

Post Oak Savannah Groundwater Conservation District

Groundwater Management Plan

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POST OAK SAVANNAH GROUNDWATER CONSERVATION DISTRICT
GROUNDWATER MANAGEMENT PLAN

1. District Mission

The Post Oak Savannah Groundwater Conservation District (POSGCD) mission is to conserve and preserve groundwater availability and groundwater users, by adopting and enforcing Rules consistent with state law. The District will accomplish this mission by requiring permits for wells and production, establishing water drawdown levels for aquifers, monitoring aquifer levels and production making appropriate adjustments to allowable and permitted production, and encouraging conservation to limit pumping, thereby extending the quantity and quality of the water available in all of the aquifers in Milam and Burleson counties.

2. Time Period of this Plan

This plan will become effective upon adoption by the POSGCD Board of Directors and certification as administratively complete by the Texas Water Development Board. The plan will remain in effect for ten (10) years after the date of certification or until a revised plan is adopted and certified.

3. Background

The POSGCD was first created in Milam and Burleson counties by an act of the 77th Legislature in 2001 by House Bill 1784. The purpose of this bill was to provide locally controlled groundwater districts 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 to regulate the transport of water out of the boundaries of the districts. The POSGCD has 10 directors, 5 from each county, and does not have the power to tax and receives all of its revenue from fees imposed on municipal/commercial pumpers and transporters of groundwater. Successful confirmation elections were held in November 2002 in both counties in accordance with Sections 36.017, 36.018, and 36.019, Water Code, and Section 41.001, Election Code.

4. **Groundwater Resources**

The POSGCD has within its boundaries the Trinity, Carrizo-Wilcox, Queen City, Sparta, and Brazos River and Little River Alluvium aquifers. The following paragraphs describe the aquifers and their location within the District. Estimates of projected groundwater availability for the aquifers in the District have been made by several organizations including the Brazos Region G planning group, the Texas Water Development Board (TWDB), and the District Hydrologist (URS). The Central Queen City/Sparta Groundwater Availability Model (hereafter referred to as the GAM), which includes the Carrizo-Wilcox aquifer system, has been applied as a means of evaluating groundwater availability and water budgets for the aquifers and management zones in the District.

a) Trinity

The Trinity aquifer is located only in the northwest corner of Milam County, with its recharge area located in the counties to the north and west. Based on the 2002 Water Plan, the projected groundwater availability in Milam County is 321 acre-feet per year.

b) Carrizo-Wilcox (includes Simsboro Aquifer)

The Carrizo-Wilcox aquifer is a major regional aquifer system that occurs throughout most of the POSGCD. The outcrop of the Carrizo-Wilcox forms a southwest to northeast trending belt through central Milam County, with the downdip portion of the aquifer to the southeast underlying southern Milam County and most of Burleson County. A large number of domestic wells, as well as public water supply systems, are screened in the Carrizo-Wilcox aquifer, with much of the water produced from the Simsboro aquifer within the Carrizo-Wilcox.

Evaluation of groundwater availability in this large aquifer system by management zones using the GAM suggests that approximately 124,500 acre-feet per year is available in the District. Section 16 provides additional information on the basis of this estimate.

c) Brazos River and Little River Alluvium

Water bearing alluvial sediments occur in floodplain and terrace deposits of the Little River in Milam County and of the Brazos River along the eastern boundary of Milam and Burleson counties. Based on results of GAM 05-05 (a specific GAM simulation performed by the TWDB in March 2005), the alluvium aquifer receives recharge primarily through precipitation on the flood-plain surface. For the most part, the water discharges from the alluvium mainly through seepage to the Brazos River, evapotranspiration, and wells. In some locations, water levels in the alluvium are higher than the underlying Sparta aquifer and some groundwater downflow does occur. Irrigation accounts for almost all of the pumpage from this aquifer. Projected groundwater availability in Burleson County is 9,400 acre-feet per year. Only a small area of Brazos River alluvium occurs in Milam County, and no estimates of groundwater availability in the Little River alluvium in Milam County are available.

d) *Queen City*

The Queen City aquifer crops out in a 5 to 8 mile wide zone generally along the Milam-Burleson County line. The aquifer extends down dip in Burleson County and is a source of groundwater for numerous domestic wells and some public water supply systems. Results of the GAM 05-05 indicate that recharge alone in this aquifer consists of 4,086 acre-feet per year in Milam County and 4,774 acre-feet per year in Burleson County for a District total of 8,860 acre-feet per year.

e) *Sparta*

The Sparta aquifer crops out in a 3 to 5 mile wide zone trending southwest-northeast just north of Highway 21 in Burleson County. The Sparta extends downdip to the south throughout most 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. The GAM 05-05 results indicate that recharge to the Sparta in Burleson County amounts to 7,707 acre-feet per year.

f) *Yegua/Jackson*

The Yegua and Jackson formations include local aquifers that provide small to moderate amounts of groundwater to domestic and irrigation wells in much of Burleson County. Because of the relatively low yields of wells in these aquifers, groundwater availability estimates have not been performed at this time for the Yegua or Jackson formations.

5. Management Zones

The District will be divided into six groundwater management zones for the purpose of evaluating and managing groundwater resources recognizing the different characteristics and anticipated future development of the aquifers in the District. Figures 1 and 2 illustrate the locations of the management zones. The District will establish and enforce Rules for the spacing of wells, the maximum allowable production of groundwater per acre of land located over an aquifer, requiring permits for production, limiting water drawdown levels, and providing for a reduction in the maximum allowable production and permitted production based on the different characteristics and continuing evaluation and monitoring within the Management Zones. These zones are as briefly described below:

5.1 Trinity Management Zone

This zone includes that part of the Trinity aquifer located in the northwest part of the District.

5.2 Brazos River and Little River Alluvium Management Zone

This zone is located along the eastern boundaries of the District and along the Little River in Milam County. It is limited to the water bearing alluvial sediments of the Brazos and Little Rivers.

5.3 Queen City and Sparta Management Zone

This zone includes all of the waterbearing outcrop and downdip formations of the Queen City and Sparta aquifers which are found in the District.

5.4 Shallow Carrizo-Wilcox (Simsboro) Management Zone

This zone includes all of the waterbearing formations of the outcrop and downdip of the Carrizo-Wilcox and Simsboro aquifers including, and north and west of, the Milano Fault Zone.

5.5 Deep Simsboro Management Zone

This zone includes that portion of the Simsboro aquifer downdip (south and east) of the Milano Fault Zone.

5.6 Deep Carrizo-Wilcox Management Zone

This zone includes the Carrizo-Wilcox aquifer (except for the Simsboro aquifer) located south and east of the Milano Fault Zone.

6. Production and Spacing of Wells

Production and spacing of wells shall be regulated by the District according to the Rules of the District.

7. Management of Groundwater Supplies

The District will evaluate and monitor groundwater availability and production consistent with the supply of groundwater within the District, in a manner intended to conserve and preserve groundwater availability and to protect groundwater users in a manner not unnecessarily and adversely limit the economic viability of all users, public and private. In consideration of groundwater availability and the economic and cultural consequences within the District impacted by water availability, the District will identify and engage in such activities and practices, that if implemented, will permit groundwater production and, as appropriate, to protect the aquifer and groundwater availability result in a reduction of permitted production of groundwater. An observation network shall be established and maintained in order to monitor changing storage conditions of groundwater supplies within the District. The District will make a regular assessment of water supply and groundwater storage conditions and will report those conditions to the Board and to the public. The District will undertake, as necessary and co-operate with investigations of the groundwater resources within the District and will make the results of investigations available to the public upon adoption by the Board.

The District will adopt rules to regulate groundwater withdrawals by means of spacing and production limits. The District may deny a well construction permit or limit groundwater withdrawals in accordance with the guidelines stated in the rules of the District. In making a determination to deny a permit or limit groundwater withdrawals, the District will consider the public benefit against individual hardship after considering all appropriate testimony.

The relevant factors to be considered in making a determination to deny a permit or limit groundwater withdrawals will include:

1. The purpose of the rules of the District
2. The equitable distribution of the resource
3. The economic hardship resulting from grant or denial of a permit or the terms prescribed by the permit
4. The potential effect the permit may have on aquifer health and sustainability of the recharge on the aquifer as a whole.

In pursuit of the Districts mission of protecting the resource, the District may require reduction of groundwater withdrawals to amounts, which will not cause harm to the aquifer. To achieve this purpose, the District may, at the Boards discretion after notice and hearing amend or revoke any permits for non-compliance, and/or reduce the production authorized by permit for the purpose of protecting the aquifer and groundwater availability. The determination to seek the amendment or revocation of a permit by the District will be based on aquifer conditions observed by the District. The District will enforce the terms and conditions of permits and the rules of the District by fine and enjoining the permit holder in a court of competent jurisdiction as provided for in Texas Water Code (TWC) Ch. 36.102, etc.

A contingency 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 contingency plan, the District will consider 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 hydro geologic conditions of the aquifers within the District and the appropriate conditions under which to implement the contingency plan.

The District will employ reasonable and necessary technical resources at its disposal to evaluate the 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 the provisions of the water supply deficit contingency plan 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.

8. Actions, Procedures, Performance and Avoidance for Plan Implementation

The District will implement the provisions of this plan and will utilize the provisions of this plan as a guidepost for on-going evaluation determining the direction or priority for all District activities. All operations of the District, all agreements entered into by the District and any additional planning efforts in which the District may participate will be consistent with the provisions of this plan.

The District will adopt rules relating to the permitting of wells and the production of groundwater. The rules adopted by the District shall be 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 the best technical data available.

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

The District will seek the cooperation in the implementation of this plan and the management of groundwater supplies within the District. All activities of the District will be undertaken in co-operation and coordinated with the appropriate state, regional or local water management entity.

9. Methodology for Tracking District Progress in Achieving Management Goals

The District manager will prepare and present an annual report to the Board of Directors on District performance in regards to achieving management goals and objectives. The presentation of the report will occur during the last monthly Board meeting each fiscal year, beginning after the adoption and certification of this plan. The report will include the number of instances in which each of the activities specified in the Districts management objectives was engaged in during the fiscal year. Each activity will be referenced to the estimated expenditure of staff time and budget in accomplishment of the activity. The notations of activity frequency, staff time and budget will be referenced to the appropriate performance standard for each management objective describing the activity, so that the effectiveness and efficiency of the Districts operations may be evaluated. The Board will maintain the report on file, for public inspection at the Districts offices upon adoption. This methodology will apply to all management goals contained within this plan.

10. Management Goals, Objectives, & Performance Standards

10.1 Efficient Use of Groundwater

Management Objective:

District will establish the “POSGCD Carrizo-Wilcox Aquifer Water Level Observation Well Program” with observation wells located according to management zones within the District. Water levels at these observation wells will be measured a minimum of twice annually.

Performance Standards:

1. Establish the Program and its criteria, and begin measurements of the observation wells within one year following the adoption and certification of this plan.
2. Number of observation wells measured each 6 months by the District.

10.2 Controlling and Preventing Waste of Groundwater

Management Objective:

The District will provide educational leadership to the citizens of the District concerning this subject through at least one printed publication such as brochures and public speaking at service organizations and public schools.

Performance Standard:

The number of publications and speaking appearances by the District each year.

10.3 Control and Prevent Subsidence

Does not apply to Post Oak Savannah Groundwater Conservation District.

10.4 Conservation of Groundwater

Management Objective:

The District will provide educational leadership to the citizens of the District concerning this subject through printed publications such as brochures, and public speaking at service organizations and public schools.

Performance Standard:

The number of publications and speaking appearances by the District each year.

10.5 Conjunctive Use of Surface and Groundwater

Management Objective:

Each year the District will confer at least once with the Brazos River Authority (BRA) on cooperative opportunities for conjunctive resource management.

Performance Standard:

The number of conferences with the BRA on conjunctive resource management each year.

10.6 Develop a Management Strategy to Address Drought Conditions

Management Objective:

The District will develop and adopt a Drought Management Strategy Plan within one year of the adoption and certification of this plan, review it annually, and revise it if necessary. The plan will be implemented when specified conditions require.

Performance Standard:

1. Development and adoption of a Drought Management Strategy Plan within one year of the adoption and certification of this plan.
2. Review all of the conditions and requirements specified in the Drought Management Strategy Plan that would trigger implementation on an annual basis.

10.7 Address Natural Resource Issues That Impact the Use and Availability of Groundwater and Which are Impacted By the Use of Groundwater

Management Objective:

1. Each year the District will confer at least once with a representative of the Texas Railroad Commission (RRC) on the impact of oil and gas production on groundwater availability, as well as the impact of groundwater production on the production of oil and gas in the District.
2. Also, during each year the District will evaluate proposed new wells and the information submitted by the applicants on those wells prior to drilling in order to assess the impact of these wells on the groundwater resources in the District.

Performance Standard:

1. The number of conferences with a representative of the Texas RRC each year as well as
2. Ongoing reports to the POSGCD Board of Directors on the possible impacts of new wells on the groundwater resources in the District.

11 Natural or Artificial Recharge of Groundwater within the District

Management Objective:

The District will assess the need and opportunity for recharge in the District on an annual basis with the first study to be completed within one year of the adoption and certification of this plan. Upon determining the need for recharge the District will adopt a plan for natural and/or artificial recharge within one year of the assessment for the need of that recharge, and review that plan on an annual basis. Possible practices for recharge in the District would be Brush Management or construction of surface ponds in key recharge areas.

12. Projected Water Demands within the District

Below is a table of Projected Water Demands within the District in acre-feet per year according to Table 2 of the 2002 State Water Planning Database.

Water Use Group	Category	2000	2010	2020	2030	2040	2050
Caldwell	Municipal	768	791	810	838	853	879
Somerville	Municipal	247	265	272	306	298	297
County-Other	Municipal	1,181	1,188	1,213	1,213	1,246	1,342
Irrigation	Irrigation	6,612	6,337	6,072	5,819	5,594	5,344
Livestock	Livestock	1,318	1,318	1,318	1,318	1,318	1,318
Manufacturing	Manufacturing	131	145	158	171	182	194
Mining	Mining	29	24	18	15	13	13
Total Projected Water Demands in acre-feet per year =		10,286	10,068	9,861	9,680	9,504	9,387

MILAM COUNTY

Water Use Group	Category	2000	2010	2020	2030	2040	2050
Cameron	Municipal	1,363	1,336	1,304	1,308	1,310	1,334
Rockdale	Municipal	1,730	1,803	1,842	1,943	2,035	2,151
Thorndale	Municipal	143	140	136	136	136	139
County-Other	Municipal	1,796	1,834	1,850	1,851	1,848	1,836
Irrigation	Irrigation	1,400	1,389	1,377	1,366	1,354	1,343
Livestock	Livestock	1,627	1,627	1,627	1,627	1,627	1,627
Manufacturing	Manufacturing	6,820	6,820	8,250	8,250	8,250	9,800
Mining	Mining	30,008	20,008	20,009	20,009	20,009	20,009
Steam Electric Power	Steam Electric Power	8,680	8,680	12,500	12,500	12,500	16,000
Total Projected Water Demands in acre-feet per year =		53,567	43,637	48,895	48,990	49,069	54,239

Total Projected Water Demands (acre-feet per year) for Burleson and Milam Counties =	63,853	53,705	58,756	58,670	58,573	63,626
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TWDB 07/23/03

13. Projected Water Supplies within the District

Below is a table of Projected Water Supplies within the District in acre-feet per year according to Table 5 of the 2002 State Water Planning Database.

**PROJECTED WATER SUPPLIES
POST OAK SAVANNAH GROUNDWATER CONSERVATION DISTRICT**

**BURLESON
COUNTY**

Water Use Group	Source Type	Source Name	2000	2010	2020	2030	2040	2050
Caldwell	Groundwater	Carrizo-Wilcox Aquifer	1,935	1,935	1,935	1,935	1,935	1,935
Somerville	Groundwater	Sparta Aquifer	593	593	593	593	593	593
County-Other	Groundwater	Carrizo-Wilcox Aquifer	21,837	21,837	21,837	21,837	21,837	21,837
Irrigation	Surface Water	Irrigation Local Supply	5,580	5,580	5,580	5,580	5,580	5,580
Irrigation	Groundwater	Brazos River Alluvium Aquifer	1,704	1,704	1,704	1,704	1,704	1,704
Irrigation	Groundwater	Carrizo-Wilcox Aquifer	3,436	3,436	3,436	3,436	3,436	3,436
Irrigation	Groundwater	Sparta Aquifer	228	228	228	228	228	228
Livestock	Groundwater	Queen City Aquifer	672	672	672	672	672	672
Livestock	Groundwater	Carrizo-Wilcox Aquifer	7,861	7,861	7,861	7,861	7,861	7,861
Manufacturing	Groundwater	Carrizo-Wilcox Aquifer	2,591	2,591	2,591	2,591	2,591	2,591
Mining	Surface Water	Brazos River Authority System	5	0	0	0	0	0
Mining	Groundwater	Sparta Aquifer	529	529	529	529	529	529
Total Projected Water Supplies in acre-feet per year =			46,971	46,966	46,966	46,966	46,966	46,966

MILAM COUNTY

Water Use Group	Source Type	Source Name	2000	2010	2020	2030	2040	2050
Cameron	Surface Water	Brazos Run-Of-River	2,629	2,629	2,629	2,629	2,629	2,629
Rockdale	Groundwater	Carrizo-Wilcox Aquifer	2,121	2,121	2,121	2,121	2,121	2,121
Thorndale	Surface Water	Brazos Run-Of-River	0	0	0	0	0	0
Thorndale	Groundwater	Carrizo-Wilcox Aquifer	333	333	333	333	333	333
County-Other	Surface Water	Brazos River Authority System	924	924	924	924	924	924
County-Other	Surface Water	Brazos Run-Of-River	162	162	162	162	162	162
County-Other	Groundwater	Carrizo-Wilcox Aquifer	2,472	2,472	2,472	2,472	2,472	2,472
County-Other	Groundwater	Trinity Aquifer	291	291	291	291	291	291
Irrigation	Surface Water	Irrigation Local Supply	8,188	8,188	8,188	8,188	8,188	8,188
Irrigation	Groundwater	Carrizo-Wilcox Aquifer	2,119	2,119	2,119	2,119	2,119	2,119
Livestock	Groundwater	Carrizo-Wilcox Aquifer	1,627	1,627	1,627	1,627	1,627	1,627
Manufacturing	Surface Water	Brazos Run-Of-River	112	112	112	112	112	112
Manufacturing	Surface Water	Brazos River Authority System	5,000	5,000	0	0	0	0
Manufacturing	Surface Water	Brazos Run-Of-River	0	0	0	0	0	0
Manufacturing	Groundwater	Carrizo-Wilcox Aquifer	7,778	17,778	17,777	17,777	17,777	17,777
Mining	Groundwater	Carrizo-Wilcox Aquifer	30,008	20,008	20,009	20,009	20,009	20,009
Steam Electric Power	Surface Water	Alcoa Lake/Reservoir	9,002	9,002	9,002	9,002	9,002	9,002
Total Projected Water Supplies in acre-feet per year =			72,766	72,766	67,766	67,766	67,766	67,766

Total Projected Water Supplies (acre-feet per year) for Burleson and Milam Counties =	119,737	119,732	114,732	114,732	114,732	114,732
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TWDB 07/23/03

14. Estimate of Groundwater Being Used Within the District

Following are tables of estimated Groundwater use within the District in acre-feet per year according to Texas Water Development Board’s Water User Survey Database.

HISTORICAL GROUNDWATER USE							
POST OAK SAVANNAH GROUNDWATER CONSERVATION DISTRICT							
BURLESON COUNTY							
Aquifer Name	Year	Municipal	Manufacturing	Power	Mining	Irrigation	Livestock
Brazos River Alluvium	1996	0	0	0	0	8,781	0
Carrizo-Wilcox		841	0	0	0	0	42
Other Undifferentiated		156	0	0	29	0	270
Queen City		317	0	0	0	0	225
Sparta		853	110	0	0	0	160
Brazos River Alluvium	1997	0	0	0	0	19	0
Carrizo-Wilcox		842	0	0	0	0	41
Other Undifferentiated		130	0	0	29	0	266
Queen City		294	0	0	0	0	222
Sparta		843	110	0	0	0	158
Brazos River Alluvium	1998	0	0	0	0	3,650	0
Carrizo-Wilcox		844	0	0	0	0	32
Other Undifferentiated		140	0	0		0	206
Queen City		331	0	0	0	0	172
Sparta		844	110	0	0	0	122
Brazos River Alluvium	1999	0	0	0	0	1,000	0
Carrizo-Wilcox		788	0	0	0	0	33
Other Undifferentiated		156	0	0	29	0	213
Queen City		303	0	0	0	0	177
Sparta		788	110	0	0	0	126
Brazos River Alluvium	2000	0	0	0	0	14,845	0
Carrizo-Wilcox		765	0	0	0	0	34
Other Undifferentiated		148	0	0	29	0	221
Queen City		319	0	0	0	0	183
Sparta		765	110	0	0	0	131

TWDB 07/28/03

HISTORICAL GROUNDWATER USE POST OAK SAVANNAH GROUNDWATER CONSERVATION DISTRICT MILAM COUNTY							
Aquifer Name	Year	Municipal	Manufacturing	Power	Mining	Irrigation	Livestock
Brazos River Alluvium	1996	3	0	0	0	52	21
Carrizo-Wilcox		2980	32,138	0	8	259	546
Other Undifferentiated		20	0	0	0	0	124
Queen City		4	0	0	0	0	28
Brazos River Alluvium	1997	3	0	0	0	62	20
Carrizo-Wilcox		2882	30,798	0	8	307	508
Other Undifferentiated		18	0	0	0	0	115
Queen City		4	0	0	0	0	26
Brazos River Alluvium	1998	0	0	0	0	65	20
Carrizo-Wilcox		2940	27,786	0	8	322	515
Other Undifferentiated		0	0	0	0	0	117
Queen City		0	0	0	0	0	26
Brazos River Alluvium	1999	0	0	0	0	67	21
Carrizo-Wilcox		2907	27,218	0	8	336	556
Other Undifferentiated		0	0	0	0	0	126
Queen City		0	0	0	0	0	29
Brazos River Alluvium	2000	0	0	0	0	130	20
Carrizo-Wilcox		2931	31,968	0	8	649	541
Other Undifferentiated		0	0	0	0	0	123
Queen City		0	0	0	0	0	28

TWDB 7/28/2003

15. Projected Annual Recharge of Groundwater Resources Within the District

Following is a table of projected annual recharge of groundwater for all aquifers (except the Trinity, Brazos River and Little River Alluvium, and Yegua/Jackson aquifers) within the District according to the GAM 05-05 simulation.

Projected Annual Recharge For Groundwater Resources Post Oak Savannah Groundwater Conservation District		
County	Average Recharge (acre-ft/yr.)	
Milam	31,587	
Burleson	13,349	
Total	44,936	

16. Estimate of Existing Total Useable Groundwater Within the District

The total estimate of existing useable groundwater in the District was derived from several sources and is presented in the following paragraphs. The source for the Trinity and Brazos Alluvium, aquifers in the District is the Projected Water Availability in acre-feet per year according to Table 4 of the 2002 State Water Planning Database. Since none of these aquifers appear to be targeted for a substantial increase in production activity, these estimates should prove satisfactory.

Shallow Carrizo-Wilcox Management Zone

The shallow Carrizo-Wilcox management zone is entirely within Milam County and approximately 75% of the Carrizo-Wilcox aquifer in the county lies within the Shallow Carrizo-Wilcox management zone. The goal of the groundwater management strategy for this management zone is to protect historic users. The principal water-bearing unit within the Carrizo-Wilcox is the Simsboro Sand. The Brazos Region G planning effort has developed the following groundwater availability estimates for Milam County.

**Estimate of Groundwater Availability
Shallow Carrizo-Wilcox Management Zone**

Aquifer	Groundwater Availability Estimate (ac-ft/yr) (based on 75% of land area)
Carrizo	11,250
Simsboro	22,500
Total	33,750

Note: estimates are based on Brazos Region G planning values.

An evaluation of Simsboro water levels relative to the position of water well screens in major water supply wells in this management zone shows that generally less than 200 feet of water is above the tops of screens. There are some wells in which water levels are below the tops of the screens.

The POSGCD will use water level measurements at monitoring wells to evaluate aquifer conditions. Specifically, drawdown of 50 feet or greater in any POSGCD monitoring well in three consecutive months compared to baseline established in 2005 will trigger evaluation/action (as described in the District Rules). In additions, GAM 05-05 simulations of the Simsboro Sand show that drawdowns of 50 feet may occur by 2030.

Deep Simsboro Management Zone

The Deep Simsboro management zone occurs southeast of the Mexia-Talco fault zone in Milam and Burleson Counties. The fault zone separates the heavily-utilized portion of the Simsboro from the undeveloped and much deeper portion of the Simsboro. Pumpage included in the GAM is reported to be 1,281 ac-ft/yr for the year 2000.

The District authorized an evaluation of groundwater availability using the GAM. The GAM was run to simulate groundwater pumping that would reduce the pressure head above the top of the Simsboro Sand by approximately 25% in the management zone, but no more than 400 feet, to evaluate the amount of groundwater produced. Under these constraints, the GAM produced approximately 60,000 ac-ft/yr of groundwater in the Simsboro Sand.

The estimate of 60,000 ac-ft/yr for the Deep Simsboro represents a value that is appropriately constrained by the best available, stakeholder-driven data, based on 2004 regional conditions as represented in the GAM, and a conservative assumption of a steady-state (no contribution from storage) flow conditions.

The District also used the results of the GAM simulation to establish an evaluation-trigger drawdown level within the Deep Simsboro management zone. A trigger drawdown level in the Deep Simsboro was identified as drawdown less than the simulated maximum (400 feet) that would enable "timely evaluation" when aquifer conditions approach the groundwater availability estimate. A value of 75% of the maximum simulated drawdown of 400 feet (that yielded the estimate of 60,000 ac-ft/yr) was identified to provide the District with sufficient time to evaluate drawdown trends before the 400 foot drawdown value is reached. This early evaluation indicator is consistent with the "Response Level 1" for public awareness and notification in drought conditions (ref. Draft Drought Management Strategy Plan). Therefore, the District has identified a trigger drawdown level of 300 feet below 2005 baseline water levels as a management tool for the Deep Simsboro management zone.

Deep Carrizo-Wilcox Management Zone

The Deep Carrizo-Wilcox Management Zone occurs southeast of the Mexia-Talco fault zone in Milam and Burleson Counties.

The District authorized an evaluation of groundwater availability using the GAM. The GAM was run to simulate groundwater pumping that would reduce the pressure head above the top of the Carrizo-Wilcox by approximately 25% in the management zone, but no more than 250 feet, to evaluate the amount of groundwater produced. Under these constraints, the GAM produced an estimate of 30,750 ac-ft/yr of groundwater in the Deep Carrizo-Wilcox management zone.

The District also used the results of the GAM simulation to establish an evaluation-trigger drawdown level within the Deep Carrizo-Wilcox management zone. A trigger drawdown level in the Deep Carrizo-Wilcox was identified as drawdown less than the simulated maximum (250 feet) that would enable "timely evaluation" when aquifer conditions approach the groundwater availability estimate. A value of 75% of the maximum simulated drawdown of 250 feet (that yielded the estimate of 30,750 ac-ft/yr) was identified to provide the District with sufficient time to evaluate drawdown trends

before the 250 foot drawdown value is reached. This 75% indicator is consistent with the "Response Level 1" for public awareness and notification in drought conditions (ref. Draft Drought Management Strategy Plan). Therefore, the District has identified a trigger drawdown level of 190 feet below 2005 baseline water levels as a management tool for the Deep Carrizo-Wilcox management zone.

Queen City/Sparta Management Zone

The Queen City/Sparta Management Zone occurs entirely within Burleson County and is currently used for domestic and small-scale municipal uses. This aquifer system has not been heavily utilized, and is not forecast to be intensively developed in the future.

The GAM 05-05 simulation indicates that the sum of recharge estimates for the Queen City and Sparta aquifers is 16,567 ac-ft/yr (for average recharge conditions in 2050). The Brazos Region G planning estimate adopted for the combined Queen City and Sparta aquifer is 13,792 ac-ft/yr for the entire Southeastern Subregion. This suggests that the Brazos Region G estimate for this aquifer system would be on the order of 50% of this value, or approximately 7,000 ac-ft/yr. To resolve these estimates and generate an improved estimate of groundwater availability, the District authorized the evaluation of groundwater availability using the GAM values for recharge in this management zone for 2004. Based on these simulations, the groundwater availability estimate for the Queen City and Sparta aquifers is 14,500 ac-ft/yr.

Summary of Existing Total Useable Groundwater

The District will periodically revise the estimate based on changes in the anticipated groundwater use in nearby counties, the presumed physical and hydraulic properties of the subsurface deposits, and changes to the GAM. As additional information becomes available, the District will also reevaluate the estimate based on other criteria such as migration of the fresh water line and localized impacts in different management zones.

Management Zone	Aquifer	Estimated Useable Groundwater
		(ac-ft/yr)
Trinity	Trinity	321
Brazos Alluvium	Brazos Alluvium	9,400
Queen City/Sparta	Queen City/Sparta	14,500
Deep Carrizo-Wilcox	Carrizo-Wilcox	30,750
Shallow Carrizo-Wilcox	Carrizo-Wilcox (inc. Simsboro)	33,750
Deep Simsboro	Simsboro	60,000



Figure 1. Map of Groundwater Management Zones

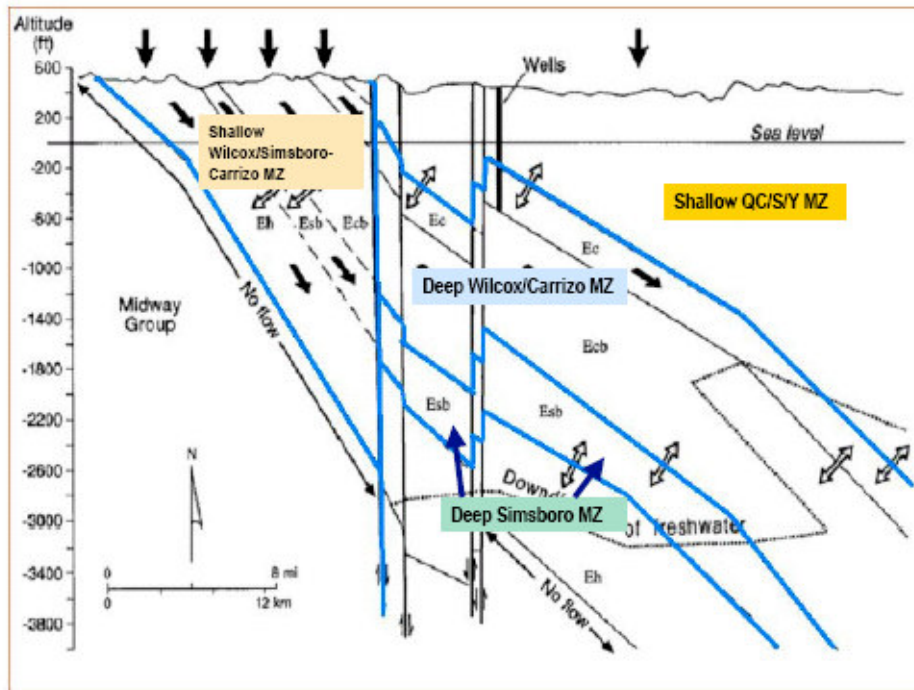


Figure 2. Schematic Cross-Section of Aquifer Management Zones.