
Central Texas Groundwater Conservation District

*District
Management
Plan*

Adopted – April 16, 2007

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Mr. John Simmons
President, Board of Directors
Central Texas Groundwater Conservation District
P.O. Box 870
Burnet, Texas 78611

May 11, 2007

Re: Delivery of Groundwater Management Plan

Dear Mr. Simmons,

TCB Inc. is pleased to deliver to the Central Texas Groundwater Conservation District (CTGCD) this Groundwater Management Plan (Plan) for submittal to the Texas Water Development Board (TWDB). The Plan has been developed in conjunction with the CTGCD Management Plan Committee, the CTGCD Board of Directors and the CTGCD Legal Counsel; Lloyd Gosselink Blevins Rochelle & Townsend P.C. The simulations of the portion of the Northern Trinity aquifer in Burnet County using the TWDB Groundwater Availability Model for the N. Trinity / Woodbine aquifer performed to assess the projected effects of pumping; and the projections of groundwater availability from the Marble Falls, Hickory, and Ellenburger-San Saba aquifers in Burnet County described in the plan document were done under my supervision and direction.

The observations and assessments made in this Plan were based on data available from public sources or referenced published sources available at the time of the plan development. The values describing spring discharges and groundwater availability presented in the Plan are based on the available data, reasonable methods of assessment and policy decisions by the CTGCD Board of Directors. If new or different data regarding groundwater conditions in Burnet County is made available, or if the adopted policies of the CTGCD Board are amended, those values presented in the Plan may change.

I have enjoyed working with the CTGCD in the development of the Plan and look forward to assisting CTGCD in the future.

Sincerely,



Charles R. Williams P.G.

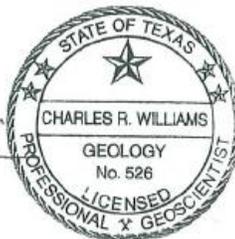


TABLE OF CONTENTS

I.	DISTRICT MISSION.....	4
II.	PURPOSE OF THE MANAGEMENT PLAN.....	4
III.	DISTRICT INFORMATION.....	5
IV.	STATEMENT OF GUIDING PRINCIPLES.....	14
V.	CRITERIA FOR PLAN CERTIFICATION.....	14
VI.	ESTIMATES OF TECHNICAL INFORMATION REQUIRED BY TWC §36.1071 / 31TAC 356.5.....	15
VII.	CONSIDER THE WATER SUPPLY NEEDS AND WATER MANAGEMENT STRATEGIES INCLUDED IN THE ADOPTED STATE WATER PLAN-TWC §36.1071(E)(4).....	24
VIII.	DETAILS ON THE DISTRICT MANAGEMENT OF GROUNDWATER.....	25
IX.	ACTIONS, PROCEDURES, PERFORMANCE AND AVOIDANCE FOR PLAN IMPLEMENTATION.....	27
X.	METHODOLOGY FOR TRACKING DISTRICT PROGRESS IN ACHIEVING MANAGEMENT GOALS–31 TAC 356.5(a)(6).....	28
XI.	GOALS, MANAGEMENT OBJECTIVES and PERFORMANCE STANDARDS.....	28
XII.	MANAGEMENT GOALS DETERMINED NOT-APPLICABLE TO THE DISTRICT ...	30
BIBLIOGRAPHY		32
APPENDIX A.....		33
APPENDIX B.....		40
APPENDIX C.....		42
APPENDIX D.....		47
APPENDIX E.....		49
APPENDIX F.....		50
APPENDIX G.....		51
APPENDIX H.....		53
APPENDIX I.....		56
Figure 1	Location and Boundaries of the Central Texas Groundwater Conservation District.....	7
Figure 2	Occurrence of the Trinity Aquifer in Burnet County.....	9
Figure 3	Occurrence of the Marble Falls Aquifer in Burnet County.....	11
Figure 4	Occurrence of the Ellenburger-San Saba Aquifer in Burnet County.....	12
Figure 5	Occurrence of the Hickory Aquifer in Burnet County.....	13
Table 1	Relationship of Geologic and Hydrologic Units in Burnet County.....	14
Table 2	Projected Surface Water Supplies for Burnet County in the 2007 State Water Plan.....	23
Table 3	Projected Burnet County Water Demand for the 2007 State Water Plan.....	24
Table 4	Groundwater-Based Water Management Strategies Recommended in 2007 State Water Plan....	25

I. DISTRICT MISSION

The mission of the Central Texas Groundwater Conservation District (District) is to protect and enhance the groundwater resources of Burnet County while protecting groundwater users and maintaining the economic vitality of the communities it serves, by adopting and enforcing rules consistent with State law.

II. PURPOSE OF THE MANAGEMENT PLAN

Senate Bill 1 (SB 1), enacted by the 75th Texas Legislature in 1997, and Senate Bill 2 (SB 2), enacted by the 77th Texas Legislature in 2001, established a comprehensive statewide planning process and the actions necessary for districts to manage and conserve the groundwater resources of the state of Texas. These bills required all underground water conservation districts to develop a management plan which defines the water needs and supply within each district and the goals each district will use to manage the underground water in order to meet its needs. In addition, the 79th Texas Legislature enacted HB 1763 in 2005 that requires joint planning among districts that are in the same Groundwater Management Area (GMA). These districts must establish the desired future conditions of the aquifers within their respective GMAs. Through this process, the districts will submit the desired future conditions to the executive administrator of the Texas Water Development Board (TWDB) who will provide each district with the estimates concerning the managed available groundwater in the management area based on the desired future conditions of the aquifers in the area. Technical information, such as the desired future conditions of the aquifers within the District's jurisdiction and the amount of managed available groundwater from such aquifers is required by statute to be included in the District's management plan and will guide the District's regulatory and management policies. This management plan is intended to satisfy the requirements of SB 1, SB 2, HB 1763, the statutory requirements of Texas Water Code (TWC) Chapter 36, and the rules and requirements of the TWDB.

This plan is required by the TWC and developed in accordance with instruction from the TWDB. The TWC and the TWDB require use of certain data provided by the TWDB. The projections of future water demands, surface water availability, water management strategies, and groundwater use in Burnet County were all provided to the District by TWDB. This document should be considered as a PLAN and will be used to identify activities or programs that the District will develop. The District considers the collection and development of site-specific data on groundwater use in Burnet County and the groundwater sources of Burnet County to be a high priority. This Plan will be updated as the District develops the site-specific data on the local groundwater use and aquifer conditions. The District is not restricted by the TWC or TWDB as to the frequency with which the Plan may be updated if considered it is appropriate by the District.

III. DISTRICT INFORMATION

A. Creation

The 79th Texas Legislature (Regular Session) created the District in 2005 by passage of SB 967. (Appendix A) The citizens of Burnet County confirmed creation of the District by an election held on September 24, 2005. The District was formed to protect the underground water resources for the citizens of Burnet County. To manage the groundwater resources under its jurisdiction the District is charged with the rights and responsibilities specified in its enabling legislation; the provisions of Chapter 36 of the Texas Water Code; this Management Plan, and the District Rules.

B. Directors

The Board of Directors consists of five members. These five directors are elected by the voters of Burnet County and serve a four-year term. The District observes the same four precincts as the Burnet County Commissioners with one at-large position. Director terms are staggered on a two-year interval. Elections are held in May, in even numbered years. A director may serve consecutive terms.

C. Authority

The District has the rights and responsibilities provided for in TWC Chapter 36 and 31 Texas Administrative Code (TAC) Chapter 356. The District is charged with undertaking hydrogeological studies, adopting a management plan, providing for the permitting of certain water wells and implementing programs to achieve statutory mandates. The District has rule-making authority to implement the policies and procedures needed to manage the groundwater resources of Burnet County.

D. Location and Extent

The boundaries of the District are the same as Burnet County. (Figure 1) This area encompasses approximately 1,019 square miles (approximately 652,160 acres). The District is bounded by Lampasas County to the north, Bell and Williamson Counties to the east, Travis and Blanco Counties to the south, and Llano and San Saba Counties to the west. Burnet County has a vibrant economy.

E. Topography and Drainage

Burnet County is located on the margin of two geographic regions. The eastern portion of the County is located in the Hill Country Region of the Balcones Escarpment. The western portion of the County is located in the Llano Uplift Region. The Colorado River and its tributaries drain the western and southern portions of the County. The tributaries of the Brazos River drain the northern and eastern portions the County.

F. Groundwater Resources of Burnet County

Burnet County enjoys a variety of groundwater resources. TWDB recognizes one major and three minor aquifers in the County. The TWDB classifies groundwater sources as major or minor aquifers. Major aquifers are defined by TWDB as aquifers that are capable of producing large yields to wells or that produce groundwater over a large area. TWDB has established no definition for a large area, but a large yield may be considered as greater than 500 gallons per minute. Minor aquifers are defined by TWDB as aquifers that may be capable of producing only limited yields to wells or that produce groundwater over a limited area. TWDB has established no definition for a limited area, but a limited yield may be less than 100 gallons per minute. Many localized sources of groundwater may not be listed as a major or minor aquifer by TWDB. However, TWDB recognizes that these classifications, or lack thereof, have no bearing on the local importance of a particular source of groundwater. Even though TWDB recognizes the potential local importance of unrecognized sources of groundwater little or no research may have been devoted to defining the extent or characterizing these resources. This is particularly true where local groundwater management agencies did not exist. At the time of development of this plan, the District has been in operation for less than two years and the existence of localized sources of groundwater is known to the District largely through citizen reports. However, the District is committed to better defining the extent and character of the groundwater resources of Burnet County. (Table 1)

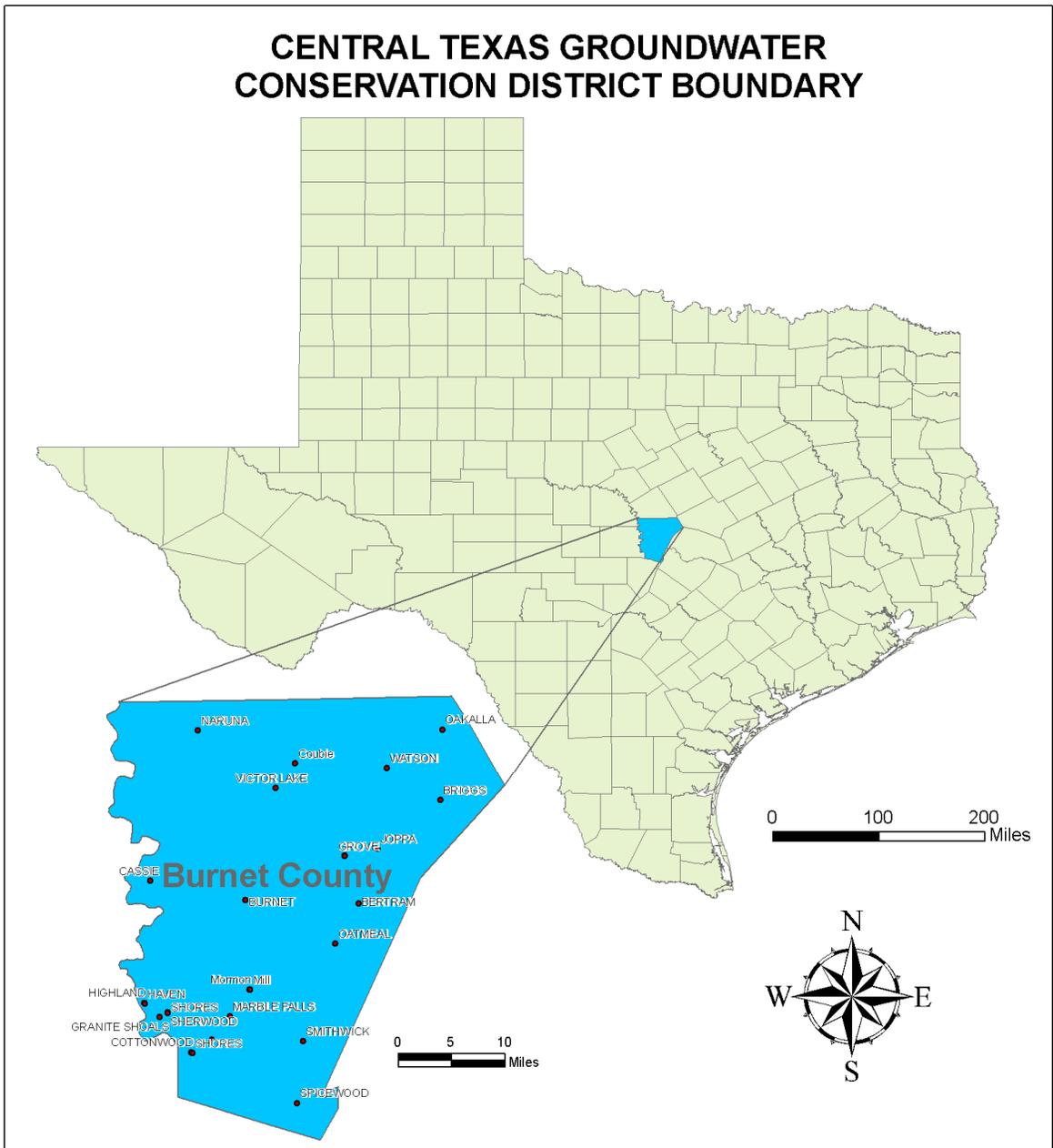


Figure 1, Location and Boundaries of the Central Texas Groundwater Conservation District

Major Aquifer

The only major aquifer located in Burnet County is the Trinity aquifer. (Figure 2)

Trinity Aquifer

The Trinity aquifer is composed of three subdivisions; the Upper Trinity; the Middle Trinity and the Lower Trinity aquifers. The Upper Trinity aquifer is composed of the Paluxy Sand and Glen Rose Formation; the Middle Trinity aquifer is composed of the Hensell Sand and Cow Creek Limestone; and the Lower Trinity aquifer is composed of the Sligo Limestone and Hosston Sand. The Upper Trinity aquifer crops out in the majority of eastern and central Burnet County. The Middle and Lower Trinity have limited outcrops in Burnet County, which both occur at or near the western most extent of the Trinity aquifer in Burnet County. Water in the Upper, Middle and Lower Trinity aquifers may not fully fill the rocks composing the aquifer and the water is in unconfined condition. This condition is un-pressurized and is also known as water-table condition. When water is encountered in this condition during drilling it will not rise in the well bore above the elevation at which it is encountered. The rock composing the Middle and Lower Trinity aquifers may be fully saturated with water but only in somewhat limited areas of eastern and southern Burnet County. This condition is known as confined or artesian condition. This condition is pressurized and when water is encountered during drilling it will rise above the elevation at which it is encountered. The availability of groundwater from the subdivisions of the Trinity aquifer is based on the management of aquifer pumping to maintain the resulting draw down within acceptable limits. The District has established management targets for the limit of acceptable draw down in the Trinity aquifer.

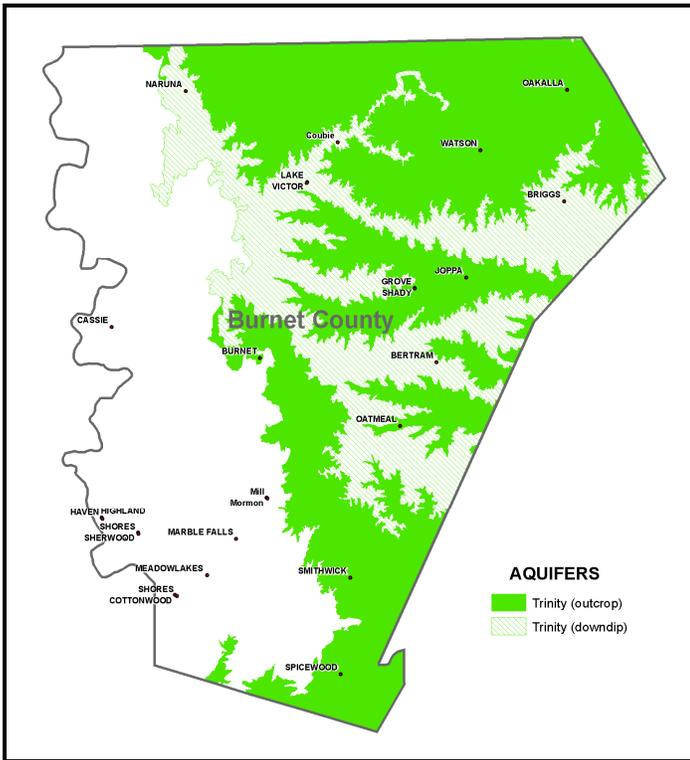


Figure 2, Occurrence of the Trinity Aquifer in Burnet County

Minor Aquifers

The groundwater sources that are not recognized as major aquifers by TWDB are particularly important to Burnet County. There are three aquifers recognized as minor aquifers by TWDB that occur in Burnet County. Minor aquifers are defined by TWDB as aquifers that may be capable of producing only limited yields to wells or that produce groundwater over a limited area. TWDB has established no definition for a limited area, but a limited yield may be less than 100 gallons per minute. In many areas wells produce water from formations which are not recognized as major or minor aquifers and may not have a large area of occurrence but which are vitally important local sources of groundwater. The information available on the characteristics of each of these minor aquifers and unrecognized formations is limited, particularly when compared to the data currently existing on major aquifers like the Trinity Aquifer. Even though TWDB recognizes the potential local importance of unrecognized sources of groundwater little or no research may have been devoted to defining the extent or characterizing these resources. This is particularly true where local groundwater management agencies did not exist. At the time of development of this plan, the District has been in operation for less than two years and the existence of localized sources of groundwater is known to the District largely through citizen reports. However, the District is committed to better defining the extent and character of the groundwater resources of Burnet County. The information included in the management plan for these minor aquifers and unrecognized formations is nevertheless based on the most sound data currently available. The District will gather and evaluate data and information on these sources of groundwater in the future in order to establish management of these important resources, and it will make any revisions to this management plan whenever new or additional information warrants.

Marble Falls Aquifer

The Marble Falls aquifer occurs in several separated outcrops. Water occurs in fractures and solution cavities in the limestone of the Marble Falls Formation of the Pennsylvanian Bend Group. Maximum thickness of the formation is 600 feet, but the thickness in Burnet County is unclear. The quality of water produced from the aquifer is suitable for most purposes. The Marble Falls aquifer is not known to have a down-dip extent in Burnet County and may occur only in the several outcrop areas. (Ashworth and Hopkins, 1995) The recharge zone of the aquifer in Burnet County is approximately 15,790 acres. (Figure 3)

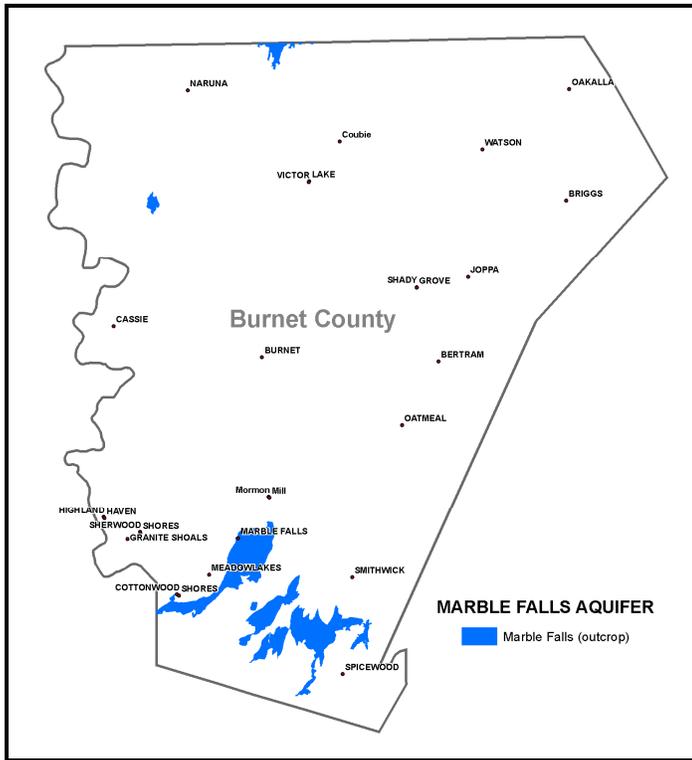


Figure 3, Occurrence of the Marble Falls Aquifer in Burnet County

Ellenburger-San Saba Aquifer

The Ellenburger-San Saba aquifer occurs along the margin of the Llano Uplift in Central Texas. Discontinuous outcrops of the aquifer surround older rocks of the uplift, and the remaining downdip portion may extend to depths of up to 3,000 feet below land surface. It is unknown if the aquifer reaches this depth in Burnet County. The aquifer is compartmentalized by block faulting. The aquifer is composed of the limestone and dolomite of the San Saba Member of the Wilberns Formation of late Cambrian age, and the Honeycut, Gorman, and Tanyard formations of the Ellenburger Group of early Ordovician age. Water occurs in solution cavities formed along faults and related fractures. Water produced from the aquifer may be hard but have less than 1,000 mg/l dissolved solids. (Ashworth and Hopkins, 1995) The recharge zone for the aquifer in Burnet County is approximately 110,413 acres. (Figure 4)

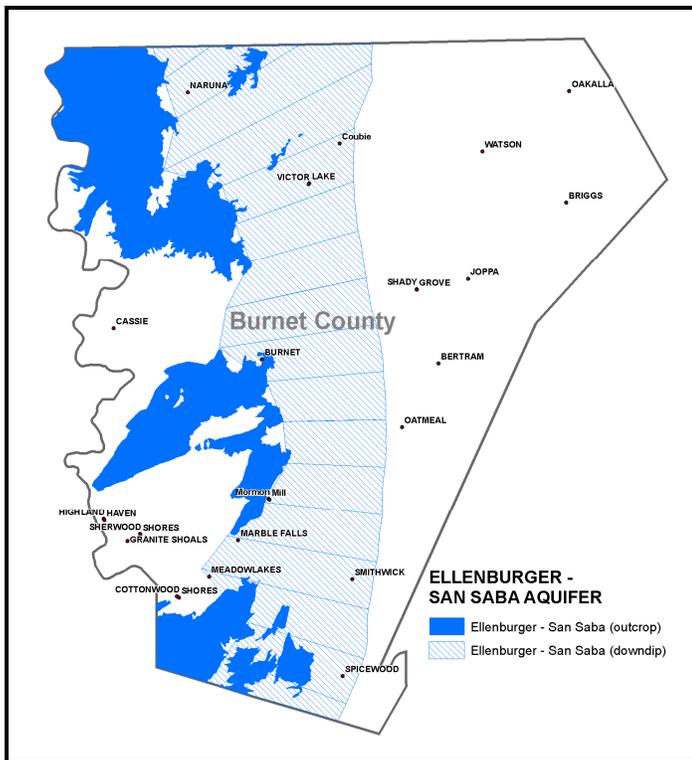


Figure 4, Occurrence of the Ellenburger-San Saba Aquifer in Burnet County

Hickory Aquifer

The Hickory aquifer occurs in the Llano Uplift region of Central Texas. Non-continuous Hickory Sandstone outcrops may overlie or flank exposed Precambrian rocks forming the central uplift core. The downdip (artesian) portion of the aquifer surrounds the uplift and may extend to depths approaching 4,500 feet. It is unknown if the aquifer occurs at this depth in Burnet County. The Hickory Sandstone Member of the Cambrian Riley Formation is one of the oldest sedimentary rock formations in Texas. In the southern and eastern extents of the aquifer, the Hickory consists of two units. The flow of the Hickory aquifer is restricted due to block faulting. Water from the aquifer is generally fresh, but locally may have alpha particle and radium concentrations in excess of drinking water standards. The water may contain radon gas. The Hickory may produce water with iron concentrations exceeding drinking water standards. (Ashworth and Hopkins, 1995) Water which exceeds a drinking water standard must be treated to meet or exceed the drinking water standard established by the United States Environmental Protection Agency before it may be distributed by a public water supply system. The recharge zone of the aquifer in Burnet County is approximately 18,011 acres. (Figure 5)

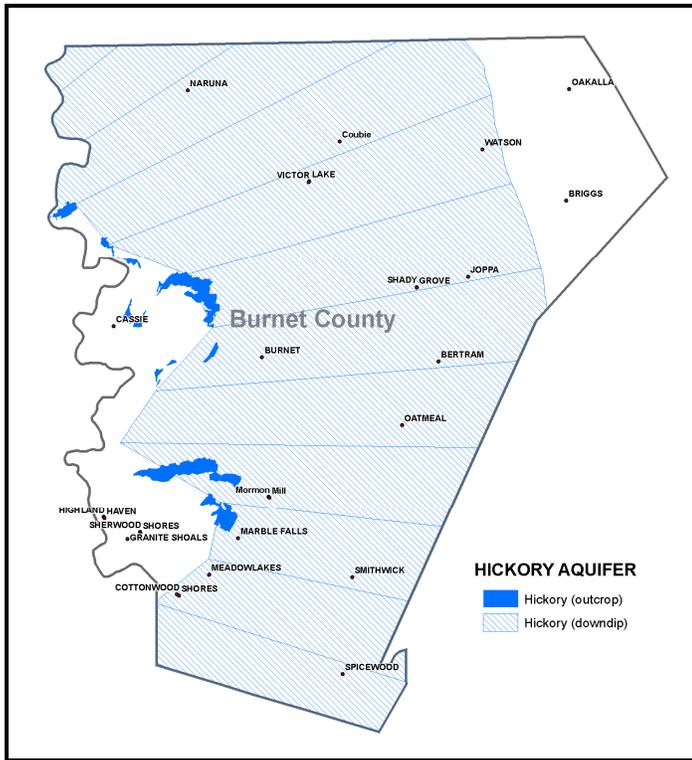


Figure 5, Occurrence of the Hickory Aquifer in Burnet County

Group	Formation	Member	Hydrologic Unit	
Fredericksburg	Walnut		Not recognized as a groundwater source	
Trinity	Paluxy		Upper Trinity aquifer	
	Glen Rose			
	Travis Peak		Hensell Sand	Middle Trinity aquifer
			Cow Creek Limestone	
			Hammett Shale	Not recognized as a groundwater source
			Sligo limestone	Lower Trinity aquifer
	Hosston Sand/Conglomerate			
Bend	Marble Falls Limestone		Marble Falls aquifer	
Ellenburger	Honeycut		Ellenburger-San Saba aquifer	
	Tanyard			
	Gorman			
Moore Hollow	Wilberns	San Saba Limestone		
	Riley Formation	Hickory Sandstone	Hickory aquifer	

Table 1, Relationship of Geologic and Hydrologic Units of Burnet County, after Duffin and Musick, 1991

IV. STATEMENT OF GUIDING PRINCIPLES

The District recognizes that the groundwater resources of Burnet County and the Central Texas region are of vital importance to the many users who are dependant on theses valuable resources. The District will strive to manage and conserve this most valuable resource in a prudent and cost effective manner through education, cooperation and development of a comprehensive understanding of the aquifers. The District's management plan is intended to serve as a tool to focus the thoughts and actions of those given the responsibility for the execution of the District's activities.

V. CRITERIA FOR PLAN CERTIFICATION

A. Planning Horizon

The time period for this plan is 10 years from the date of approval by the TWDB. This plan will be reviewed in five years. The District will consider the necessity to amend the plan and re-adopt the plan with or without amendments as required by TWC 36.1072(e).

This management plan will remain in effect until replaced by a revised management plan approved by the TWDB.

B. Board Resolution

A certified copy of the Central Texas Groundwater Conservation District resolution adopting the plan is located in Appendix B - District Resolution.

C. Plan Adoption

Public notices documenting that the plan was adopted following appropriate public meetings and hearings are located in Appendix C – Notice of Meetings.

D. Coordination with Surface Water Management Entities

Letters transmitting copies of this plan to the Lower Colorado River Authority and the Brazos River Authority are located in Appendix D – Letters to Surface Water Management Entities.

VI. ESTIMATES OF TECHNICAL INFORMATION REQUIRED BY TWC § 36.1071 / 31TAC 356.5

A. Managed available groundwater in the district based on the desired future condition established under TWC 36.108—TWC § 36.10701(e)(3)(A)

Managed available groundwater is defined in TWC §36.001 as “the amount of water that may be permitted by a district for beneficial use in accordance with the desired future condition of the aquifer.” The desired future condition of the aquifer may only be determined through joint planning with other groundwater conservation districts (GCDs) in the same groundwater management area (GMA) as required by the 79th Legislature with the passage of HB 1763 into law. The District is located in GMA 8. The GCDs of GMA 8 have not completed the joint planning process to determine the desired future condition of the aquifers in the GMA. Therefore, because GMA 8 has not completed the joint planning process, the District is unable to present a final value for the managed available groundwater in the aquifers of Burnet County as of the date of this plan. However, the District presents the information that it has developed for use in the GMA-8 process below as the selected management conditions and aquifer availability for each aquifer in the District. TWDB does not allow the District to refer to this information as the “desired future condition” of the aquifer or the “managed available groundwater” of the aquifer.

For the purposes of managing groundwater within the boundaries of the District and pursuant to Chapter 36 of the Texas Water Code, the District identified selected groundwater management conditions as a benchmark to establish groundwater availability in the aquifers of the District. The identification of the selected local groundwater management conditions was accomplished using a process similar to the currently required GMA process. The District identified the local

benchmark management conditions for the aquifers in preparation for meeting the requirement of the District's management plan. As required by statute, the District's identified benchmark management conditions were applied to the TWDB groundwater availability model (GAM) for the Trinity aquifer in Burnet County. (Bene and Hardin, 2004) The District used other calculations for the Marble Falls, Ellenburger-San Saba and Hickory aquifers because a GAM is not available for these aquifers as of the date of this plan. Using the GAM and other calculations the District established groundwater availability values for the aquifers of Burnet County, based on maintaining the identified local conditions. The major and minor aquifer groundwater availability values established by the District will be used to coordinate with the other districts for the purpose of joint planning in the 45 counties included in GMA 8. (Appendix E)

The District recognizes that there are several localized sources of groundwater in Burnet County which have not been recognized as major or minor aquifers but which are of vital local importance as a source of water supply. The TWDB or other State agencies have not researched or characterized these groundwater sources. The District has been in operation less than 2 years as of the date of this plan. The information available (if any) is not sufficient for the local groundwater sources to be addressed by the District in this plan. The District will seek to expand the knowledge of these important local resources so that management of these aquifers may be established in the future.

Trinity Aquifer

To assess groundwater availability, the District conducted a series of simulations using the TWDB's Groundwater Availability Model (GAM) for the Northern Trinity/Woodbine aquifers. The series of GAM simulations iteratively applied increasing amounts of groundwater pumping from the aquifer over a predictive period that included a repeat of the drought of record. Pumping was increased, until the amount of pumping that could be sustained by the aquifer without exceeding the selected management conditions during the simulated drought of record was identified.

a. Selected Management Conditions

There are three recognized subdivisions in the Trinity aquifer. The District applied the Northern Trinity/Woodbine aquifer GAM to simulate the Trinity aquifer subdivisions as follows: the Upper Trinity aquifer (Layer 3-Paluxy + Layer 4-Glen Rose); the Middle Trinity aquifer (Layer 5-Hensell); and the Lower Trinity aquifer (Layer 7-Hosston). The District selected the maintenance of the water levels (saturated thickness) in the unconfined portions of the aquifer over a 50-year horizon that included a repeat of the drought of record as the preferred management condition at or above the levels specified below. *The selected management conditions are intended to define sustainable use by establishing management goals for each aquifer subdivision of the Trinity aquifer.* The District then conducted the GAM simulations during the summer of 2006. The available draw down was indexed in the western extent of the aquifer in the District near Burnet, Texas and to year 2000 water levels. This area was chosen because it is on the up-dip margin of the aquifer. In this area each of the aquifer subdivisions is in un-confined condition and each has a relatively low saturated thickness (approximately 8 to 23 feet). By maintaining the aquifer water levels (saturated thickness) in this area the District can provide for the sustainability of the aquifer and minimize the potential for the reductions in the

yields of shallow wells due to aquifer use. The following 50-year criteria were applied to the individual GAM layers to assess the amounts of sustainable use:

Layer 3 (Paluxy) – 98 percent of saturated thickness (less than 0.5-foot change in a saturated thickness of approximately 8.5 feet)

Layer 4 (Glen Rose) – 65 percent of saturated thickness (less than 6-foot change in a saturated thickness of approximately 15 feet)

Layer 5 (Hensell) – 75 percent of saturated thickness (less than 2-foot change in a saturated thickness of approximately 8 feet)

Layer 7 (Hosston) – 90 percent of saturated thickness (less than 3-foot change in a saturated thickness of approximately 23 feet)

b. Groundwater Availability

The estimated total groundwater availability for the Trinity aquifer in Burnet County is 3,600 acre-feet per year which is based on the amounts of groundwater that could be pumped while maintaining the selected management conditions in each aquifer subdivision discussed above. In determining the volume of water available for permitting, 1,500 acre-feet per year is allocated for exempt well users. This leaves **2,100 acre-feet per year as the groundwater available for permitting for the Trinity aquifer.**

The District may also consider management of the Trinity aquifer by subdivision, if determined appropriate. If management by subdivision is implemented, the groundwater availability figure adopted by the District for each subdivision will need to consider the amount of water allocated for exempt well use within each subdivision. See Appendix F for availability figures for the Upper, Middle, and Lower Trinity aquifers based on the GAM simulations.

Minor Aquifers

As of the date of this plan there are currently no TWDB GAMs available for the Marble Falls, Ellenburger-San Saba or the Hickory aquifers. To assess the groundwater availability of these aquifers the District made iterative calculations of the potential effects of increasing amounts of pumping to determine if the preferred management conditions could be upheld. The calculations employed a methodology that considered the estimated annual aquifer recharge, the area of the unconfined portion of the aquifer, the average aquifer thickness and the effective aquifer porosity (coefficient of storage) to assess the effects of pumping over a 50-year period. As previously discussed, there is relatively little data currently available on the minor aquifers and unrecognized groundwater-bearing formations in Burnet County. To account for this scarcity of data, conservative assumptions were employed for the average aquifer thickness and effective porosity (or coefficient of storage) to complete the calculations of availability for each aquifer. The details of the minor aquifer availability calculations are in given in Appendix G.

a. Selected Management Conditions

The District selected the maintenance of the saturated thickness in the unconfined portions of the aquifers over a 50-year horizon as the preferred management condition to define the desired

future condition of the aquifers and the sustainable amount of groundwater use for each aquifer. Again, due to the relatively low amount of information currently available on the minor aquifers in the District, the District exercised caution in selecting the management criterion for each aquifer. The following 50-year criteria were applied to the individual minor aquifers to assess the amounts of sustainable use:

Marble Falls aquifer – Approximately 80 percent of the calculated recharge value

Ellenburger-San Saba aquifer – Approximately 80 percent of the calculated recharge value

Hickory aquifer – Approximately 80 percent of the calculated recharge value

b. Groundwater Availability

Marble Falls aquifer – The total estimated groundwater availability for the Marble Falls aquifer in Burnet County is 1,600 acre-feet per year which is based on the amounts of groundwater that could be pumped while maintaining the selected management conditions. In determining the volume of water available for permitting, 500 acre-feet per year is allocated for exempt well users. This leaves **1,100 acre-feet per year as the groundwater available for permitting for the Marble Falls aquifer.**

Ellenburger-San Saba aquifer – The total estimated groundwater availability for the Ellenburger-San Saba aquifer in Burnet County is 4,400 acre-feet per year which is based on the amounts of groundwater that could be pumped while maintaining the selected management conditions. In determining the volume of water available for permitting, 1,500 acre-feet per year is allocated for exempt well users. This leaves **2,900 acre-feet per year as the groundwater available for permitting for the Ellenburger-San Saba aquifer.**

Hickory aquifer – The total estimated groundwater availability for the Hickory aquifer in Burnet County is 3,600 acre-feet per year which is based on the amounts of groundwater that could be pumped while maintaining the selected management conditions. In determining the volume of water available for permitting, 1,500 acre-feet per year is allocated for exempt well users. This leaves **2,100 acre-feet per year as the groundwater available for permitting for the Hickory aquifer.**

See Appendix G for details on the calculation methodology and the calculations for each aquifer.

**B. Amount of groundwater being used within the district on an annual basis—
31TAC356.5 (a)(5)(B) (Implementing TWC §36.1071(e)(3)(B))**

To estimate the annual amount of groundwater being used in the District, the District has relied on the TWDB Annual Water Use Survey Data. In past years responses to the TWDB survey was voluntary. As a result, the TWDB water use survey data is subject to variations in the completeness or accuracy of the data. The TWDB estimate of the amount of groundwater being used in the District on an annual basis is 3,303 acre-feet per year. The estimate is from the TWDB Annual Water Use Survey for the Year 2003 which is the most recent data available. TWDB data on estimated groundwater use is available from 1980 to 2003, excepting 1981 to

1983 when no data was collected. Details of the estimate of the total amount of groundwater use are presented in Appendix H. It shows that an estimated 56% goes to municipal use, 23% for livestock, 19.5% for mining, and 1.8% for irrigation. As of the date of this plan the District has been in operation less than two years. The District will make its own estimates of groundwater use in Burnet County when the registration and permitting of wells in the District is complete and an aquifer assignment has been given to the registered and permitted wells. However, the District will conduct surveys of the groundwater use by public water supply entities prior to the registration and permitting of wells.

C. Annual amount of recharge from precipitation to the groundwater resources within the district—31TAC356.5 (a)(5)(C) (Implementing TWC §36.1071(e)(3)(C))

The estimate of the annual amount of recharge to the Trinity aquifer in the District is based on the GAM simulations conducted to assess the amount of available groundwater in the aquifer within Burnet County. The Northern Trinity/Woodbine aquifer GAM application simulated 43 years of average climatic conditions and ended the final decade with a 7-year drought of record using the built-in climatic conditions in the predictive model of the GAM. Recharge estimates reflecting both the final year of the drought of record and average years are presented for the Trinity aquifers. The District estimated the amount of annual recharge to the minor aquifers in the District based on the recharge rates for each aquifer given in TWDB Report 238, the average annual precipitation for Burnet County from the National Oceanic and Atmospheric Administration (NOAA) and the area of the aquifer outcrop area in Burnet based on the TWDB GIS coverage.

1. Trinity Aquifer Recharge

- a. Average Year (simulated 2040) = 35,749 acre-feet per year
- b. Drought of Record (simulated 2050) = 16,331 acre-feet per year

Trinity aquifer estimate source: Taken from the N. Trinity / Woodbine aquifer GAM Water Budget, Turner, Collie & Braden GAM Run #6; July 12, 2006

2. Marble Falls Aquifer Recharge = 1,974 acre-feet per year

Recharge Rate is 5 percent of the annual rainfall of 30 inches over 15,790 acres

3. Ellenburger-San Saba Aquifer = 5,521 acre-feet per year

Recharge Rate is 2 percent of the annual rainfall of 30 inches over 110,413 acres

4. Hickory Aquifer = 4,503 acre-feet per year

Recharge Rate is 10 percent of the annual rainfall of 30 inches over 18,011 acres

D. For each aquifer, annual volume of water that discharges from the aquifer to springs and any surface water bodies, including lakes, streams, and rivers—TWC §36.1071(e)(3)(D)

The estimate of the annual amount of water discharged to surface water systems by the groundwater resources of the District is based on the GAM simulations conducted to assess the amount of available groundwater in the Trinity aquifer within Burnet County. The Northern Trinity/Woodbine aquifer GAM application simulated 43 years of average climatic conditions and ended the final decade with a 7-year drought of record using the built-in climatic conditions in the predictive model of the GAM. The amount of annual discharge from the aquifer may vary significantly due to climatic conditions. Discharge estimates reflecting both the worst year of the drought of record and average years are presented for the Trinity aquifer. The values presented for the Trinity aquifer are the sum of the Stream Leakage and Drains values in the GAM Water Budget.

1. Trinity Aquifer

- a. Average Year (simulated 2040) = 652 acre-feet per year
- b. Drought of Record (simulated 2050) = 497 acre-feet per year

Trinity aquifer estimate source: Taken from the N. Trinity / Woodbine aquifer GAM Water Budget, Turner, Collie & Braden GAM Run #6; July 12, 2006

In order to fulfill the statutory requirements for groundwater management plans, the District estimated the amount of the annual discharge to surface water systems by the minor aquifers in the District. The estimates given below for minor aquifer discharges to surface water systems in Burnet County are based entirely on previously published estimates of spring discharges. The previously published estimates of minor aquifer discharges to surface water systems in Burnet County are extremely limited. The minor aquifers for which estimates are presented are limited to the aquifers for which previously published information was located by the District. There are several springs identified in the available publications for which no data on flow rates is given. There are several springs identified for which flow rates have been published but for which the source of water is not identified. Additional springs that may exist within the District but which have not been identified in the available publications nor have estimates of discharge been published are not included in the estimates given in this plan. Due to the limited time in which the District has been in operation, the District has not been able to develop new information on minor aquifer discharges to surface water systems. Due to the limited information available at the time this plan was prepared, the District does not warrant the completeness of these estimates of minor aquifer discharges to surface water systems in Burnet County. The District will in the future undertake studies to identify the quantity of water discharged by springs and to quantify other discharges of water from the aquifers to surface water systems.

To present estimates of minor aquifer discharge to the surface water systems of Burnet County, the available information on flow rates from the various springs issuing from an aquifer were converted to an annualized rate in acre-feet per year. Because the annualized discharge rates are based on single measurement, it is possible that the annualized discharge rates do not reflect seasonal or climatically influenced variations. Most data on spring flow rates are given with the

date of measurement. The discharge rates of some springs for which data is available indicate that flow rates appear to have diminished over time. It is possible that the flow rates of the springs for which information is presented in this plan may have diminished since the time of measurement. The values presented for the minor aquifer discharges to surface water systems are the sum of the available information for each aquifer.

2. Ellenburger-San Saba Aquifer = 2,813 acre-feet per year
3. Marble Falls Aquifer = 1,423.35 acre-feet per year
4. Springs of Unknown Origin = 144.78 acre-feet per year

Estimate source: (USGS, 2003 & Brune, 1981)

For a list of springs and discharge rates, see Appendix I.

E. Annual volume of flow into and out of the district within each aquifer and between aquifers in the district, if a groundwater availability model is available — TWC §36.1071(e)(3)(E)

The Trinity aquifer is the only aquifer in the District for which a TWDB GAM (Northern Trinity/Woodbine aquifer GAM) is available. The estimates of the amount of water flowing into and out of the District within each aquifer and between aquifers in the District are based on the GAM simulations performed to assess the availability of Trinity aquifer groundwater. The Northern Trinity/Woodbine aquifer GAM is a 7-layer model and can resolve vertical movement of water within subdivisions of the aquifer as well as water movement through the aquifer into and out of the District. The Northern Trinity/Woodbine aquifer GAM application simulated 43 years of average climatic conditions and ended the final decade with a 7-year drought of record using the built-in climatic conditions in the predictive model of the GAM. The amount of annual flow of water into, out of and within these aquifers may vary significantly due to climatic conditions. Discharge estimates reflecting both the worst year of the drought of record and average years are presented for the Trinity aquifer.

Trinity Aquifer

a. Average Year (simulated 2040)

Flow into the aquifer within the District:

Upper Trinity aquifer—Layers 3 + 4 = 305 acre-feet per year

Middle Trinity aquifer—Layer 5 = 239 acre-feet per year

Lower Trinity aquifer—Layer 7 = 562 acre-feet per year

Flow out of the District within the aquifer:

Upper Trinity aquifer—Layers 3 + 4 = 1,429 acre-feet per year

Middle Trinity aquifer—Layer 5 = 2,405 acre-feet per year

Lower Trinity aquifer—Layer 7 = 3,483 acre-feet per year

Movement between aquifer subdivisions in the District:

Leakage from the Edwards aquifer to the Upper Trinity aquifer (Layers 3 + 4) in the District = 28 acre-feet per year

Leakage from the Upper Trinity aquifer downward to the Middle Trinity aquifer (Layer 5) = 962 acre-feet per year

Leakage from the Middle Trinity aquifer downward to the Lower Trinity aquifer confining zone (Layer 6) = 1,463 acre-feet per year

Leakage from the Lower Trinity aquifer confining zone downward into the Lower Trinity aquifer (Layer7) = 2,211 acre-feet per year

b. Drought of Record (simulated 2050)

Flow into the aquifer within the District:

Upper Trinity aquifer—Layers 3 + 4 = 299 acre-feet per year

Middle Trinity aquifer—Layer 5 = 237 acre-feet per year

Lower Trinity aquifer—Layer 7 = 568 acre-feet per year

Flow out of the District within the aquifer:

Upper Trinity aquifer—Layers 3 + 4 = 1,403 acre-feet per year

Middle Trinity aquifer—Layer 5 = 2,418 acre-feet per year

Lower Trinity aquifer—Layer 7 = 3,545 acre-feet per year

Movement between aquifer subdivisions in the District:

Leakage from overlying formations to the Upper Trinity aquifer (Layers 3 + 4) in the District = 27 acre-feet per year

Leakage from the Upper Trinity aquifer downward to the Middle Trinity aquifer (Layer 5) = 962 acre-feet per year

Leakage from the Middle Trinity aquifer downward to the Lower Trinity aquifer confining zone (Layer 6) = 1,449 acre-feet per year

Leakage from the Lower Trinity aquifer confining zone downward into the Lower Trinity aquifer (Layer7) = 2,231 acre-feet per year

Trinity aquifer estimate source: Taken from the N. Trinity / Woodbine aquifer GAM Water Budget, Turner, Collie & Braden GAM Run #6; July 12, 2006

F. Projected surface water supply in the district, according to the most recently adopted state water plan— TWC §36.1071(e)(3)(F)

The most recently adopted state water plan is the 2007 State Water Plan. This Plan indicates a projected surface water supply for Burnet County of 13,171 acre-feet/year for year 2010.

Water User Group	User Basin	Water Source RWPG	Water Source Basin	Source Name	2000	2010	2020	2030	2040	2050	2060
Kempner WSC	Brazos	G	Brazos	Brazos River Authority	301	316	342	370	401	440	488
Burnet	Colorado	K	Colorado	Highland Lakes	4,100	4,100	4,100	4,100	0	0	0
Cottonwood Shores	Colorado	K	Colorado	Highland Lakes	138	138	0	0	0	0	0
County-Other	Colorado	K	Colorado	Highland Lakes	901	556	330	280	250	250	250
Granite Shoals	Colorado	K	Colorado	Highland Lakes	830	830	830	0	0	0	0
Kingsland WSC	Colorado	K	Colorado	Highland Lakes	40	45	52	58	64	71	0
Lake LBJ MUD	Colorado	K	Colorado	Highland Lakes	233	259	294	327	358	0	0
Marble Falls	Colorado	K	Colorado	Highland Lakes	2,000	2,000	2,000	0	0	0	0
Marble Falls	Colorado	K	Colorado	Highland Lakes	1,000	1,000	1,000	1,000	1,000	0	0
Manufacturing	Colorado	K	Colorado	Highland Lakes	500	500	500	500	500	500	500
Irrigation	Colorado	K	Colorado	Irrigation Local Supply	276	276	276	276	276	276	276
Livestock	Brazos	K	Brazos	Livestock Local Supply	341	341	341	341	341	341	341
Livestock	Colorado	K	Colorado	Livestock Local Supply	210	210	210	210	210	210	210
Meadowlakes	Colorado	K	Colorado	Other Local Supply	486	486	486	486	486	486	486
Manufacturing	Colorado	K	Colorado	Other Local Supply	1,237	1,367	1,503	1,643	1,761	1,933	1,933
Mining	Colorado	K	Colorado	Other Local Supply	767	747	762	778	801	826	826

Table 2, Projected Surface Water Supplies for Burnet County in the 2007 State Water Plan (in acre-feet per year)

G. Projected total demand for water in the district according to the most recently adopted state water plan— TWC §36.1071(e)(3)(G)

The most recently adopted state water plan is the 2007 State Water Plan. This Plan indicates a projected total water demand for Burnet County of 10,665 acre-feet/year for year 2010.

WUG Name	River Basin	Water Demand (ac-ft/yr)						
		2000	2010	2020	2030	2040	2050	2060
Bertram	Brazos	226	258	295	334	371	412	463
Burnet	Colorado	849	983	1,143	1,300	1,461	1,635	1,849
Chisholm Trail SUD	Brazos	15	28	40	53	66	79	94
Cottonwood Shores	Colorado	121	147	177	208	239	271	312
County-Other	Brazos	392	468	566	660	753	853	981
County-Other	Colorado	1,237	1,479	1,786	2,083	2,378	2,693	3,097
Granite Shoals	Colorado	327	385	453	525	592	669	763
Kempner WSC	Brazos	228	298	381	466	548	636	741
Kingsland WSC	Colorado	49	55	63	70	77	85	95
Lake LBJ MUD	Colorado	200	227	261	293	324	359	402
Marble Falls	Colorado	1,616	1,795	2,016	2,238	2,452	2,693	2,984
Meadowlakes	Colorado	492	687	916	1,150	1,372	1,618	1,903
Total Municipal Demand		5,752	6,810	8,097	9,380	10,633	12,003	13,684
Irrigation	Brazos	0	0	0	0	0	0	0
Irrigation	Colorado	103	101	100	98	96	95	93
Total Irrigation Demand		103	101	100	98	96	95	93
Livestock	Brazos	409	409	409	409	409	409	409
Livestock	Colorado	426	426	426	426	426	426	426
Total Livestock Demand		835	835	835	835	835	835	835
Manufacturing	Brazos	0	0	0	0	0	0	0
Manufacturing	Colorado	743	963	1,109	1,248	1,384	1,502	1,636
Total Manufacturing Demand		743	963	1,109	1,248	1,384	1,502	1,636
Mining	Brazos	54	61	64	66	67	69	70
Mining	Colorado	1,671	1,895	1,985	2,032	2,078	2,121	2,165
Total Mining Demand		1,725	1,956	2,049	2,098	2,145	2,190	2,235
Steam Electric Power	Brazos	0	0	0	0	0	0	0
Steam Electric Power	Colorado	0	0	0	0	0	0	0
Total Steam Electric Demand		0	0	0	0	0	0	0
BURNET COUNTY TOTAL WATER DEMAND		9,158	10,665	12,190	13,659	15,093	16,625	18,483

Table 3, Projected Burnet County Water Demand from the 2007 State Water Plan (in acre-feet per year)

VII. Consider The Water Supply Needs And Water Management Strategies Included In The Adopted State Water Plan— Twc §36.1071(E)(4)

The 2007 State Water Plan identifies projected water shortages for 14 WUGs and recommends 23 WMSs to meet the identified needs of these WUGs. Of the recommended WMSs, 15 involve conservation, the renewal of existing surface water contracts or the purchase of additional surface water. These 15 WMS will meet the needs of 9 WUGs. The remaining 8 WMSs involve the expansion of existing groundwater supplies to meet the projected water shortages of 5 WUGs. The recommended groundwater WMSs includes each of the 4 principal groundwater sources in Burnet County (Trinity, Marble Falls, Ellenburger-San Saba, and Hickory aquifers).

However, 3 of the 8 recommended WMSs do not project additional groundwater use until years 2030 to 2050. In 2010 the projected expansion of groundwater use recommended in the 2007 State Water Plan is an additional 1,015 ac-ft per year. Within the time period of this plan, the availability of groundwater in the aquifers of Burnet County as presented in this plan will not prevent the implementation of any WMSs recommended in the 2007 State Water Plan.

User Name	Basin	Water Management Strategy Name	Source Name	Water Management Strategies (ac-ft/yr)						
				2000	2010	2020	2030	2040	2050	2060
County-Other	Colorado	Expand current GW supply	Trinity	18	266	581	915	986	1,047	1,047
Livestock	Brazos	Expand current GW supply	Trinity	23	23	23	23	23	23	23
Mining	Brazos	Expand current GW supply	Trinity	0	7	10	12	22	24	25
Total of Trinity Aquifer Strategies				41	296	614	950	1,031	1,094	1,095
County-Other	Colorado	Expand current GW supply	Marble Falls	0	0	0	0	25	314	718
Mining	Colorado	Expand current GW supply	Marble Falls	437	681	756	788	811	829	873
Total of Marble Falls Aquifer Strategies				437	681	756	788	836	1,143	1,591
Bertram	Brazos	Expand current GW supply	Ellenburger-San Saba	19	38	61	90	122	152	194
Mining	Colorado	Expand current GW supply	Ellenburger-San Saba	0	0	0	0	0	0	49
Total of Ellenburger -San Saba Aquifer Strategies				19	38	61	90	122	152	243
County-Other	Colorado	Expand current GW supply	Hickory	0	0	0	0	199	199	199
Total of Hickory Aquifer Strategies				0	0	0	0	199	199	199

Table 4, Groundwater-Based Water Management Strategies Recommended in the 2007 State Water Plan (in acre-feet per year)

VIII. DETAILS ON THE DISTRICT MANAGEMENT OF GROUNDWATER

The District will manage the use of groundwater within the District in order to conserve the resource while seeking to maintain the economic viability of all resource user groups, public and private. The District seeks to manage the groundwater resources of the District as practicably as possible as defined in the plan by the management goals established for each aquifer or aquifer

subdivision. The Texas Legislature established that groundwater conservation districts are the preferred method of groundwater management in Section 36.0015 of the Texas Water Code. In consideration of the economic and cultural activities occurring within the District, the District will identify and engage in such activities and practices, that if implemented may result in the conservation of groundwater in the District. The District will manage groundwater resources through rules developed and implemented in accordance with Chapter 36 of the Texas Water Code and the provisions of the District Act.

Subject to Board approval, the District may coordinate with a river authority established by the State of Texas on the permitting of quarries and other activities within the jurisdiction of both entities in Burnet County in order to assess the effects of proposed groundwater use and the effects of proposed operations on groundwater quality by the quarries or other activities. The District will require that any well constructed as an exempt well under activities regulated by the Texas Railroad Commission (TRC) and later converted to another use not regulated by the TRC will be required to seek a permit for the use of groundwater in the District.

An observation well network will be established and maintained in order to monitor changing storage conditions of groundwater supplies within the District. When a monitoring well network has been established the District will make a regular assessment of water supply and groundwater storage conditions and will report those conditions to the District Board of Directors and to the public. The District may undertake, as necessary, investigations of the groundwater resources within the District and will make the results of investigations available to the public. The District will co-operate with investigations of the groundwater resources of the District undertaken by other local political subdivisions or agencies of the State of Texas.

In order to better manage groundwater resources the District may establish management zones for; and adopt different rules for: (1) each aquifer, subdivision of an aquifer, or geologic strata located in whole or in part within the boundaries of the District; or (2) each geographic area overlying an aquifer or subdivision of an aquifer located in whole or in part within the boundaries of the district.

For the purpose of managing the use of groundwater within the District, the District may define sustainable use as the use of an amount of groundwater in the District as a whole or any management zone established by the District that does not exceed:

- a) The desired future conditions of aquifers in the District established by the District prior to the establishment of the desired future condition of aquifers in a groundwater management area in which the District is located or
- b) The desired future conditions of aquifers within the District established by a groundwater management area in which the District is participating or
- c) The amount of managed available groundwater resulting from the establishment of a desired future aquifer condition established by the District or a groundwater management area in which the District is located or
- d) The amount of annual recharge of the aquifer or aquifer subdivision in which the use occurs as recognized by the District or

e) Any other criteria established by the District as being a threshold of use beyond which further use of the aquifer or aquifer subdivision may result in a specified undesirable or injurious condition

The District may adopt rules that protect existing or historic use of groundwater in the District prior to the effective date of the rules to the maximum extent practical consistent with this plan and the goals and objectives set forth herein. The District may impose more restrictive permit conditions on new permit applications and permit amendment applications to increase use by historic users if the limitations:

- a) Apply to all subsequent new permit applications and permit amendment applications to increase use by historic users, regardless of the type or location of use;
- b) Bear a reasonable relationship to the District's existing management plan; and
- c) Are reasonably necessary to protect existing use

The District may adopt rules to regulate groundwater withdrawals by means of spacing and/or production limits. The relevant factors to be considered in making a determination to grant or deny a permit or limit groundwater withdrawals shall include those set forth in the District Act, Chapter 36 of the Texas Water Code, and the rules of the District. The District may employ technical resources at its disposal, as needed, to evaluate the groundwater resources available within the District and to determine the effectiveness of regulatory or conservation measures. In consideration of particular individual, localized or District-wide conditions, including without limitation climactic conditions, the District may by rule allow an increase or impose a decrease in the total production in a management zone above or below the sustainable amount for a period of time considered necessary by the District in order to accomplish the purposes set forth in Chapter 36, Water Code, or the District Act. The exercise of said discretion by the Board shall not be construed as limiting the power of the Board.

IX. ACTIONS, PROCEDURES, PERFORMANCE AND AVOIDANCE FOR PLAN IMPLEMENTATION

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

Rules adopted by the District for the permitting of wells and the use of groundwater shall comply with TWC Chapter 36, including §36.113, and the provisions of this management plan. All rules will be adhered to and enforced. The promulgation and enforcement of the rules will be based on the best technical evidence available to the District.

X. METHODOLOGY FOR TRACKING DISTRICT PROGRESS IN ACHIEVING MANAGEMENT GOALS – 31 TAC 356.5(a)(6)

The District will prepare and present an Annual Report to the Board of Directors on District performance in regards to achieving management goals and objectives for the fiscal year. The report will be presented within 120 days following the completion of the District's fiscal year, beginning with FY2007. The Board will maintain the report on file, for public inspection at the District's offices upon adoption in a regular noticed meeting of the Board.

XI. GOALS, MANAGEMENT OBJECTIVES and PERFORMANCE STANDARDS

The management goals, objectives, and performance standards of the District in the areas specified in 31TAC§356.5 are addressed below.

Management Goals

**A. Providing the Most Efficient Use of Groundwater –31TAC 356.5(a)(1)(A)
(Implementing TWC §36.1071(a)(1))**

1. Objective: Each year, beginning in 2007, the District will require the registration of all wells within the District's jurisdiction.

Performance Standard: Each year, the number of new and existing wells registered with the District will be presented in the District's annual report.

2. Objective: Each year, beginning in FY2008 the District will require permits for all non-exempt use of groundwater in the District as defined in the District's rules, in accordance with adopted procedures.

Performance Standard: Each year, a summary of the number applications for the drilling of non-exempt wells, the number of applications for the permitted use of groundwater and the disposition of the applications will be will be presented in the District's annual report.

**B. Controlling and Preventing Waste of Groundwater –31TAC 356.5(a)(1)(B)
(Implementing TWC §36.1071(a)(2))**

Objective: Each year, the District will provide information on eliminating and reducing the waste of groundwater and focusing on water quality protection. This may be accomplished annually by one of the following methods:

- a. compile literature packets for distribution to schools in Burnet County;
- b. conduct classroom presentations;
- c. sponsor an educational program/curriculum;
- d. post information on the District's web site;
- e. submit newspaper articles for publication;
- f. conduct public presentations;
- g. set up displays at public events;
- h. distribute brochures/literature.

Performance Standard: The annual report will include a summary of the District activities during the year to disseminate educational information on eliminating and reducing the wasteful use of groundwater focusing on water quality protection.

C. Addressing Conjunctive Surface Water Management Issues – 31TAC356.5 (a)(1)(D) ((Implementing TWC §36.1071(a)(4))

Objective: Each year, the District will participate in the regional planning process by attending a minimum of two meetings of the Lower Colorado Regional Water Planning Group (Region K) per fiscal year.

Performance Standard: Each year, attendance at Region K meetings by a representative of the District will be reflected in the District's annual report and will include the number of meetings attended and the dates.

D. Addressing Natural Resource Issues which Impact the Use and Availability of Groundwater, and which are Impacted by the Use of Groundwater – 31TAC§356.5 (a)(1)(E) ((Implementing TWC §36.1071(a)(5))

Objective: Each year the District will monitor water-levels within the District by measuring the water level of at least 8 wells.

Performance Standard: Each year, the District's Annual Report will provide a status report on the number of wells measured and the monitoring results.

E. Addressing Drought Conditions – 31TAC356.5 (a)(1)(F) ((Implementing TWC §36.1071(a)(6))

Objective: Each month, the District will download the updated Palmer Drought Severity Index (PDSI) map and check for the periodic updates to the Drought Preparedness Council Situation Report (Situation Report) posted on the Texas Water Information Network website www.txwin.net.

Performance Standard: Each year, the downloaded PDSI maps and Situation Reports will be included in the District Annual Report to the Board of Directors.

F. Addressing Conservation, Recharge Enhancement, Rainwater Harvesting, Precipitation Enhancement, or Brush Control, Where Appropriate and Cost-Effective – 31TAC356.5 (a)(1)(G) (Implementing TWC §36.1071(a)(7))

Precipitation enhancement is not an appropriate or cost-effective program for the District at this time because there is not an existing precipitation enhancement program operating in nearby counties in which the District could participate and share costs. The cost of operating a single-county precipitation enhancement program is prohibitive and would require the District to increase taxes in Burnet County.

1. Objective: Each year, the District will promote rainwater harvesting by posting information on rainwater harvesting on the District web site.

Performance Standard: Each year, the annual report will include a copy of the information on rainwater harvesting that is provided on the District web site.

2. Objective: Each year, the District will provide information relating to recharge enhancement and brush control on the District web site.

Performance Standard: Each year, the District annual report will include a copy of the information that has been provided on the District web site relating to recharge enhancement and brush control.

3. Objective: Each year, the District will promote conservation by one of the following methods:

- a. conduct an annual contest on water conservation;
- b. distribute conservation literature packets to schools in Burnet County;
- c. conduct classroom conservation presentations;
- d. sponsor an educational conservation program/curriculum;
- e. post conservation information on the District's web site;
- f. provide a newspaper article on conservation for publication;
- g. publish an article on conservation in the District newsletter;
- h. conduct a public conservation presentation;
- i. set up a conservation display at a public event or;
- j. distributing conservation brochures/literature to the public.

Performance Standard: Each year, the annual report will include a summary of the District activity during the year to promote conservation.

XII. MANAGEMENT GOALS DETERMINED NOT-APPLICABLE TO THE DISTRICT

A. Controlling and Preventing Subsidence – 31TAC§356.5 (a)(1)(C)

This category of management goal is not applicable to the District because the major water producing formations in the District are composed primarily of competent limestone. The structural competency of the aquifer materials significantly limits the potential for the occurrence of land surface subsidence in the District.

B. Addressing in a Quantitative Manner the Desired Future Conditions of the Groundwater Resources – 31TAC (a)(1)(H) (Implementing TWC §36.1071(a)(8))

This category of management goal is not now applicable to the District because GMA 8 is currently in the process of developing the desired future condition of the groundwater

resources in GMA 8 and the desired future conditions of the groundwater resources has not yet been defined. The District is coordinating with other groundwater conservation districts in GMA 8 to define the desired future conditions of the aquifers, as required by TWC 36.108. The District will review and evaluate the GAM simulation results from the Northern Trinity/Woodbine aquifer GAM and other available data as a participant in the GMA 8 process. The GMA 8 process incorporates a provision to determine if revisions are needed regarding total aquifer storage and groundwater availability. GMA 8 anticipates developing the desired future conditions of the aquifers in the GMA on or before the statutory deadline of September 1, 2010.

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APPENDIX A

S.B. No. 967

AN ACT

relating to the creation of the Central Texas Groundwater Conservation District; providing authority to impose a tax and issue bonds.

BE IT ENACTED BY THE LEGISLATURE OF THE STATE OF TEXAS:

SECTION 1. Subtitle H, Title 6, Special District Local Laws Code, is amended by adding Chapter 8810 to read as follows:

CHAPTER 8810. CENTRAL TEXAS GROUNDWATER

CONSERVATION DISTRICT

SUBCHAPTER A. GENERAL PROVISIONS

Sec. 8810.001. DEFINITIONS. In this chapter:

- (1) "Board" means the board of directors of the district.
- (2) "Director" means a member of the board.
- (3) "District" means the Central Texas Groundwater

Conservation District.

Sec. 8810.002. NATURE OF DISTRICT. The district is a groundwater conservation district in Burnet County created under and essential to accomplish the purposes of Section 59, Article XVI, Texas Constitution.

Sec. 8810.003. CONFIRMATION ELECTION REQUIRED. If the creation of the district is not confirmed at a confirmation election held before September 1, 2007:

(1) the district is dissolved on September 1, 2007, except that:

- (A) any debts incurred shall be paid;
- (B) any assets that remain after the payment of debts shall be transferred to Burnet County; and
- (C) the organization of the district shall be maintained until all debts are paid and remaining assets are transferred; and

(2) this chapter expires on September 1, 2010.

Sec. 8810.004. INITIAL DISTRICT TERRITORY. The initial

boundaries of the district are coextensive with the boundaries of Burnet County, Texas.

Sec. 8810.005. CONSTRUCTION OF CHAPTER. This chapter shall be liberally construed to achieve the legislative intent and purposes of Chapter 36, Water Code. A power granted by Chapter 36, Water Code, or this chapter shall be broadly interpreted to achieve that intent and those purposes.

Sec. 8810.006. APPLICABILITY OF OTHER GROUNDWATER CONSERVATION DISTRICT LAW. Except as otherwise provided by this chapter, Chapter 36, Water Code, applies to the district.

[Sections 8810.007-8810.020 reserved for expansion]

SUBCHAPTER A-1. TEMPORARY PROVISIONS

Sec. 8810.021. APPOINTMENT OF TEMPORARY DIRECTORS.

(a) Not later than the 45th day after the effective date of this chapter, five temporary directors shall be appointed as follows:

(1) the Burnet County Commissioners Court shall appoint one temporary director from each of the four commissioners precincts in the county to represent the precincts in which the temporary directors reside; and

(2) the county judge of Burnet County shall appoint one temporary director who resides in the district to represent the district at large.

(b) If there is a vacancy on the temporary board of directors of the district, the authority who appointed the temporary director whose position is vacant shall appoint a person to fill the vacancy.

(c) Temporary directors serve until the earlier of:

(1) the time the temporary directors become initial directors as provided by Section 8810.024; or

(2) the date this chapter expires under Section 8810.003.

Sec. 8810.022. ORGANIZATIONAL MEETING OF TEMPORARY DIRECTORS. As soon as practicable after all the temporary directors have qualified under Section 36.055, Water Code, a majority of the temporary directors shall convene the organizational meeting of the district at a location within the district agreeable to a majority of the directors. If an agreement on location cannot be reached, the organizational meeting shall be at the Burnet County Courthouse.

Sec. 8810.023. CONFIRMATION ELECTION. (a) The temporary directors shall hold an election to confirm the creation of the district.

(b) Section 41.001(a), Election Code, does not apply to a confirmation election held as provided by this section.

(c) Except as provided by this section, a confirmation election must be conducted as provided by Sections 36.017(b)-(i), Water Code, and the Election Code. Section 36.017(d), Water Code, does not apply to a confirmation election under this section.

(d) The ballot for the election must be printed to provide for voting for or against the proposition: "The creation of the Central Texas Groundwater Conservation District and the imposition of a maintenance tax at an initial rate not to exceed two cents for each \$100 of assessed valuation."

(e) If a majority of the votes cast at the election are not in favor of the creation of the district, the temporary directors may call and hold a subsequent confirmation election. The subsequent election may not be held before the first anniversary of the date on which the previous election was held.

(f) The district may not impose a maintenance tax unless the tax is confirmed under this section.

Sec. 8810.024. INITIAL DIRECTORS. (a) If creation of the district is confirmed at an election held under Section 8810.023, the temporary directors of the district become the initial directors of the district and serve on the board of directors until permanent directors are elected under Section 8810.025.

(b) The initial directors representing commissioners precincts 2 and 4 shall serve a term expiring June 1 following the first regularly scheduled election of directors under Section 8810.025, and the initial directors representing commissioners precincts 1 and 3 shall serve a term expiring June 1 following the second regularly scheduled election of directors. The at-large director shall serve a term expiring June 1 following the second regularly scheduled election of directors.

Sec. 8810.025. INITIAL ELECTION OF PERMANENT DIRECTORS. On the uniform election date prescribed by Section 41.001, Election Code, in May of the first even-numbered year after the year in which the district is authorized to be created at a confirmation election, an election shall be held in the district for the election of two directors to replace the initial directors who, under Section 8810.024(b), serve a term expiring June 1 following that election.

Sec. 8810.026. EXPIRATION OF SUBCHAPTER. This subchapter expires September 1, 2010.

[Sections 8810.027-8810.050 reserved for expansion]

SUBCHAPTER B. BOARD OF DIRECTORS

Sec. 8810.051. DIRECTORS; TERMS. (a) The district is governed by a board of five directors.

(b) Directors serve staggered four-year terms, with two or three directors' terms expiring June 1 of each even-numbered year.

(c) A director may serve consecutive terms.

Sec. 8810.052. METHOD OF ELECTING DIRECTORS: COMMISSIONERS PRECINCTS. (a) The directors of the district shall be elected according to the commissioners precinct method as provided by this section.

(b) One director shall be elected by the voters of the entire district, and one director shall be elected from each county commissioners precinct by the voters of that precinct.

(c) Except as provided by Subsection (e), to be eligible to be a candidate for or to serve as director at large, a person must be a registered voter in the district. To be a candidate for or to serve as director from a county commissioners precinct, a person must be a registered voter of that precinct.

(d) A person shall indicate on the application for a place on the ballot:

(1) the precinct that the person seeks to represent;

or

(2) that the person seeks to represent the district at large.

(e) When the boundaries of the county commissioners precincts are redrawn after each federal decennial census to reflect population changes, a director in office on the effective date of the change, or a director elected or appointed before the effective date of the change whose term of office begins on or after the effective date of the change, shall serve in the precinct to which elected or appointed even though the change in boundaries places the person's residence outside the precinct for which the person was elected or appointed.

Sec. 8810.053. ELECTION DATE. The district shall hold an election to elect the appropriate number of directors on the uniform election date prescribed by Section 41.001, Election Code, in May of each even-numbered year.

Sec. 8810.054. DIVISION OF MUNICIPALITY. The provision in Section 36.059(b), Water Code, concerning the division of a municipal corporation among precincts does not apply to an election under this chapter.

[Sections 8810.055-8810.100 reserved for expansion]

SUBCHAPTER C. POWERS AND DUTIES

Sec. 8810.101. PERMIT CONSIDERATION. Before granting or denying a permit under Section 36.113, Water Code, the district shall consider if the proposed use of water unreasonably affects surrounding landowners.

Sec. 8810.102. PERMITS FOR CERTAIN ACTIVITIES; APPLICABLE RULES. (a) The district may require a permit for any activity that extracts groundwater or allows more than 25,000 gallons of groundwater a day to escape.

(b) If a permit is required under Subsection (a), the permit holder is subject to rules adopted by the district to:

(1) conserve, preserve, protect, and recharge the groundwater or a groundwater reservoir or its subdivisions to control subsidence, prevent degradation of groundwater quality, and prevent waste of groundwater; and

(2) carry out any other power or duty under Chapter 36, Water Code.

(c) To the extent of a conflict, this section controls over Section 36.117(b), Water Code.

Sec. 8810.103. IMPACT OF TRANSFER. (a) If the district finds that a transfer of groundwater out of the district negatively impacts any of the factors described by Section 36.122(f), Water Code, the district may impose additional requirements or limitations on the permit that are designed to minimize those impacts.

(b) Sections 36.122(c), (e), (i), and (j), Water Code, do not apply to a requirement or limitation imposed under this section.

Sec. 8810.104. CONTRACTS WITH OTHER GOVERNMENTAL ENTITIES. The district and another governmental entity, including a river authority located in the district, may enter into a contract for the performance by that entity of a district function.

Sec. 8810.105. REVENUE. (a) To pay the maintenance and operating costs of the district and to pay any bonds or notes issued by the district, the district may:

(1) impose ad valorem taxes at a rate not to exceed five cents on each \$100 of assessed valuation of taxable property;

(2) assess fees for services or for water withdrawn from nonexempt wells; or

(3) solicit and accept grants from any private or public source.

(b) The district may not impose ad valorem taxes to pay the maintenance and operating costs of the district at a rate that exceeds the maximum rate approved by a majority of the voters of the district voting at an election in the district held for that purpose.

Sec. 8810.106. PROHIBITION ON DISTRICT USE OF EMINENT

DOMAIN POWERS. The district may not exercise the power of eminent domain.

[Sections 8810.107-8810.150 reserved for expansion]

SUBCHAPTER D. DISSOLUTION

Sec. 8810.151. ELECTION FOR DISSOLUTION. (a) If the district has no outstanding bond or other long-term indebtedness, the district may be dissolved by a favorable vote of a majority of the registered voters of the district at an election called for that purpose.

(b) The board shall call a dissolution election if the board receives a petition for dissolution signed by at least 50 percent of the registered voters in the district as computed by using the list of registered voters for Burnet County.

(c) If the district is dissolved under this section, the board shall:

(1) notify the Texas Commission on Environmental Quality and the secretary of state of the dissolution; and

(2) transfer title to any assets of the district to Burnet County.

SECTION 2. (a) The legal notice of the intention to introduce this Act, setting forth the general substance of this Act, has been published as provided by law, and the notice and a copy of this Act have been furnished to all persons, agencies, officials, or entities to which they are required to be furnished under Section 59, Article XVI, Texas Constitution, and Chapter 313, Government Code.

(b) The governor has submitted the notice and Act to the Texas Commission on Environmental Quality.

(c) The Texas Commission on Environmental Quality has filed its recommendations relating to this Act with the governor, lieutenant governor, and speaker of the house of representatives within the required time.

(d) All requirements of the constitution and laws of this state and the rules and procedures of the legislature with respect to the notice, introduction, and passage of this Act are fulfilled and accomplished.

SECTION 3. This Act takes effect immediately if it receives a vote of two-thirds of all the members elected to each house, as provided by Section 39, Article III, Texas Constitution. If this Act does not receive the vote necessary for immediate effect, this Act takes effect September 1, 2005.

President of the Senate

Speaker of the House

I hereby certify that S.B. No. 967 passed the Senate on April 28, 2005, by the following vote: Yeas 31, Nays 0.

Secretary of the Senate

I hereby certify that S.B. No. 967 passed the House on May 25, 2005, by the following vote: Yeas 144, Nays 0, two present not voting.

Chief Clerk of the House

Approved:

Date

Governor

APPENDIX B

RESOLUTION ADOPTING MANAGEMENT PLAN

RESOLUTION 2007-04-16-07

THE STATE OF TEXAS

§

CENTRAL TEXAS GROUNDWATER
CONSERVATION DISTRICT

§

§

§

WHEREAS, the Central Texas Groundwater Conservation District (the "District") is a political subdivision of the State of Texas organized and existing under and by virtue of Article XVI, Section 59, of the Texas Constitution, and as a groundwater conservation district acting pursuant to and in conformity with Chapter 36, Texas Water Code and Act of May 25, 2005, 79th Leg., R.S., ch. 855, 2005 Tex. Gen. Laws 2899 codified at Tex. Spec. Dist. Loc. Laws Code Ann. ch. 8810 (Vernon Supp. 2006) (the "District's Enabling Act");

WHEREAS, under the direction of the Board of Directors of the District (the "Board"), and in accordance with Sections 36.1071 and 36.1072 of the Texas Water Code, and 31 Texas Administrative Code Chapter 356, the District has timely undertaken the development of its Management Plan;

WHEREAS, as part of the process of developing its Management Plan, the District requested and received the assistance of the Texas Water Development Board (the "TWDB") and worked closely with the TWDB staff to obtain staff's input and comments on the draft Management Plan and its technical and legal sufficiency;

WHEREAS, the Board and the staff of the District and the District's consultants and legal counsel reviewed and analyzed the District's best available data, groundwater availability modeling information, and other information and data required by the TWDB;

WHEREAS, the District issued the notice in the manner required by state law and held a public hearing on March 5, 2007, to receive public and written comments on the Management Plan at the District's office located at 225 S. Pierce Street, Suite 104, Burnet, Texas, and accepted additional written comments on the Management Plan from the public after that date;

WHEREAS, the District coordinated its planning efforts on a regional basis with the appropriate surface water management entities during the preparation of the Management Plan;

WHEREAS, the Board finds that the Management Plan meets all of the requirements of Chapter 36, Water Code, and 31 Texas Administrative Code Chapter 356; and

WHEREAS, the Board of Directors met in a public meeting on April 16, 2007, properly noticed in accordance with appropriate law, and considered adoption of the attached Management Plan and approval of this resolution after due consideration of all comments received.

NOW THEREFORE BE IT RESOLVED THAT:

1. The above recitals are true and correct.
2. The Board of Directors for the District hereby adopts the attached Management Plan as the Management Plan for the District;
3. The Board of Directors and the General Manager for the District are further authorized to take all steps necessary to implement this resolution and submit the Management Plan to the TWDB for its approval; and
4. The Board of Directors and General Manager for the District are further authorized to take any and all action necessary to coordinate with the TWDB as may be required in furtherance of TWDB's approval pursuant to the provisions of Section 36.1072 of the Texas Water Code.

AND IT IS SO ORDERED.

Upon motion duly made by Director Todd Fox, and seconded by Director Jerry Bostick, and upon discussion, the Board of Directors voted 3 in favor and 1 opposed, 0 abstained, and 1 absent, and the motion thereby PASSED on this 16th day of April, 2007.

CENTRAL TEXAS GROUNDWATER CONSERVATION DISTRICT

By: _____
Board President

Attest: _____
Board Secretary

APPENDIX C

March 5, 2007:

NOTICE OF THE MEETING OF THE CENTRAL TEXAS GROUNDWATER CONSERVATION DISTRICT

Notice is hereby given that the Board of Directors of the Central Texas Groundwater Conservation District ("District") will hold a Public Hearing on the District Management Plan and a Regular Board meeting on Monday, March 5, 2007, at 6:00 p.m. in the District office located at 225 S. Pierce Street, Suite 104, Burnet, Texas.

The following items of business will be discussed, considered, and potentially acted upon by the Board of Directors: (see footnote 1)

1. Open Hearing to receive comments on Central Texas Groundwater Conservation District Management Plan.
2. Close Hearing
3. Open Board Meeting.
4. Consider and/or take action on Minutes of Board Meeting held February 15, 2007.
5. Public Comment. (See footnote 2)
6. Discuss and/or take action on adoption of Central Texas Groundwater Conservation District Management Plan.
7. Consider and take action on Financial Report:
 - a. Expenditures for February 2007
 - c. Review of 2006 – 2007 Budget
8. Reconsider and/or take action on bids submitted February 15, 2007 for the purchase of a District vehicle.
7. Consider and/or take action on District participation in advertisement requests within the District.
8. Consider and/or take action on giving property tax relief to "qualifying charitable organizations as defined in Chapter 11.18, Property Tax Code".
9. Consider and/or take action on GMA 8 interlocal Agreement.
10. Discussion and/or take action on date for next work session on District Rules.
11. Director's comments. (See Footnote 3)
12. Manager's Report. (See Footnote 3)
13. Identify agenda items for next Board Meeting.
14. Set next meeting date.
15. Adjournment.

Footnotes:

1. At any time during the meeting and in compliance with the Texas Open Meetings Act, Chapter 551, Government Code, Vernon's Texas Codes, Annotated, the Central Texas Groundwater Conservation District Board may meet in executive session on any of the above agenda items for consultation concerning attorney- client matters (~-55 1.071); deliberation regarding real property (~-55 1.072); deliberation regarding prospective gift (~-55 1.073); personnel matters (~-55 1.074); and deliberation regarding security devices (~-551.076), Any

subject discussed in executive secession may be subject to action during any open meeting.

2. Citizens who desire to address the Board on any matter may sign up to do so prior to the meeting. Public comments will be received during this portion of the meeting. Please limit comments to 3 minutes. No discussion or final action will be taken by the Board.

3. Comments will include activities and issues pertinent to the organization of the District and management of groundwater within the District, including, but not limited to, current events in the District involving groundwater, wells, and state or regional developments related to water management.

Certification: I, the undersigned authority, do hereby certify that on February 1, 2007, at or before 1:00 p.m., I posted and filed the above notice of meeting with the Burnet County Clerk's office and also posted a copy in the hallway of the Burnet County Courthouse in a place convenient and readily accessible to the general public at all times. I also certify that a copy of the notice on door and on an outside window of the District office and that it will remain so posted continuously for at least 72 hours preceding the scheduled time of said meeting in accordance with the Texas Government Code, Chapter 551.

Richard S. Bowers, General Manager
Central Texas Groundwater Conservation District

April 2, 2007:

**NOTICE OF THE MEETING OF THE CENTRAL TEXAS
GROUNDWATER CONSERVATION DISTRICT**

Notice is hereby given that the Board of Directors of the Central Texas Groundwater Conservation District ("District") will hold a Regular Board meeting on Monday, April 2, 2007, at 6:00 p.m. in the District office located at 225 S. Pierce Street, Suite 104, Burnet, Texas.

The following items of business will be discussed, considered, and potentially acted upon by the Board of Directors: (see footnote 1)

Call meeting to order and establish a quorum.

1. Public Comment (See footnote 2)
2. Consider and/or take action on Minutes of Board Meeting held March 5, 2007, and Management Plan and Rules work session held March 23, 2007.
3. Discuss and/or take action on adoption of Central Texas Groundwater Conservation District Management Plan.
4. Consider and take action on Financial Report:
 - a. Expenditures for March 2007
 - b. Review of 2006 – 2007 Budget

- c. Consider amendments to 2006 – 2007 Budget.
5. Consider and/or take action on presentation and proposal by Allan Standen with Daniel B. Stephens & Associates, Inc. in regard to software, various datasets and computer training to manage groundwater information within the District.
6. Groundwater Management Area 8 and 9 update.
7. Director's comments. (See Footnote 3)
8. Manager's Report. (See Footnote 3)
9. Identify agenda items for next Board Meeting.
10. Set next meeting date.
11. Adjournment.

The Central Texas Groundwater Conservation District is committed to compliance with the Disabilities Act (ADA). Reasonable accommodations and equal opportunity for effective communications will be provided upon request. Please contact the District office at 512-756-4900 at least 24 hours in advance if accommodation is needed.

Footnotes:

1. At any time during the meeting and in compliance with the Texas Open Meetings Act, Chapter 551, Government Code, Vernon's Texas Codes, Annotated, the Central Texas Groundwater Conservation District Board may meet in executive session on any of the above agenda items for consultation concerning attorney- client matters (~55 1.071); deliberation regarding real property (~55 1.072); deliberation regarding prospective gift (~55 1.073); personnel matters (~55 1.074); and deliberation regarding security devices (~551.076), Any subject discussed in executive secession may be subject to action during any open meeting.
2. Citizens who desire to address the Board on any matter may sign up to do so prior to the meeting. Public comments will be received during this portion of the meeting. Please limit comments to 3 minutes. No discussion or final action will be taken by the Board.
3. Comments will include activities and issues pertinent to the organization of the District and management of groundwater within the District, including, but not limited to, current events in the District involving groundwater, wells, and state or regional developments related to water management.

Certification: I, the undersigned authority, do hereby certify that on March 28, 2007, at or before 5:00 p.m., I posted and filed the above notice of meeting with the Burnet County Clerk's office and also posted a copy in the hallway of the Burnet County Courthouse in a place convenient and readily accessible to the general public at all times. I also certify that a copy of the notice was posted on the door and on an outside window of the District office and that they will remain so posted continuously for at least 72 hours preceding the scheduled time of said meeting in accordance with the Texas Government Code, Chapter 551.

Richard S. Bowers, General Manager
Central Texas Groundwater Conservation District

April 16, 2007:

**NOTICE OF THE MEETING OF THE CENTRAL TEXAS
GROUNDWATER CONSERVATION DISTRICT**

Notice is hereby given that the Board of Directors of the Central Texas Groundwater Conservation District ("District") will hold a Special Board meeting on Monday, April 16, 2007, at 6:00 p.m. in the District office located at 225 S. Pierce Street, Suite 104, Burnet, Texas.

The following items of business will be discussed, considered, and potentially acted upon by the Board of Directors: (see footnote 1)

Call meeting to order and establish a quorum.

5. Public Comment (See footnote 2).
6. Consider and/or take action on Minutes of Board Meeting held April 2, 2007.
7. Discuss and/or take action on adoption of Central Texas Groundwater Conservation District Management Plan.
8. Set next meeting date.
9. Adjournment.

The Central Texas Groundwater Conservation District is committed to compliance with the Disabilities Act (ADA). Reasonable accommodations and equal opportunity for effective communications will be provided upon request. Please contact the District office at 512-756-4900 at least 24 hours in advance if accommodation is needed.

Footnotes:

1. At any time during the meeting and in compliance with the Texas Open Meetings Act, Chapter 551, Government Code, Vernon's Texas Codes, Annotated, the Central Texas Groundwater Conservation District Board may meet in executive session on any of the above agenda items for consultation concerning attorney- client matters (~55 1.071); deliberation regarding real property (~55 1.072); deliberation regarding prospective gift (~55 1.073); personnel matters (~55 1.074); and deliberation regarding security devices (~551.076), Any subject discussed in executive secession may be subject to action during any open meeting.

2. Citizens who desire to address the Board on any matter may sign up to do so prior to the meeting. Public comments will be received during this portion of the meeting. Please limit comments to 3 minutes. No discussion or final action will be taken by the Board.

3. Comments will include activities and issues pertinent to the organization of the District and management of groundwater within the District, including, but not limited to, current events in the District involving groundwater, wells, and state or regional developments related to water management.

Certification: I, the undersigned authority, do hereby certify that on April 12, 2007, at or before 5:00 p.m., I posted and filed the above notice of meeting with the Burnet County Clerk's office and also posted a copy in the hallway of the Burnet County Courthouse in a place convenient and readily accessible to the general public at all times. I also certify that on April 11, 2007 at or before 5:00 p.m. a copy of the notice was posted on the door and on an outside window of the District office and that they will remain so posted continuously for at least 72 hours preceding the scheduled time of said meeting in accordance with the Texas Government Code, Chapter 551.

Richard S. Bowers, General Manager
Central Texas Groundwater Conservation District

APPENDIX D

The attached letter was sent to the following entities:

Phil Ford, General Manager/CEO
Brazos River Authority
P. O. Box 7555
Waco, Texas 76714

Joe Beal, General Manager
Lower Colorado River Authority
P.O. Box 220
Austin, Texas 78767

Geoffery P. Saunders, Senior Hydrologist
Lower Colorado River Authority
P.O. Box 220
Austin, Texas 78767-0220

Tom Hegemier, P.E., Water
Resource Protection
Lower Colorado River Authority
P.O. Box 220
Austin, Texas 78767-0220

City of Bertram
244 Hwy. 29 East
Bertram, Texas 78605

Mike T. Steele, City Manager
City of Burnet
P.O. Box 1369
Burnet, Texas 78611

City of Cottonwood Shores
3808 Cottonwood Dr
Cottonwood Shores, Texas 78654

City of Granite Shoals
410 N. Phillips
Granite Shoals, Texas 78654

George W. Russell, City Manager
City of Marble Falls
800 3rd Marble Falls, Texas 78654

City of Meadowlakes
111-D Meadowlakes Dr
Meadowlakes, Texas 78654

Ron Fiesler, General Manager
Blanco-Pedernales GCD
P.O. Box 1516 P.O. Box 729
Johnson City, Texas 78636

Cheryl Maxwell, Administrative Manager
Clearwater UWCD
Belton, Texas 76513

Paul Tybor, Manager
Hill Country UWCD
508 S. Washington
Fredericksburg, Texas 78624

Joe Cooper, Manager
Middle Trinity GCD
150 N Harbin St, Suite 434
Stephenville, Texas 76401

Gary Westbrook, Manager
Post Oak Savannah GCD
P.O. Box 92
Milano, Texas 76556

John Burk, Chairman
Lower Colorado Regional Water Planning Group
P.O. Drawer P
Bastrop, Texas 78602



**CENTRAL TEXAS
GROUNDWATER
CONSERVATION
DISTRICT**
P.O. Box 870
Burnet, Texas 78611

February 28, 2007

SEE ATTACHED LIST

Enclosed is a copy of the proposed Management Plan for the Central Texas Groundwater Conservation District. The information provided in this plan will be used when the District formulate Rules for the District as well as the development of programs and data collection activities.

The District will hold a public hearing on the Plan at 6:00 p.m. on Monday, March 5, 2007. The hearing will be held at the District office located at 225 S. Pierce, Suite 104, Burnet, Texas.

Please feel free to contact me if you have any question in regard to the Plan.

Sincerely,

Richard S. Bowers
General Manager

APPENDIX E

Groundwater Management Areas In Texas



2007-2010
This map was prepared by the Texas Water Development Board using GIS
technology and data provided by the Texas Water Development Board. It is
intended to provide a general overview of the state and is not intended to
be used for any other purpose. The board does not assume any liability for
any errors or omissions.

Map prepared by: Bob Farris
Map date: 10/2007
Map scale: 1:1,000,000
Map projection: NAD 83
Map datum: NAD 83

APPENDIX F

Groundwater Availability in the Trinity Aquifer Subdivisions within the District

Model Layer (geologic unit)	Hydrologic Unit	Annual Availability (acre- feet per year)
Layer 3 (Paluxy)	Upper Trinity aquifer	400
Layer 4 (Glen Rose)		
Layer 5 (Hensell)	Middle Trinity aquifer	700
Layer 6 (Cow Creek, Hammett, Sligo)	Represented in model as aquitar	N/A
Layer 7 (Hosston)	Lower Trinity aquifer	2,500
Total Availability	All Units	3,600

APPENDIX G - DETAILS ON MINOR AQUIFER CALCULATIONS

Calculation Methodology

Assumptions: unconfined aquifer

Groundwater Availability = Groundwater Availability_{Storage} + Groundwater Availability_{Recharge}

GWA = GWAS + GWA_R

GWA = Groundwater availability (ac-ft/yr)

GWAS = Groundwater availability from storage (ac-ft/yr)

GWA_R = Groundwater availability from recharge (ac-ft/yr)

GWAS = (1-DD)*B*A*N/Y/43560

DD = average percentage of drawdown maintained (%)

B = average saturated thickness of aquifer (ft)

A = area of aquifer (ft²)

N = effective porosity

Y = time duration (yrs)

GWA_R = P*A*R/43560

P = average yearly precipitation (ft/yr)

R = % precipitation that infiltrates into groundwater system

Equation: GWA = GWAS + GWA_R = (1-DD)*B*A*N/Y/43560 + P*A*R/43560

Aquifer Details

Marble Falls

Recharge Rate = 5 Percent of Annual Rainfall (TWDB Report 238)

Recharge Area = 15,790 acres (GIS calculation from TWDB Aquifer Coverage)

Annual Rainfall = 30 inches (NOAA)

Saturated Thickness = 160 feet

Effective Porosity (Coefficient of Storage) = 0.15 (dimensionless)

Ellenburger-San Saba

Recharge Rate = 2 Percent of Annual Rainfall (TWDB Report 238)

Recharge Area = 110,413 acres (GIS calculation from TWDB Aquifer Coverage)

Annual Rainfall = 30 inches (NOAA)

Saturated Thickness = 500 feet

Effective Porosity (Coefficient of Storage) = 0.15 (dimensionless)

Hickory

Recharge Rate = 10 Percent of Annual Rainfall (TWDB Report 238)

Recharge Area = 18,011 acres (GIS calculation from TWDB Aquifer Coverage)

Annual Rainfall = 30 inches (NOAA)

Saturated Thickness = 160 feet

Effective Porosity (Coefficient of Storage) = 0.15 (dimensionless)

APPENDIX H-TWDB Groundwater Use Data Estimates for Burnet County (a-f/yr)

Aquifer	Year	Municipal	Manufacturing	Power	Mining	Irrigation	Livestock	Total
Ellenburger-San								
Saba	1980	680	0	0	0	50	85	815
Hickory		35	0	0	0	0	10	45
Marble Falls		30	0	0	0	0	8	38
Other-Undifferentiated		30	0	0	0	0	8	38
Trinity		921	4	0	0	50	211	1,186
Ellenburger-San								
Saba	1984	446	0	0	107	0	114	667
Hickory		72	0	0	0	82	13	167
Marble Falls		91	0	0	0	0	11	102
Other-Undifferentiated		208	0	0	0	0	11	219
Trinity		989	1	0	9	209	286	1,494
Ellenburger-San								
Saba	1985	55	0	0	1	0	118	174
Hickory		38	0	0	0	168	14	220
Marble Falls		9	0	0	0	0	12	21
Other-Undifferentiated		151	0	0	0	0	12	163
Trinity		1,606	1	0	16	432	295	2,350
Ellenburger-San								
Saba	1986	892	0	0	1	0	109	1,002
Hickory		47	0	0	0	84	13	144
Marble Falls		6	0	0	1	0	11	18
Other-Undifferentiated		159	0	0	0	0	11	170
Trinity		829	2	0	17	216	274	1,338
Ellenburger-San								
Saba	1987	802	0	0	1	0	103	906
Hickory		49	0	0	0	84	12	145
Marble Falls		4	0	0	0	0	10	14
Other-Undifferentiated		151	0	0	1	0	10	162
Trinity		880	2	0	14	216	257	1,369
Ellenburger-San								
Saba	1988	108	0	0	102	0	110	320
Hickory		44	0	0	0	84	13	141
Marble Falls		3	0	0	0	0	11	14
Other-Undifferentiated		166	0	0	0	0	11	177
Trinity		830	4	0	15	216	276	1,341
Ellenburger-San								
Saba	1989	161	0	0	160	0	109	430
Hickory		40	0	0	0	28	13	81
Marble Falls		2	0	0	0	0	11	13
Other-Undifferentiated		144	0	0	4	0	11	159
Trinity		782	6	0	14	72	272	1,146
Ellenburger-San								
Saba	1990	305	0	0	160	0	107	572
Hickory		49	0	0	0	32	13	94
Marble Falls		62	0	0	0	0	11	73
Other-		147	0	0	4	0	11	162

Undifferentiated								
Trinity	675	4	0	14	82	269	1,044	

APPENDIX H-TWDB Groundwater Use Data Estimates for Burnet County (a-f/yr)

Aquifer	Year	Municipal	Manufacturing	Power	Mining	Irrigation	Livestock	Total
Ellenburger-San Saba	1991	368	0	0	83	0	110	561
Hickory		50	0	0	0	32	13	95
Marble Falls		53	0	0	0	0	11	64
Other-Undifferentiated		151	1	0	216	0	11	379
Trinity		544	4	0	15	82	276	921
Ellenburger-San Saba	1992	343	0	0	125	0	104	572
Hickory		75	0	0	0	32	12	119
Marble Falls		54	0	0	0	0	10	64
Other-Undifferentiated		159	1	0	100	0	10	270
Trinity		520	4	0	15	82	260	881
Ellenburger-San Saba	1993	496	0	0	2	0	104	602
Hickory		169	0	0	0	18	12	199
Marble Falls		61	0	0	0	0	10	71
Other-Undifferentiated		329	1	0	223	0	10	563
Trinity		540	4	0	15	47	260	866
Ellenburger-San Saba	1994	533	0	0	0	0	110	643
Hickory		170	0	0	0	100	13	283
Marble Falls		59	0	0	0	0	11	70
Other-Undifferentiated		75	0	0	280	0	11	366
Trinity		562	4	0	15	0	275	856
Ellenburger-San Saba	1995	600	0	0	0	0	112	712
Hickory		147	0	0	0	74	13	234
Marble Falls		70	0	0	0	0	11	81
Other-Undifferentiated		105	0	0	315	0	11	431
Trinity		567	4	0	15	0	281	867
Ellenburger-San Saba	1996	653	0	0	1	0	85	739
Hickory		144	0	0	0	85	10	239
Marble Falls		76	0	0	0	0	8	84
Other-Undifferentiated		96	0	0	314	0	8	418
Trinity		616	4	0	15	0	214	849
Ellenburger-San Saba	1997	814	0	0	1	0	92	907
Hickory		154	0	0	0	85	11	250
Marble Falls		82	0	0	0	0	9	91
Other-Undifferentiated		98	0	0	314	0	9	421
Trinity		827	4	0	15	0	231	1,077
Ellenburger-San	1998	863	0	0	0	0	107	970

Saba								
Hickory	163	0	0	0	85	13	261	
Marble Falls	87	0	0	0	0	10	97	
Other-Undifferentiated	104	0	0	88	0	10	202	
Trinity	877	4	0	4	0	268	1,153	

APPENDIX H-TWDB Groundwater Use Data Estimates for Burnet County (a-f/yr)

Aquifer	Year	Municipal	Manufacturing	Power	Mining	Irrigation	Livestock	Total
Ellenburger-San								
Saba	1999	703	0	0	1	0	116	820
Hickory		127	0	0	0	85	14	226
Marble Falls		94	0	0	0	0	11	105
Other-Undifferentiated		80	0	0	314	0	11	405
Trinity		859	4	0	15	0	291	1,169
Ellenburger-San								
Saba	2000	681	0	0	2	0	109	792
Hickory		123	0	0	0	78	13	214
Marble Falls		91	0	0	0	0	10	101
Other-Undifferentiated		77	0	0	610	0	10	697
Trinity		831	4	0	29	0	274	1,138
Ellenburger-San								
Saba	2001	640	0	0	2	0	213	855
Hickory		160	0	0	0	114	26	300
Marble Falls		103	0	0	0	0	20	123
Other-Undifferentiated		111	0	0	610	0	20	741
Trinity		859	5	0	31	0	535	1,430
Ellenburger-San								
Saba	2002	638	0	0	2	0	203	843
Hickory		182	0	0	0	114	24	320
Marble Falls		120	0	0	0	0	19	139
Other-Undifferentiated		79	0	0	610	0	19	708
Trinity		823	5	0	31	0	508	1,367
Ellenburger-San								
Saba	2003	644	0	0	2	0	199	845
Hickory		139	0	0	0	59	24	222
Marble Falls		90	0	0	0	0	19	109
Other-Undifferentiated		76	0	0	610	0	19	705
Trinity		887	5	0	31	0	499	1,422

APPENDIX I

Springs and Spring Discharge Rates in Burnet County

Spring	Aquifer	Discharge (acre-feet/year)
BT-57-22-202 ¹	San Saba Ls. of Ellenburger-San Saba aquifer	8.07
Delaware Springs ¹	San Saba Ls. of Ellenburger-San Saba aquifer	500.03
BT-57-14-902 ¹	San Saba Ls. of Ellenburger-San Saba aquifer	64.52
Big Spring ¹	San Saba Ls. of Ellenburger-San Saba aquifer	701.66
	Total=	1,274.28
Holland & Sand Springs ¹	Ellenburger Gp of Ellenburger-San Saba aquifer	3.06
BT_57-14-903 ¹	Ellenburger Gp of Ellenburger-San Saba aquifer	8.07
Patterson Springs ¹	Ellenburger Gp of Ellenburger-San Saba aquifer	4.74
Ebeling Springs ²	Ellenburger Gp of Ellenburger-San Saba aquifer	690.30
Tanyard Springs ²	Ellenburger Gp of Ellenburger-San Saba aquifer	5.11
Persimmon Springs ²	Ellenburger Gp of Ellenburger-San Saba aquifer	89.49
Mud Springs ²	Ellenburger Gp of Ellenburger-San Saba aquifer	69.04
Boiling Springs ²	Ellenburger Gp of Ellenburger-San Saba aquifer	43.47
Soldier Spring ²	Ellenburger Gp of Ellenburger-San Saba aquifer	24.29
Greenwood Springs ³	Ellenburger Gp of Ellenburger-San Saba aquifer	-
Wolf Springs ³	Ellenburger Gp of Ellenburger-San Saba aquifer	-
Williams Springs ³	Ellenburger Gp of Ellenburger-San Saba aquifer	-
Sulphur Springs ⁴	Ellenburger Gp of Ellenburger-San Saba aquifer	-
	Total=	937.57
Krause Springs ²	Marble Falls aquifer	485.77
	Total=	485.77
Buzzard Roost Spring ¹	Tanyard Fm. of Ellenburger-San Saba aquifer	16.13
BT-57-15-709 ¹	Tanyard Fm. of Ellenburger-San Saba aquifer	1.61
Lemons South Spring ¹	Tanyard Fm. of Ellenburger-San Saba aquifer	20.97
Lemons Middle Spring ¹	Tanyard Fm. of Ellenburger-San Saba aquifer	35.49
Lemons Park Office Spring ¹	Tanyard Fm. of Ellenburger-San Saba aquifer	140.33
	Total=	214.53
BT-57-30-801 ¹	Honeycut Fm. of Ellenburger-San Saba aquifer	322.60
Boil Springs ¹	Honeycut Fm. of Ellenburger-San Saba aquifer	241.95
Horseshoe Springs ¹	Honeycut Fm. of Ellenburger-San Saba aquifer	96.78
Felps Spring ¹	Honeycut Fm. of Ellenburger-San Saba aquifer	646.82
	Total=	1,308.15
Pecan Spring ¹	Unknown origin	14.48
Flatrock Springs ¹	Unknown origin	130.30
	Total=	144.78
	Burnet County Total=	2,957.61

¹ - Data from USGS, 2003.

² - Data from Brune, 1981.

³ - These springs were mentioned in Brune, 1981; however, no discharge values were given.

⁴ - No discharge values were given for these springs because they are currently under seven meters of water due to the creation of the Marble Falls Reservoir.