues are sufficient, the District will consider funding a grant to obtain a review, study, or report of pertinent groundwater issues, or to sponsor the attendance of students at summer camps/seminars that place emphasis on the conservation of water resources.
2. Within 3 years of approval of this plan, the District will adopt rules to define "waste" and limit the waste of groundwater resources in the District by users of that groundwater.

Performance Standards:

1. The number of publications and speaking appearances by the District each year, and the number of grants considered and students actually accepting and attending an educational summer camp or seminar.
2. Presence of a section in the District Rules defining "waste" and establishing requirements on permittees to prevent waste of groundwater production in the District.

17.3 Control and Prevent Subsidence

Management Objectives:

1. 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.
2. 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.

Performance Standards:

1. 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 of the assessment will be discussed in a District Board meeting and be document in a presentation or a report.
2. As outlined in TWC Ch. 36.108 (d), The District will take into consideration the "*Identification of the Vulnerability of the Major and Minor Aquifers of Texas to Subsidence with Regard to Groundwater Pumping"* when considering subsidence during GMA 12 joint planning.

17.4 Conservation of Groundwater including Rainwater Harvesting, Precipitation Enhancement, Brush Control, Conjunctive Use, and/or Recharge Enhancement of Groundwater Resources in the District

Management Objectives:

1. The District will provide educational leadership to citizens within the District concerning this subject. The educational efforts will be through at least one printed publication, such as a brochure, and at least one public speaking program at a service organization and/or public school as provided for in the District's Public Education Program. Each of the following topics will be addressed in that program:
    a. Conservation
    b. Rainwater Harvesting
    c. Brush Control
    d. Recharge Enhancement
    e. Conjunctive Use
    f. Precipitation Enhancement

More information can be found at Education – POSGCD.

2. During years when District revenues are sufficient, the District will consider sponsoring the attendance of students and/or teachers at summer camps/seminars that place emphasis on the conservation of groundwater, rainwater harvesting, brush control, groundwater recharge enhancement, conjunctive use, precipitation enhancement of water resources, or a combination of such groundwater management programs.
3. During years when District revenues are sufficient, the District will provide scholarships for students to participate in the programs that place emphasis on the conservation of groundwater,

rainwater harvesting, brush control, groundwater recharge enhancement, conjunctive use, precipitation enhancement of water resources, or a combination of such groundwater management programs, such as the Texas 4-H Water Ambassadors Program.

4. The District will encourage and support projects and programs to conserve and/or preserve groundwater, and/or enhance groundwater recharge, by annually funding Districtprograms, including the Aquifer Conservation Program and the Groundwater Conservation and Enhancement Grant Program, during years when the District's revenues remain at a level sufficient to fund the program. The objective of this program is to obtain the active participation and cooperation of local water utilities, fire departments and public agencies in the funding and successful completion of programs and projects that will result in the conservation of groundwater and the protection or enhancement of the aquifers in the District. The qualifying water conservation projects and programs will include, as appropriate, projects that: result in the conservation of groundwater, reduce the loss or waste of groundwater, recharge enhancement, rainwater harvesting, precipitation enhancement, brush control, or any combination thereof. The District's objective is to benefit the existing and future users of groundwater in the District by providing for the more efficient use of water, increasing recharge to aquifers, reducing waste, limiting groundwater level declines, and maintaining or increasing the amount of groundwater available, by awarding at least one grant under the program in each county annually.

Performance Standards:

1. The number of publications and speaking appearances by the District each year under the District's Public Education Program.
2. The number of students sponsored to attend a summer camp/seminar emphasizing the conservation of water.
3. The number of students receiving scholarships to participate in programs emphasizing the conservation of water, such as the Ambassador 4-H program.
4. Annual funding, when applicable, for the District's Aquifer Conservation Program, Groundwater Conservation and Enhancement Grant Program, and the number of projects and programs reviewed, approved, and funded under that program. A written report providing estimated benefit of the amount of groundwater conserved, of the recharge enhancement, and/or of addition groundwater protection provided by the program.
5. The number and content of reports submitted regarding sponsored programs.

17.5 Conjunctive Use of Surface and Groundwater

Management Objective:

The District will confer annually with the Brazos River Authority (BRA) on cooperative opportunities for conjunctive resource management.

In an effort to enhance long term conservation of groundwater resources, the District encourages conjunctive water use projects to meet future needs and will encourage these water projects through rules, fees or other incentives.

Performance Standard:

1. The number of conferences with the BRA on conjunctive resource management.
2. The number of times each year in which the applicant, general manager or the Board considers conjunctive use in the permitting process.

3. Presence of a section in the District Rules defining "Conjunctive Use" and establish standards for conjunctive use projects.

17.6 Drought Management Strategy

The District is aware that, with climatic changes, the need for groundwater being produced changes. Available tools and information can be found at the TWDB website, https://www.waterdatafortexas.org/drought. The District management strategy is to monitor and review compliance with the District's DFCs and PDLs in response to the changes in groundwater being produced.

Management Objective:

The District, under Section 16 of District Rules, will continue to monitor groundwater, in the different management zones, to maintain compliance with DFCs and PDLs adopted by the District. The District will provide information and tools that can be found at the TWDB website. Performance Standard:

Reports to the Board on the number of monitoring wells and the frequency of measurements.

17.7 Provide information on Drought Status, at a Board Meeting, at least quarterly. Natural Resource Issues That Impact the Use and Availability of Groundwater and Which are Impacted by the Use of Groundwater

Management Objectives:

1. The District will confer at least once every two years with appropriate agencies on the impact of groundwater resources in the District.
2. The District will evaluate permit applications for new wells and the information submitted by the applicants on those wells prior to drilling. The District will assess the impact of these wells on the groundwater resources in the District.
3. The District will implement the POSGCD Well Closure Program. The objective of the well closure program is to obtain the closure and plugging of derelict and abandoned wells in a manner that is consistent with state law, for the protection of the aquifers, the environment, and the public safety. The District will conduct a program to identify, inspect, categorize and cause abandoned and derelict water, oil and gas wells to be closed and plugged, by annually funding the program or segments or phases of the program appropriate to be funded in such fiscal year. The District will fund the closure of abandoned wells, according to the most recently adopted District policies, during years when the District's revenues remain at a level sufficient to fund the program.
4. In years when funding is available, the District will enter into interlocal agreements with Milam and Burleson County to protect and preserve groundwater resources from potential contaminants through the County Conservation and Preservation Grant.

Performance Standards:

1. The number of conferences with a representative of appropriate agencies.
2. Reports to the Board on the number of new well permit applications filed, and the possible impacts of those new wells on the groundwater resources in the District.

3. Annual funding, when applicable, for the District's Well Closure Program, and the number of wells closed and plugged as a result of the Well Closure Program.
4. Monthly reports from Milam and Burleson Counties will be provided to the District regarding the requirements of the interlocal agreements.

17.8 Groundwater Well Assistance Program

Management Objective:

The District will maintain a Groundwater Well Assistance Program (GWAP). The purpose of the GWAP is to help restore a water supply to well owners in the District who own wells that have experienced significant groundwater level declines caused by groundwater pumping in GMA 12. Another purpose of the GWAP is to improve the POSGCD monitoring program and the POSGCD's understanding of groundwater aquifer systems in POSGCD by increasing the number of monitoring wells in the monitoring well network.

Performance Standard:

At least once every two years evaluate the number of register wells at risk of their water levels declining below their pump within the next ten years.

17.9 Mitigation

Management Objective:

The District will require filing with the District of mitigation plans required by the District or any State agency regarding impacts caused by groundwater pumping in the District.

Performance Standards:

1. Mitigation plans on file at the District that are related to groundwater pumping in the District.
2. Report of impacts and predicted impacts on well owners in the District on file at the District Offices.

17.10 Desired Future Conditions and Protective Drawdown Limits

Management Objective:

At least once every three years, the District will monitor water levels and evaluate whether the change in water levels addresses the DFCs and PDLs adopted by the District. The District will estimate total annual groundwater production for each aquifer based on the water use reports, estimated exempted use, and other relevant information, and compare these production estimates to the MAGs listed in Table 8-1.

Performance Standards:

1. At least once every three years, the general manager will report to the Board the measured water levels obtained from the monitoring wells within each Management Zone/Area, the average measured drawdown for each Management Zone/Area calculated from the measured water levels of the monitoring wells within the Management Zone/Area, a comparison of the average measured drawdowns for each Management Zone/Area with the DFCs/PDLs for each Management Zone/Area, and the District's progress in conforming with the DFCs/PDLs.

2. At least once every three years, the general manager will report to the Board the total permitted production and the estimated total annual production for each aquifer and compare these amounts to the MAGs listed in Table 8-1 for each aquifer.

17.11 Sustainability of the Groundwater Resource

Management Objective:

Beginning in 2023, the District will evaluate the long-term sustainability of its groundwater supply relative to current production and permitted production. The District will describe the conditions that define sustainability and develop and apply an set of criteria for evaluating the sustainability of the District's aquifers.

Performance Standards:

18.0 AT LEAST ONCE EVERY THREE YEARS, THE GENERAL MANAGER WILL REPORT TO THE BOARD ON THE SUSTAINABILITY OF THE GROUNDWATER RESOURCES. THE REPORT WILL INCLUDE A DEFINITION OF GROUNDWATER SUSTAINABILITY AND THE METHODOLOGY FOR ASSESSING THE SUSTAINABILITY OF EACH RELEVANT AQUIFER BASED ON CURRENT PRODUCTION AND PROJECTED PRODUCTION. PROJECTED WATER DEMANDS

The projected net water demands (in acre-feet) within the District based on the 2022 State Water Plan are compiled in TWDB (2022), provided as **Appendix A**. The District also established future Municipal Groundwater Use Demands in the District for planning purposes. The methodology and results of that effort are as follows:

Method for Establishing Future Municipal Use Demands of Groundwater. The District adopted a resolution, dated March 11, 2003, establishing production rights for Local Water Utilities within the District (water supply corporations, special utility districts, municipal utility districts and cities), as a rule. This rule allowed these Local Water Utilities to obtain a permit to produce a volume of water annually according to one of two methods:

1. An amount equal to the highest annual pumpage it reported from wells within the District in any consecutive twelve months prior to September 31, 2001; or
2. The Local Water Utility could present to the Board a Long-Term Plan prepared by a qualified engineer that projects the annualized long-term water needs as the official projection of the water required by that Local Water Utility in the planning period (for not more than forty [40] years) for providing retail water service within that Local Water Utility's defined service area. If a Local Water Utility adopted this plan on or before March 30, 2004, and the Board found the highest annual pumpage projected in the Long-Term Plan (the "Plan Amount") was not unreasonable, the

Local Water Utility was authorized to obtain a permit to pump and produce up to the Plan Amount. **Table 18-1** below contains the results of this effort.

Table 18-1 Municipal Use Groundwater Demands Projected through 2044

Producer	Estimated Acre-Feet per Year
Burleson County	
Apache Hills	11
Birch Creek	16
Burl. Co. MUD	73
Burl. Investm.	7
Cade Lakes	123
Centerline	21
Caldwell	1,969
Snook	154
Somerville	670
Clara Hills	5
Clay	7
Cooks Point	10
Deanville	350
Lakeview	21
Little Oak Forrest	5
Lyons	106
Post Oak Hill	11
Shupak Utilities	19
Tunis	108
Whispering Woods	7
Wilderness Sound	15
Total for Burleson Co.	3,708
Milam County	
Alcoa	702
Rockdale	2,129
Gause	74
Marlow	108
Milano	673
Minerva	28
North Milam	369
Southwest Milam	2,492
Total for Milam Co.	6,575
DISTRICT TOTALS	10,283

19.0 PROJECTED WATER SUPPLIES WITHIN THE DISTRICT

The projected surface water supplies (in acre-feet) within the District based on the 2022 State Water Plan are compiled in TWDB (2022), provided as **Appendix A**.

Table 19-1 lists the projected groundwater supplies within the District in acre-feet per year according to the 2022 State Water Plan Data. The District has participated and will participate in future regional water planning, and will consider the water supply needs and water management strategies included in the adopted state water plan.

Table 19-1 Projected Groundwater Supplies in acre-feet per year Within the District According the 2022 State Water Plan data

WUG Name	Source Name (aquifer)	Existing WUG Supply					
		2020	2030	2040	2050	2060	2070
Burleson County							
COUNTY-OTHER	CARRIZO-WILCOX	550	550	550	550	550	550
COUNTY-OTHER	QUEEN CITY	250	250	250	250	250	250
DEANVILLE WSC	CARRIZO-WILCOX	659	659	659	659	659	659
IRRIGATION,	BRAZOS RIVER ALLUVIUM	25,189	25,189	25,189	25,189	25,189	25,189
IRRIGATION	CARRIZO-WILCOX	294	294	294	294	294	294
IRRIGATION	YEGUA-JACKSON	974	974	974	974	974	974
MANUFACTURING	SPARTA	111	111	111	111	111	111
MINING	YEGUA-JACKSON	2,018	2,018	2,018	2,018	2,018	2,018
SNOOK	SPARTA	494	494	494	494	494	494
SOMERVILLE	SPARTA	891	891	891	891	891	891
SubTotal		31,430	31,430	31,430	31,430	31,430	31,430
Milam County							
COUNTY-OTHER	BRAZOS RIVER ALLUVIUM	160	160	160	160	160	160
IRRIGATION	BRAZOS RIVER ALLUVIUM	4,422	4,422	4,422	4,422	4,422	4,422
IRRIGATION	CARRIZO-WILCOX	2,224	1,878	1,777	1,986	2,075	2,075
IRRIGATION	QUEEN CITY	53	56	56	56	56	56
MILANO WSC	CARRIZO-WILCOX	255	217	231	230	239	243
MILANO WSC	CARRIZO-WILCOX	265	223	235	235	247	253
MINING	CARRIZO-WILCOX	76	64	61	68	71	71
NORTH MILAM WSC	CARRIZO-WILCOX	423	358	338	378	395	394
ROCKDALE	CARRIZO-WILCOX	1,094	924	624	727	771	771
SOUTHWEST MILAM WSC	CARRIZO-WILCOX	140	113	101	108	114	108

SOUTHWEST MILAM WSC	CARRIZO-WILCOX	1,118	888	795	850	873	839
THORNDALE	CARRIZO-WILCOX	202	202	202	201	201	201
SubTotal		10,272	9,345	8,842	9,261	9,464	9,433
Total		**41,702**	**40,775**	**40,272**	**40,691**	**40,894**	**40,863**

20.0 PROJECTED WATER NEEDS AND WATER STRATEGIES

The projected water supply needs and water management strategies (in acre-feet) within the District based on the 2022 State Water Plan are compiled in TWDB (2022), provided as **Appendix A**.

Milam County:
Projected water supply needs listed in the TWDB estimated historical water use/2022 state water plan data packet are primarily Steam Electric Power. Additional needs exist in irrigation and Municipal. From 2020 to 2070, the total needs in Milam County are projected to increase from 32,333 AF to 33,215 AF, an 882 AF increase.
Projected water management strategies listed in the TWDB estimated historical water use/2022 state water plan data packet and located within Milam County are: Agricultural Conservation (Irrigation), ASR (Thorndale), Corrizo Aquifer Development (Rockdale, Southwest Milam WSC), and Municipal Conservation (Cameron, Rockdale, North Milam WSC). From 2020 to 2070, the total water management strategies in Milam County are projected to increase from 274 AF to 4,690 AF, an increase of 4,416 AF.

Burleson County:
Projected water supply needs listed in the TWDB estimated historical water use/2022 state water plan data packet are primarily Irrigation. Additional needs exist in Municipal. From 2020 to 2070, the total needs in Burleson County are projected to increase from 353 AF to 393 AF.
Projected water management strategies listed in the TWDB estimated historical water use/2022 state water plan data packet and located within Burleson County are: Agricultural Conservation (Irrigation), Sparta Aquifer Development (Manufacturing), Corrizo Aquifer Development (Southwest Milam WSC), Municipal Conservation (Caldwell, Snook, Somerville), and Industrial Water Conservation (Manufacturing). From 2020 to 2070, the total water management strategies in Burleson County are projected to increase from 833 AF to 2,355 AF, an increase of 1,522 AF.

21.0 ESTIMATED GROUNDWATER USE WITHIN THE DISTRICT

The estimated historical water use (in acre-feet) within the District based on the TWDB Historical Water Use Survey is compiled in TWDB (2022), provided as Appendix A.

22.0 ESTIMATED ANNUAL RECHARGE OF GROUNDWATER RESOURCES WITHIN THE DISTRICT

The estimated annual recharge from precipitation to groundwater by aquifer (in acre-feet) within the District is compiled in GAM Run 22-007 (Wade, 2022), provided as **Appendix B**.

23.0 ESTIMATED ANNUAL DISCHARGES FROM THE AQUIFER TO SPRINGS AND ANY SURFACE WATER BODIES, INCLUDING LAKES, STREAMS AND RIVERS

The estimated annual discharges from each aquifer to springs and any surface water bodies, including lakes, streams, and rivers (in acre-feet) within the District are compiled in GAM Run 22-007 (Wade, 2022), provided as Appendix B.

24.0 ESTIMATED ANNUAL GROUNDWATER FLOW INTO AND OUT OF THE DISTRICT WITHIN EACH AQUIFER AND BETWEEN AQUIFERS IN THE DISTRICT

The estimated annual groundwater flow into and out of the District within each aquifer and between aquifers (in acre-feet) within the District is compiled in GAM Run 22-007 (Wade, 2022), provided as Appendix B.

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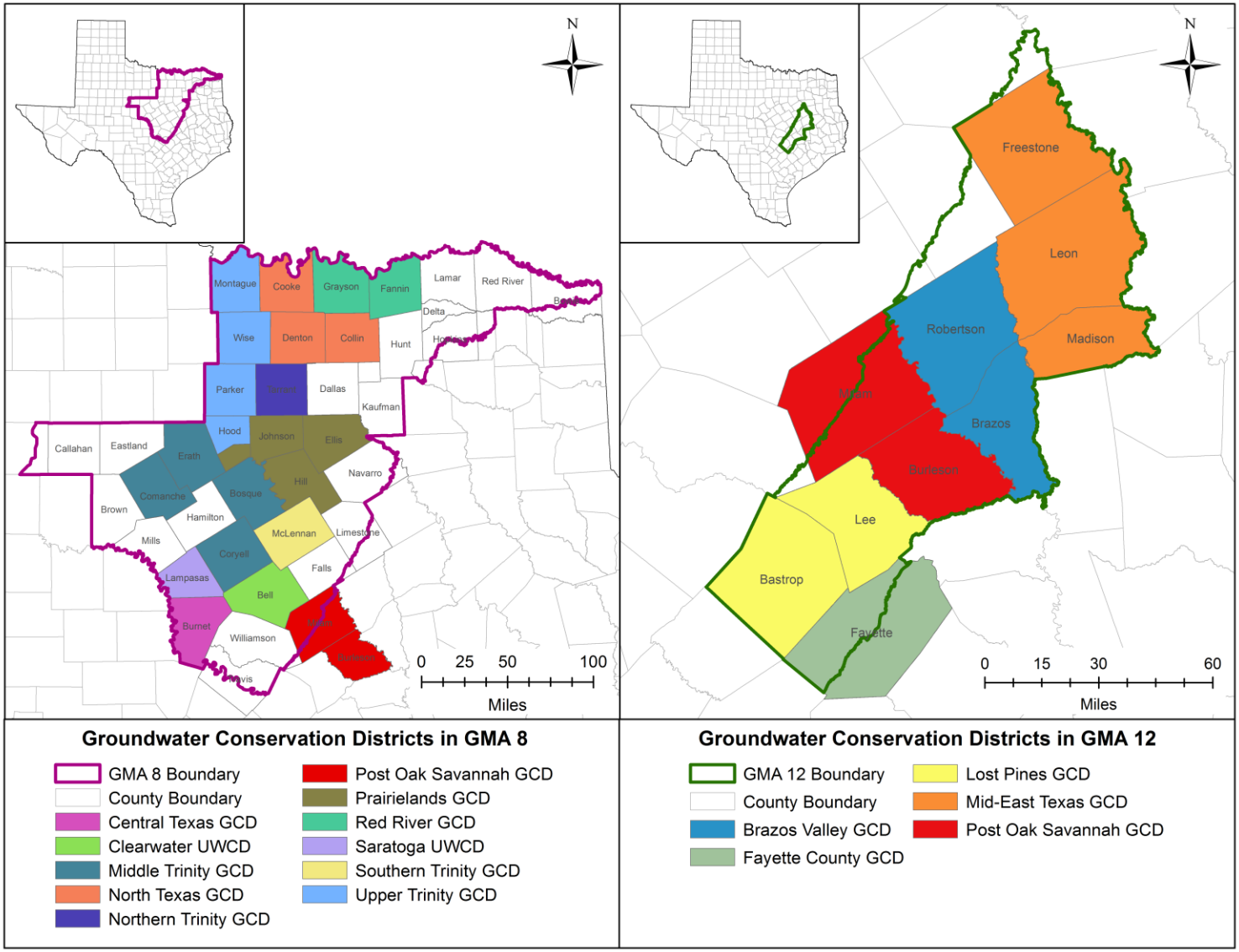

Figure 1 Counties and Groundwater Districts Associated with Groundwater Management Areas 8 and 12

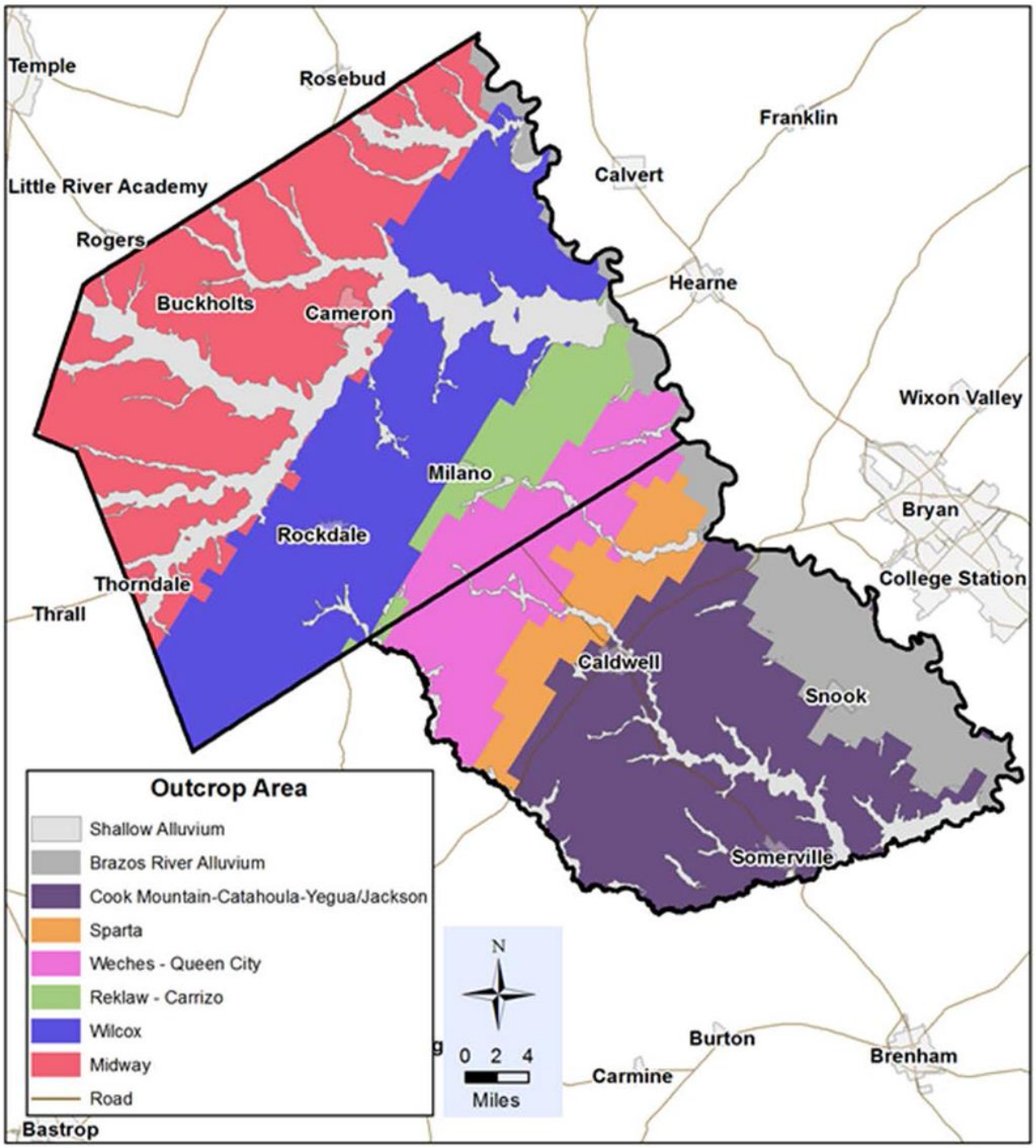

Figure 2 Outcrops Associated with Aquifers and Geological Formations in the District

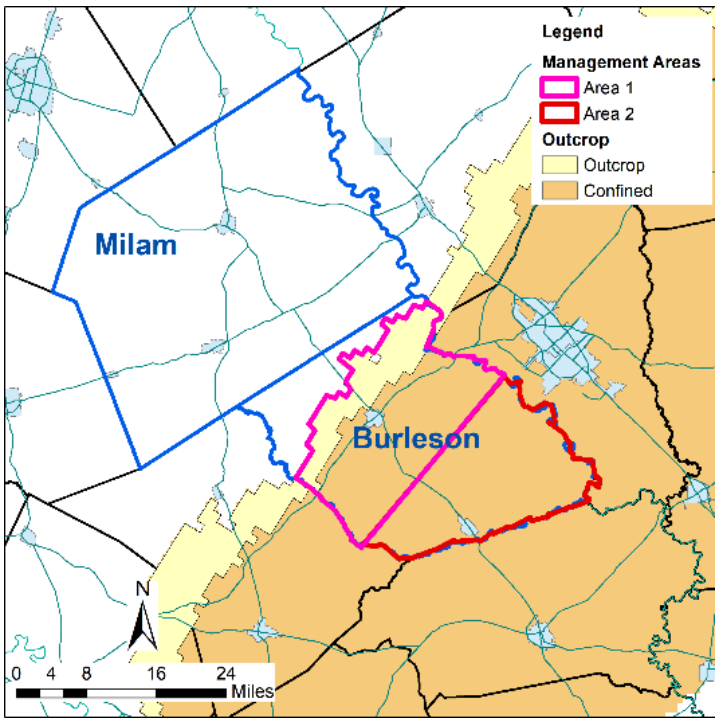

Figure 3 Sparta Management Zone and the Two Management Areas that comprise it: Sparta Management Area 1 and Sparta Management Area 2

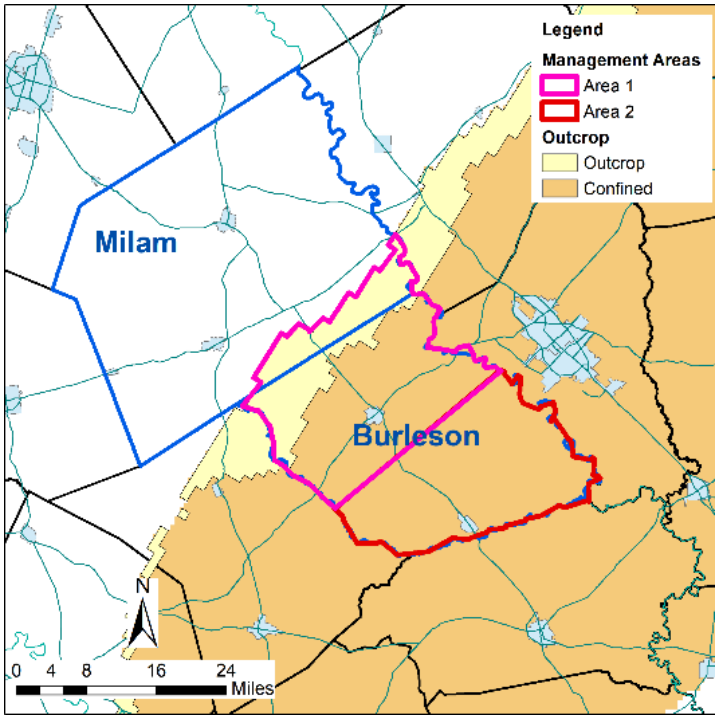

Figure 4 Queen City Management Zone and the Two Management Areas that comprise it: Queen City Management Area 1 and Queen City Management Area 2

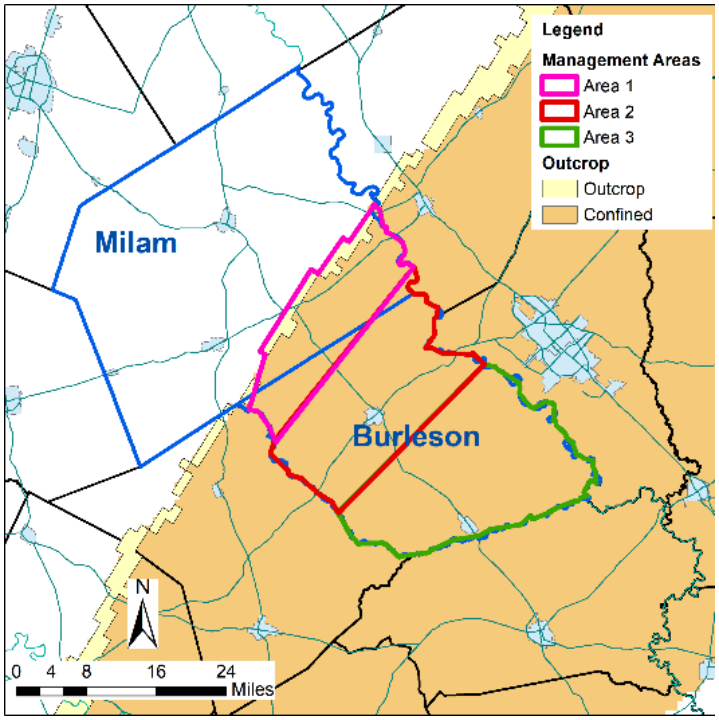

Figure 5 Carrizo Management Zone and the Three Management Areas that comprise it: Carrizo Management Area 1, Carrizo Management Area 2., and Carrizo Management Area 3

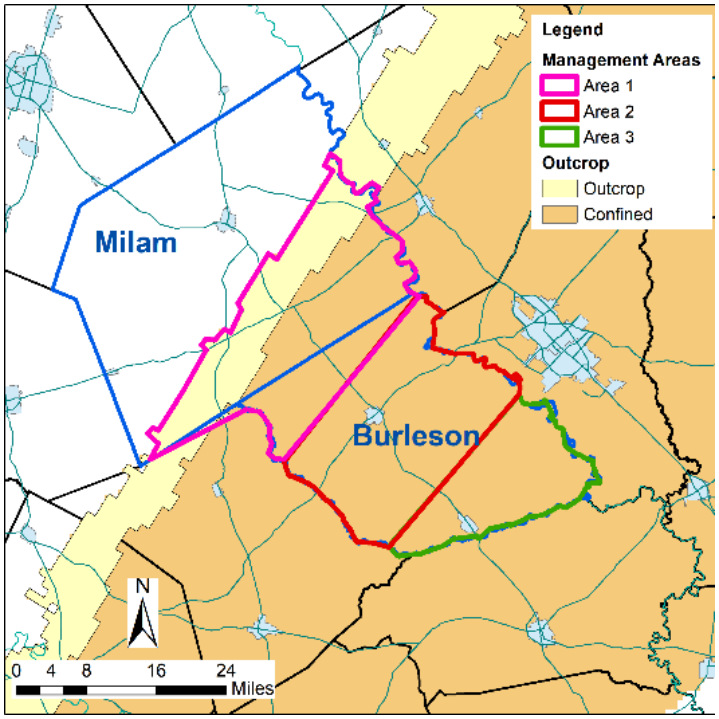

Figure 6 Calvert Bluff Management Zone and the Three Management Areas that comprise it: Calvert Bluff Management Area 1, Calvert Bluff Management Area 2., and Calvert Bluff Management Area 3

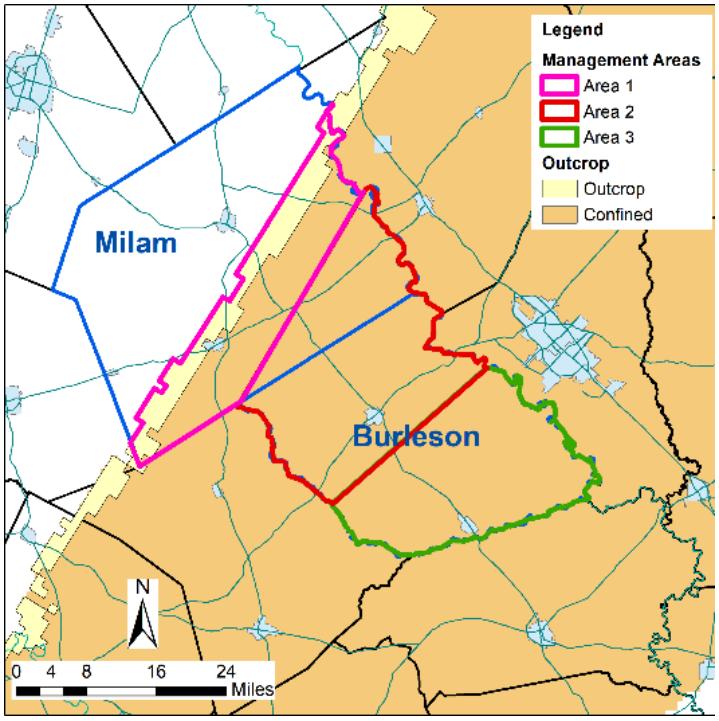

Figure 7 Simsboro Management Zone and the Three Management Areas that comprise it: Simsboro Management Area 1, Simsboro Management Area 2., and Simsboro Management Area 3

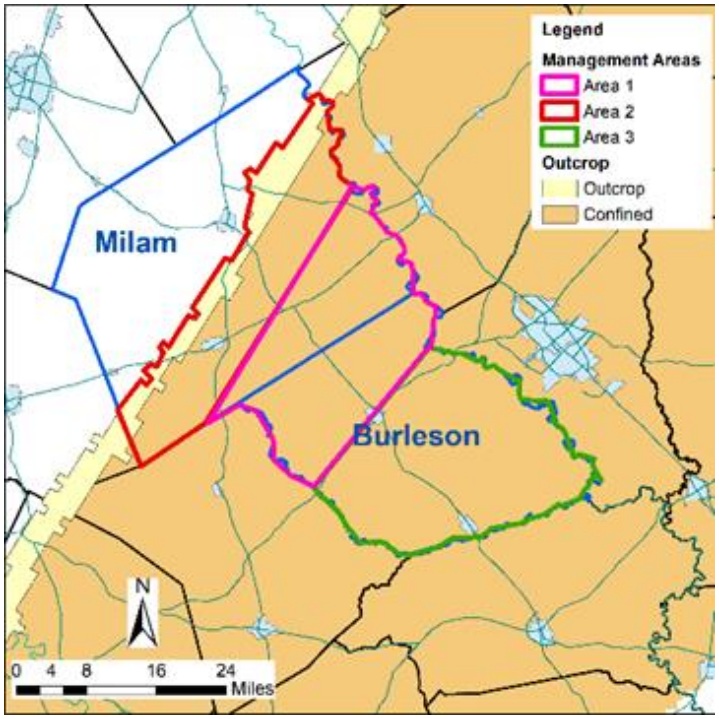

Figure 8 Hooper Management Zone and the Three Management Areas that comprise it: Hooper Management Area 1, Hooper Management Area 2., and Hooper Management Area 3