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**GONZALES COUNTY  
UNDERGROUND WATER CONSERVATION DISTRICT**

# MANAGEMENT PLAN



**Original:** February 1998

**Revision 1.0:** September 2003

**Revision 2.0:**



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## **1.0 DISTRICT MISSION**

The mission of the Gonzales County Underground Water Conservation District (GCUWCD) is to conserve, preserve, protect, and prevent waste of groundwater resources. It shall be the policy of the Board of Directors that the most efficient use of groundwater in the District is to provide for the needs of the citizens and ensure growth for future generations. The Board of Directors, with the cooperation of the citizens of the District, shall implement this management plan and its accompanying rules to achieve this goal. GCUWCD shall also establish, as part of this plan, the policies of water conservation, public information and technical research by cooperation and coordination with the citizens of the District and equitable enforcement of this plan and its accompanying rules.

## **2.0 PURPOSE OF THE MANAGEMENT PLAN**

Senate Bill 1 (SB 1), enacted in 1997, and Senate Bill 2 (SB 2), enacted in 2001, established a comprehensive statewide planning process, including requirements for groundwater conservation Districts under the Texas Water Code Chapter 36 to manage and conserve the groundwater resources of the State of Texas. This legislation requires that each groundwater conservation District develop a management plan which addresses the following management goals, as applicable: (1) providing the most efficient use of groundwater, (2) controlling and preventing waste of groundwater, (3) controlling and preventing subsidence, (4) addressing conjunctive surface water management issues, (5) addressing natural resource issues, (6) addressing drought conditions, (7) addressing conservation, recharge enhancement, rainwater, precipitation enhancement, or brush control, where appropriate and cost-effective, and (8) addressing the desired future conditions of the groundwater resources.

House Bill 1763, enacted in 2005, requires joint planning among Districts within the same Groundwater Management Area (GMA). These Districts must establish the Desired Future Conditions (DFCs) of the aquifers within their respective GMAs. Through this process, the Districts will submit the DFCs of the aquifer to the executive administrator of the Texas Water Development Board (TWDB). The TWDB will calculate the managed available groundwater (MAG) in each District within the management area based upon the submitted DFCs of the aquifer within the GMA. Technical information, such as the DFCs of the aquifers within the District's jurisdiction and the amount of MAG from such aquifers is required by statute to be included in the District's management plan and will guide the District's regulatory and management policies.

## **3.0 DISTRICT INFORMATION**

### **3.1 Creation**

The GCUWCD was created on an order of the Texas Commission on Environmental Quality (TCEQ), formerly the Texas Natural Resource Conservation Commission (TNRCC), on November 19, 1993. A copy of TNRCC order number 101692-DO4, approving the petition for creation of the GCUWCD, is included in **Appendix 1**.

### **3.2 Directors**

The GCUWCD Board of Directors is comprised of five (5) members elected from single member Districts. Election of directors is held in May of the same year as the U.S. Presidential election. The Board of Directors meets in regular sessions on the second Tuesday each month in the City of Gonzales, Texas. All meetings of the Board of Directors are open to the public as set forth in the Texas Open

Meetings Act, Title 5, Chapter 551 of the Texas Government Code, and advanced written notices of such meetings are posted as prescribed in said Act.

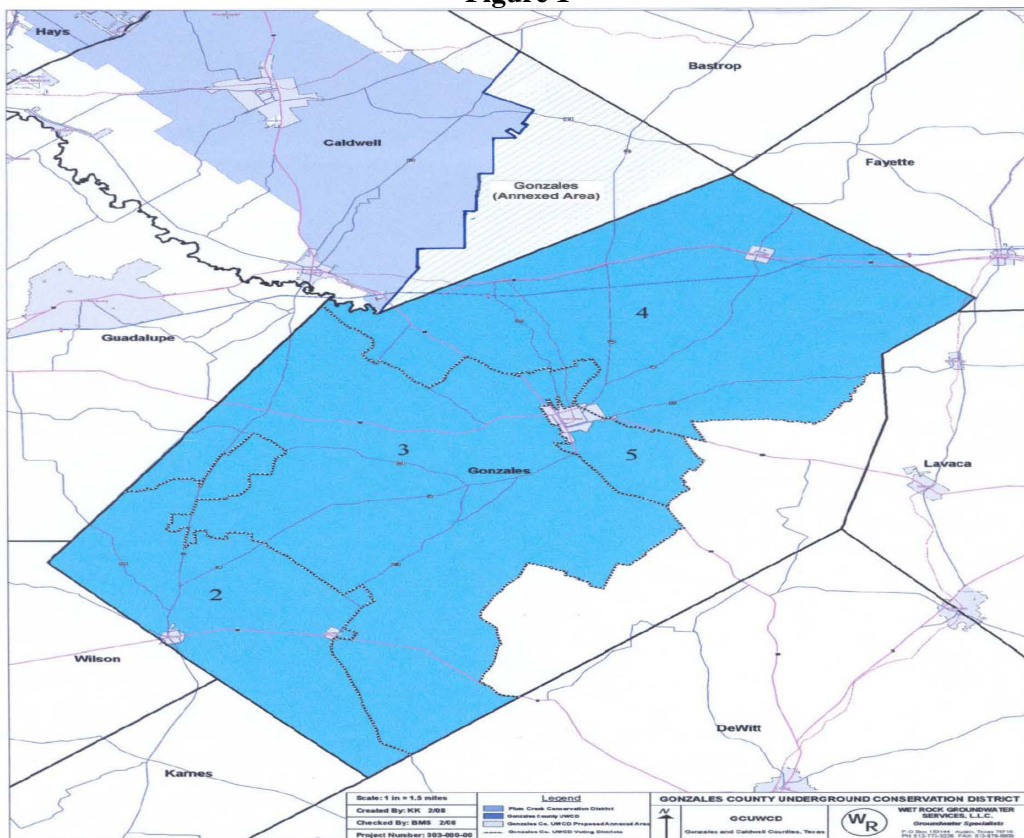
### 3.3 Authority of the District

As stated in TNRCC order number 101692-DO4, the GCUWCD has all the rights, powers, privileges, authority, and functions conferred by, and subject to all duties imposed by, the TCEQ and the general laws of the State of Texas relating to underground water conservation districts. The District is governed by the provisions of Texas Water Code (TWC) Chapter 36 and 31 Texas Administrative Code (TAC) Chapter 356.

### 3.4 District Boundaries

GCUWCD serves the areas of Gonzales County and the southeast portion of Caldwell County (**Figure 1**). Gonzales County is bounded by Guadalupe, Wilson, Karnes, DeWitt, Lavaca, Fayette and Caldwell counties. There are approximately 677,000 acres in Gonzales County, of which 101,000 acres are excluded from the District as they lie over the zones of undesirable groundwater, leaving 576,000 acres within the boundaries of the county. Incorporated towns within Gonzales County include Gonzales, Waelder, Nixon, and Smiley. In December 2007, GCUWCD approved a resolution to annex the southeastern portion of Caldwell County into the District. An election was held in Caldwell County on May 10, 2008, with voters approving the annexation. The Board approved the canvass of the proposition election to ratify the annexation on May 13, 2008. The annexed area of Caldwell County encompasses approximately 77,440 acres. Delhi and Taylorsville are the principal communities in the area. The District's economy is primarily agricultural, with poultry production being the primary income producer, followed by beef cattle and farming. Oil and gas production also contributes to the local economy.

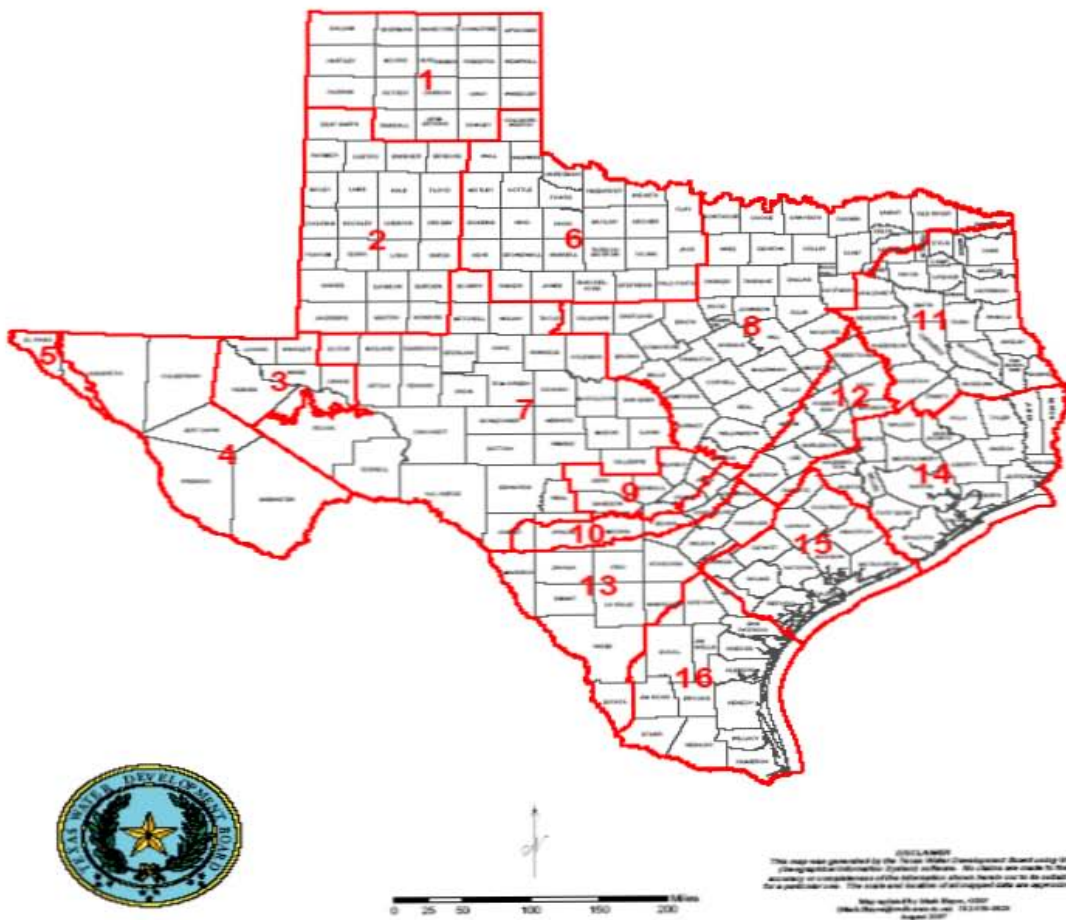
**Figure 1**



The GCUWCD is located within Groundwater Management Area 13 (GMA 13). GMA 13 includes seventeen counties and nine groundwater conservation Districts (**Figure 2**). House Bill 1763 requires joint planning among the groundwater conservation Districts within GMA 13. The District is actively engaged in the joint planning process and provides input to GMA 13. The District has a joint management agreement with Evergreen Underground Water Conservation District, Guadalupe County Underground Water Conservation District, Medina County Groundwater Conservation District, and Wintergarden Groundwater Conservation District. This agreement, signed on August 8, 2000, states that the Districts will cooperate in managing the groundwater resources of the Carrizo aquifer. The District has provided and will continue to provide the other Districts in the aquifer management area with copies of its management plan and rules when changes are made.

**Figure 2**

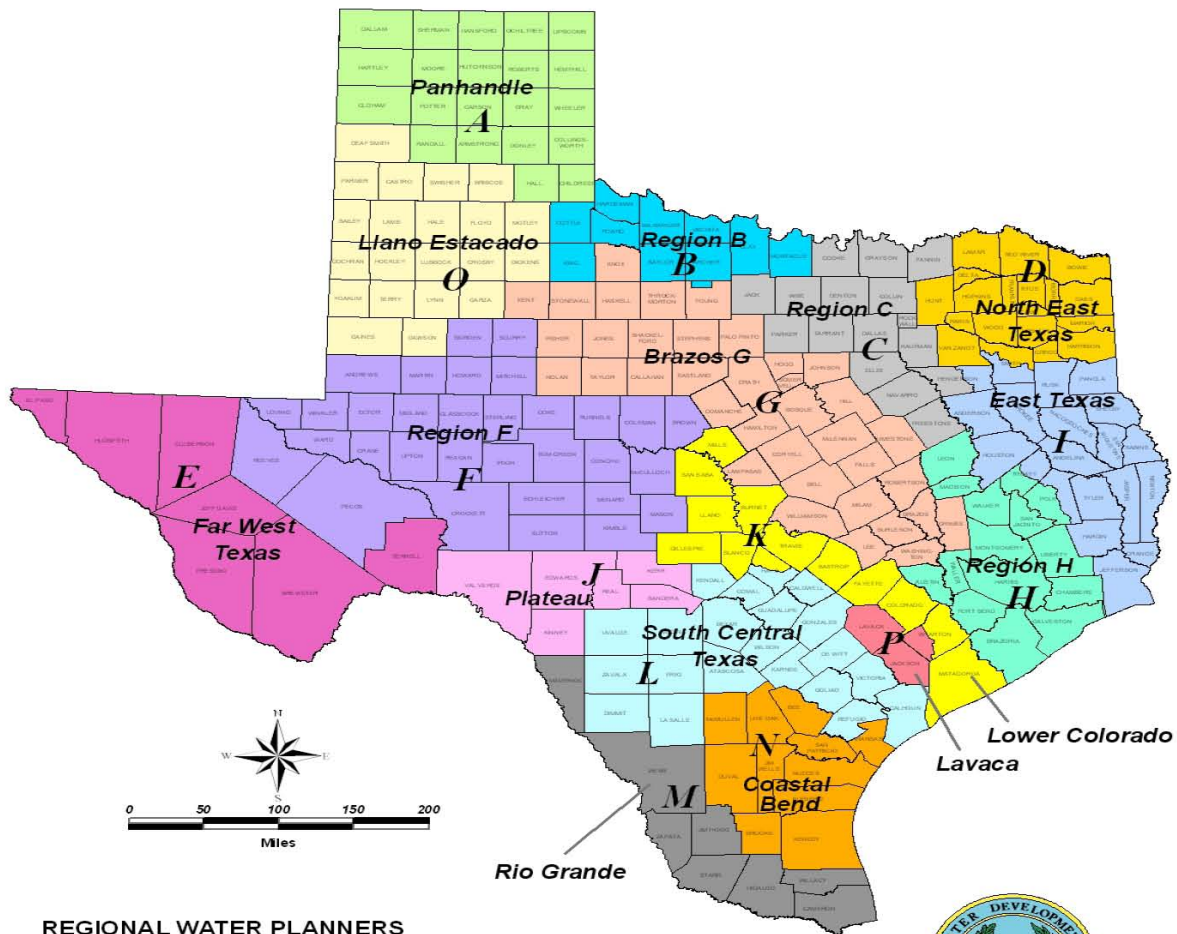
**Groundwater Management Areas in Texas**



The GCUWCD is located within planning Region L (South Central Texas Regional Planning Group). Region L includes all or parts of 21 counties, portions of nine river and coastal basins, the Guadalupe Estuary, and San Antonio Bay (**Figure 3**). The Board of Directors unanimously supports the concept of a grassroots planning effort. The District will actively provide input to the regional plan and participate in the planning effort.

**Figure 3**

## *Regional Water Planning Areas*



**REGIONAL WATER PLANNERS**

Connie Townsend (512) 463 - 8290 - Regions E, J & M  
 Temple McKinnon (512) 475 - 2057 - Regions D, H & I  
 Angela Masloff (512) 936 - 0872 - Regions A, B & C  
 Matt Nelson (512) 936 - 3550 - Regions G, L & N  
 Angela Kennedy (512) 463 - 1437 - Regions F, O & P  
 David Meeseey (512) 936 - 0852 - Region K



Updated by Mark Hayes  
 Mapping Coordinator  
 RIO Division/GIS Section  
 8/10/2008



### **3.5 Topography and Drainage**

The GCUWCD lies within south-central Texas on the Gulf Coastal Plain. In most of the District the topography ranges from flat to rolling. However, two prominent lines of hills extend across parts of Gonzales County – one along the northwestern boundary from Ottine to about seven (7) miles northwest of Dewville and the other along the boundary with Lavaca County. In Caldwell County, the minimum elevation, about 295 feet, is at the southern tip of the County where Plum Creek joins the San Marcos River. The maximum elevation is in the area of the so-called “Iron Mountains” peaks southeast and south of McMahan.

Most of the District lies in the drainage basin of the Guadalupe River. Two small areas in the eastern and southeastern parts of the District are drained by the Colorado River. Most of the southern and southwestern parts of Gonzales County are drained by Sandies Creek, which flows southeastward and enters the Guadalupe River near Cuero in Dewitt County. Most of the northern and northeastern parts of Gonzales County are drained by Peach Creek, which flows southward, entering the Guadalupe River about ten (10) miles southeast of Gonzales. Plum Creek, the major tributary to the San Marcos River in Caldwell County, drains about 310 square miles (about 60 percent) of the County.

### **3.6 Groundwater Resources**

The Wilcox Group yields small to moderate quantities of fresh to slightly saline water to a few wells in and near the outcrop in the northwestern part of Gonzales County. In Caldwell County, the Wilcox yields small to large quantities of water to many wells for domestic and stock purposes, public supply, and some irrigation. The Wilcox Group crops out in a small area in the GCUWCD near Ottine. The Wilcox is composed of clay, silt, fine to medium-grained sand and sandstone, sandy shale, and thin beds of lignite. The thickness of the Wilcox ranges from about 1,300 to 3,200 feet, with a maximum thickness of 2,000 feet occurring in an erosional channel in the southeastern part of the District. This erosional channel is filled largely with silty shale.

The principal water-bearing formation in the GCUWCD is the Carrizo Aquifer, which yields moderate to large quantities of fresh to slightly saline water throughout a large part of its subsurface extent. Most of the Carrizo in the GCUWCD has at least 80 percent sand. Portions of the Carrizo in the eastern half of the GCUWCD have 60 to 80 percent sand, generally corresponding to the area of the Yoakum Channel. Geologic thickness maps produced for the GCUWCD indicate that the Carrizo varies from less than 200 feet over the San Marcos Arch in the central portion of the county to more than 600 feet in the western portion of the GCUWCD and about 800 feet in the Yoakum Channel in the eastern portion of the GCUWCD. The Carrizo crops out in a small area along the western edge of Gonzales County and across the southeast portion of Caldwell County in a belt 1.5 to 3.5 miles wide. The Carrizo consists of beds of massive, commonly cross-bedded coarse sand and some minor amounts of sandstone and clay.

The Queen City aquifer yields small to moderate quantities of fresh to slightly saline water to wells in the area of the outcrop and downdip for a distance of about 5 to 8 miles. The Queen City aquifer crops out in a northeastward trending belt across Gonzales and Caldwell Counties about 2 to 4 miles wide and is composed of massive to thin bedded medium to fine sand and clay. The thickness of the Queen City ranges from about 400 to 825 feet where the entire section is present.

The Sparta aquifer yields small to moderate quantities of fresh to slightly saline water in the outcrop and for a few miles downdip. The Sparta aquifer crops out in a belt about 1 mile wide trending northeastward across Gonzales County and consists of fine to medium grained sand with some shale. The thickness of the Sparta aquifer averages about 100 feet.



## **4.0 CRITERIA FOR PLAN APPROVAL**

### **4.1 Planning Horizon**

This plan shall be used for the ten (10) year period following approval as administratively complete by the Texas Water Development Board as required by *31 TAC §356.5(a)*. The GCUWCD shall implement these goals and policies for a planning period of ten (10) years and will review the plan in five (5) years or sooner as circumstances warrant.

### **4.2 Board Resolution**

A certified copy of the GCUWCD's resolution adopting this plan as required by *31 TAC §356.6(a)(2)* is included in **Appendix 2**.

### **4.3 Plan Adoption**

Public notices documenting that this plan was adopted following appropriate public meetings and hearings, as required by *31 TAC §356.6(a)(4)*, are included in **Appendix 3**.

### **4.4 Coordination with Surface Water Management Entities**

Letters transmitting copies of this plan to the Region L are included in **Appendix 4** as required by *31 TAC §356.6(a)(4)*.

## **5.0 MANAGED AVAILABLE GROUNDWATER**

Section 36.108, Texas Water Code, requires joint planning among the groundwater conservation districts within GMA 13. A key part of joint planning is determining "desired future conditions" (DFCs) that are used to calculate "managed available groundwater" (MAG). These conditions and volumes are used for regional water plans, groundwater management plans, and permitting. DFCs are the desired, quantified conditions of groundwater resources (such as water levels, water quality, spring flows, or volumes) at a specified time or times in the future or in perpetuity.

The DFCs of the groundwater within the District have not yet been established in accordance with Section 36.108 of the Texas Water Code. The District is actively participating in the joint planning process and the development of a desired future condition for the portion of the aquifers within the District and the GMA area. Therefore, this goal is not applicable to the District at this time.

Managed available groundwater (MAG) is a volume of groundwater defined by the adopted DFCs and will be provided to the GCUWCD by the Texas Water Development Board (TWDB). Section 36.1132, Texas Water Code requires that, to the extent possible, the GCUWCD shall issue permits up to the point that the total volume of groundwater permitted equals the MAG.

An estimate of the available amount of groundwater in the District is not now required by *31 TAC §356.5(a)(5)(A)*. To date the DFCs for the aquifers located within the District boundaries and within GMA 13 have not been established; therefore, an estimate of the MAG is not available at this time (**Table 1** intentionally left blank). The District is actively working with the other member districts within GMA 13 towards determining the DFCs for each aquifer located within the District. Once these DFCs are established an estimate of the MAG can be calculated. This management plan will be revised upon establishment of DFCs and the MAG. Water users in their planning process should be cognizant that the DFCs and MAG determinations will impact future pumping scenarios, and the DFCs could be different than the drawdown limitations set for the Carrizo, Wilcox, Queen City, and Sparta aquifers in this management plan.

The GCUWCD has chosen to divide the District into two zones (western and eastern) based on previous geologic and hydrologic studies. These zones are divided by the San Marcos Arch structural feature which roughly coincides with the San Marcos and Guadalupe Rivers.

The District will evaluate and monitor groundwater availability and regulate groundwater production consistent with the rules of the District and the following drawdown limitations. Production from an individual well or combination of wells in a well field shall be restricted in order that the maximum drawdown of the water table or artesian pressure in selected monitor wells shall not be greater than 100 feet in the Carrizo or Wilcox aquifers or 50 feet in the Queen City or Sparta aquifers from the baseline measurements stated in the District rules. The District will use water level and water quality measurements at monitoring wells designated by the Board of Directors to evaluate aquifer conditions.

The District will consider permit applications that are in compliance with District rules. In accordance with § 36.1071(f), Texas Water Code, the District will, if necessary, adopt amended rules to implement the management plan. The amount of groundwater available in the District is dependent on the drawdown limitations for each aquifer as set forth in the rules in order to conserve, preserve, and protect the groundwater resources of the District. A permit confers no vested rights in the holder, and it may be revoked or suspended, or its terms may be modified or amended at any time pursuant to the provisions of the District's rules.

Groundwater modeling will be used to determine whether specific permit applications meet the drawdown limitations of the District. Modeling is required on all permit applications from the same producer or producers connected or to be connected to a common gathering/transportation piping system capable of producing greater than or equal to 3,000 acre-feet of water per calendar year.

According to information included in the Final Reports of Groundwater Availability Models for the Carrizo-Wilcox, Queen City and Sparta Aquifers, prepared for the TWDB, limitations are intrinsic to models. Model limitations can be grouped into several categories including: (1) limitations in the data supporting a model, (2) limitations in the implementation of a model which may include assumptions inherent to the model application, and (3) limitations regarding model applicability. The report also states that the GAMs were developed on a regional scale and are applicable for assessing regional aquifer conditions resulting from groundwater development over a fifty-year time period. At this scale, the models are not capable of precisely predicting aquifer responses at specific points such as a particular well. Thus, the estimation of available groundwater calculated by the Southern Carrizo-Wilcox Queen City and Sparta (SCWQCS) GAM should be considered as a tool to assist the District in managing the aquifers to comply with the District's rules of a 100 foot drawdown in the Carrizo and Wilcox aquifers and a 50 foot drawdown in the Queen City and Sparta aquifers. Over time, the District will compare the GAM runs with actual groundwater monitoring data to assess the accuracy level of the models. The District reserves the right to amend permits, at any time, based on actual groundwater monitoring data if warranted by excessive aquifer drawdown.

## **6.0 CURRENT WATER USE**

The Texas Water Development Board Water Uses Unit operates an annual survey of ground and surface water use by municipal and industrial entities within the state of Texas. This survey collects the volume of both ground and surface water used, the source of the water, water sales and other pertinent data from the users. The data provides an important source of information in helping guide water supply studies and regional and state water planning. Presentation of this data in the management plan is required by 31 TAC §356.5 (a)(5)(B).

### 6.1 Complete County Usage Estimates

In 2004, approximately 18,160 acre-feet of groundwater and surface water was used in the areas encompassing all of Gonzales and Caldwell Counties (**Table 2**). The five year average combined groundwater and surface water usage from 2000 to 2004 was approximately 19,445 acre-feet.

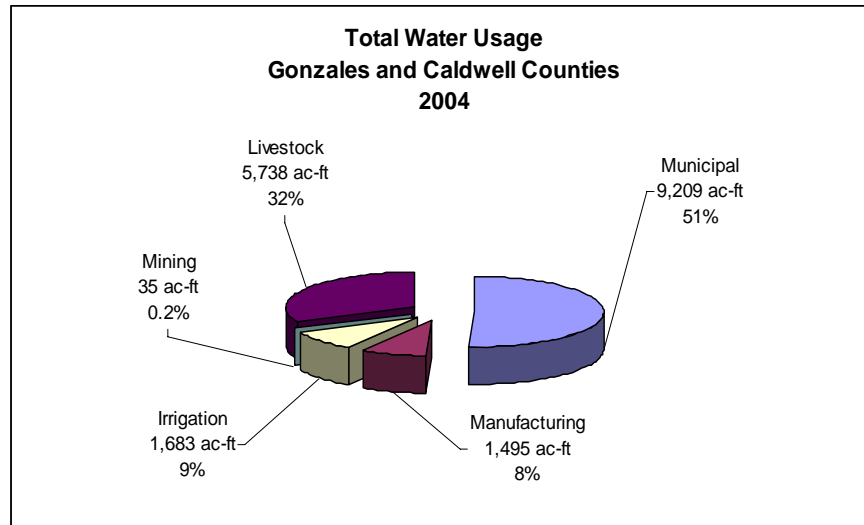
**Table 2**  
**Groundwater and Surface Water Usage**  
**Entire Areas of Gonzales and Caldwell Counties**

Designated User	Water Usage 2000 (acre-feet)	Water Usage 2001 (acre-feet)	Water Usage 2002 (acre-feet)	Water Usage 2003 (acre-feet)	Water Usage 2004 (acre-feet)
Municipal	3,956	4,341	3,899	5,426	4,439
Manufacturing	2,051	1,593	1,456	2,653	1,494
Irrigation	2,438	1,498	1,561	1,900	1,500
Mining	33	29	29	29	29
Livestock	4,463	4,400	4,624	4,724	4,687
<b>Total Gonzales</b>	<b>12,941</b>	<b>11,861</b>	<b>11,569</b>	<b>14,732</b>	<b>12,149</b>
Municipal	4,929	4,534	4,311	4,978	4,770
Manufacturing	11	200	6	0	1
Irrigation	989	1,590	1,590	1,065	183
Mining	12	6	6	6	6
Livestock	917	888	958	965	1,051
<b>Total Caldwell</b>	<b>6,858</b>	<b>7,218</b>	<b>6,871</b>	<b>7,014</b>	<b>6,011</b>

Data from TWDB Water Uses Survey

In 2004, the largest usage of water in the two counties combined was municipal at 51 percent (**Figure 4**). The next largest water usage was livestock at approximately 32 percent followed by irrigation usage at 9 percent. Approximately 8 percent of the total usage was from manufacturing and another 0.2 percent was from mining usage.

**Figure 4**



## 6.2 Apportioned District Usage Estimates

Apportioned usage estimates that represent usage solely within the boundaries of the GCUWCD are required by the TWDB. The apportioned usage is based on a proportional area percentage which is derived by dividing the amount of acres or square miles covered by the District by the total number of acres or square miles contained within Gonzales County and the annexed area of Caldwell County. The percentage derived by the TWDB is 84.48 percent for Gonzales County and 22.05 percent for Caldwell County. If all designated users are known to be located entirely within the District then no apportionment is required for that designated user.

Groundwater usage accounted for approximately 5,578 acre-feet of the total water used in the District in 2004, as shown in **Table 3** below. The largest groundwater usage was municipal (2,564 acre-feet) followed by manufacturing (1,332 acre-feet) and irrigation (1,175 acre-feet). The five year average groundwater usage from 2000 to 2004 was approximately 5,996 acre-feet.

**Table 3**  
**Groundwater Usage**  
**Gonzales County Underground Water Conservation District**

<b>Designated User</b>	<b>Water Usage 2000 (acre-feet)</b>	<b>Water Usage 2001 (acre-feet)</b>	<b>Water Usage 2002 (acre-feet)</b>	<b>Water Usage 2003 (acre-feet)</b>	<b>Water Usage 2004 (acre-feet)</b>
<i>Municipal</i>	1,605	1,776	1,596	2,218	1,816
Manufacturing	1,693	1,421	1,298	2,366	1,332
Irrigation	1,860	1,138	1,186	1,064	1,140
Mining	33	29	29	29	29
Livestock	446	432	454	464	460
<b>Total Gonzales</b>	<b>5,637</b>	<b>4,796</b>	<b>4,563</b>	<b>6,141</b>	<b>4,777</b>
<i>Municipal</i>	825	711	676	781	748
<i>Manufacturing</i>	2	44	1	0	0
<i>Irrigation</i>	30	49	49	28	35
<i>Mining</i>	3	1	1	1	1
<i>Livestock</i>	20	14	15	15	17
<b>Total Caldwell</b>	<b>880</b>	<b>819</b>	<b>742</b>	<b>825</b>	<b>801</b>

### Data from TWDB Water Uses Survey

*Apportioned values are presented in italics. Estimates that have not been apportioned are considered to be entirely within the District.*

Surface water usage accounted for 6,470 acre-feet of the total water used in the District in 2004, as shown in **Table 4** below. The largest surface water usage was livestock (3,786 acre-feet) followed by municipal (2,238 acre-feet) and irrigation (309 acre-feet). The five year average surface water usage from 2000 to 2004 was approximately 6,713 acre-feet.

**Table 4**  
**Surface Water Usage**  
**Gonzales County Underground Water Conservation District**

<b>Designated User</b>	<b>Water Usage 2000 (acre-feet)</b>	<b>Water Usage 2001 (acre-feet)</b>	<b>Water Usage 2002 (acre-feet)</b>	<b>Water Usage 2003 (acre-feet)</b>	<b>Water Usage 2004 (acre-feet)</b>
<i>Municipal</i>	<i>1,737</i>	<i>1,892</i>	<i>1,698</i>	<i>2,365</i>	<i>1,934</i>
<i>Manufacturing</i>	<i>302</i>	<i>145</i>	<i>133</i>	<i>242</i>	<i>137</i>
<i>Irrigation</i>	<i>488</i>	<i>304</i>	<i>317</i>	<i>706</i>	<i>304</i>
<i>Mining</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>
<i>Livestock</i>	<i>3,394</i>	<i>3,352</i>	<i>3,523</i>	<i>3,599</i>	<i>3,571</i>
<b>Total Gonzales</b>	<b>5,921</b>	<b>5,693</b>	<b>5,671</b>	<b>6,912</b>	<b>5,946</b>
<i>Municipal</i>	<i>262</i>	<i>289</i>	<i>275</i>	<i>317</i>	<i>304</i>
<i>Manufacturing</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>
<i>Irrigation</i>	<i>188</i>	<i>301</i>	<i>301</i>	<i>206</i>	<i>5</i>
<i>Mining</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>
<i>Livestock</i>	<i>182</i>	<i>182</i>	<i>196</i>	<i>198</i>	<i>215</i>
<b>Total Caldwell</b>	<b>632</b>	<b>772</b>	<b>772</b>	<b>721</b>	<b>524</b>

**Data from TWDB Water Uses Survey**

*Apportioned values are presented in italics. Estimates that have not been apportioned are considered to be entirely within the District.*

**7.0 ANNUAL GROUNDWATER RECHARGE, DISCHARGE, AND FLOW**

Texas State Water Code, Section 36.1071, Subsection (h) states that, in developing its groundwater management plan, groundwater conservation Districts shall use groundwater availability modeling (GAM) provided by the TWDB. Information derived from GAMs that shall be included in the management plan includes:

1. the annual amount of recharge from precipitation, if any, to the groundwater resources within the District – required by 31 TAC § 356.5(a)(5)(C)
2. for each aquifer within the District, the annual volume of water that discharges from the aquifer to springs and any surface water bodies, including lakes, streams, and rivers – required by 31 TAC § 356.5(a)(5)(D)
3. the annual volume of flow into and out of the District within each aquifer and between aquifers in the District – required by 31 TAC § 356.5(a)(5)(E)

The TWDB ran a groundwater availability model (GAM 08-22 Revision) for the southern part of the Carrizo-Wilcox, Queen City, and Sparta aquifers to create a groundwater budget. A groundwater budget summarizes water entering and leaving the aquifer according to input parameters assigned in the model to simulate the groundwater flow system. The components of the water budgets shown in **Table 5** and **Table 6** below include:

1. Precipitation Recharge – this is the aerielly distributed recharge sourced from precipitation falling on the outcrop areas of the aquifers (where the aquifer is exposed at the land surface) within the District.

2. Surface Water Outflow – this is the total water exiting the aquifer (outflow) to surface water features such as streams, reservoirs, and drains (springs).
3. Flow Into and Out of District – this component describes lateral flow within the aquifer between the District and adjacent counties.
4. Flow Between Aquifers – this describes the vertical flow, or leakage, between aquifers or confining units. Inflow to an aquifer from an overlying aquifer will always equal the outflow from the other aquifer.

**Table 5**  
**Groundwater Recharge/Discharge/Flow**  
**Gonzales and Caldwell Counties**  
**Gonzales County Underground Water Conservation District**

Aquifer or Confining Unit	Annual Recharge from Precipitation (acre-feet/yr)	Annual Discharge from Aquifer to Surface Water (acre-feet/yr)	Annual Flow Into District (acre-feet/yr)	Annual Flow Out of District (acre-feet/yr)
Sparta	3,105	2,127	386	70
Weches	808	521	117	35
Queen City	7,291	3,583	1,172	126
Reklaw	2,168	1,935	170	156
Carrizo	6,927	6,896	8,897	5,732
Wilcox (upper)	0	0	30	48
Wilcox (middle)	921	31	2,031	3,488
Wilcox (lower)	0	0	4,052	2,506

**Data from GAM 08-22 Revised**

**Table 6**  
**Groundwater Net Flow Between Aquifers**  
**Gonzales and Caldwell Counties**  
**Gonzales County Underground Water Conservation District**

Aquifer or Confining Unit	Annual Net Flow Between Aquifers (acre-feet/yr)
Weches into Sparta	4,511
Queen City into Weches	4,183
Reklaw into Queen City	3,190
Carrizo into Reklaw	1,945
Carrizo into Wilcox (upper)	649
Wilcox (upper) into Wilcox (middle)	194
Wilcox (lower) into Wilcox (middle)	190

**Data from GAM 08-22 Revised**

Details of how the natural or artificial recharge of groundwater within the District could be increased are required by *31 TAC § 356.5 (a)(5)(C)*. A significant amount of the District's annual rainfall occurs during large rainstorms and much of this rainfall is lost as surface water runoff. By installing small reservoirs on drainage gullies and small dams on creeks some of this runoff could be captured and will serve to recharge the aquifers. An additional benefit of these reservoirs is water for livestock and wildlife, and erosion control.

Brush management is another option for increasing groundwater recharge. Water runoff and/or deep percolation can be increased by decreasing evapo-transpiration, which can be accomplished by managing vegetation. An increase in runoff resulting from brush control could result in two potential water supply benefits; increasing recharge of groundwater due to increased sheet and/or stream flow traversing outcrops or faults, or enhancing stream flows and existing water supply reservoirs.

## **8.0 PROJECTED WATER SUPPLY**

Estimates of projected water supplies represent the estimated capacity of water systems to deliver water to meet user needs on an annual basis. Estimates of projected water supplies are compared with estimates of projected water demand to determine if the existing infrastructure is capable of meeting the expected needs of the water user group. Presentation of this data in the management plan is required by *31 TAC § 356.5 (a)(5)(F)*.

Since the GCUWCD does not cover all of Gonzales and Caldwell Counties the TWDB recommends that the projected water supplies presented in the management plan be based on a proportional area percentage. The proportional area percentage is derived by dividing the amount of acres or square miles covered by the District by the total number of acres or square miles contained within Gonzales County and the annexed area of Caldwell County. The percentage derived by the TWDB is 84.48 percent for Gonzales County and 22.05 percent for Caldwell County. If all designated users are known to be located entirely within the District then no apportionment is required for that designated user.

### **8.1 Surface Water Supply**

Projected surface water supply data are derived from the TWDB 2007 State Water Plan, Volume 3, Regional Water Planning Group. The projected surface water supply for the District in 2010 is expected to decrease by 267 acre-feet per year from the 2000 surface water supply estimates (**Table 7**). From 2010 to 2060 the projected surface water supplies are expected to remain stable.



**Table 7**  
**Projected Surface Water Supply**  
**Gonzales County Underground Water Conservation District**

<b>Water User Group</b>	<b>County</b>	<b>River Basin</b>	<b>Source Name</b>	<b>2000 ac-ft/yr</b>	<b>2010 ac-ft/yr</b>	<b>2020 ac-ft/yr</b>	<b>2030 ac-ft/yr</b>	<b>2040 ac-ft/yr</b>	<b>2050 ac-ft/yr</b>	<b>2060 ac-ft/yr</b>
<i>Gonzales</i>	<i>Gonzales</i>	<i>Guadalupe</i>	<i>Guadalupe Run-of-River</i>	<i>1,892</i>	<i>1,892</i>	<i>1,892</i>	<i>1,892</i>	<i>1,892</i>	<i>1,892</i>	<i>1,892</i>
<i>Gonzales CO WSC</i>	<i>Gonzales</i>	<i>Guadalupe</i>	<i>Canyon Lake/Reservoir</i>	<i>0</i>	<i>532</i>	<i>532</i>	<i>532</i>	<i>532</i>	<i>532</i>	<i>532</i>
<i>Irrigation</i>	<i>Gonzales</i>	<i>Guadalupe</i>	<i>Canyon Lake/Reservoir</i>	<i>0</i>	<i>6</i>	<i>6</i>	<i>6</i>	<i>6</i>	<i>6</i>	<i>6</i>
<i>Irrigation</i>	<i>Gonzales</i>	<i>Guadalupe</i>	<i>Guadalupe River Combined Run-of-River Irr.</i>	<i>0</i>	<i>1,730</i>	<i>1,730</i>	<i>1,730</i>	<i>1,730</i>	<i>1,730</i>	<i>1,730</i>
<i>Livestock</i>	<i>Gonzales</i>	<i>Lavaca</i>	<i>Livestock Local Supply</i>	<i>46</i>	<i>62</i>	<i>62</i>	<i>62</i>	<i>62</i>	<i>62</i>	<i>62</i>
<i>Livestock</i>	<i>Gonzales</i>	<i>Guadalupe</i>	<i>Livestock Local supply</i>	<i>5,022</i>	<i>2,366</i>	<i>2,366</i>	<i>2,366</i>	<i>2,366</i>	<i>2,366</i>	<i>2,366</i>
			<b>Total Gonzales</b>	<b>6,960</b>	<b>6,588</b>	<b>6,588</b>	<b>6,588</b>	<b>6,588</b>	<b>6,588</b>	<b>6,588</b>
<i>County Other</i>	<i>Caldwell</i>	<i>Guadalupe</i>	<i>Guadalupe Run-of-River</i>	<i>0</i>	<i>110</i>	<i>110</i>	<i>110</i>	<i>110</i>	<i>110</i>	<i>110</i>
<i>Irrigation</i>	<i>Caldwell</i>	<i>Guadalupe</i>	<i>Guadalupe River Combined Run-of-River Irr.</i>	<i>0</i>	<i>73</i>	<i>73</i>	<i>73</i>	<i>73</i>	<i>73</i>	<i>73</i>
<i>Livestock</i>	<i>Caldwell</i>	<i>Colorado</i>	<i>Livestock Local Supply</i>	<i>31</i>	<i>17</i>	<i>17</i>	<i>17</i>	<i>17</i>	<i>17</i>	<i>17</i>
<i>Livestock</i>	<i>Caldwell</i>	<i>Guadalupe</i>	<i>Livestock Local Supply</i>	<i>153</i>	<i>84</i>	<i>84</i>	<i>84</i>	<i>84</i>	<i>84</i>	<i>84</i>
<i>Gonzales CO WSC</i>	<i>Caldwell</i>	<i>Guadalupe</i>	<i>Canyon Lake/Reservoir</i>	<i>0</i>	<i>5</i>	<i>5</i>	<i>5</i>	<i>5</i>	<i>5</i>	<i>5</i>
			<b>Total Caldwell</b>	<b>184</b>	<b>289</b>	<b>289</b>	<b>289</b>	<b>289</b>	<b>289</b>	<b>289</b>
<b>Total Projected Surface Water Supply</b>				<b>7,144</b>	<b>6,877</b>	<b>6,877</b>	<b>6,877</b>	<b>6,877</b>	<b>6,877</b>	<b>6,877</b>

**Data from the TWDB 2007 State Water Plan, Volume 3, Regional Water Planning Group**  
*Apportioned values are presented in italics. Estimates that have not been apportioned are considered to be entirely within the District.*

## 8.2 Groundwater Supply

Estimates of projected groundwater supplies typically represent the pumping capacity of the wells or well field that supply a water user group. The projected groundwater supplies of a water user group may significantly exceed the amount of water actually used by the user because the well fields supplying the user groups have additional or redundant capacity. This is particularly true of municipal water user groups where redundant capacity is built into the system to ensure a constant supply of water.

Projected groundwater supply data are derived from the TWDB 2007 State Water Plan, Volume 3, Regional Water Planning Group. The projected groundwater supply for the District is expected to decrease by 244 acre-feet/year from 2010 to 2060 (Table 8).

**Table 8  
Projected Groundwater Supply  
Gonzales County Underground Water Conservation District**

<b>Water User Group</b>	<b>County</b>	<b>Source Name</b>	<b>2010 ac-ft/yr</b>	<b>2020 ac-ft/yr</b>	<b>2030 ac-ft/yr</b>	<b>2040 ac-ft/yr</b>	<b>2050 ac-ft/yr</b>	<b>2060 ac-ft/yr</b>
Gonzales	Gonzales	Carrizo-Wilcox	403	403	403	403	403	403
Nixon	Gonzales	Carrizo-Wilcox	600	600	600	600	600	600
Waelder	Gonzales	Queen City	665	665	665	665	665	665
County Other	Gonzales	Carrizo-Wilcox	13	13	13	13	13	13
County Other	Gonzales	Carrizo-Wilcox	559	559	559	559	559	559
Manufacturing	Gonzales	Sparta	1,632	1,632	1,632	1,632	1,632	1,632
Manufacturing	Gonzales	Carrizo-Wilcox	1,786	1,786	1,786	1,786	1,786	1,786
Mining	Gonzales	Carrizo-Wilcox	3	2	2	2	2	2
Mining	Gonzales	Queen City	6	6	6	6	5	5
Mining	Gonzales	Sparta	5	5	5	5	5	5
Mining	Gonzales	Carrizo-Wilcox	14	14	13	12	12	12
Irrigation	Gonzales	Queen City	47	40	35	30	26	22
Irrigation	Gonzales	Sparta	51	44	38	33	28	24
Irrigation	Gonzales	Carrizo-Wilcox	210	181	156	134	116	100
Livestock	Gonzales	Carrizo-Wilcox	26	26	26	26	26	26
Livestock	Gonzales	Queen City	805	805	805	805	805	805
Livestock	Gonzales	Sparta	329	329	329	329	329	329
Livestock	Gonzales	Carrizo-Wilcox	1,419	1,419	1,419	1,419	1,419	1,419
<i>Gonzales CO WSC</i>	<i>Gonzales</i>	<i>Carrizo-Wilcox</i>	<i>1,103</i>	<i>1,103</i>	<i>1,103</i>	<i>1,103</i>	<i>1,103</i>	<i>1,103</i>
		<b>Total Gonzales</b>	<b>9,676</b>	<b>9,632</b>	<b>9,595</b>	<b>9,562</b>	<b>9,534</b>	<b>9,510</b>
<i>County Other</i>	<i>Caldwell</i>	<i>Carrizo-Wilcox</i>	<i>6</i>	<i>6</i>	<i>6</i>	<i>6</i>	<i>6</i>	<i>6</i>
<i>County Other</i>	<i>Caldwell</i>	<i>Carrizo-Wilcox</i>	<i>19</i>	<i>19</i>	<i>19</i>	<i>19</i>	<i>19</i>	<i>19</i>
County Other	Caldwell	Queen City	121	125	129	132	135	138
<i>Manufacturing</i>	<i>Caldwell</i>	<i>Carrizo-Wilcox</i>	<i>7</i>	<i>7</i>	<i>7</i>	<i>7</i>	<i>7</i>	<i>7</i>
<i>Mining</i>	<i>Caldwell</i>	<i>Carrizo-Wilcox</i>	<i>2</i>	<i>2</i>	<i>2</i>	<i>2</i>	<i>2</i>	<i>2</i>
<i>Mining</i>	<i>Caldwell</i>	<i>Carrizo-Wilcox</i>	<i>1</i>	<i>1</i>	<i>2</i>	<i>2</i>	<i>2</i>	<i>2</i>
<i>Irrigation</i>	<i>Caldwell</i>	<i>Carrizo-Wilcox</i>	<i>4</i>	<i>3</i>	<i>3</i>	<i>2</i>	<i>2</i>	<i>2</i>
<i>Irrigation</i>	<i>Caldwell</i>	<i>Carrizo-Wilcox</i>	<i>138</i>	<i>123</i>	<i>109</i>	<i>97</i>	<i>86</i>	<i>77</i>
Irrigation	Caldwell	Queen City	89	81	74	68	62	56
<i>Livestock</i>	<i>Caldwell</i>	<i>Carrizo-Wilcox</i>	<i>17</i>	<i>17</i>	<i>17</i>	<i>17</i>	<i>17</i>	<i>17</i>
<i>Livestock</i>	<i>Caldwell</i>	<i>Carrizo-Wilcox</i>	<i>84</i>	<i>84</i>	<i>84</i>	<i>84</i>	<i>84</i>	<i>84</i>
<i>Aqua WSC</i>	<i>Caldwell</i>	<i>Carrizo-Wilcox</i>	<i>48</i>	<i>48</i>	<i>48</i>	<i>48</i>	<i>48</i>	<i>48</i>
<i>Gonzales CO WSC</i>	<i>Caldwell</i>	<i>Carrizo-Wilcox</i>	<i>10</i>	<i>10</i>	<i>10</i>	<i>10</i>	<i>10</i>	<i>10</i>
		<b>Total Caldwell</b>	<b>546</b>	<b>526</b>	<b>510</b>	<b>494</b>	<b>480</b>	<b>468</b>
<b>Total Projected Groundwater Supply</b>			<b>10,222</b>	<b>10,158</b>	<b>10,105</b>	<b>10,056</b>	<b>10,014</b>	<b>9,978</b>

**Data from the TWDB 2007 State Water Plan, Volume 3, Regional Water Planning Group**

*Apportioned values are presented in italics. Estimates that have not been apportioned are considered to be entirely within the District.*

## 9.0 PROJECTED WATER DEMAND

The projected water demand estimates are derived from the TWDB 2007 State Water Plan, Volume 3, Regional Water Planning Group. These water demand projections are separated into the following designated uses: municipal, manufacturing, steam electric, irrigation, mining, and livestock. Water demand is the total volume of water required to meet the needs of the specified user groups located within the District’s planning area.

Since the GCUWCD does not cover all of Gonzales and Caldwell Counties the TWDB recommends that all water demand projections presented in the management plan be based on a proportional area percentage which is derived by dividing the amount of acres covered by the District by the total number of acres within Gonzales and Caldwell Counties. Presentation of this data in the management plan is required by 31 TAC 356.5 (a)(5)(G).

### 9.1 Municipal Water Demand

Projected population growth estimates for Gonzales and Caldwell Counties were taken from the TWDB-Approved 2000-2060 population projections for counties and for Water User Groups (cities, utilities, and county-other rural areas). Population growth within the two counties is projected to increase significantly from the 2000 Census data as shown in **Table 9** below.

**Table 9**  
**County Population Projections**  
**Gonzales County Underground Water Conservation District**

County	P2000 Census	P2010	P2020	P2030	P2040	P2050	P2060
Gonzales (Total County)	18,628	19,872	21,227	22,260	23,003	23,219	23,151
Caldwell (Annexed Area)	7,099	10,134	13,169	15,757	18,357	20,970	23,499
Totals	25,727	30,006	34,396	38,017	41,360	44,189	46,650

**Data from the TWDB-Approved 2000-2060 population projections**

The overall population of the two county area is estimated to increase from 25,727 to 46,650 (81 percent) between 2000 and 2060. Meeting the water supply needs of this projected influx of people will be a major challenge facing the GCUWCD.

The projected municipal water usage, in 2000, comprised approximately 29 percent of the District’s total water demand. It is projected to increase by 2,046 acre-feet/year in 2060 as shown in **Table 10** below.

**Table 10**  
**Municipal Water Demand**  
**Gonzales County Underground Water Conservation District**

County	D2000 ac-ft/yr	D2010 ac-ft/yr	D2020 ac-ft/yr	D2030 ac-ft/yr	D2040 ac-ft/yr	D2050 ac-ft/yr	D2060 ac-ft/yr
Gonzales	3,371	3,784	4,236	4,581	4,828	4,900	4,876
Caldwell	242	341	442	527	614	700	783
Totals	3,613	4,125	4,678	5,108	5,442	5,600	5,659

**Data from the TWDB 2007 State Water Plan, Volume 3, Regional Water Planning Group**

## 9.2 County Other Water Demand

The projected county other water usage, in 2000, comprised approximately 3 percent of the District's total water demand. The county other demand is projected to decrease by 206 acre-feet/year in 2060

**Table 11  
County Other Water Demand  
Gonzales County Underground Water Conservation District**

County	D2000 ac-ft/yr	D2010 ac-ft/yr	D2020 ac-ft/yr	D2030 ac-ft/yr	D2040 ac-ft/yr	D2050 ac-ft/yr	D2060 ac-ft/yr
Gonzales	386	335	277	234	203	194	197
Caldwell	51	52	50	46	41	38	34
Totals	437	387	327	280	244	232	231

Data from the TWDB 2007 State Water Plan, Volume 3, Regional Water Planning Group

## 9.3 Manufacturing Water Demand

The projected manufacturing water use, in 2000, accounted for approximately 14 percent of the District's total water demand. Manufacturing demand is projected to increase by 1,145 acre-feet/year in 2060.

**Table 12  
Manufacturing Water Demand  
Gonzales County Underground Water Conservation District**

County	D2000 ac-ft/yr	D2010 ac-ft/yr	D2020 ac-ft/yr	D2030 ac-ft/yr	D2040 ac-ft/yr	D2050 ac-ft/yr	D2060 ac-ft/yr
Gonzales	1,733	2,028	2,220	2,384	2,544	2,684	2,874
Caldwell	2	3	4	5	5	6	6
Totals	1,735	2,031	2,224	2,389	2,549	2,690	2,880

Data from the TWDB 2007 State Water Plan, Volume 3, Regional Water Planning Group

## 9.4 Irrigation and Livestock Water Demand

Gonzales County is the number four county in the State of Texas in agricultural receipts. The need for water is currently expanding at a rapid pace due to expansion in the poultry industry. The projected irrigation and livestock water usage combined, in 2000, accounted for approximately 54 percent of the District's total water demand. TWDB projections, however, show irrigation demand is projected to decrease by 1,626 acre-feet/year in 2,060. Livestock use is projected to grow only 232 acre-feet/year by 2060.

**Table 13  
Irrigation Water Demand  
Gonzales County Underground Water Conservation District**

County	D2000 ac-ft/yr	D2010 ac-ft/yr	D2020 ac-ft/yr	D2030 ac-ft/yr	D2040 ac-ft/yr	D2050 ac-ft/yr	D2060 ac-ft/yr
Gonzales	2,060	1,102	950	819	705	608	525
Caldwell	218	231	205	181	161	143	127
Totals	2,278	1,333	1,155	1,000	866	751	652

Data from the TWDB 2007 State Water Plan, Volume 3, Regional Water Planning Group

The GCUWCD compared the authorized and permitted irrigation well data compiled by the District to the projected irrigation water demand estimates derived from the TWDB 2007 State Water Plan, Volume 3, Regional Water Planning Group estimates. The current GCUWCD data shows approximately 10,187 acre-feet per year authorized or permitted in the District compared to the 2,278 acre-feet/year for the year 2000 in the State Water Plan. Most of these irrigation wells have been permitted since 2000 (approximately 8,068 acre-feet/year) indicating that irrigation usage in the District is trending upward instead of decreasing as shown in the State Water Plan.

**Table 14  
Livestock Water Demand  
Gonzales County Underground Water Conservation District**

County	D2000 ac-ft/yr	D2010 ac-ft/yr	D2020 ac-ft/yr	D2030 ac-ft/yr	D2040 ac-ft/yr	D2050 ac-ft/yr	D2060 ac-ft/yr
Gonzales Livestock	4,375	4,607	4,607	4,607	4,607	4,607	4,607
Caldwell Livestock	202	202	202	202	202	202	202
Totals	4,577	4,809	4,809	4,809	4,809	4,809	4,809

**Data from the TWDB 2007 State Water Plan, Volume 3, Regional Water Planning Group**

### 9.5 Mining Water Demand

Projected mining water usage, in 2000, accounted for approximately 0.2 percent of the District's total water demand. Mining demand is projected to remain fairly steady through 2060.

**Table 15  
Mining Water Demand  
Gonzales County Underground Water Conservation District**

County	D2000 ac-ft/yr	D2010 ac-ft/yr	D2020 ac-ft/yr	D2030 ac-ft/yr	D2040 ac-ft/yr	D2050 ac-ft/yr	D2060 ac-ft/yr
Gonzales	28	24	23	22	21	21	21
Caldwell	3	3	3	4	4	4	4
Totals	31	27	26	26	25	25	25

**Data from the TWDB 2007 State Water Plan, Volume 3, Regional Water Planning Group**

### 9.6 Total Water Demand

GCUWCD is estimated to have an overall projected increase of approximately 13 percent in water demand from 2000 to 2060. Gonzales County is projected to have an overall increase in demand of 1,146 acre-feet/year from 2000 to 2060. Caldwell County is projected to have an overall increase in demand of 439 acre-feet/year from 2000 to 2060.

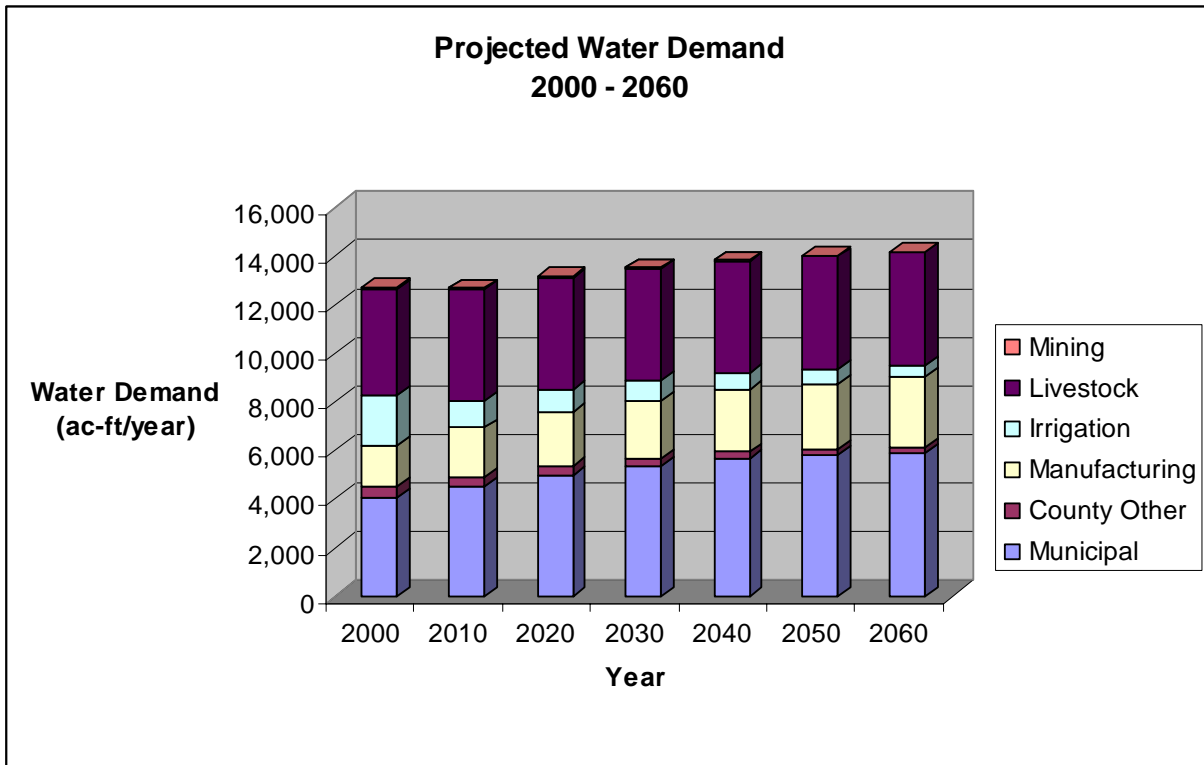
**Table 16**  
**Total Water Demand**  
**Gonzales County Underground Water Conservation District**

County	D2000 ac-ft/yr	D2010 ac-ft/yr	D2020 ac-ft/yr	D2030 ac-ft/yr	D2040 ac-ft/yr	D2050 ac-ft/yr	D2060 ac-ft/yr
Gonzales	11,952	11,878	12,312	12,646	12,908	13,013	13,098
Caldwell	718	832	906	965	1,029	1,094	1,157
Totals	12,670	12,710	13,218	13,611	13,937	14,107	14,255

Data from the TWDB 2007 State Water Plan, Volume 3, Regional Water Planning Group

Figure 5 below shows the contributions of each water use category to the total projected demands for the GCUWCD from 2000 to 2060.

**Figure 5**



Data from the TWDB 2007 State Water Plan, Volume 3, Regional Water Planning Group

**10.0 CONSIDERATION OF ADOPTED STATE WATER PLAN**

The projected water needs/surplus data provided in the 2007 State Water Plan, Volume 3, Regional Water Planning Group Database indicates that the GCUWCD faces water needs in both Gonzales and Caldwell Counties as shown in **Table 17** below.

**Table 17**  
**Water Needs/Surplus Data**  
**Gonzales County Underground Water Conservation District**

WUG	County	2010 ac-ft/year	2020 ac-ft/year	2030 ac-ft/year	2040 ac-ft/year	2050 ac-ft/year	2060 ac-ft/year
Gonzales CO WSC	Gonzales	0	0	-46	-166	-197	-184
Aqua WSC	Caldwell	-49	-121	-178	-240	-300	-362
Gonzales CO WSC	Caldwell	2	-14	-29	-43	-57	-71

**Data from the TWDB 2007 State Water Plan, Volume 3, Regional Water Planning Group**

Water management strategies were identified for several water user groups (WUGs) in the GCUWCD. The water management strategies included both conservation measures as well as temporary overdraft of the Carrizo-Wilcox aquifer as indicated in **Table 18** below.

**Table 18**  
**Water Management Strategies**  
**Gonzales County Underground Water Conservation District**

WUG	County	Water Management Strategy	2010 ac-ft/year	2020 ac-ft/year	2030 ac-ft/year	2040 ac-ft/year	2050 ac-ft/year	2060 ac-ft/year
Gonzales CO WSC	Gonzales	Municipal Water Conservation	103	225	364	499	618	721
Gonzales CO WSC	Gonzales	Local Carrizo-Wilcox Temporary Overdraft	0	464	464	464	464	464
Gonzales	Gonzales	Municipal Water Conservation	116	245	325	353	381	414
Nixon	Gonzales	Municipal Water Conservation	35	64	72	75	83	93
Waelder	Gonzales	Municipal Water Conservation	0	0	0	3	7	11
County Other	Gonzales	Municipal Water Conservation	6	7	5	0	0	3
Aqua WSC	Caldwell	Municipal Water Conservation	0	0	0	0	6	19
Aqua WSC	Caldwell	Local Carrizo-Wilcox Temporary Overdraft	536	536	536	536	536	536
Gonzales CO WSC	Caldwell	Municipal Water Conservation	40	87	141	194	240	281
Gonzales CO WSC	Caldwell	Local Carrizo-Wilcox Temporary Overdraft	0	181	181	181	181	181

**Data from the TWDB 2007 State Water Plan, Volume 3, Regional Water Planning Group**

Water management strategies are specific plans to increase water supply or maximize existing supply to meet a specific need. Municipal water conservation strategies focus on reducing residential, commercial, and institutional water use through a variety of social or technological approaches. Local Carrizo-Wilcox temporary overdraft strategies involve temporarily over-drafting the aquifer during drought conditions to supplement water supplies.



In the adopted 2007 State Water Plan, the South Central Texas Regional Water Planning Group (SCTRWPG) recommended several proposed groundwater projects in the District. These projects include the Regional Carrizo for Bexar County Supply project, Expansion of the Schertz-Seguin Local Government Corporations Capacity, the Canyon Regional Water Authority Wells Ranch Project, and the Hays/Caldwell Carrizo Project. The GCUWCD has rules and a management plan that need to be considered in project planning. When these projects were evaluated in conformance with the existing rules and management plan of the District, part of the supply developed by these projects exceeds the District's drawdown limitations. In addition, predictive groundwater simulations for the purpose of evaluating cumulative effects were performed at the direction of the SCTRWPG. The resulting drawdown in each of the project well fields exceeded the 100 foot drawdown limitation in the Carrizo aquifer as stated in the rules of the District. The total amount of water proposed in these projects exceeds the drawdown limitations of the District. These projects do not cause the GCUWCD management plan to be in conflict with the South Central Regional Water Plan.

The District has used supply and demand projections from the 2007 State Water Plan. The District has considered the water supply needs and water management strategies included in the adopted State Plan, as required by TWC, Section 36.1071(e)(4). Therefore the District believes this plan is consistent with the most recent approved Regional Planning Group and State Water Plan strategies.

## **11.0 MANAGEMENT OF GROUNDWATER RESOURCES**

GCUWCD will manage groundwater resources consistent with the intent and purpose of the District to conserve, preserve, protect and prevent waste of groundwater resources so that the economy of the areas within the District will be ensured of growth for future generations. Details of how the District will manage groundwater supplies, as required by *31 TAC 356.5(a)(6)*, as well as the actions, procedures, performance and avoidance necessary to effectuate the management plan, including specifications and the proposed rules, as required by *31 TAC 356.5(a)(4)*, are presented below.

### **11.1 Regulatory Action Plan**

Pursuant to Chapter 36 of the Texas Water Code, the District has adopted rules limiting groundwater production based on tract size and the spacing of wells, to provide for conserving, preserving, protecting, preventing degradation of water quality and to prevent the waste of groundwater. This District will enforce the rules of the District to meet the goals of regulating the production of groundwater within the District. These rules will govern the permitting of wells to be drilled and the production of water from permitted wells. The rules shall be adhered to and shall be based on the best technical evidence available. Copies of the District's Rules and the Management Plan shall be available at the District's office at no charge to residents of the District.

### **11.2 Permits and Enforcement**

The District may deny permits or limit groundwater withdrawals following the guidelines stated in the rules of the District and this plan. In determining whether to issue a permit or limit groundwater withdrawal, the District will consider the public benefit against individual hardship after considering all appropriate testimony and all relevant factors.

In carrying out its purpose, the District may require the reduction of groundwater withdrawal to amounts that will not cause the water table or artesian pressure to drop to a level that would cause harm to the aquifer or exceed the specified drawdown limitations. To achieve this purpose the District may, on its discretion and based on information obtained through its monitoring procedures, amend or revoke any permits after notice and hearing.

The District will enforce the terms and conditions of permits and its rules by enjoining the permittee in a court of competent jurisdiction as provided for in Chapter 36.102 of the Texas Water Code.

### **11.3 Exempt Wells**

This plan and its accompanying rules shall exempt wells from permits as provided for in Chapter 36.117 of the Texas Water Code. The District shall exempt all domestic and livestock wells.

### **11.4 Permit Fees**

The District will assess reasonable fees for processing a permit to drill a test hole, for processing drilling and production permits, for processing transportation permits, and for processing permits to rework, re-equip, or alter a water well. There shall be no charge of any kind for recording the location of an existing well with the District.

### **11.5 Equity and Discretion**

The District shall treat all citizens and entities of the District with equality. Upon applying for a permit to drill a water well or a permit to increase the capacity of an existing well, the Board of Directors shall take into consideration all circumstances concerning the applicant's situation. The Board may grant an exception to the rules of the District when granting permits to prevent hardship or economic loss, also taking into consideration hydrological, physical or geophysical characteristics. Therefore, temporary exceptions to the general rule for a specific area may be necessary if an economic hardship will be created that is significantly greater for one person than for others in the District. In considering the granting of an exception, the Board will factor any adverse impact on adjacent landowners. The exercising of discretion by the Board shall not be construed so as to limit the power of the Board.

### **11.6 Spacing Requirements**

No permitted well shall be drilled such that said well shall be located closer than five hundred (500) feet to the property line. Spacing of new wells from an existing well shall be in accordance with the classifications as set forth in the rules of the District.

### **11.7 Production Ratios**

The District may adopt rules to regulate groundwater withdrawals by means of production limits. The District may deny a well permit or limit groundwater withdrawals in accordance with guidelines stated in the rules of the District. In making a determination to deny a permit or reduce the amount of groundwater withdrawals authorized in an existing permit, the District may weigh the public benefit in managing the aquifer to be derived from denial of a groundwater withdrawal permit or the reduction of the amount of authorized groundwater withdrawals against the individual hardship imposed by the permit denial or authorization reduction.

The number of acres of land and the population of any incorporated city that are within the Certificate of Convenience and Necessity (CCN) of a public or private water utility may be taken into consideration when granting a permit to produce water providing that the proposed well is within the city limits of that city.

### **11.8 Cooperation and Coordination**

Public cooperation is essential for this plan to accomplish its objectives. The District will work with the public and local and state government to achieve the goals set forth in this plan. The District will coordinate activities with all public water suppliers, private water suppliers, industrial users and agricultural users to help them conserve groundwater. The Guadalupe Blanco River Authority is the local entity regulating all surface water in the District and the District will work closely with this agency to achieve our mutual water related goals. The Texas Commission on Environmental Quality is the agency

charged with protecting the state's water resources, and the Texas Water Development Board is the agency responsible for water resources planning and promotion of water conservation practices. The District will continue to work with both of these agencies to conserve, preserve and protect water resources and to prevent waste as outlined in this plan.

### **11.9 Subsidence**

Subsidence is not a factor with the aquifers managed by this District.

### **11.10 Transportation of Water From the District**

In accordance with Chapter 36.122 of the Texas Water Code, if the proposed use of a water well or wells is for transportation of water outside the District additional information shall be required and a transportation permit must be obtained from the Board before operating a transportation facility. The District may, every five years, in considering renewal of a transportation permit, review the amount of water that may be transferred out of the District. At any time during the term of a transportation permit, the District may revise or revoke the permit if the use of water unreasonably affects existing groundwater and surface water resources or existing Permit Holders.

### **11.11 Groundwater Protection**

Section 26.401 of the Texas Water Code states that: "In order to safeguard present and future groundwater supplies, usable and potential usable groundwater must be protected and maintained."

Groundwater contamination may result from many sources, including current and past oil and gas production, agricultural activities, industrial and manufacturing processes, commercial and business endeavors, domestic activities and natural sources that may be influenced by or may result from human activities. The District shall take appropriate measures to monitor activities that are either causing, or have the potential threat to cause groundwater contamination. Due to permeability of aquifer outcrops and recharge zones, there is a greater threat of groundwater contamination from surface pollution in recharge and outcrop regions, and the District will monitor those areas more closely.

### **11.12 Drought Management**

Drought is a condition that plagues the GCUWCD periodically. The Board of Directors of the District are very concerned that water will be available for the needs of the citizens during times of drought. The General Manager of the District will update the Board at every monthly meeting on drought conditions in the District. The General Manager shall report the Palmer Drought Severity Index to the Board during the manager's report for the month. The Board of Directors shall instruct the General Manager of the appropriate actions to be taken upon notification of moderate to severe drought. The possible actions to be taken may include public service announcements on the radio, newspaper articles on conditions of the aquifer, water conservation information and notices to municipal suppliers to implement their drought plan.

### **11.13 Technical Research and Studies**

The District, in cooperation with the Texas Water Development Board and the Texas Commission on Environmental Quality, shall conduct studies to monitor the water level in the Sparta, Queen City, Carrizo, and Wilcox aquifers to determine if there is any danger of damaging these aquifers due to over production. The District shall also establish monitoring wells through out the District to determine if any degradation of water quality is occurring. The District is currently cooperating with the Texas Water Development Board with its monitoring of the Wilcox, Carrizo, Queen City, Sparta and other minor aquifers.

#### **11.14 Groundwater Recharge**

The GCUWCD is prohibited from engaging in any groundwater recharge enhancement projects at this time by order of the Texas Natural Resource Conservation Commission number 101692-DO4.

#### **11.15 Public Information**

A well informed public is vital to the proper operation of a groundwater District. The District will keep the citizens of the District informed by means of timely newspaper articles and public service radio announcements. As part of the public information program the directors of the District and the District manager will make presentations to any public gathering, as requested, in order to keep the citizens informed about District activities and to promote proper use of available groundwater. The District has an ongoing program to assist teachers at public schools with the education of children on issues of groundwater conservation and the hydrology of our area.

#### **11.16 Conservation and Natural Resource Issues**

Water is the most precious natural resource on Earth. The District shall promote conservation as a way of life in order to conserve fresh water for future generations. The District shall require wells in areas that are in danger of over producing groundwater and damaging the aquifers to restrict production by means of production permits and metering of the amount of water produced. The District will work with water utilities, agricultural and industrial users to promote the efficient use of water so that we may conserve water. The District will keep abreast of developments in water conservation and update its requirements as needed. The District shall, upon request, provide information on wells and water levels to the Natural Resources Conservation Service in order to develop waste management plans for the poultry producers.

Abandoned oil wells pose the greatest threat to the aquifers of the District. District personnel will monitor oilfield activity and notify the public that they may report abandoned oil wells and other problems associated with oil production to the District.

### **12.0 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 report will occur in January. The report will include the number of instances in which each of the activities specified in the District's 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 District's operations may be evaluated. The Board will maintain the report on file for public inspection at the District's offices upon adoption. This methodology will apply to all management goals contained within this plan.

### **13.0 GOALS, MANAGEMENT OBJECTIVES, PERFORMANCE STANDARDS AND METHODOLOGY FOR TRACKING PROGRESS**

The District's management goals, objectives, performance standards, and methodology for tracking progress, as specified in *31 TAC 356.5* are addressed below.

### 13.1 Plan Elements Required by State Law and Rule

<p style="text-align: center;"><b>Providing the Most Efficient Use of Groundwater</b> <i>31 TAC 356.5(a)(1)(A)</i></p>
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The District's goal is to provide for the most efficient use of the groundwater resources of the GCUWCD.

**Management Objective 1:** The District will register at least 20 exempt wells annually and will compile 100 percent of the data in a database within 30 working days.

**Performance:** Record the date and number of exempt wells registered annually, the percentage of exempt wells that were entered into the database, and the number of days before the data was entered.

**Management Objective 2:** The District will measure water levels in 20 wells three times a year in western Gonzales County within the same 60 day period and will compile 100 percent of the water level data into a database within 30 working days.

**Performance:** Record the date and number of wells measured, the percent of collected water level data that was entered into the database, and the number of days before the data was entered.

**Management Objective 3:** The District will measure water levels in 20 wells three times a year in eastern Gonzales County within the same 60 day period and will compile 100 percent of the water level data into a database within 30 working days.

**Performance:** Record the date and number of wells measured, the percent of collected water level data that was entered into the database, and the number of days before the data was entered.

**Management Objective 4:** The District will meet with the cities of Gonzales, Nixon, Smiley and Waelder, at least once a year, to inform the cities on water availability for economic development. The District will provide input on 100 percent of requests for information within 30 days of the request.

**Performance:** Record the date and number of meetings with each city. Record number of requests for information from each city, the number of responses to each city, and the number of days required to respond to each request for information.

**Management Objective 5:** The District will attend all Groundwater Management Area (GMA) 13 meetings annually. The District will provide input on 100 percent of the requests for information within 30 days.

**Performance:** Record the number of GMA meetings posted annually, the number of GMA 13 meetings attended annually, the number of requests for information made by GMA 13, the number of responses to requests for information by GMA 13, the number of days required for each response to GMA 13 requests for information.

**Management Objective 6:** The District will meet with the Gonzales Area Development Corporation (GADC), at least once a year, to inform the GADC on water availability for economic development. The District will provide input on 100 percent of requests for information within 30 days of the request.

**Performance:** Record the date and number of meetings with the GADC. Record the number of requests for information from the GADC, the number of responses given to the GADC, and the number of days required to respond to each request for information.

**Management Objective 7:** The District will gather water production data from at least 4 public water suppliers annually and will compile 100 percent of these figures into a database of groundwater usage within 30 working days of receipt in order to better project the needs of the District.

**Performance:** Record the number of public suppliers from which water production data was collected annually, the percent of collected water production data that was entered into the database, and the number of days before the data was entered.

**Management Objective 8:** The District will gather water production data from at least 10 irrigation wells and 5 livestock production facilities annually and will compile 100 percent of these figures into a database of groundwater usage within 30 working days of receipt in order to project future water use.

**Performance:** Record the number of irrigation wells and number livestock production facilities from which water production data was collected annually, the percent of collected water production data that was entered into the database, and the number of days before the data was entered.

<p><b>Controlling and Preventing Waste of Groundwater</b> <i>31 TAC 356.5(a)(1)(B)</i></p>
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The District believes that preventing the contamination of groundwater is the single most important waste prevention activity it can undertake. The District will proactively prevent and control waste of District groundwater through a focused monitoring program.

**Management Objective 1:** The District will collect samples for water quality data in 20 wells annually at locations throughout the District during the same period every year and will compile 100 percent of this data into a water quality database within 30 working days of receipt. In selecting wells the District will emphasize the wells at or near the zone of bad water or potential pollution sources based on best available data.

**Performance:** Record the date and number of wells sampled annually, the location of the wells sampled, the percent of water quality data that was entered into the database, and the number of days before the data was entered.

**Management Objective 2:** The District will monitor new facilities and activities on the recharge zones of the Carrizo/Wilcox, Queen City and Sparta aquifers on at least an annual basis for point source and non-point source pollution and compile 100 percent of this data into a pollution database within 30 working days from completion of the survey.

**Performance:** Record the date and results of visual survey of all recharge zones for point source and nonpoint source activities and facilities, the percent of available information that was entered into the database, and the number of days before the data was entered.

**Management Objective 3:** The District will meet with the Railroad Commission at least once annually and coordinate its efforts with this agency in locating abandoned or deteriorated oil wells. The District

will act on local complaints of abandoned or deteriorated oil wells within 30 days and compile 100 percent of the complaints and resulting District action in a database.

**Performance:** Record the date and number of meetings with the Railroad Commission annually. Record the date and number of complaints filed with the District annually, the time required to respond to each complaint, and the percentage of complaints entered into the database.

**Controlling and Preventing Subsidence**  
*31 TAC 356.5(a)(1)(C)*

Due to a rigid geologic framework subsidence is not an issue within the GCUWCD. Therefore, the management goal is not applicable.

**Conjunctive Surface Water Management**  
*31 TAC 356.5(a)(1)(D)*

The District's goal is to maximize the efficient use of groundwater and surface water for the benefit of the residents of the District.

**Management Objective 1:** The District will meet with the staff of the Guadalupe Blanco River Authority, at least once a year, to share information updates about conjunctive use potential.

**Performance:** Record the date and number of meetings with GBRA representatives annually.

**Management Objective 2:** The District will attend at least one Regional Water Planning Group meeting annually to share information updates about conjunctive use potential.

**Performance:** Record the date and number of meetings with the Regional Water Planning Group annually.

**Addressing Natural Resource Issues**  
*31 TAC 356.5(a)(1)(E)*

The District's goal is to protect the Natural Resources of the GCUWCD.

**Management Objective 1:** The District will meet with Natural Resources Conservation Service representatives to exchange information on wells and water levels at least once annually.

**Performance:** Record the date and number of meetings with the Natural Resources Conservation Service representatives annually.

**Management Objective 2:** The District will meet with the local Texas Railroad Commission engineering technician at least once annually to review oil well permits and oil related activity that could endanger the aquifers.

**Performance:** Record the date and number of meetings with the Railroad Commission engineering technician annually.



**Addressing Drought Conditions**  
*31 TAC 356.5(a)(1)(F)*

The District's goal is to provide information and coordinate an appropriate response with local water users and water managers regarding the existence of extreme drought events in the District.

**Management Objective:** The General Manager will access the National Weather Service – Climate Prediction Center website ([http://www.cpc.ncep.noaa.gov/products/monitoring\\_and\\_data/drought.shtml](http://www.cpc.ncep.noaa.gov/products/monitoring_and_data/drought.shtml)) monthly to determine the Palmer Drought Severity Index and will submit a report to the Board of Directors monthly. The District will, 100 percent of the time when under extreme drought conditions, as defined by the Palmer Drought Severity Index, provide information to and coordinate with local water users and water managers regarding drought response activities.

**Performance:** Record the date and number of monthly reports made to the District Board of Directors. Record the date and number of times when the District was under extreme drought conditions and the number of times letters were sent to public water suppliers.

**Addressing Conservation, Recharge Enhancement, Rainwater Harvesting, Precipitation Enhancement, Brush Control**  
*31 TAC 356.5(a)(1)(G)*

The District believes that the most efficient and effective ways to facilitate conservation within the District are through sound data collection, dissemination, and the distribution of public information about the groundwater resources in the GCUWCD, its current use and more effective ways to use it.

**Management Objective 1:** The District will publish an information article in a publication of wide circulation in the District, at least annually, describing conservation measures that can be taken by water users within the District.

**Performance:** Record date and number of conservation articles published annually.

**Management Objective 2:** The District will publish an information article in a publication of wide circulation in the District, at least annually, describing recharge enhancement measures.

**Performance:** Record date and number of recharge enhancement articles published annually.

**Management Objective 3:** The District will publish an information article in a publication of wide circulation in the District, at least annually, describing rainwater harvesting measures that can be taken by water users within the District.

**Performance:** Record date and number of rain water harvesting articles published annually.

**Management Objective 4:** The District will publish an information article in a publication of wide circulation in the District, at least annually, describing current precipitation enhancement measures.

**Performance:** Record date and number of precipitation enhancement articles published annually.

**Management Objective 5:** The District will publish an information article in a publication of wide circulation in the District, at least annually, describing brush control measures that can be used by landowners within the District.

**Performance:** Record date and number of brush control articles published annually.

**Addressing the Desired Future Conditions of the Groundwater Resources**  
*31 TAC 356.5(a)(1)(H)*

This category of the management plan goal is not applicable to the District because the Desired Future Condition of the groundwater resources has not been defined.

**13.2 Plan Elements Developed at the Discretion of the District**

**Transportation of Water from the District**

The District will seek an accurate accounting of water transported from the District to users outside its boundaries.

**Management Objective:** The District will obtain monthly usage reports from individuals or entities that transport groundwater out of the District and will compile 100 percent of this data into a database within 30 working days of receipt.

**Performance:** Record the date and number of usage reports received from each individual or entity that transports groundwater out of the District, the percent of usage data that was entered into the database each month, and the number of days before the data was entered each month.

This Management Plan is approved by the undersigned on April 14, 2009. This Management Plan takes effect on approval by the Texas Water Development Board.

Gonzales County Underground Water Conservation District  
Board of Directors

  
Emmet J. Baker Jr., President

Attest:

  
Kurt Trammell, Vice President

  
Jean Peterek, Secretary

  
Link Benson, Director

  
Bruce Patteson, Director

**LOCATION OF DISTRICT OFFICE:**

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**APPENDIX 1**

**TNRCC Order Number 101692-DO4**























**APPENDIX 2**

**Certified Copy of GCUWCD Resolution  
Adopting Management Plan**





## **APPENDIX 3**

### **Public Notice Adopting Management Plan**





## **APPENDIX 4**

### **Certified Mail Receipts From Surface Water Management Entities**











# **APPENDIX 5**

## **References**

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