

***LOST PINES GROUNDWATER CONSERVATION  
DISTRICT***

**MANAGEMENT PLAN**

*September 15, 2004  
Revised: August 10, 2010*

*Contact Information:*

**Lost Pines Groundwater Conservation District:**

*General Manager: Joe Cooper  
908 Loop 230  
P.O. Box 1027  
Smithville, TX 78957  
512- 360-5088  
lpgcd@lostpineswater.org*

**Hydrogeologist Consultants:**

*Robert S. Kier Consulting  
Katie Kaighin, P.G. & Bob Kier, PhD, P.G.  
505 E. Huntland Dr., Suite 250  
Austin, TX 78752  
512-684-3342 or 512-684-3343  
kkaighin@rskconsult.com or bkier@rskconsult.com*

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### **INTRODUCTION**

#### **DISTRICT MISSION**

The mission of the Lost Pines Groundwater Conservation District (LPGCD) is to preserve and to protect interests in groundwater within Bastrop and Lee counties. Since surface water use and permitting is governed under different statutes and regulations, this mission statement applies only to groundwater. This mission statement has seven overarching management goals:

- Providing the most efficient use of groundwater
- Controlling and preventing waste of groundwater
- Addressing conjunctive surface water management issues
- Addressing natural resource issues that impact the use and availability of groundwater and which are impacted by the use of groundwater
- Addressing drought conditions
- Addressing conservation, recharge enhancement, rainwater harvesting, precipitation enhancement, or brush control, where appropriate and cost effective, and
- Addressing, in a quantitative manner, the desired future conditions (DFCs) of the groundwater resources established pursuant to §36.108, Texas Water Code, at a time when such desired future conditions have been identified.

One other overarching management goal, relevant in some groundwater conservation Districts, controlling and preventing subsidence, is not applicable to the LPGCD.

In fulfilling its mission, the LPGCD will endeavor to maintain the aquifers in the District on a sustainable basis. The LPGCD considers “sustainability” as development and use of groundwater in a manner that can be maintained in perpetuity.

## **TIME PERIOD COVERED BY THIS MANAGEMENT PLAN**

This Management Plan becomes effective upon adoption by the Board of Directors for the LPGCD and remains in effect for ten calendar years from the date of adoption. The LPGCD may review the Management Plan annually; however, once every five years, at a minimum, the District must review and re-adopt this groundwater management plan, with or without change. The adopted Management Plan must then be submitted to the Texas Water Development Board (TWDB) for approval of administrative completeness.

## **STATEMENT OF GUIDING PRINCIPALS**

### **Basis**

The guiding principals for the LPGCD derive from its mission statement. The LPGCD recognizes that groundwater resources within the District are of vital importance to the residents and businesses in Bastrop and Lee counties and effectively constitute the only source of water available for all or most all of the District. Without discriminating against those seeking to export groundwater from the District, the LPGCD was created to conserve, to preserve, and to protect the groundwater resources within the two counties and to prevent waste. The LPGCD may also support artificial recharge or enhanced recharge within the District. The District believes the valuable groundwater resources in Bastrop and Lee counties can be managed in a prudent manner through education and conservation coupled with reasonable regulation. A basic understanding of the nature and occurrence of the aquifers in the LPGCD, their hydrologic properties, the locations and capacities of existing wells, the permitting of new wells, and tracking aquifer conditions through a network of monitoring wells provides the foundation for development of a management plan.

### **Policy**

Without discriminating against those seeking to export groundwater from the District, it is the policy of the LPGCD to plan for the present and future groundwater needs of Bastrop and Lee counties. Groundwater is to be conserved, preserved, and protected and waste prevented to maintain the viability of the groundwater supply for future generations in the two counties.

The LPGCD will do four principal things to achieve its management goals and to protect the water supply in Bastrop and Lee counties:

1. Regulate spacing between wells to ensure fairness and sufficient water for everyone.

2. Regulate the amount of water that large users can pump; when water levels begin to drop or when DFCs are established by GMA-12, it may be necessary to reduce the amount that large users pump to avoid or to minimize depletion of the water supply District-wide or in specified areas within the District.
3. Measure water levels and monitor changes in those water levels to detect declines before the declines become serious, leaving users without water.
4. When DFCs have been identified for each aquifer, enforce DFCs by measuring water levels in representative wells throughout the District; it may be necessary for the District to reduce the amount of groundwater that non-exempt users pump to avoid or to minimize depletion of the groundwater supply in specified areas within the District to maintain compliance with the DFCs.

To the extent practical, the LPGCD will attempt to manage the aquifers within its jurisdiction on a sustainable basis. The concept of sustainability, while seemingly simple, is actually quite difficult to implement. Under natural conditions, aquifers are in a state of approximate dynamic equilibrium. Over one or more centuries, or even millennia, recharge is approximately balanced by discharge or a change in storage of water within the aquifer. Absent major climatic or geologic events, discharge tends to come into balance with recharge and there is very little change in storage. Thus, the concept of sustainability is commonly taken as meaning that discharge must be limited to the amount of recharge; i.e., pumpage of groundwater should not exceed recharge to prevent a decrease in groundwater storage in the aquifer. This approach is sometimes termed achieving a “safe yield” from the aquifer. A correlative argument, also commonly advanced, is that pumping an aquifer will increase recharge and that equilibrium will be preserved through inducing greater amounts of recharge to match the greater amounts of pumping. For example, the aquifers in the LPGCD have been thought to be full to the top, as evidenced by springs and historically flowing wells, and recharge has been thought to be rejected because there is no more room for water in the aquifers. Based on investigations to date of the hydrogeology within the District, the Board of Directors of the LPGCD does not believe the aquifers are full and rejecting recharge that could otherwise occur. Recharge is limited not by the fullness of the aquifers, but by the nature of the soils through which infiltrating water must pass to recharge the aquifers. Under these circumstances, sustainability has little to do with changing the amount of recharge and everything to do with how much natural discharge can be captured, including natural discharge to surface-water courses, the use of which is governed by a totally different set of regulations.

Compounding implementation of the concept of sustainability is that it is impossible to withdraw water from an aquifer without reducing storage, at least immediately surrounding the well while the well is being pumped. Otherwise there would be no way to induce groundwater to move to the well. In fact, to develop the groundwater resources in the District, water must be removed from storage to achieve a new state of dynamic equilibrium, if such is possible. Other compounding factors affecting sustainability are the distance between recharge and discharge, the slowness with which groundwater, and

even just pressure changes, move through an aquifer, the corresponding time it takes to reach a new state of approximate dynamic equilibrium, the nature and location of natural discharge, and the geometry and parameters of the aquifer. Thus, some withdrawal of groundwater from storage is essential to the production of groundwater, but the delayed reaction of groundwater in the aquifer to changes in discharge from new wells may make achieving a new approximate dynamic equilibrium within a human lifetime, let alone the limited term of office of a director on the LPGCD Board, a practical impossibility. Allowing too much pumpage from the aquifers means that the aquifers are being mined, depleting the available resource for future generations. Allowing too little pumpage means that use of the resource is not optimized for the maximum benefit of the citizens within the LPGCD.

The Board of Directors of the LPGCD will implement this management plan and any necessary changes or modifications to adhere to the policy stated herein. In implementing this management plan, the Board also will attempt to adhere as closely as possible to the concept of sustainability to preserve, to conserve, and to protect the natural groundwater resources of the District for the citizens of Bastrop and Lee counties and for future generations, without discriminating against those who seek to export groundwater from the District. By doing so, the LPGCD Board of Directors believes that it is bringing a long-term perspective to the management of groundwater resources within the District.

### **Technical Research and Studies**

The LPGCD, in cooperation with the TWDB, the Texas Commission on Environmental Quality (TCEQ), the Lower Colorado River Regional Planning Group (LCRRPG or Region K), the Brazos River Regional Water Planning Group (Brazos G or Region G), and other entities, will conduct studies to better understand the nature and occurrence of groundwater resources within the District. In support of its mission statement and guiding principals, the LPGCD will undertake, from time to time, technical research and studies that are believed to lead toward better, more efficient and fair management of the water resources within the District. The LPGCD Board of Directors recognize that the foundation of good groundwater management is built upon the availability of high-quality data, ever more sophisticated analyses of groundwater flow systems, and increasingly better understanding of the interaction between groundwater and surface water.

## **ABOUT THE DISTRICT**

### **GENERAL DESCRIPTION**

#### **Creation and Powers**

In 1949, the Texas legislature authorized the creation of Underground Water Conservation Districts to perform certain duties and functions and to hold specific powers set forth in Article 7880-3c, Texas Civil Statutes, currently in Chapter 36 of the Texas Water Code. Section 36.0015 of the Texas Water Code, passed as Senate Bill 1 by the 75<sup>th</sup> legislature in 1997, specifies that local groundwater conservation Districts are the State's preferred mechanism by which to manage groundwater resources. The LPGCD was created in 1999 by Senate Bill 1911 of the 76<sup>th</sup> Texas legislature, pursuant to Section 59, Article 16 of the Texas Constitution. State Senator Ken Armbrister and State Representative Robbie Cook sponsored the original legislation that created the District. Creation of the LPGCD was ratified by the 77<sup>th</sup> Texas Legislature in 2001. The LPGCD was confirmed by the voters in Bastrop and Lee counties in November 2002.

The LPGCD has all the powers and duties set forth in Chapter 36 of the Texas Water Code, as reinforced by Article XVI, §59 of the Texas Constitution.

#### **Governing Board**

The LPGCD is governed by a ten-member Board of Directors, one-half of whom are appointed by the Bastrop County Judge and one-half of whom are appointed by the Lee County Judge, qualified and sworn as required by law. After the initial appointment of directors and the setting of staggered terms, each Director is appointed to a four-year term beginning in January. Thus, every second year, following the initial appointment of directors, two directors are appointed by the Bastrop County Judge and two Directors are appointed by the Lee County Judge. The succeeding second year, three Directors are appointed by the Lee County Judge and three Directors are appointed by the Bastrop County Judge.

Each year, in January, the Board selects one of its members to serve as president, a second member to serve as vice-president, and a third to serve as secretary-treasurer. The president presides over board meetings and proceedings. The vice-president presides in the absence of the president or when the president recuses himself from any matter brought before the board. The secretary-treasurer is charged with keeping a true and correct account of all board meetings and other proceedings. The board may also appoint an assistant secretary to assist the secretary treasurer. The president may appoint committees to draft policy recommendations for the board and appoint the chair and members of each committee. A committee may comprise members of the board and/or non-board members. Each committee serves at the pleasure of the president.

Members of the Board of Directors and officers serve until their successors are appointed, qualified to hold office, and sworn in. In the event of a vacancy in any office, the board shall select one of its remaining members to fill out the term of office. In the absence of a General Manager, under the LPGCD rules, the president of the board is to exercise the duties delegated to the General Manager. Business of the LPGCD may be conducted when a quorum is present and notice of the board meeting has been properly posted in accordance with the Open Meetings Act.

The LPGCD Board of Directors will hold its meetings on the days and at the places established by resolution of the board. At the request of the president, or by written request of at least three board members, the board may hold special meetings. All board meetings must be held in accordance with the Open Meetings Act.

Members of the LPGCD may not communicate, directly or indirectly with any agency, person, party or representatives of a party or agency, concerning any issue of fact or law in any contested case before the board except on notice and opportunity for all parties to participate. A board member may communicate *ex parte* with other members of the Board of Directors and with staff if a quorum is not present.

### **Daily Operations**

The LPGCD board may appoint a General Manager as the chief administrative officer of the District. The General Manager shall have full authority to manage and to operate the affairs of the District subject only to direction provided by the Board of Directors through policies and orders the board adopts. The General Manager of the LPGCD may, with the approval of the board, employ other persons necessary to carry out the daily operations of the District. The General Manager may delegate duties as may be necessary to effectively and expeditiously accomplish daily operations; however, delegation of those duties does not relieve the General Manager from overall responsibilities under the Texas Water Code, the act creating the District, or policies, orders and permits promulgated by the board.

The LPGCD board, by resolution shall establish an official office of the District, and the office will maintain regular business hours.

All documents, records, reports, and minutes of the LPGCD are available for public inspection and copying, in accordance with the Open Records Act. Upon written request by any person, the District will furnish copies of its public records. A copying charge may be imposed, pursuant to policies established by the Board of Directors. A list of copying charges will be maintained by the District.

Requests for certified copies must be made in writing. Copies may be certified by the secretary-treasurer of the board, the assistant secretary, or the General Manager. A charge for certification may be imposed by the board, in addition to the copying charge, pursuant to policies established by the board.



## **Rules and Regulations**

The rules and regulations of the LPGCD are contained in a separate document entitled “Lost Pines Groundwater Conservation District Rules and Regulations.”

## **LOCATION AND EXTENT**

The boundaries of the LPGCD are coincident with the boundaries of Bastrop and Lee counties with surrounding counties.

## **Topography**

Bastrop and Lee counties lie along the inner edge of the Texas Gulf Coastal Plain. The topography is flat to gently rolling. The Colorado River bisects Bastrop County. Middle Yegua Creek crosses Lee County. Relief is somewhat in excess of 250 feet and ranges from slightly less than 400 feet where the Colorado River exits Bastrop County to slightly greater than 650 feet along the Bastrop-Lee county line just north of the upper reaches of West Yegua Creek.

## **GROUNDWATER AND SURFACE WATER RESOURCES**

### **GEOLOGY**

Except for a small area of Cretaceous-age marl along the northwest border of Bastrop County south of the Colorado River that is not an aquifer, the geologic units exposed in Bastrop and Lee counties are entirely Tertiary and Quaternary in age. All the tertiary age geologic units dip or tilt to the southeast. From oldest (westernmost) to youngest (easternmost), the Tertiary age geologic units exposed in Bastrop and Lee counties include: the Midway Group, the Wilcox Group, the Carrizo Formation, the Reklaw Formation, the Queen City Sand, the Weches Formation, the Sparta Sand, the Cook Mountain Formation, the Yegua Formation, the Caddell Formation, the Welborne Formation, and the Manning Formation. In Bastrop and Lee counties, three formations are recognized in the Wilcox Group. From oldest to youngest, these formations are the Hooper, Simsboro, and Calvert Bluff formations. All these Tertiary age geologic units are composed of varying portions of sand, silt, and clay, with clay and silt dominating in some formations and sand in others.

Quaternary age geologic units within the LPGCD include river or stream alluvium, such as along the Colorado River and Middle Yegua Creek, and higher terrace deposits. Some of the higher terrace deposits, for example at Giddings, have no apparent relationship to modern stream courses.

## **GROUNDWATER RESOURCES**

### **Aquifers**

The two major aquifers within the LPGCD are the Simsboro Formation of the Wilcox Group and the Carrizo Formation. Both are predominantly sand. Lesser amounts of water can be extracted from the Hooper Formation and the Calvert Bluff Formation of the Wilcox Group. Historically, though, the Wilcox Group and the Carrizo Formation have been considered a single aquifer; one of the nine Major Aquifers of the State. The Queen City Sand and the Sparta Sand also are important aquifers, but are not used as much as the Simsboro and the Carrizo. The Queen City and the Sparta are designated Minor Aquifers in the State. Alluvium along the Colorado River also yields water for municipal supply for the City of Bastrop and for irrigation. The other geologic units in the District are not known to yield significant quantities of groundwater and there are no known users.

### **Recharge**

The term “recharge” is defined in 31 Texas Administrative Code §356.2.14 as “The addition of water from precipitation or runoff by seepage or infiltration to an aquifer from the land surface, streams, or lakes directly into a formation or indirectly by way of leakage from another.” Recharge to the aquifers in the LPGCD occurs from direct precipitation on the outcrop, from losses from surface water bodies, and from interformational leakage. The amount of recharge from direct precipitation appears to be more a function of the nature of the soils than the amount of precipitation. Nevertheless, recharge of direct precipitation where the sandy aquifer units crop out, that is intersect the ground surface, is higher than where the soils and formations at the ground surface are dominated by clay. Effective recharge from precipitation, that is recharge that moves down dip into the deeper portions of the aquifer and is not discharged to surface streams, is typically only a few percent of average annual rainfall.

Leakage between formations accounts for a large component of total recharge. Under natural, pre-developed conditions, most interformational leakage was upward into the geologically younger formations. Locally, pumping stresses may have reversed the direction of interformational leakage.

Estimates of recharge are discussed under the Groundwater Availability Modeling below.

### **Storage**

Groundwater storage in the aquifers within the LPGCD occurs in two different forms. The dominant form of storage is within the pore spaces between the sedimentary grains

that compose the aquifer. Removal of water from that form of storage involves physically draining the pore spaces. The drainable pore space is commonly called effective porosity (it is commonly somewhat less than the actual amount of pore space) and is expressed as a percentage of a unit volume of the deposit (volume of the sedimentary grains plus the drainage volume of the pore spaces). The upper surface of groundwater within an aquifer in which the only water produced is from physically draining the pore spaces is at atmospheric pressure and is called a water table. An aquifer in which the water table is at or beneath the top of the aquifer is said to be unconfined. Examples of unconfined aquifers in the LPGCD are the Colorado River Alluvium and the outcrop areas of the Simsboro, Carrizo, Queen City, and Sparta aquifers.

In contrast, when the water level rises to the top of an aquifer, pressure begins to build up within the aquifer and a different kind of groundwater storage occurs (in addition to the storage in the pore spaces between the grains of aquifer). The pressure derives from the weight of the water and its confinement within the aquifer. For this reason, such aquifers are known as confined aquifers. As the weight and pressure build, the water becomes slightly compressed and the aquifer expands slightly. If a well were drilled into a confined aquifer, the water level in the well would rise within the well until the pressure at the top of the water column equilibrated with atmospheric pressure. Examples of confined aquifers are the deeper portions of the Simsboro, the Carrizo, and the Queen City aquifers.

Because water rises above the top of the aquifer in a well drilled into a confined aquifer, the aquifer also is known as an artesian aquifer and the pressure called artesian pressure. In some situations, artesian pressure is sufficient to cause groundwater to flow at the Earth's surface. Water produced from a confined or artesian aquifer is from artesian storage -- the slight expansion of the water and the slight compression of the aquifer -- resulting in a decline in artesian or confining pressure. The aquifer remains full of water from bottom to top, however. Where aquifers extend to great depths, say several thousand feet below the Earth's surface, the buildup of pressure is considerable, and a significant, but still a relatively small portion of the total amount of water contained within such an aquifer can be in artesian storage. Only if the artesian pressure were sufficiently reduced to cause the water level in a well to drop below the top of the aquifer would the pore spaces between the grains actually drain.

### **Groundwater Quality**

Within the LPGCD, the quality of groundwater that can be produced from the various aquifers is generally suitable for all purposes. Locally, however, the concentration of total dissolved solids (TDS), iron, and hydrogen sulfide, are elevated, limiting usefulness for potable purposes. In some places in the District, methane is produced along with groundwater. Based on current information, the occurrence of elevated concentrations of TDS, hydrogen sulfide, iron, and/or methane, cannot be accurately predicted.

## **Groundwater Availability Modeling**

In 1999, the 76<sup>th</sup> Texas legislature approved funding, through the TWDB, of a Groundwater Availability Model (GAM) program. The stated purpose of the GAMs is to provide reliable and timely information on groundwater availability to the citizens of the state to assure adequate groundwater supplies or to recognize the inadequacy of supplies over a fifty-year planning period. Two major expectations of the GAM program are: 1) to develop standardized, thoroughly-documented, publicly available numerical groundwater flow models and supporting data; and 2) to provide predictions of groundwater availability over a fifty-year planning period, based on current projections of groundwater use and anticipated demands during normal and drought of record climatic conditions. The currently applicable GAM for the LPGCD is the one developed for the central parts of the Queen City, Sparta, and Carrizo-Wilcox aquifers (Kelley and others, 2004, Groundwater Availability Models for the Queen City and Sparta Aquifers). This GAM is a quasi-three dimensional, numerical model based on interpretations of geologic structure and depositional settings of the Queen City, Sparta, and Carrizo-Wilcox aquifers, hydrologic properties, estimates of historic water use derived from surveys, and estimated base-flow discharge into the Colorado River and other large streams in the area. The Central Queen City and Sparta GAM encompasses the Queen City, Sparta, Carrizo-Wilcox aquifers, and all the formations in between from the surface water divide between the San Antonio and the Guadalupe rivers to the southwest and the surface water divide between the Trinity and the Neches rivers to the northeast. Similar GAMs were developed for the parts of the Queen City, Sparta, and Carrizo-Wilcox to the southwest and to the northeast, with considerable overlap between these GAMs and the GAM for the central part of the Queen City, Sparta, and Carrizo-Wilcox aquifers. The LPGCD is using the Central Queen City and Sparta GAM as a tool for evaluating the availability of groundwater within the District to assess the anticipated long-term consequences of in-District consumption and out-of-District transfer from permitted non-exempt wells and from exempt wells within the District, and, if necessary, as a basis for developing different management zones within the District.

Portions of Bastrop and Lee counties are also included in the Northern Trinity GAM (Bené and others, 2004). The Northern Trinity GAM model encompasses the Cretaceous-age Woodbine Group, which is virtually not present in LPGCD, the Washita and Fredericksburg groups, and the Trinity Group. The Trinity Group, which makes up the Trinity Aquifer that is included in the Northern Trinity GAM is divided into the Paluxy Formation, the Glen Rose Formation, and the Travis Peak Formation; the latter formation is further subdivided into the Hensell, Pearsall, Cow Creek, Hammett, Sligo, and Hosston members. While it is known that the Trinity Aquifer underlies LPGCD, the depth of the members of the Trinity Aquifer, the chemical quality of the Trinity Aquifer, and the expense of not only reaching, but treating groundwater from the Trinity Aquifer in LPGCD render this aquifer virtually unusable. There are no known wells in LPGCD completed in the Trinity Aquifer. Also, as per review of the Northern Trinity GAM report, there is no historical use nor is there any projected groundwater use from the Trinity Aquifer in Bastrop and Lee counties. Nonetheless, review of the Northern Trinity GAM indicates that portions of both Bastrop and Lee counties are included in this GAM,

and as per Chapter 36.1071(h) of the Water Code, since the Northern Trinity GAM covers a portion of LPGCD, information regarding the Trinity Aquifer must be included in this Management Plan. That information, when it can be determined from the Northern Trinity GAM, is discussed below.

A portion of southeast Lee County and a small portion of east-southeast Bastrop County are included in the GAM for the Yegua-Jackson Aquifer (Kelley and others, 2010). The Yegua-Jackson GAM encompasses the Jackson Group and the Yegua Formation. The alternating sand- and clay-rich Yegua-Jackson Aquifer interval includes the Middle Eocene Upper Claiborne Group (Yegua and Cook Mountain formations) and the overlying Upper Eocene to Oligocene Jackson Group (Caddell, Wellborn, Manning, and Whitsett formations). Although there are no registered wells at this time completed in the Yegua-Jackson Aquifer in LPGCD, exempt or non-exempt, portions of both Bastrop and Lee counties are included in this GAM, and as per Chapter 36.1071(h) of the Water Code, since the Yegua-Jackson GAM covers a portion of LPGCD, information regarding the Yegua-Jackson Aquifer must be included in this Management Plan. That information, which can be determined from the Yegua-Jackson GAM, is discussed below.

Groundwater availability runs were conducted by the TWDB on behalf of LPGCD as per Texas State Water Code Section 36.1071 (h) to determine the numerical information required for each aquifer (See Groundwater Availability Run 10-014 from the TWDB at [www.twdb.state.tx.us/gam/GAMruns/GR10-14.pdf](http://www.twdb.state.tx.us/gam/GAMruns/GR10-14.pdf)). The numerical information on estimates of annual recharge from precipitation, the volume of water that discharges from the aquifer to springs and any surface water bodies including lakes, streams, and rivers, the volume of subsurface flow into and out of each aquifer within the district, and the net annual volume of flow between each aquifer in the district are included for easy reference in Table 1.

#### Estimates of Recharge from Direct Precipitation

There are no direct methods by which to estimate recharge from direct precipitation, a necessary input to the GAMs. Typically, it is on the order of just a few percent of average annual rainfall.

#### *Queen City, Sparta, and Carrizo-Wilcox Aquifers*

Based on the currently applicable Queen City and Sparta GAM, exclusive of interformational leakage and losses from surface water bodies, the total amount of recharge from direct precipitation in LPGCD is 47,002 acre-feet per year. Recharge to the Tertiary-age Sparta Aquifer in LPGCD is 10,142 acre-feet per year. Recharge to the Queen City Aquifer in LPGCD is 7,256 acre-feet per year. Recharge to the Carrizo-Wilcox Aquifer from direct precipitation LPGCD is estimated to be 29,604 acre-feet per year.

#### *Trinity Aquifer*

The Trinity Aquifer, beneath the Wilcox, receives no effective recharge from direct precipitation as per the Northern Trinity Aquifer GAM.

#### *Yegua-Jackson Aquifer*

Based on the information from the Yegua-Jackson GAM, exclusive of interformational leakage and losses from surface water bodies, the total amount of recharge from direct precipitation in LPGCD is 38,859 acre-feet per year.

#### *Other Aquifers*

There are no reliable estimates of recharge from direct precipitation for alluvium in LPGCD from the Queen City and Sparta GAM, or for the higher terrace deposits in Lee County.

#### Volume of Water that Discharges from the Aquifers to Springs and Any Surface Water Bodies

#### *Queen City, Sparta, and Carrizo-Wilcox Aquifers*

Based on the Queen City and Sparta GAM, the total amount of water that discharges from the aquifers in LPGCD to springs and any surface water bodies including lakes, streams, and rivers is 42,832 acre-feet per year. Estimated annual discharge to surface water bodies from the Tertiary age formations are as follows: the Sparta discharges approximately 4,564 acre-feet and the Queen City Aquifer discharges approximately 5,488 acre-feet. Discharge from the Carrizo-Wilcox Aquifer to surface water bodies is estimated to be 32,780 acre-feet per year.

#### *Trinity Aquifer*

As per the Northern Trinity Aquifer GAM, there is no estimate of the annual volume of water that is discharged from any of the units modeled by this GAM to springs or any surface water bodies in LPGCD.

#### *Yegua-Jackson Aquifer*

Based on the Yegua-Jackson GAM, the total amount of water that discharges from the aquifers in LPGCD to springs and any surface water bodies including lakes, streams, and rivers is 35,780 acre-feet per year.

#### *Other Aquifers*

There are no reliable estimates at this time for the amount of water discharged to surface water bodies from the alluvium in LPGCD, or for the higher terrace deposits in Lee County.

## Volume of Flow Into and Out of Each Aquifer Within the District

### *Queen City, Sparta, and Carrizo-Wilcox Aquifers*

The Queen City and Sparta GAM was also used to determine the estimated annual volume of groundwater flow into and out of LPGCD within each aquifer in the district. The total estimated volume of flow from the Queen City, Sparta, and Carrizo-Wilcox aquifers into LPGCD is 15,992 acre-feet per year. The total estimated volume of flow out of LPGCD from the Queen City, Sparta, and Carrizo-Wilcox aquifers is 23,800 acre-feet per year. Estimated annual volume of flow from the younger Tertiary age formations into LPGCD is 1,299 acre-feet into the Sparta Aquifer and 670 acre-feet into the Queen City Aquifer. Estimated annual volume of flow out of LPGCD from these formations is 733 acre-feet from the Sparta Aquifer and 3,354 acre-feet from the Queen City Aquifer. The estimated annual volume of flow into the Carrizo-Wilcox Aquifer in LPGCD is 14,023 acre-feet and out of the Carrizo-Wilcox Aquifer in LPGCD is 19,713 acre-feet.

### *Trinity Aquifer*

The Northern Trinity GAM was also used to determine the estimated annual volume of groundwater flow into and out of LPGCD within each aquifer in the district. The total estimated volume of flow from the Trinity Aquifer into LPGCD is 517 acre-feet per year. The total estimated volume of flow out of LPGCD from the Trinity Aquifer is 661 acre-feet per year.

### *Yegua-Jackson Aquifer*

The Yegua-Jackson GAM was used to determine the estimated annual volume of groundwater flow into and out of LPGCD. The total estimated volume of flow from the Yegua-Jackson Aquifer into LPGCD is 5,883 acre-feet per year. The total estimated volume of flow out of LPGCD from the Yegua-Jackson Aquifer is 10,155 acre-feet per year.

## Estimated Net Annual Volume of Flow Between Aquifers

### *Queen City, Sparta, and Carrizo-Wilcox Aquifers*

The estimated net annual volume of flow between aquifers in LPGCD was also calculated using the Queen City and Sparta GAM. Estimated net flow from the Weches Confining Unit to the Sparta Aquifer is 970 acre-feet per year. Estimated net flow from the Queen City Aquifer into the Weches Confining Unit is 946 acre-feet per year. Estimated annual net flow from the Queen City Aquifer into the Reklaw Confining Unit is 179 acre-feet. Estimated annual net flow from the Reklaw Confining Unit into the Carrizo-Wilcox Aquifer is 1,309 acre-feet.

### *Trinity Aquifer*

As per the Northern Trinity GAM, there is no estimate of net annual volume of flow between each aquifer in LPGCD for any of the units modeled by this GAM.

#### *Yegua-Jackson Aquifer*

The Yegua-Jackson GAM estimates no net annual volume of flow between the Yegua-Jackson aquifer formations in LPGCD or from the Yegua Jackson aquifers to any of the underlying aquifers or confining units.

### **Groundwater Availability**

Like the concept of sustainability, groundwater availability would seem to be rather simple to define and to quantify, but it is actually quite difficult to do either. The availability of groundwater is a function of many interrelated factors, the same factors that compound an effort to manage an aquifer on a sustainable basis; no one single figure or quantity is sufficient to accurately describe the amount of groundwater that can be withdrawn on an average annual basis. One thing is clear, no groundwater can be withdrawn without depleting storage, particularly artesian storage, to some extent. It is that amount of depletion that is in accordance with the management policies and goals of the District that defines how much groundwater is available. In the end, the amount of groundwater that can be withdrawn from an aquifer over any finite period of time can be determined only by monitoring water levels. It is for this reason that the LPGCD, in cooperation with the local municipalities and water supply companies has established a monitoring well network and a system of reporting water levels to the District and is planning a system of monitoring wells with automatic water level reporting.

Nevertheless, for the purposes of achieving a determination of administrative completeness, the LPGCD Management Plan must specify a figure for the amount of groundwater that ostensibly is available from aquifers within the District on an average annual basis. Lacking a better figure, and in accordance with TWDB guidance, the LPGCD has, at least on an interim basis, set the amount of groundwater available on an average annual basis approximately equal to the amount of recharge from direct precipitation in Bastrop and Lee counties as used in the currently available GAM for the central part of the Carrizo-Wilcox, Queen City, and Sparta aquifers (Kelley and others, 2004; Dutton and others, 2003). This amount of recharge from direct precipitation is a total of 47,002 acre-feet per year within the District. Please note, the amount of recharge from direct precipitation represents only recharge to the Sparta, Queen City, and Carrizo-Wilcox aquifers; the Trinity Aquifer receives no recharge from direct precipitation, and while the Yegua Jackson Aquifer does receive recharge from direct precipitation, this aquifer is not known to be used by either exempt or nonexempt wells within the District. The LPGCD believes that this estimate of groundwater availability within Bastrop and Lee counties is reasonably conservative and defensible. Once desired future conditions have been set by GMA-12 and accepted by the TWDB and the TWDB has provided the District with MAGs by aquifer and by county a different figure may emerge.



It is anticipated that as the LPGCD builds a history of water levels in the aquifers within the District and that the basis for estimating demands for groundwater from the aquifers within the District improves determination of the amount of groundwater available on an average annual basis can be refined. Historical groundwater use is summarized in Table 2.

#### Estimate of Managed Available Groundwater

The DFCs for the Queen City, Sparta, and Carrizo-Wilcox aquifers located within the District boundaries and within Groundwater Management Area 12 have just recently been adopted by GMA 12 (May 26, 2010); therefore, an estimate of the managed available groundwater (MAG) is not yet available so the requirement to present MAG data in the groundwater management plan is not applicable at this time. Once MAG estimates become available from the TWDB, the District will amend the management plan.

### **SURFACE WATER RESOURCES**

Currently surface water resources are little used in Bastrop and Lee counties because of their general lack of availability and because what is available has already been appropriated to the exclusion of new water rights permits. Surface water withdrawn from the Colorado River is used as make-up water for Lake Bastrop, which functions as a cooling pond for the Lower Colorado River Authority's Sim Gideon power plant. Another, privately owned power plant in Bastrop County also draws its cooling water from the Colorado River. Some water withdrawn from the Colorado River also is used for irrigation and a small amount of surface water also is used for irrigation and livestock watering in Lee County. No other uses of surface water within the LPGCD are known. The surface water supplies, as summarized from Volume 3 of the 2007 State Water Plan, are presented in Table 3. Historical surface water use is summarized in Table 2.

### **REGIONAL DEVELOPMENT**

#### **EXISTING DEVELOPMENT**

Based on the most recent demand projections, included in the 2006 Regions K and G Water Plans and subsequently the 2007 State Water Plan, groundwater currently is used in the LPGCD for municipal, manufacturing, mining, livestock, and irrigation purposes (Table 4). All water used for steam-electric (cooling water) purposes in the LPGCD is from surface water supplies. The other demand categories represent groundwater use almost entirely; surface water use in these categories is negligible for planning purposes.

Currently, the two largest use categories are for municipal purposes, including rural-domestic use, and for mining purposes. Uses for municipal purposes include all water used for ordinary municipal purposes; e.g., drinking, cooking, washing, bathing, sanitary

purposes, lawn watering, fire fighting, and the like. Uses for mining purposes normally include dewatering requirements, to keep the mine dry, and depressurization of underlying aquifers, to prevent blowout of the mine floor. Estimated groundwater use within the LPGCD for municipal purposes in the year 2003 was 10,398 acre-feet in Bastrop County and 2,883 acre-feet in Lee County. Estimated mining use in 2003 was nominal in Bastrop County, 22 acre-feet, and also nominal in Lee County, 16 acre-feet (Table 5). The Three Oaks Mine in Lee County is currently permitted to use up to 15,000 acre-feet per year.

Almost all the mining water use is from the Simsboro Aquifer. Most of the municipal water demands also is from the Simsboro Aquifer, although the City of Giddings and Lee County Water Supply Corporation have some wells in the Queen City Sand and a few of Aqua Water Supply's wells and Manville Water Supply's wells may be in the Calvert Bluff Formation.

## **DEVELOPMENT TRENDS**

As indicated above, both Region G (Lee County) and Region K (Bastrop County) have recently revised projections of water supply demands in preparation for the next revision of the State Water Plan in 2012. These revised projections are under review by the TWDB.

Municipal and non-municipal water demand projections for 2000-2060 that were obtained from the 2006 Regional Water Plans for Regions K and G and are being used by LPGCD to estimate water demands over the next fifty years. The same demands are used by LPGCD in the DFC development and modeling process. However, at the time the original model file was developed, only the Initially Prepared Plan (IPP) was available for Region G and those demand projections were used to develop the original LPGCD model file. There are minor differences in a couple of the demand categories between the 2006 Region G IPP and the approved 2006 Region G plan. These differences are at most 6% for a given decade and are well within an acceptable range of accuracy as determined by LPGCD. Although of and by themselves, the 2006 Regional Water Plan and the 2007 State Water Plan demand projections do not distinguish whether the origin of the water is surface water or groundwater, for Bastrop and Lee counties, the distinction is fairly clear-cut. Other than some minor, insignificant use of surface water for irrigation purposes, all the demands are anticipated to be met by groundwater except the for steam-electric (cooling water) demands in Bastrop County, which will be supplied entirely by surface water. The 2006 Regional Water Plans were used to develop the 2007 State Water Plan. The 2007 State Water Plan tabulates concisely only in-GCD demands. To determine out-of-GCD demands from the State Water Plan would be very difficult, and it might not be possible unless one knew every single potential destination of groundwater sourced from a GCD. That would be possible only if the groundwater source were properly referenced by the receiving county. The 2007 State Water Plan numbers, then, are the groundwater demand estimates that are incorporated into this Management Plan (Table 4).

The 2007 State Water Plan demand projections represent in-groundwater conservation district (in-GCD) only, and are taken from Volume 3 of the 2007 State Water Planning Database. As previously stated, it is difficult to impossible to distinguish out-of-groundwater conservation District (out-of-GCD) demands in the 2007 State Water Plan, but the out-of-District demands reflected by various supply strategies proposed by the planning regions to meet anticipated water shortages in the regions had been reduced by proportional, but unstated, amounts so that water demands in each planning region and possible supplies for the region matched more closely. The out-of-GCD demands from LPGCD are not specifically tabulated anywhere in the 2007 State Water Plan.

The latest demand projections for the LPGCD through 2060 are provided in Table 4. Municipal demands in both Bastrop and Lee counties are expected to increase, more so in Bastrop County than Lee County because Bastrop County is where the major population growth is expected to occur. The demand for municipal water in Lee County over the next fifty years is projected to grow by less than a factor of two, but the demand for municipal water in Bastrop County is expected to nearly quadruple.

Mining demands for water are continuing to drop over the next fifty years. The Sandow lignite mine has closed, eliminating 20,000 acre-feet of dewatering/depressurization requirements for that mine. The Three Oaks lignite mine opened about the same time as the Sandow Mine closed, but the projected demands for dewatering/depressurization requirements are only about 5,000 acre-feet in each county; however, the Three Oaks Mine is permitted to use up to 15,000 acre-feet per year. The only discrepancy between the Region G and Region K projections is that Region G shows mining extending to or near the year 2040, whereas, Region K shows mining only until the year 2030. Region G's time estimate more closely matches ALCOA's original announced life of the mine; thus in exercising the GAM, it has been assumed that the Three Oaks Mine is active until the year 2040.

Projected changes in the other demand categories -- manufacturing, livestock, and irrigation -- are relatively insignificant. Manufacturing demands are expected to increase some, especially in Bastrop County. Livestock demands are expected to hold steady, and irrigation demands are expected to decrease, again, especially in Bastrop County. Overall, the net change in these three use categories is very small. Finally, there are significant demand increases anticipated in the county other demand category, which estimate exempt well pumping in Bastrop County. County other demands are projected in the 2007 State Water Plan to hold steady over the next five decades in Lee County; however, this may be incorrect given LPGCD's current knowledge of that county.

The demand estimates prepared by the planning regions and approved by the TWDB, are for in-GCD demands only. Groundwater pumpage within Bastrop and Lee counties that is exported to neighboring counties is not accounted for. The areas encompassed by each of several retail rural water purveyor's "Certificate of Convenience and Necessity" (CCN) or other special utility Districts commonly extend outside the LPGCD. The pumpage is within the LPGCD, but recognition of demand is in the county and river basin of use. Thus, the estimates of water demand used for the purposes of preparing this

Management Plan do not fully encompass all the demands on groundwater resources that currently occur and will continue to occur within the LPGCD. At present, though, there is no mechanism to account for these demands or to even assess their relative significance. According to the largest municipal water supplier operating in the District, the amount of water pumped out of the two counties is minor but growing.

In addition, potential large transfers of groundwater out of the District are not encompassed by the water demand projections developed by the planning regions. For example, up to 15,000 acre-feet of water potentially could be extracted from the Three Oaks Mine area in Bastrop and Lee counties for transfer to San Antonio or used elsewhere. Other water marketing entities are looking for available groundwater for transfer to Williamson County and to the Region L area, and the Brazos River Authority has announced that it also is seeking groundwater from the Carrizo-Wilcox Aquifer for Williamson County to augment surface water supplies. These groundwater demands would be over and above those shown by planning Regions G and K for Lee and Bastrop counties. Such potential demands must be separately evaluated.

## **GROUNDWATER SUPPLY ISSUES AND POTENTIAL SOLUTIONS**

Groundwater supply issues for the LPGCD are relatively simple and straightforward; unfortunately, potential solutions are not readily apparent. Looking solely at the total amount of water within the pore spaces between the sedimentary particles, based on the GAM for the Queen City, Sparta, and Carrizo-Wilcox aquifers, there are slightly more than approximately 301 million acre-feet of water in storage. In addition, there are slightly less than three and a half million acre-feet of water in artesian storage, but this amount is equivalent to only about one percent of the amount of water in intergranular storage and, thus, is comparatively a much smaller amount of water. Unfortunately the existence of artesian storage is critical because it is the pressure associated with this artesian storage that drives the natural behavior of the aquifers, most particularly the discharge of groundwater to surface water courses. Artesian pressure also likely influences the overall quality of water in the aquifers. While recognizing that some temporary decline in artesian pressure must occur for groundwater to be produced, the LPGCD believes that a long-term, continued reduction in artesian pressure is not in the best interests of the citizens and businesses in Bastrop and Lee counties, which depend on groundwater for a potable water supply.

It is this fact coupled with the limited amount of potentially usable natural recharge on an average annual basis, only about 47,002 acre-feet per year based on the GAM for the Queen City, Sparta, and Carrizo-Wilcox aquifers, that restricts, to a first approximation, the amount of groundwater that can be withdrawn from aquifers within the District without potentially adversely affecting artesian pressure, water levels in the aquifers, and the amount of groundwater contributing to the base flow of the surface water courses (again, please note, the amount of recharge from direct precipitation represents only recharge to the Sparta, Queen City, and Carrizo-Wilcox aquifers; the Trinity Aquifer receives no recharge from direct precipitation, and the while the Yegua Jackson Aquifer

does receive recharge from direct precipitation, this aquifer is not known to be used by either exempt or nonexempt wells within the District). Thus, the LPGCD's ability to manage groundwater resources within the District on a sustainable basis in accordance with its mission statement is severely restricted because there is so little of the total amount of water in storage to work with.

The LPGCD's ability to achieve its mission statement -- to manage the groundwater resources within the District on a sustainable basis in perpetuity -- is, thus, tenuous, at best. Total in-GCD groundwater demands are estimated to be 30,800 acre-feet in 2010. However, it is important to keep in mind that the amount of total recharge to usable aquifers within the District, 47,002 acre-feet per year, is for all aquifer formations. The in-District demands are primarily concentrated in the Simsboro Aquifer and even beginning as early as 2010, there are projected water needs shortages within the District for in-District use (Table 6). Proposed water management strategies are summarized for each county in Table 7. Thus, although it appears on a strictly recharge versus demand basis that recharge within the District would fully support all in-District demands (Table 4), as projected by the 2007 State Water Plan, this would only be the case if pumping were proportionally distributed in each aquifer layer as per the amount of water being recharged. Also, clearly out-of-GCD groundwater demands which currently exist are ignored by the in-GCD groundwater use estimation. Using a simple water balance approach, the in-District demand would consume the equivalent of approximately one-half of all the water in artesian storage in the two counties by 2060. This simple water-balance approach does not consider the potential negative affects of major out-of-District demands, such as those in the Bryan College Station area or potential well fields in neighboring Post Oak Savannah GCD, that affect artesian pressure in the District, but are outside of the District's control.

The demand for groundwater within Bastrop and Lee counties is projected to increase to a total of approximately 44,000 acre-feet per year by 2060. Even though mining water demands will decrease and then virtually cease by about 2040, municipal demands are anticipated to nearly quadruple in Bastrop County and nearly double in Lee County over the next fifty or so years.

Yet, the Carrizo-Wilcox Aquifer especially in the LPGCD is perceived by those outside of the District to have an over abundance of groundwater for transfer out of the District. In addition, the Brazos River Authority is seeking to withdraw an unknown amount of water to meet growing water needs in Williamson County. On top of these possible transfers, private water marketers also are seeking to transfer groundwater from within Bastrop and Lee counties and the counties surrounding the two counties to meet other water demands outside of the District and even outside of Regions G and K.

Thus, whether the LPGCD will be able to achieve its mission statement remains to be seen, even to meet only in-District demands. It is clear, though, that with major transfers of groundwater outside of the District, achieving the mission statement will be impossible. Perhaps, with the potential for a new GAM being developed that would include better water level, aquifer characteristics, and mining data for the Queen City,

Sparta, and Carrizo-Wilcox aquifers, the LPGCD will be able to better understand the groundwater resources within the District and to refine estimates of groundwater availability. Additionally, it would be enormously helpful if the next State Water Plan slated for 2012 completion would have a concise summary of not only in-District demands, but also out-of-District transfer demands. There appears to be no other solution at this point, since the LPGCD is precluded by law from discriminating between in-District operating permits and out-of-District transfers.

## **APPROVAL CRITERIA**

### **REGIONAL COOPERATION AND COORDINATION WITH SURFACE WATER ENTITIES**

#### **Lower Colorado River Regional Planning Group (Region K)**

The LPGCD regularly coordinates with Region K through participation at regional planning meetings and, when deemed necessary, by written and verbal communication.

#### **Brazos River Regional Planning Group (Region G)**

The LPGCD has regularly sought coordination and communication with Region G by verbal and written means. A representative of the LPGCD commonly attends the Region G planning meetings.

#### **Lower Colorado River Authority**

The LPGCD communicates with the Lower Colorado River Authority (LCRA) through the Region K planning group and by direct communication on an as needed basis. In that conjunctive use of surface and groundwater has not occurred to date in Bastrop and Lee counties and the statutes and regulations for surface water are so different from those for groundwater, regular communication for that purpose has not yet occurred, but is not precluded and would be welcomed in the future.

#### **Brazos River Authority**

The LPGCD communicates with the Brazos River Authority (BRA) through the Region G planning group and by direct communication on an as needed basis. Commonly representatives of the BRA attend LPGCD Board meetings. In that conjunctive use of surface and groundwater has not occurred to date in Bastrop and Lee counties and the statutes and regulations for surface water are so different from those for groundwater, regular communication for that purpose has not previously occurred, but is beginning and is welcomed.

## **DISTRICT RULES**

A link to LPGCD's rules where the rules can be read and downloaded is provided in the section entitled Actions, Procedures, Performance, and Avoidance Necessary to Effectuate the Management Plan.

## **A COPY OF THE OFFICIAL PLAN DELIVERED TO THE EXECUTIVE ADMINISTRATOR**

A copy of the official plan will be delivered to the Executive Administrator of the TWDB.

## **DIGITAL COPY OF THE MANAGEMENT PLAN**

A digital copy of the official Management Plan will be emailed to the TWDB Groundwater Resources Division.

## **CERTIFIED COPY OF DISTRICT'S RESOLUTION ADOPTING THE MANAGEMENT PLAN**

A certified copy of the LPGCD's resolution adopting this Management Plan is provided in Attachment 1.

## **EVIDENCE OF NOTICE AND HEARING PROVIDING CITIZENS WITHIN THE DISTRICT THE OPPORTUNITY TO COMMENT ON THE MANAGEMENT PLAN PRIOR TO ADOPTION BY THE DISTRICT BOARD**

Evidence of public notice and hearing providing citizens within the District the opportunity to comment on the Management Plan prior to the adoption is provided in Attachment 2.

## **EVIDENCE OF PUBLIC NOTICE AND HEARING TO ADOPT THE MANAGEMENT PLAN**

Evidence of public notice and hearing prior to the adoption of this Management Plan is provided in Attachment 3.

## **DISTRICT BOARD RESOLUTION ADOPTING THE MANAGEMENT PLAN FOLLOWING NOTICE AND HEARING**

A copy of the District Board resolution adopting the Management Plan following notice and hearing is provided in Attachment 4.

## **EVIDENCE THAT FOLLOWING NOTICE AND HEARING THE DISTRICT COORDINATED WITH ALL SURFACE WATER MANAGEMENT ENTITIES**

Copies of certified letters addressed to surface water management entities, LCRA and BRA, that deliver a copy of the District's Management Plan for review and comment after the plan has been adopted by the District are provided in Attachment 5.

## **MANAGEMENT GOALS, OBJECTIVES, AND PERFORMANCE STANDARDS**

### **REQUIRED GOALS, OBJECTIVES, AND PERFORMANCE STANDARDS**

**Goal 1:** Provide the most efficient use of groundwater.

**Management Objective:** To inform the residents of Bastrop and Lee counties about the efficient use of groundwater by providing information at least once per year in the form of a newspaper article or literature handout. Such information may be related to irrigation efficiency, transmission losses, xeriscaping, or any other related subject deemed appropriate by the LPGCD Board. In addition, to the extent practical, the LPGCD will sponsor or co-sponsor workshops open to the public that address the efficient use of groundwater. The information on efficient use of groundwater may be disseminated in conjunction with information on controlling and preventing waste of groundwater and/or water conservation.

**Performance Standard:** The General Manager will document in the Annual Report all (or 100%) of the information disseminated to the public on the most efficient use of groundwater. The number and subject of public workshops will also be documented in the Annual Report that address this issue and similar issues.

**Goal 2:** Controlling and preventing waste of groundwater.

**Management Objective 2-1:** To inform the residents of Bastrop and Lee counties about controlling and preventing the waste of groundwater by providing information at least once per year in the form of a newspaper article or literature handout. Such information may be related to irrigation efficiency, leaky or poorly functioning plumbing, transmission losses, xeriscaping, or any other related subject deemed appropriate by the LPGCD Board. In addition, to the extent practical, the LPGCD will sponsor or co-sponsor workshops open to the public that address controlling and preventing waste of groundwater. The information on waste of groundwater may be disseminated in conjunction with information on efficient use of groundwater and/or water conservation.

**Performance Standard 2-1:** The General Manager will document in the Annual Report all (or 100%) of the information disseminated to the public on controlling and



preventing waste of groundwater. The number and subject of public workshops will also be documented in the annual report.

**Management Objective 2-2:** The district will document and report to the relevant WSC any leaks noticed or reported to District personnel.

**Performance Standard 2-2:** The number of documented and reported leaks each year will be included in the annual report.

**Goal 3:** Controlling and preventing subsidence.

This goal is not applicable at this time in LPGCD as there are no known or anticipated issues relating to subsidence of formations within the District.

**Goal 4:** Address conjunctive surface water management issues.

**Management Objective 4:** To encourage the use of surface water supplies where available and practical, to meet the needs of specific user groups within the District.

**Performance Standard 4:** The General Manager or his designated representative will attend at least once annually a Region K and a Region G Regional Water Planning meeting. The General Manager or his designated representative will encourage the development of surface water supplies where appropriate to benefit the District at these meetings through either a verbal or a written statement submitted at the Regional Water Planning meeting or within the month following the attended Regional Water Planning meeting. This activity will be noted in the General Manager's Annual Report presented to the District Board of Directors.

**Goal 5:** Address natural resource issues that impact the use and availability of groundwater and which are impacted by the use of groundwater.

**Management Objective:** To provide information to the public about the status of groundwater use, availability, and water levels and a description of natural resource issues, e.g., mining, out of District transport of groundwater, protection of endangered species, or the spread of phreatophytic vegetation, that impact the use and availability of groundwater or which are affected by the use and availability of groundwater.

**Performance Standard:** The General Manager will include in his Annual Report for the LPGCD Board the status of groundwater use, availability, and water levels within the District and a description of natural resource issues. Once this report is reviewed and accepted by the LPGCD Board, it shall be made available to the

public at the District's office. In addition, the General Manager will cause a summary of the Annual Report to be published in one or more newspapers of general circulation in Bastrop and Lee counties. To the extent practical, the LPGCD also will sponsor or co-sponsor workshops open to the public that address this issue and similar issues.

**Goal 6:** Address drought conditions.

**Management Objective:** Drought conditions are to be gathered from at least one known weather station in each county in the District. Based on GAM modeling and an understanding of the outcrop areas of the principal aquifers – Simsboro, Carrizo, Queen City, and Sparta – in the LPGCD, recharge appears to be relatively constant under the current climatic regime and little affected by drought conditions. It is anticipated, though that drought conditions will result in increased pumpage and decreased natural discharge, thereby affecting water levels in the aquifers.

**Performance Standard:** The General Manager will include in his Annual Report for the LPGCD Board information on precipitation amounts as compared to water levels within the District and a description of apparent trends. Once this report is reviewed and accepted by the LPGCD Board, it shall be made available to the public at the District's office and posted on the LPGCD website. In addition, the General Manager will cause a summary of the Annual Report to be published in one or more newspapers of general circulation in Bastrop and Lee counties. The summary may be published in conjunction with the publication of the summary of natural resource issues. In addition, to the extent practical, the LPGCD will sponsor or co-sponsor workshops open to the public that address this issue and similar issues.

**Goal 7-1:** Address conservation of groundwater resources where appropriate and cost-effective.

**Management Objective 7-1:** To educate the public within the District concerning water conservation where appropriate and cost effective. One or more articles related to advances in plumbing fixtures that conserve water and comparative cost savings of installing such fixtures, xeriscaping, or any other related subject deemed appropriate by the LPGCD board or staff will be collected from newspapers or literature publications on an annual basis.

**Performance Standard 7-1:** A file of published articles that address conservation of groundwater resources will be kept on file at the District's office and will be available to the public to review during business hours. The number of published articles will be documented in the Annual Report for the LPGCD Board.

**Goal 7-2:** Address recharge enhancement where appropriate and cost-effective.

The District does not currently have the financial resources to buy property and construct recharge structures, therefore, this goal is not applicable to the District at this time.

**Goal 7-3:** Address rainwater harvesting where appropriate and cost-effective.

**Management Objective 7-3:** To educate the public within the District concerning rainwater harvesting where appropriate and cost effective. One or more articles related to advances in rainwater harvesting or any other related subject deemed appropriate by the LPGCD board or staff will be collected from newspapers or literature publications on an annual basis.

**Performance Standard 7-3:** A file of published articles that address rainwater harvesting will be kept on file at the District's office and will be available to the public to review during business hours. The number of published articles will be documented in the Annual Report for the LPGCD Board.

**Goal 7-4:** Address precipitation enhancement where appropriate and cost effective.

There is no known precipitation enhancement activity, nor planned activity in LPGCD, therefore, this goal is not applicable to the District at this time.

**Goal 7-5:** Address brush control where appropriate and cost effective.

**Management Objective 7-5:** To educate the public within the District concerning brush control where appropriate and cost effective. One or more articles related to brush control or any other related subject deemed appropriate by the LPGCD board or staff will be collected from newspapers or literature publications on an annual basis.

**Performance Standard 7-5:** A file of published articles that address brush control will be kept on file at the District's office and will be available to the public to review during business hours. The number of published articles will be documented in the Annual Report for the LPGCD Board.

**Goal 8:** To address, in a quantitative manner, the desired future conditions (DFCs) of the groundwater resources established pursuant to §36.108, Texas Water Code.

**Management Objective 8:** Desired future conditions (DFCs) will be addressed in this Management Plan for all groundwater resources pursuant to §36.108, Texas Water Code at a time when such desired future conditions have been identified by GMA-12, approved by the TWDB, and managed available groundwater (MAG) have been established by the TWDB. At this time, DFCs have been approved by

GMA-12 for the Queen City, Sparta, Carrizo, Calvert Bluff, Simsboro, and Hooper formations. DFCs for these formations have been submitted to the TWDB for review. Additionally, once DFCs have been verified by the TWDB and MAGs have been provided by the TWDB, this Management Plan will be updated. A monitoring well system with automatic data recording and daily reporting capabilities is currently being installed in a minimum of 6 monitor wells across the District in the Simsboro Aquifer as a basis for comparing water levels to DFCs. Additionally, at least one monitoring well will be established to monitor the water level for each aquifer formation with a desired future condition: water level values will be collected at least semiannually for the purpose of controlling pumpage to manage ground water levels at and above DFC levels.

**Performance Standard 8:** The water levels will be included in the District database and a discussion of the water level trend-Desired Future Condition comparison will be reported to the Board of Directors at least on an annual basis.

## **DISTRICT SPECIFIC GOALS, OBJECTIVES, AND PERFORMANCE STANDARDS**

**Goal:** Public education.

**Management Objective:** To inform the public about any and all matters related to the occurrence, distribution, behavior, and use of groundwater. To a degree, this management objective overlaps with all the required goals and management objectives described above; however, the focus of this management objective is on children.

**Performance Standard:** At least once each year in each county of the LPGCD, the General Manager, assisted by other staff and consultants, as necessary, will present a program dealing with the above matters at a public school. The particular timing and age-level of such a program will be coordinated with the local school systems.

**Goal:** Drilling permits.

**Management Objective:** To review and evaluate all applications for drilling permits for exempt and non-exempt wells, not otherwise excluded and not existing prior to the date the District rules became effective.

**Performance Standard:** At least once per year, notify all known water-well drillers operating in the District of the requirement for the prospective non-excluded well owner to obtain a drilling permit and the requirement that the driller insure that no new non-excluded well is drilled in the District without a permit.

**Goal:** Register all wells within the LPGCD boundaries.

**Management Objective:** To register all exempt wells drilled since the LPGCD Rules became effective and attempt to register all pre-existing exempt wells.

**Performance Standard:** Registration of newly drilled exempt wells is accomplished by refunding the drilling permit fee upon submittal of completion reports, well logs, and well registration materials. The number of newly drilled wells will be documented in the annual report by the General Manager and in the LPGCD's database. Registration of pre-existing exempt wells is a more difficult issue, because registration of such wells is voluntary. The General Manager or his designated representative will note the existence of unregistered wells, spot the location of such wells on a map as best possible, and visit with the landowner, if possible, to encourage registration of the wells. Documentation of attempts to encourage registration of wells that were in existence prior to the effective date of the LPGCD Rules will be through notes made and kept on file at the District offices.

**Goal:** Operating permits.

**Management Objective:** To review and evaluate all applications for operating permits for non-exempt wells, not otherwise excluded, within the LPGCD. In addition, the LPGCD will notify operating permit holders of the need to renew their operating permit at least sixty days prior to expiration.

**Performance Standard:** At least once per year, notify all known water-well drillers and pump installers operating in the District of the requirement for the owner of a non-exempt well, not otherwise excluded, to obtain an operating permit and the requirement that the driller and/or pump installer insure that no non-exempt well, not otherwise excluded, is placed into service within the District without an operating permit. In addition, the General Manager shall cause to be published in one or more newspapers of general circulation in Bastrop and Lee counties an article related to the requirement to obtain operating permits for non-exempt wells, not otherwise excluded. Such an article may be combined with articles on other subjects published by the District.

**Goal:** Transfer Permits.

**Management Objective:** To review and evaluate all applications for transfer permits. Notify holders of transfer permits of the need to renew their transfer permit prior to expiration.

**Performance Standard:** At least annually, the General Manager shall cause to be published in one or more newspapers of general circulation in Bastrop and Lee counties an article related to the requirement to obtain a transfer permit to transfer groundwater out of the District. Such an article may be combined with articles on other subjects published by the District.

**Goal:** Timely processing of all drilling permits, operating permits and transfer permits.

**Management Objective:** To complete administrative review of all permit applications and schedule for LPGCD consideration within sixty days of receipt of an administratively complete permit application.

**Performance Standard:** On an annual basis track the dates on which applications are received, the dates on which administrative review is completed, and the date on which the board considered applications. For any permit application taking longer than sixty days to process, record a brief comment in the files as to the reason for the delay. Provide an annual summary of the permit application tracking to the LPGCD board. Upon review and approval of the report, make it available for public review at the District office.

**Goal:** Maintain a database.

**Management Objectives:** To maintain a database of each drilling permit and registration of an exempt well, each drilling and operating permit for a non-exempt well, and each transfer permit. The LPGCD's intent is to be able to generate plots of the locations of each registered and permitted well, available completion information for the well, and to compute distances between the wells based on the most detailed coordinates in the data base.

**Performance Standard:** The database will be constantly changing and evolving, as new data are acquired and entered into the database and as new or updated software and hardware become available. The overall performance standard is; Does it do what the LPGCD needs done? The measurable standard is an annual report prepared by the General Manager to the Board describing changes made to the structure and the content of the database and containing recommendations for additional changes and improvements. Once reviewed and accepted by the Board it shall be made available to the public at the LPGCD's office. In addition, the General Manager will submit for publication a copy of the annual report in one or more newspapers of general circulation in Bastrop and Lee counties. In addition, to the extent practical, the LPGCD will sponsor or co-sponsor workshops open to the public that address this issue and similar issues.

**ACTIONS, PROCEDURES, PERFORMANCE, AND AVOIDANCE NECESSARY TO EFFECTUATE THE MANAGEMENT PLAN**

The LPGCD will implement the provisions of this Management Plan through the development and application of rules consistent with the Management Plan, using it as a guide to its principles and polices. Operation of the LPGCD, additional planning efforts, and additional rulemaking will be consistent with this plan or subsequent management plans adopted by the LPGCD and approved by the TWDB. The LPGCD will adhere to and enforce the rules it develops. These rules, subsequent additions or revisions, and revisions to this Management Plan will be based on the best technical advice available to the LPGCD. A copy of LPGCD's rules can be found at <http://www.lostpineswater.org/documents/rules.pdf> .

The LPGCD will treat all citizens equally. In the exercise of its powers under Chapter 36 of the Texas Water Code, the LPGCD may use the discretion permitted by the water code and its rules to consider unique situations or local conditions and the potential for adverse economic and environmental consequences. Exercise of its discretion should not be construed as limiting the power and authority of the LPGCD.

The LPGCD will seek cooperation from municipalities, water supply companies, irrigators, and all other users of groundwater pumped in Bastrop and Lee counties in the implementation of this Management Plan. The LPGCD also will seek to cooperate and coordinate with state and regional water planning authorities and agencies and adjacent groundwater conservation Districts.





## **TABLES**

**TABLE 1: Groundwater Availability Model (GAM) Information for LPGCD**

All numbers are rounded to the nearest 1 acre-foot. Reported flow estimates include both fresh and brackish waters present in the aquifers. Version 2.01 of the GAM for the central parts of the Carrizo-Wilcox, Queen City, and Sparta Aquifers (Dutton and others, 2003; Kelley and others, 2004), version 1.01 of the GAM for the Northern section of the Trinity Aquifer (Bené and others, 2004), and version 1.01 of the Yegua-Jackson Aquifer GAM (Kelley and others, 2010). Results for these models were provided by the TWDB in Groundwater Availability Run 10-014.

<b>Mangement Plan Requirement</b>	<b>Aquifer or Confining Unit</b>	<b>Results</b>
Estimated annual amount of recharge from precipitation to LPGCD	Yegua-Jackson Aquifer	38,859
	Sparta Aquifer	10,142
	Queen City Aquifer	7,256
	Carrizo-Wilcox Aquifer	29,604
	Trinity Aquifer	0
Estimated annual volume of water that discharges from the aquifer to springs and any surface awter body including lakes, streams, and rivers	Yegua-Jackson Aquifer	35,780
	Sparta Aquifer	4,564
	Queen City Aquifer	5,488
	Carrizo-Wilcox Aquifer	32,780
	Trinity Aquifer	0
Estimated annual volume of flow into LPGCD within each aquifer in LPGCD	Yegua-Jackson Aquifer	5,883
	Sparta Aquifer	1,299
	Queen City Aquifer	670
	Carrizo-Wilcox Aquifer	14,023
	Trinity Aquifer	517
Estimated annual volume of flow out of the LPGCD within each aquifer in LPGCD	Yegua-Jackson Aquifer	10,155
	Sparta Aquifer	733
	Queen City Aquifer	3,354
	Carrizo-Wilcox Aquifer	19,713
	Trinity Aquifer	661
Estimated net annual volume of flow between each aquifer in LPGCD	Weches Confining Unit into the Sparta Aquifer	970
	Queen City Aquifer into the Weches Confining Unit	946
	Queen City Aquifer into the Reklaw Confining Unit	179
	Reklaw Confining Unit into the Carrizo-Wilcox Aquifer	1,309

**Table 2**  
**Historical Water Use Estimate Summary**  
**TWDB - Water Use Survey**  
**Lost Pines GCD**  
Unit: Acre Feet (ACFT)

GW = groundwater; SW = surface water

**Bastrop County**

Year	Source	Steam					Livestock	Total
		Municipal	Manufacturing	Electric	Irrigation	Mining		
1974	GW	2,524	205	0	927	2	231	3,889
	SW	0	0	5,411	2,088	0	1,808	9,307
<b>Total</b>		<b>2,524</b>	<b>205</b>	<b>5,411</b>	<b>3,015</b>	<b>2</b>	<b>2,039</b>	<b>13,196</b>
1980	GW	3,861	173	0	749	0	616	5,399
	SW	0	0	4,249	2,640	200	864	7,953
<b>Total</b>		<b>3,861</b>	<b>173</b>	<b>4,249</b>	<b>3,389</b>	<b>200</b>	<b>1,480</b>	<b>13,352</b>
1984	GW	5,155	169	0	325	10	624	6,283
	SW	1	56	4,002	805	0	937	5,801
<b>Total</b>		<b>5,156</b>	<b>225</b>	<b>4,002</b>	<b>1,130</b>	<b>10</b>	<b>1,561</b>	<b>12,084</b>
1985	GW	4,959	165	0	105	10	562	5,801
	SW	0	390	4,500	260	0	844	5,994
<b>Total</b>		<b>4,959</b>	<b>555</b>	<b>4,500</b>	<b>365</b>	<b>10</b>	<b>1,406</b>	<b>11,795</b>
1986	GW	5,043	166	0	51	10	524	5,794
	SW	0	41	3,849	200	0	786	4,876
<b>Total</b>		<b>5,043</b>	<b>207</b>	<b>3,849</b>	<b>251</b>	<b>10</b>	<b>1,310</b>	<b>10,670</b>
1987	GW	5,798	62	0	51	12	558	6,481
	SW	0	6	3,960	200	0	838	5,004
<b>Total</b>		<b>5,798</b>	<b>68</b>	<b>3,960</b>	<b>251</b>	<b>12</b>	<b>1,396</b>	<b>11,485</b>
1988	GW	6,083	30	0	75	10	591	6,789
	SW	0	3	5,506	300	6	888	6,703
<b>Total</b>		<b>6,083</b>	<b>33</b>	<b>5,506</b>	<b>375</b>	<b>16</b>	<b>1,479</b>	<b>13,492</b>
1989	GW	6,432	28	0	273	10	581	7,324
	SW	0	2	4,052	273	6	871	5,204
<b>Total</b>		<b>6,432</b>	<b>30</b>	<b>4,052</b>	<b>546</b>	<b>16</b>	<b>1,452</b>	<b>12,528</b>
1990	GW	6,247	26	0	323	10	572	7,178
	SW	0	1	2,967	322	6	859	4,155
<b>Total</b>		<b>6,247</b>	<b>27</b>	<b>2,967</b>	<b>645</b>	<b>16</b>	<b>1,431</b>	<b>11,333</b>
1991	GW	5,978	64	0	322	26	585	6,975
	SW	0	0	2,911	322	6	879	4,118
<b>Total</b>		<b>5,978</b>	<b>64</b>	<b>2,911</b>	<b>644</b>	<b>32</b>	<b>1,464</b>	<b>11,093</b>
1992	GW	5,876	43	0	323	20	610	6,872
	SW	0	0	2,694	323	12	915	3,944
<b>Total</b>		<b>5,876</b>	<b>43</b>	<b>2,694</b>	<b>646</b>	<b>32</b>	<b>1,525</b>	<b>10,816</b>
1993	GW	6,577	69	0	181	20	609	7,456
	SW	0	0	3,810	120	12	915	4,857
<b>Total</b>		<b>6,577</b>	<b>69</b>	<b>3,810</b>	<b>301</b>	<b>32</b>	<b>1,524</b>	<b>12,313</b>
1994	GW	6,542	72	0	423	20	632	7,689
	SW	1	0	3,468	273	9	948	4,699
<b>Total</b>		<b>6,543</b>	<b>72</b>	<b>3,468</b>	<b>696</b>	<b>29</b>	<b>1,580</b>	<b>12,388</b>
1995	GW	6,755	72	0	443	22	598	7,890
	SW	0	0	3,904	295	6	897	5,102
<b>Total</b>		<b>6,755</b>	<b>72</b>	<b>3,904</b>	<b>738</b>	<b>28</b>	<b>1,495</b>	<b>12,992</b>
1996	GW	7,883	81	0	443	22	704	9,133
	SW	1	0	5,715	295	6	1,056	7,073
<b>Total</b>		<b>7,884</b>	<b>81</b>	<b>5,715</b>	<b>738</b>	<b>28</b>	<b>1,760</b>	<b>16,206</b>
1997	GW	7,470	71	0	395	22	510	8,468
	SW	1	0	2,638	263	6	764	3,672
<b>Total</b>		<b>7,471</b>	<b>71</b>	<b>2,638</b>	<b>658</b>	<b>28</b>	<b>1,274</b>	<b>12,140</b>

Disclaimer: The Water Use estimates posted are subject to revision as additional data and corrections are made available to the TWDB.

1998	GW	8,451	31	0	343	22	585	9,432
	SW	0	0	3,588	228	6	878	4,700
<b>Total</b>		<b>8,451</b>	<b>31</b>	<b>3,588</b>	<b>571</b>	<b>28</b>	<b>1,463</b>	<b>14,132</b>
1999	GW	8,892	41	0	234	22	629	9,818
	SW	2	0	3,721	162	6	945	4,836
<b>Total</b>		<b>8,894</b>	<b>41</b>	<b>3,721</b>	<b>396</b>	<b>28</b>	<b>1,574</b>	<b>14,654</b>
2000	GW	8,753	55	0	904	22	609	10,343
	SW	3	0	1,944	942	6	913	3,808
<b>Total</b>		<b>8,756</b>	<b>55</b>	<b>1,944</b>	<b>1,846</b>	<b>28</b>	<b>1,522</b>	<b>14,151</b>
2001	GW	8,492	43	0	834	12	403	9,784
	SW	87	0	3,417	869	28	1,136	5,537
<b>Total</b>		<b>8,579</b>	<b>43</b>	<b>3,417</b>	<b>1,703</b>	<b>40</b>	<b>1,539</b>	<b>15,321</b>
2002	GW	7,990	47	0	834	12	402	9,285
	SW	82	0	2,944	869	28	1,135	5,058
<b>Total</b>		<b>8,072</b>	<b>47</b>	<b>2,944</b>	<b>1,703</b>	<b>40</b>	<b>1,537</b>	<b>14,343</b>
2003	GW	8,047	90	0	400	12	437	8,986
	SW	83	0	2,944	0	28	1,231	4,286
<b>Total</b>		<b>8,130</b>	<b>90</b>	<b>2,944</b>	<b>400</b>	<b>40</b>	<b>1,668</b>	<b>13,272</b>
2004	GW	8,803	59	0	539	12	441	9,854
	SW	90	0	2,944	0	28	1,242	4,304
<b>Total</b>		<b>8,893</b>	<b>59</b>	<b>2,944</b>	<b>539</b>	<b>40</b>	<b>1,683</b>	<b>14,158</b>

NOTE: All Pumpage reported in acre-feet

3/6/2009

Source: TWDB Water Use Survey Database (<http://www.twdb.state.tx.us/wushistorical/DesktopDefault.aspx?PageID=1>)

### Lee County

Year	Source	Steam						Total
		Municipal	Manufacturing	Electric	Irrigation	Mining	Livestock	
1974	GW	1,014	35	0	334	0	229	1,612
	SW	0	0	0	349	0	1,340	1,689
<b>Total</b>		<b>1,014</b>	<b>35</b>	<b>0</b>	<b>683</b>	<b>0</b>	<b>1,569</b>	<b>3,301</b>
1980	GW	1,936	22	0	250	2	646	2,856
	SW	0	0	0	251	0	850	1,101
<b>Total</b>		<b>1,936</b>	<b>22</b>	<b>0</b>	<b>501</b>	<b>2</b>	<b>1,496</b>	<b>3,957</b>
1984	GW	2,474	23	0	35	0	590	3,122
	SW	0	0	0	105	0	886	991
<b>Total</b>		<b>2,474</b>	<b>23</b>	<b>0</b>	<b>140</b>	<b>0</b>	<b>1,476</b>	<b>4,113</b>
1985	GW	2,605	23	0	55	0	527	3,210
	SW	0	0	0	168	0	791	959
<b>Total</b>		<b>2,605</b>	<b>23</b>	<b>0</b>	<b>223</b>	<b>0</b>	<b>1,318</b>	<b>4,169</b>
1986	GW	2,655	27	0	56	0	528	3,266
	SW	0	0	0	169	0	792	961
<b>Total</b>		<b>2,655</b>	<b>27</b>	<b>0</b>	<b>225</b>	<b>0</b>	<b>1,320</b>	<b>4,227</b>
1987	GW	2,731	4	0	56	0	555	3,346
	SW	0	0	0	169	0	834	1,003
<b>Total</b>		<b>2,731</b>	<b>4</b>	<b>0</b>	<b>225</b>	<b>0</b>	<b>1,389</b>	<b>4,349</b>
1988	GW	2,823	6	0	56	0	577	3,462
	SW	0	0	0	169	0	865	1,034
<b>Total</b>		<b>2,823</b>	<b>6</b>	<b>0</b>	<b>225</b>	<b>0</b>	<b>1,442</b>	<b>4,496</b>
1989	GW	2,710	6	0	172	0	567	3,455
	SW	0	0	0	126	0	851	977
<b>Total</b>		<b>2,710</b>	<b>6</b>	<b>0</b>	<b>298</b>	<b>0</b>	<b>1,418</b>	<b>4,432</b>
1990	GW	2,991	5	0	164	0	559	3,719
	SW	0	0	0	119	0	839	958
<b>Total</b>		<b>2,991</b>	<b>5</b>	<b>0</b>	<b>283</b>	<b>0</b>	<b>1,398</b>	<b>4,677</b>
1991	GW	2,822	6	0	164	16	572	3,580
	SW	0	0	0	119	0	858	977
<b>Total</b>		<b>2,822</b>	<b>6</b>	<b>0</b>	<b>283</b>	<b>16</b>	<b>1,430</b>	<b>4,557</b>
1992	GW	2,926	0	0	128	16	685	3,755
	SW	0	0	0	93	0	1,026	1,119
<b>Total</b>		<b>2,926</b>	<b>0</b>	<b>0</b>	<b>221</b>	<b>16</b>	<b>1,711</b>	<b>4,874</b>

Disclaimer: The Water Use estimates posted are subject to revision as additional data and corrections are made available to the TWDB.

1993	GW	3,116	0	0	263	16	751	4,146
	SW	0	0	0	155	0	1,127	1,282
<b>Total</b>		<b>3,116</b>	<b>0</b>	<b>0</b>	<b>418</b>	<b>16</b>	<b>1,878</b>	<b>5,428</b>
1994	GW	3,038	4	0	379	16	747	4,184
	SW	0	0	0	186	0	1,121	1,307
<b>Total</b>		<b>3,038</b>	<b>4</b>	<b>0</b>	<b>565</b>	<b>16</b>	<b>1,868</b>	<b>5,491</b>
1995	GW	3,007	4	0	336	16	773	4,136
	SW	0	0	0	197	0	1,160	1,357
<b>Total</b>		<b>3,007</b>	<b>4</b>	<b>0</b>	<b>533</b>	<b>16</b>	<b>1,933</b>	<b>5,493</b>
1996	GW	3,291	4	0	322	16	692	4,325
	SW	0	0	0	189	0	1,038	1,227
<b>Total</b>		<b>3,291</b>	<b>4</b>	<b>0</b>	<b>511</b>	<b>16</b>	<b>1,730</b>	<b>5,552</b>
1997	GW	3,132	4	0	322	16	638	4,112
	SW	0	0	0	189	0	957	1,146
<b>Total</b>		<b>3,132</b>	<b>4</b>	<b>0</b>	<b>511</b>	<b>16</b>	<b>1,595</b>	<b>5,258</b>
1998	GW	3,405	6	0	322	16	602	4,351
	SW	0	0	0	189	0	903	1,092
<b>Total</b>		<b>3,405</b>	<b>6</b>	<b>0</b>	<b>511</b>	<b>16</b>	<b>1,505</b>	<b>5,443</b>
1999	GW	3,369	11	0	453	16	636	4,485
	SW	0	0	0	266	0	955	1,221
<b>Total</b>		<b>3,369</b>	<b>11</b>	<b>0</b>	<b>719</b>	<b>16</b>	<b>1,591</b>	<b>5,706</b>
2000	GW	3,336	11	0	495	16	619	4,477
	SW	0	0	0	470	0	928	1,398
<b>Total</b>		<b>3,336</b>	<b>11</b>	<b>0</b>	<b>965</b>	<b>16</b>	<b>1,547</b>	<b>5,875</b>
2001	GW	2,977	13	0	661	8	454	4,113
	SW	0	0	0	610	0	1,107	1,717
<b>Total</b>		<b>2,977</b>	<b>13</b>	<b>0</b>	<b>1,271</b>	<b>8</b>	<b>1,561</b>	<b>5,830</b>
2002	GW	2,833	16	0	688	8	467	4,012
	SW	0	0	0	634	0	1,140	1,774
<b>Total</b>		<b>2,833</b>	<b>16</b>	<b>0</b>	<b>1,322</b>	<b>8</b>	<b>1,607</b>	<b>5,786</b>
2003	GW	2,880	12	0	571	8	471	3,942
	SW	0	0	0	8	0	1,148	1,156
<b>Total</b>		<b>2,880</b>	<b>12</b>	<b>0</b>	<b>579</b>	<b>8</b>	<b>1,619</b>	<b>5,098</b>
2004	GW	3,540	13	0	580	8	481	4,622
	SW	0	0	0	3	0	1,172	1,175
<b>Total</b>		<b>3,540</b>	<b>13</b>	<b>0</b>	<b>583</b>	<b>8</b>	<b>1,653</b>	<b>5,797</b>

**NOTE:** All Pumpage reported in acre-feet

3/6/2009

**Source:** TWDB Water Use Survey Database (<http://www.twdb.state.tx.us/wushistorical/DesktopDefault.aspx?PageID=1>)

**Table 3**  
**2007 State Water Plan**  
**Projected Surface Water Supplies**  
**Lost Pines GCD**

**Bastrop County**

RWPG	Water User Group	County	River Basin	Source Name	2010	2020	2030	2040	2050	2060
K	Aqua WSC	Bastrop	Colorado	Highland Lakes Lake/ Reservoir System	3,822	3,634	3,475	3,366	0	0
K	County Other	Bastrop	Colorado	Highland Lakes Lake/ Reservoir System	2,050	700	700	700	700	700
K	Irrigation	Bastrop	Colorado	Colorado River Combined Run-of-River Irrigation	750	750	750	750	750	750
K	Livestock	Bastrop	Brazos	Livestock Local Supply	154	154	154	154	154	154
K	Livestock	Bastrop	Colorado	Livestock Local Supply	696	696	696	696	696	696
K	Livestock	Bastrop	Guadalupe	Livestock Local Supply	5	5	5	5	5	5
K	Manufacturing	Bastrop	Colorado	Other Local Supply	48	48	48	48	48	48
K	Mining	Bastrop	Colorado	Other Local Supply	10	8	7	7	9	9
K	Steam Electric Power	Bastrop	Colorado	Highland Lakes Lake/ Reservoir System	16,720	16,720	16,720	13,970	10,750	10,750
<b>Total Projected Surface Water Supplies (acre-feet per year) =</b>					<b>24,255</b>	<b>22,715</b>	<b>22,555</b>	<b>19,696</b>	<b>13,112</b>	<b>13,112</b>

Source: Volume 3, 2007 State Water Planning Database  
(<http://www.twdb.state.tx.us/DATA/db07/defaultReadOnly.asp>)

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**Lee County**

RWPG	Water User Group	County	River Basin	Source Name	2010	2020	2030	2040	2050	2060
G	Irrigation	Lee	Brazos	Brazos River Combined Run-of-River Irrigation	108	108	108	108	108	108
G	Irrigation	Lee	Colorado	Brazos River Combined Run-of-River Irrigation	20	20	20	20	20	20
G	Livestock	Lee	Brazos	Livestock Local Supply	1,299	1,299	1,299	1,299	1,299	1,299
G	Livestock	Lee	Colorado	Livestock Local Supply	248	248	248	248	248	248
<b>Total Projected Surface Water Supplies (acre-feet per year) =</b>					<b>1,675</b>	<b>1,675</b>	<b>1,675</b>	<b>1,675</b>	<b>1,675</b>	<b>1,675</b>

Source: Volume 3, 2007 State Water Planning Database  
 (<http://www.twdb.state.tx.us/DATA/db07/defaultReadOnly.asp>)

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**Table 4**  
**2007 State Water Plan**  
**Projected Water Demands**  
**Lost Pines GCD**

**Bastrop County**

RWPG	Water User Group	County	River Basin	2010	2020	2030	2040	2050	2060
K	Aqua WSC	Bastrop	Colorado	5,424	6,547	7,827	9,377	11,326	13,859
K	Bastrop	Bastrop	Colorado	1,460	1,755	2,115	2,518	3,040	3,709
K	Bastrop County WCID #2	Bastrop	Colorado	341	473	626	801	1,029	1,315
K	County Other	Bastrop	Brazos	93	140	194	257	336	435
K	County Other	Bastrop	Colorado	2,275	3,429	4,747	6,276	8,211	10,634
K	County Other	Bastrop	Guadalupe	61	91	127	167	219	284
K	Creedmoor-Maha WSC	Bastrop	Colorado	19	23	29	35	43	54
K	Elgin	Bastrop	Colorado	1,063	1,193	1,344	1,521	1,757	2,066
K	Irrigation	Bastrop	Brazos	89	78	68	59	52	45
K	Irrigation	Bastrop	Colorado	1,521	1,329	1,158	1,013	882	769
K	Lee County WSC	Bastrop	Brazos	49	61	75	92	112	139
K	Lee County WSC	Bastrop	Colorado	77	95	117	143	175	217
K	Livestock	Bastrop	Brazos	259	259	259	259	259	259
K	Livestock	Bastrop	Colorado	1,202	1,202	1,202	1,202	1,202	1,202
K	Livestock	Bastrop	Guadalupe	61	61	61	61	61	61
K	Manufacturing	Bastrop	Colorado	84	101	119	137	155	167
K	Manufacturing	Bastrop	Guadalupe	8	10	11	13	14	16
K	Manville WSC	Bastrop	Colorado	67	94	125	161	207	266
K	Mining	Bastrop	Brazos	10	9	10	11	11	11
K	Mining	Bastrop	Colorado	5,016	5,018	5,018	18	19	20
K	Mining	Bastrop	Guadalupe	7	8	8	8	8	8
K	Polonia WSC	Bastrop	Colorado	18	23	29	35	44	55
K	Smithville	Bastrop	Colorado	732	838	972	1,122	1,319	1,577
K	Steam Electric Power	Bastrop	Colorado	12,000	14,000	16,000	18,000	19,500	19,500
<b>Total Projected Water Demands</b>									
<b>(acre-feet per year) =</b>				<b>31,936</b>	<b>36,837</b>	<b>42,241</b>	<b>43,286</b>	<b>49,981</b>	<b>56,668</b>

Source: Volume 3, 2007 State Water Planning Database  
(<http://www.twdb.state.tx.us/DATA/db07/defaultReadOnly.asp>)

3/6/2009



## Lee County

RWPG	Water User Group	County	River Basin	2010	2020	2030	2040	2050	2060
G	Aqua WSC	Lee	Brazos	443	494	532	567	596	625
G	County Other	Lee	Brazos	53	51	49	47	46	46
G	County Other	Lee	Colorado	276	265	256	247	241	239
G	Giddings	Lee	Brazos	617	702	771	824	873	918
G	Giddings	Lee	Colorado	489	556	611	652	691	727
G	Irrigation	Lee	Brazos	738	720	700	681	661	643
G	Irrigation	Lee	Colorado	202	196	191	186	181	175
G	Lee County WSC	Lee	Brazos	721	834	931	1,011	1,079	1,143
G	Lexington	Lee	Brazos	270	305	334	357	378	397
G	Livestock	Lee	Brazos	1,299	1,299	1,299	1,299	1,299	1,299
G	Livestock	Lee	Colorado	248	248	248	248	248	248
G	Manufacturing	Lee	Colorado	13	14	15	16	17	18
G	Manville WSC	Lee	Brazos	19	25	30	34	38	41
G	Mining	Lee	Brazos	5,450	5,450	5,450	5,450	13	13
G	Southwest Milam WSC	Lee	Brazos	44	52	58	63	67	71
<b>Total Projected Water Demands</b>									
<b>(acre-feet per year) =</b>				<b>10,882</b>	<b>11,211</b>	<b>11,475</b>	<b>11,682</b>	<b>6,428</b>	<b>6,603</b>

Source: Volume 3, 2007 State Water Planning Database  
 (<http://www.twdb.state.tx.us/DATA/db07/defaultReadOnly.asp>)

3/6/2009

**Table 5**  
**Historical Groundwater Pumpage Summary**  
**TWDB - Water Use Survey**  
**Lost Pines GCD**  
Unit: Acre Feet (ACFT)

**Bastrop County**

Year	Aquifer	Steam					Total	
		Municipal	Manufacturing	Electric	Irrigation	Mining		Livestock
1980	CARRIZO-WILCOX	3,905	152	0	1,394	0	790	6,241
	OTHER	11	0	0	24	0	234	269
	QUEEN CITY	56	0	0	44	0	150	250
	SPARTA	2	0	0	36	0	58	96
<b>Total</b>		<b>3,974</b>	<b>152</b>	<b>0</b>	<b>1,498</b>	<b>0</b>	<b>1,232</b>	<b>6,856</b>
1984	CARRIZO-WILCOX	5,570	133	0	311	10	400	6,424
	OTHER	15	0	0	5	0	119	139
	QUEEN CITY	46	0	0	0	0	75	121
	SPARTA	3	0	0	9	0	30	42
<b>Total</b>		<b>5,634</b>	<b>133</b>	<b>0</b>	<b>325</b>	<b>10</b>	<b>624</b>	<b>6,726</b>
1985	CARRIZO-WILCOX	5,486	128	0	100	10	360	6,084
	OTHER	15	0	0	2	0	107	124
	QUEEN CITY	43	0	0	0	0	69	112
	SPARTA	3	0	0	3	0	27	33
<b>Total</b>		<b>5,547</b>	<b>128</b>	<b>0</b>	<b>105</b>	<b>10</b>	<b>563</b>	<b>6,353</b>
1986	CARRIZO-WILCOX	5,265	132	0	49	10	335	5,791
	OTHER	16	0	0	1	0	99	116
	QUEEN CITY	44	0	0	0	0	63	107
	SPARTA	3	0	0	1	0	25	29
<b>Total</b>		<b>5,328</b>	<b>132</b>	<b>0</b>	<b>51</b>	<b>10</b>	<b>522</b>	<b>6,043</b>
1987	CARRIZO-WILCOX	6,119	59	0	49	12	357	6,596
	OTHER	17	0	0	1	0	107	125
	QUEEN CITY	50	0	0	0	0	69	119
	SPARTA	3	0	0	1	0	27	31
<b>Total</b>		<b>6,189</b>	<b>59</b>	<b>0</b>	<b>51</b>	<b>12</b>	<b>560</b>	<b>6,871</b>
1988	CARRIZO-WILCOX	6,441	24	0	72	10	378	6,925
	OTHER	18	0	0	1	0	113	132
	QUEEN CITY	50	0	0	0	0	72	122
	SPARTA	3	0	0	2	0	28	33
<b>Total</b>		<b>6,512</b>	<b>24</b>	<b>0</b>	<b>75</b>	<b>10</b>	<b>591</b>	<b>7,212</b>
1989	CARRIZO-WILCOX	6,785	24	0	259	10	371	7,449
	OTHER	19	0	0	5	0	111	135
	QUEEN CITY	56	0	0	0	0	71	127
	SPARTA	3	0	0	8	0	28	39
<b>Total</b>		<b>6,863</b>	<b>24</b>	<b>0</b>	<b>272</b>	<b>10</b>	<b>581</b>	<b>7,750</b>
1990	CARRIZO-WILCOX	6,575	23	0	309	10	366	7,283
	OTHER	20	0	0	6	0	109	135
	QUEEN CITY	57	0	0	0	0	69	126
	SPARTA	3	0	0	8	0	28	39
<b>Total</b>		<b>6,655</b>	<b>23</b>	<b>0</b>	<b>323</b>	<b>10</b>	<b>572</b>	<b>7,583</b>
1991	CARRIZO-WILCOX	6,338	10	0	308	20	374	7,050
	OTHER	14	0	0	6	0	111	131
	QUEEN CITY	77	0	0	0	6	71	154
	SPARTA	1	0	0	8	0	29	38
<b>Total</b>		<b>6,430</b>	<b>10</b>	<b>0</b>	<b>322</b>	<b>26</b>	<b>585</b>	<b>7,373</b>
1992	CARRIZO-WILCOX	6,177	12	0	309	20	390	6,908
	OTHER	10	0	0	6	0	116	132

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1992	QUEEN CITY	83	0	0	0	0	74	157
	SPARTA	0	0	0	8	0	30	38
<b>Total</b>		<b>6,270</b>	<b>12</b>	<b>0</b>	<b>323</b>	<b>20</b>	<b>610</b>	<b>7,235</b>
1993	CARRIZO-WILCOX	6,880	62	0	172	20	389	7,523
	OTHER	9	0	0	4	0	116	129
	QUEEN CITY	47	0	0	0	0	74	121
	SPARTA	0	0	0	5	0	30	35
<b>Total</b>		<b>6,936</b>	<b>62</b>	<b>0</b>	<b>181</b>	<b>20</b>	<b>609</b>	<b>7,808</b>
1994	CARRIZO-WILCOX	6,842	67	0	423	20	404	7,756
	OTHER	10	0	0	0	0	120	130
	QUEEN CITY	48	0	0	0	0	77	125
	SPARTA	0	0	0	0	0	31	31
<b>Total</b>		<b>6,900</b>	<b>67</b>	<b>0</b>	<b>423</b>	<b>20</b>	<b>632</b>	<b>8,042</b>
1995	CARRIZO-WILCOX	7,122	62	0	443	22	382	8,031
	OTHER	2	0	0	0	0	114	116
	QUEEN CITY	29	0	0	0	0	74	103
	SPARTA	0	0	0	0	0	29	29
<b>Total</b>		<b>7,153</b>	<b>62</b>	<b>0</b>	<b>443</b>	<b>22</b>	<b>599</b>	<b>8,279</b>
1996	CARRIZO-WILCOX	8,340	65	0	443	22	449	9,319
	OTHER	2	0	0	0	0	134	136
	QUEEN CITY	18	4	0	0	0	87	109
	SPARTA	0	0	0	0	0	34	34
<b>Total</b>		<b>8,360</b>	<b>69</b>	<b>0</b>	<b>443</b>	<b>22</b>	<b>704</b>	<b>9,598</b>
1997	CARRIZO-WILCOX	7,874	65	0	395	22	325	8,681
	OTHER	2	0	0	0	0	97	99
	QUEEN CITY	19	0	0	0	0	63	82
	SPARTA	0	0	0	0	0	25	25
<b>Total</b>		<b>7,895</b>	<b>65</b>	<b>0</b>	<b>395</b>	<b>22</b>	<b>510</b>	<b>8,887</b>
1998	CARRIZO-WILCOX	8,908	19	0	343	22	373	9,665
	OTHER	2	0	0	0	0	112	114
	QUEEN CITY	21	0	0	0	0	72	93
	SPARTA	0	0	0	0	0	29	29
<b>Total</b>		<b>8,931</b>	<b>19</b>	<b>0</b>	<b>343</b>	<b>22</b>	<b>586</b>	<b>9,901</b>
1999	CARRIZO-WILCOX	9,372	30	0	234	22	401	10,059
	OTHER	2	0	0	0	0	120	122
	QUEEN CITY	23	0	0	0	0	78	101
	SPARTA	0	0	0	0	0	31	31
<b>Total</b>		<b>9,397</b>	<b>30</b>	<b>0</b>	<b>234</b>	<b>22</b>	<b>630</b>	<b>10,313</b>
2000	CARRIZO-WILCOX	9,226	38	0	904	22	389	10,579
	OTHER	2	0	0	0	0	116	118
	QUEEN CITY	22	0	0	0	0	75	97
	SPARTA	0	0	0	0	0	30	30
<b>Total</b>		<b>9,250</b>	<b>38</b>	<b>0</b>	<b>904</b>	<b>22</b>	<b>610</b>	<b>10,824</b>
2001	CARRIZO-WILCOX	9,121	41	0	834	22	392	10,410
	OTHER	2	0	0	0	0	117	119
	QUEEN CITY	45	0	0	0	0	77	122
	SPARTA	0	0	0	0	0	30	30
<b>Total</b>		<b>9,168</b>	<b>41</b>	<b>0</b>	<b>834</b>	<b>22</b>	<b>616</b>	<b>10,681</b>
2002	CARRIZO-WILCOX	9,803	28	0	834	22	392	11,079
	OTHER	2	0	0	0	0	117	119
	QUEEN CITY	46	0	0	0	0	77	123
	SPARTA	0	0	0	0	0	30	30
<b>Total</b>		<b>9,851</b>	<b>28</b>	<b>0</b>	<b>834</b>	<b>22</b>	<b>616</b>	<b>11,351</b>
2003	CARRIZO-WILCOX	10,352	27	0	400	22	232	11,033
	OTHER	2	0	0	0	0	69	71
	QUEEN CITY	44	0	0	0	0	45	89
	SPARTA	0	0	0	0	0	18	18
<b>Total</b>		<b>10,398</b>	<b>27</b>	<b>0</b>	<b>400</b>	<b>22</b>	<b>364</b>	<b>11,211</b>

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NOTE: All Pumpage reported in acre-feet

3/6/2009

Source: TWDB Water Use Survey Database (<http://www.twdb.state.tx.us/wushistorical/DesktopDefault.aspx?PageID=2>)

Lee County

Year	Aquifer	Steam					Total	
		Municipal	Manufacturing	Electric	Irrigation	Mining Livestock		
1980	CARRIZO-WILCOX	1,349	0	0	165	2	241	1,757
	OTHER	67	0	0	0	0	128	195
	QUEEN CITY	499	0	0	85	0	211	795
	SPARTA	43	0	0	0	0	66	109
<b>Total</b>		<b>1,958</b>	<b>0</b>	<b>0</b>	<b>250</b>	<b>2</b>	<b>646</b>	<b>2,856</b>
1984	CARRIZO-WILCOX	1,584	0	0	21	0	219	1,824
	OTHER	53	0	0	0	0	117	170
	QUEEN CITY	727	0	0	11	0	193	931
	SPARTA	83	0	0	3	0	61	147
<b>Total</b>		<b>2,447</b>	<b>0</b>	<b>0</b>	<b>35</b>	<b>0</b>	<b>590</b>	<b>3,072</b>
1985	CARRIZO-WILCOX	1,708	0	0	35	0	196	1,939
	OTHER	55	0	0	2	0	105	162
	QUEEN CITY	738	0	0	18	0	172	928
	SPARTA	62	0	0	0	0	54	116
<b>Total</b>		<b>2,563</b>	<b>0</b>	<b>0</b>	<b>55</b>	<b>0</b>	<b>527</b>	<b>3,145</b>
1986	CARRIZO-WILCOX	1,831	0	0	35	0	196	2,062
	OTHER	55	0	0	3	0	105	163
	QUEEN CITY	678	0	0	18	0	172	868
	SPARTA	43	0	0	0	0	55	98
<b>Total</b>		<b>2,607</b>	<b>0</b>	<b>0</b>	<b>56</b>	<b>0</b>	<b>528</b>	<b>3,191</b>
1987	CARRIZO-WILCOX	1,811	0	0	35	0	206	2,052
	OTHER	48	0	0	3	0	111	162
	QUEEN CITY	736	0	0	18	0	181	935
	SPARTA	41	0	0	0	0	57	98
<b>Total</b>		<b>2,636</b>	<b>0</b>	<b>0</b>	<b>56</b>	<b>0</b>	<b>555</b>	<b>3,247</b>
1988	CARRIZO-WILCOX	1,881	0	0	35	0	215	2,131
	OTHER	44	0	0	3	0	115	162
	QUEEN CITY	753	0	0	18	0	188	959
	SPARTA	41	0	0	0	0	59	100
<b>Total</b>		<b>2,719</b>	<b>0</b>	<b>0</b>	<b>56</b>	<b>0</b>	<b>577</b>	<b>3,352</b>
1989	CARRIZO-WILCOX	1,733	0	0	104	0	210	2,047
	OTHER	46	0	0	15	0	113	174
	QUEEN CITY	756	0	0	53	0	185	994
	SPARTA	48	0	0	0	0	58	106
<b>Total</b>		<b>2,583</b>	<b>0</b>	<b>0</b>	<b>172</b>	<b>0</b>	<b>566</b>	<b>3,321</b>
1990	CARRIZO-WILCOX	1,918	0	0	103	0	207	2,228
	OTHER	65	0	0	8	0	112	185
	QUEEN CITY	860	0	0	53	0	182	1,095
	SPARTA	72	0	0	0	0	58	130
<b>Total</b>		<b>2,915</b>	<b>0</b>	<b>0</b>	<b>164</b>	<b>0</b>	<b>559</b>	<b>3,638</b>
1991	CARRIZO-WILCOX	1,748	0	0	103	16	212	2,079
	OTHER	67	0	0	8	0	114	189
	QUEEN CITY	840	0	0	53	0	186	1,079
	SPARTA	76	0	0	0	0	60	136
<b>Total</b>		<b>2,731</b>	<b>0</b>	<b>0</b>	<b>164</b>	<b>16</b>	<b>572</b>	<b>3,483</b>
1992	CARRIZO-WILCOX	1,812	0	0	81	16	253	2,162
	OTHER	68	0	0	6	0	137	211
	QUEEN CITY	878	0	0	41	0	223	1,142
	SPARTA	82	0	0	0	0	72	154
<b>Total</b>		<b>2,840</b>	<b>0</b>	<b>0</b>	<b>128</b>	<b>16</b>	<b>685</b>	<b>3,669</b>
	CARRIZO-WILCOX	1,891	0	0	169	16	278	2,354

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Thursday, March 22, 2007  
Table 5

1993	OTHER	66	0	0	8	0	150	224
	QUEEN CITY	990	0	0	86	0	245	1,321
	SPARTA	78	0	0	0	0	79	157
<b>Total</b>		<b>3,025</b>	<b>0</b>	<b>0</b>	<b>263</b>	<b>16</b>	<b>752</b>	<b>4,056</b>
1994	CARRIZO-WILCOX	1,852	0	0	249	16	276	2,393
	OTHER	68	0	0	0	0	149	217
	QUEEN CITY	937	0	0	130	0	243	1,310
	SPARTA	82	0	0	0	0	79	161
<b>Total</b>		<b>2,939</b>	<b>0</b>	<b>0</b>	<b>379</b>	<b>16</b>	<b>747</b>	<b>4,081</b>
1995	CARRIZO-WILCOX	1,714	0	0	220	16	285	2,235
	OTHER	86	0	0	0	0	154	240
	QUEEN CITY	1,029	0	0	116	0	252	1,397
	SPARTA	88	0	0	0	0	81	169
<b>Total</b>		<b>2,917</b>	<b>0</b>	<b>0</b>	<b>336</b>	<b>16</b>	<b>772</b>	<b>4,041</b>
1996	CARRIZO-WILCOX	1,833	0	0	211	16	255	2,315
	OTHER	88	0	0	0	0	139	227
	QUEEN CITY	1,181	0	0	111	0	226	1,518
	SPARTA	94	0	0	0	0	73	167
<b>Total</b>		<b>3,196</b>	<b>0</b>	<b>0</b>	<b>322</b>	<b>16</b>	<b>693</b>	<b>4,227</b>
1997	CARRIZO-WILCOX	1,721	0	0	211	16	234	2,182
	OTHER	88	0	0	0	0	128	216
	QUEEN CITY	1,133	0	0	111	0	208	1,452
	SPARTA	82	0	0	0	0	67	149
<b>Total</b>		<b>3,024</b>	<b>0</b>	<b>0</b>	<b>322</b>	<b>16</b>	<b>637</b>	<b>3,999</b>
1998	CARRIZO-WILCOX	1,871	0	0	211	16	221	2,319
	OTHER	96	0	0	0	0	120	216
	QUEEN CITY	1,232	0	0	111	0	197	1,540
	SPARTA	89	0	0	0	0	63	152
<b>Total</b>		<b>3,288</b>	<b>0</b>	<b>0</b>	<b>322</b>	<b>16</b>	<b>601</b>	<b>4,227</b>
1999	CARRIZO-WILCOX	1,851	0	0	297	16	234	2,398
	OTHER	95	0	0	0	0	128	223
	QUEEN CITY	1,219	0	0	156	0	208	1,583
	SPARTA	88	0	0	0	0	67	155
<b>Total</b>		<b>3,253</b>	<b>0</b>	<b>0</b>	<b>453</b>	<b>16</b>	<b>637</b>	<b>4,359</b>
2000	CARRIZO-WILCOX	1,833	0	0	324	16	228	2,401
	OTHER	94	0	0	0	0	124	218
	QUEEN CITY	1,207	0	0	171	0	202	1,580
	SPARTA	87	0	0	0	0	65	152
<b>Total</b>		<b>3,221</b>	<b>0</b>	<b>0</b>	<b>495</b>	<b>16</b>	<b>619</b>	<b>4,351</b>
2001	CARRIZO-WILCOX	1,573	0	0	430	16	229	2,248
	OTHER	96	0	0	0	0	126	222
	QUEEN CITY	1,175	0	0	231	0	204	1,610
	SPARTA	100	0	0	0	0	65	165
<b>Total</b>		<b>2,944</b>	<b>0</b>	<b>0</b>	<b>661</b>	<b>16</b>	<b>624</b>	<b>4,245</b>
2002	CARRIZO-WILCOX	1,463	0	0	448	16	236	2,163
	OTHER	97	0	0	0	0	130	227
	QUEEN CITY	1,210	0	0	240	0	210	1,660
	SPARTA	101	0	0	0	0	67	168
<b>Total</b>		<b>2,871</b>	<b>0</b>	<b>0</b>	<b>688</b>	<b>16</b>	<b>643</b>	<b>4,218</b>
2003	CARRIZO-WILCOX	1,424	0	0	372	16	190	2,002
	OTHER	99	0	0	0	0	104	203
	QUEEN CITY	1,256	0	0	199	0	169	1,624
	SPARTA	104	0	0	0	0	55	159
<b>Total</b>		<b>2,883</b>	<b>0</b>	<b>0</b>	<b>571</b>	<b>16</b>	<b>518</b>	<b>3,988</b>

**NOTE:** All Pumpage reported in acre-feet

3/6/2009

**Source:** TWDB Water Use Survey Database (<http://www.twdb.state.tx.us/wushistorical/DesktopDefault.aspx?PageID=2>)

Disclaimer: The Water Use estimates posted are subject to revision as additional data and corrections are made available to the TWDB.

Thursday, March 22, 2007  
Table 5

**Table 6**  
**2007 State Water Plan**  
**Projected Water Needs**  
**Lost Pines GCD**

Positive values reflect a water surplus; negative values reflect a water need.

**Bastrop County**

RWPG	WUG	County	River Basin	2010	2020	2030	2040	2050	2060
K	Aqua WSC	Bastrop	Colorado	4,350	3,039	1,600	-59	-5,374	-7,907
K	Bastrop	Bastrop	Colorado	467	172	-188	-591	-1,113	-1,782
K	Bastrop County WCID #2	Bastrop	Colorado	830	698	545	370	142	-144
K	County Other	Bastrop	Brazos	270	282	292	267	200	101
K	County Other	Bastrop	Colorado	1,026	-1,722	-3,379	-5,130	-7,065	-9,488
K	County Other	Bastrop	Guadalupe	135	105	69	29	-23	-88
K	Creedmoor-Maha WSC	Bastrop	Colorado	1	-3	-8	-12	-19	-30
K	Elgin	Bastrop	Colorado	616	481	327	149	-87	-395
K	Irrigation	Bastrop	Brazos	-61	-50	-40	-31	-24	-17
K	Irrigation	Bastrop	Colorado	-58	134	305	450	581	694
K	Lee County WSC	Bastrop	Brazos	676	664	650	633	613	586
K	Lee County WSC	Bastrop	Colorado	1,046	1,028	1,006	980	948	906
K	Livestock	Bastrop	Brazos	75	75	75	75	75	75
K	Livestock	Bastrop	Colorado	4,816	4,816	4,816	4,816	4,816	4,816
K	Livestock	Bastrop	Guadalupe	341	341	341	341	341	341
K	Manufacturing	Bastrop	Colorado	2	-7	-17	-25	-32	-44
K	Manufacturing	Bastrop	Guadalupe	-8	-10	-11	-13	-14	-16
K	Manville WSC	Bastrop	Colorado	101	79	54	27	-7	-52
K	Mining	Bastrop	Brazos	18	19	18	17	17	17
K	Mining	Bastrop	Colorado	-4,293	-4,297	-4,298	702	703	702
K	Mining	Bastrop	Guadalupe	67	66	66	66	66	66
K	Polonia WSC	Bastrop	Colorado	7	1	-4	-10	-17	-25
K	Smithville	Bastrop	Colorado	98	84	53	-50	-36	-294
K	Steam Electric Power	Bastrop	Colorado	4,720	2,720	720	-4,030	-8,750	-8,750
<b>Total Projected Water Needs (acre-feet per year) =</b>				<b>-4,420</b>	<b>-6,089</b>	<b>-7,945</b>	<b>-9,951</b>	<b>-22,561</b>	<b>-29,032</b>

Source: Volume 3, 2007 State Water Planning Database

3/6/2009

(<http://www.twdb.state.tx.us/DATA/db07/defaultReadOnly.asp>)

Lee County

RWPG	WUG	County	River Basin	2010	2020	2030	2040	2050	2060
G	Aqua WSC	Lee	Brazos	3	-45	-83	-118	-147	-176
G	County Other	Lee	Brazos	15	17	19	21	22	22
G	County Other	Lee	Colorado	80	91	100	109	115	117
G	Giddings	Lee	Brazos	93	8	-61	-114	-163	-208
G	Giddings	Lee	Colorado	92	25	-30	-71	-110	-146
G	Irrigation	Lee	Brazos	102	101	101	103	103	102
G	Irrigation	Lee	Colorado	0	2	3	2	3	4
G	Lee County WSC	Lee	Brazos	-305	-418	-515	-595	-663	-726
G	Lexington	Lee	Brazos	496	461	432	409	388	369
G	Livestock	Lee	Brazos	0	0	0	0	0	0
G	Livestock	Lee	Colorado	0	0	0	0	0	0
G	Manufacturing	Lee	Colorado	5	4	3	2	1	0
G	Manville WSC	Lee	Brazos	23	16	11	7	3	0
G	Mining	Lee	Brazos	0	0	0	0	0	0
G	Southwest Milam WSC	Lee	Brazos	4	0	-10	-15	-19	-23
<b>Total Projected Water Needs (acre-feet per year) =</b>				<b>-305</b>	<b>-463</b>	<b>-699</b>	<b>-913</b>	<b>-1,102</b>	<b>-1,279</b>

Source: Volume 3, 2007 State Water Planning Database

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**Table 7**  
**2007 State Water Plan**  
**Projected Water Management Strategies**  
**Lost Pines GCD**

**Bastrop County**

RWPG	WUG	WUG County	River Basin	Water Management Strategy	Source Name	Source County	2010	2020	2030	2040	2050	2060
K	Steam Electric Power	Bastrop	Colorado	Amend LCRA Contract	Highland Lakes Lake/Reservoir System	Reservoir	0	0	0	1,280	2,780	2,780
K	County Other	Bastrop	Colorado	Development of Carrizo-Wilcox Aquifer	Carrizo-Wilcox Aquifer	Bastrop	0	0	0	0	0	924
K	County Other	Bastrop	Guadalupe	Development of Carrizo-Wilcox Aquifer	Carrizo-Wilcox Aquifer	Bastrop	0	0	0	0	23	88
K	Aqua WSC	Bastrop	Colorado	Expansion of Carrizo-Wilcox Aquifer	Carrizo-Wilcox Aquifer	Bastrop	0	0	0	59	2,124	4,796
K	Bastrop County WCID #2	Bastrop	Colorado	Expansion of Carrizo-Wilcox Aquifer	Carrizo-Wilcox Aquifer	Bastrop	0	0	0	0	0	144
K	County Other	Bastrop	Colorado	Expansion of Carrizo-Wilcox Aquifer	Carrizo-Wilcox Aquifer	Bastrop	0	330	1,987	3,738	5,673	7,172
K	Elgin	Bastrop	Colorado	Expansion of Carrizo-Wilcox Aquifer	Carrizo-Wilcox Aquifer	Bastrop	0	0	0	0	87	395
K	Manufacturing	Bastrop	Colorado	Expansion of Carrizo-Wilcox Aquifer	Carrizo-Wilcox Aquifer	Bastrop	0	7	17	25	32	44
K	Mining	Bastrop	Colorado	Expansion of Carrizo-Wilcox Aquifer	Carrizo-Wilcox Aquifer	Bastrop	4,293	4,297	4,298	0	0	0
K	Polonia WSC	Bastrop	Colorado	Expansion of Carrizo-Wilcox Aquifer	Carrizo-Wilcox Aquifer	Bastrop	0	0	4	10	17	25
K	Smithville	Bastrop	Colorado	Expansion of Carrizo-Wilcox Aquifer	Carrizo-Wilcox Aquifer	Bastrop	0	0	0	50	36	294
K	Manufacturing	Bastrop	Guadalupe	Expansion of Carrizo-Wilcox Aquifer	Carrizo-Wilcox Aquifer	Bastrop	8	10	11	13	14	16
K	Bastrop	Bastrop	Colorado	Expansion of Other Aquifer	Other Aquifer	Bastrop	0	0	0	0	300	791
K	Irrigation	Bastrop	Brazos	Expansion of Queen City Aquifer	Queen City Aquifer	Bastrop	40	40	40	31	24	17



K	Irrigation	Bastrop	Colorado	Expansion of Queen City Aquifer	Queen City Aquifer	Bastrop	58	0	0	0	0	0
K	Aqua WSC	Bastrop	Colorado	LCRA Contract Renewals	Highland Lakes Lake/Reservoir System	Reservoir	0	0	0	0	3,250	3,111
K	County Other	Bastrop	Colorado	LCRA Contract Renewals	Highland Lakes Lake/Reservoir System	Reservoir	42	1,392	1,392	1,392	1,392	1,392
K	Steam Electric Power	Bastrop	Colorado	LCRA Contract Renewals	Highland Lakes Lake/Reservoir System	Reservoir	0	0	0	2,750	5,970	5,970
K	Bastrop	Bastrop	Colorado	Municipal Conservation	Conservation	Bastrop	107	254	462	682	813	991
K	Elgin	Bastrop	Colorado	Municipal Conservation	Conservation	Bastrop	58	41	19	0	0	0
K	Smithville	Bastrop	Colorado	Municipal Conservation	Conservation	Bastrop	20	0	0	0	0	0
K	Irrigation	Bastrop	Brazos	Temporary Overdraft of Queen City Aquifer	Queen City Aquifer	Bastrop	21	10	0	0	0	0
K	Lee County WSC	Bastrop	Colorado	Water Transfer	Carrizo-Wilcox Aquifer	Bastrop	0	-48	-117	-171	-232	-319
K	Creedmoor-Maha WSC	Bastrop	Colorado	Water Transfer	Highland Lakes Lake/Reservoir System	Reservoir	0	3	8	12	19	30
K	Manville WSC	Bastrop	Colorado	Water Transfer	Highland Lakes Lake/Reservoir System	Reservoir	0	0	0	0	7	52
<b>Total Projected Water Management Strategies (acre-feet per year) =</b>							<b>4,647</b>	<b>6,336</b>	<b>8,121</b>	<b>9,871</b>	<b>22,329</b>	<b>28,713</b>

Source: Volume 3, 2007 State Water Planning Database  
(<http://www.twdb.state.tx.us/DATA/db07/defaultReadOnly.asp>)

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### Lee County

RWPG	WUG	WUG County	River Basin	Water Management Strategy	Source Name	Source County	2010	2020	2030	2040	2050	2060
G	Aqua WSC	Lee	Brazos	Additional Carrizo Aquifer Development	Carrizo-Wilcox Aquifer	Lee	0	285	270	252	233	212
G	Giddings	Lee	Brazos	Additional Carrizo Aquifer Development	Carrizo-Wilcox Aquifer	Lee	0	0	250	250	250	250
G	Giddings	Lee	Colorado	Additional Carrizo Aquifer Development	Carrizo-Wilcox Aquifer	Lee	0	0	150	150	150	150
G	Lee County WSC	Lee	Brazos	Additional Carrizo Aquifer Development	Carrizo-Wilcox Aquifer	Lee	750	750	750	750	750	750
G	Southwest Milam WSC	Lee	Brazos	Additional Carrizo Aquifer Development	Carrizo-Wilcox Aquifer	Milam	0	0	10	15	19	23

G	Giddings	Lee	Brazos	Municipal Water Conservation	Conservation	Lee	39	107	101	91	87	91
<b>Total Projected Water Management Strategies (acre-feet per year) =</b>							<b>789</b>	<b>1,142</b>	<b>1,531</b>	<b>1,508</b>	<b>1,489</b>	<b>1,476</b>

Source: Volume 3, 2007 State Water Planning Database  
(<http://www.twdb.state.tx.us/DATA/db07/defaultReadOnly.asp>)

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## **ATTACHMENT 1**

### **CERTIFIED COPY OF DISTRICT'S RESOLUTION ADOPTING THE MANAGEMENT PLAN**

A certified copy of the LPGCD's resolution adopting this Management Plan.

## **ATTACHMENT 2**

### **EVIDENCE OF NOTICE AND HEARING PROVIDING CITIZENS WITHIN THE DISTRICT THE OPPORTUNITY TO COMMENT ON THE MANAGEMENT PLAN PRIOR TO ADOPTION BY THE DISTRICT BOARD**

Evidence of public notice and hearing providing citizens within the District the opportunity to comment on the Management Plan prior to the adoption.

## **ATTACHMENT 3**

### **EVIDENCE OF PUBLIC NOTICE AND HEARING TO ADOPT THE MANAGEMENT PLAN**

Evidence of public notice and hearing prior to the adoption of this Management Plan.

## **ATTACHMENT 4**

### **DISTRICT BOARD RESOLUTION ADOPTING THE MANAGEMENT PLAN FOLLOWING NOTICE AND HEARING**

A copy of the District Board resolution adopting the Management Plan following notice and hearing.

## **ATTACHMENT 5**

### **EVIDENCE THAT FOLLOWING NOTICE AND HEARING THE DISTRICT COORDINATED WITH ALL SURFACE WATER MANAGEMENT ENTITIES**

Copies of certified letters addressed to surface water management entities, LCRA and BRA, that deliver a copy of the District's Management Plan for review and comment after the plan has been adopted by the District.