



*Clearwater Underground Water
Conservation District*

District Management Plan

Adopted – October 24, 2000

Revisions Adopted December 13, 2005

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I. DISTRICT MISSION

The mission of the Clearwater Underground Water Conservation District (District) is to develop and implement an efficient, economical and environmentally sound groundwater management program to protect and enhance the water resources of the District.

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 their 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 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 to be included in the District's management plan and will guide the District's regulatory and management policies.

The District's management plan satisfies 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.

III. DISTRICT INFORMATION

A. Creation

Creation of the District was authorized in 1989 by the 71st Texas Legislature under HB 3172. The citizens of Bell County confirmed creation of the District by an election held on August 21, 1999.

The District was formed to protect the underground water resources for the citizens of Bell County. Beyond its enabling legislation, the District is governed primarily by the provisions of Chapter 36 of the Texas Water Code, the District's Management Plan, and the District Rules.

CLEARWATER UNDERGROUND WATER CONSERVATION DISTRICT BOUNDARY



Prepared By: Central Texas Council of Governments--September 2000

Exhibit A

B. Directors

The Board of Directors consists of five members. These five directors are elected by the voters of Bell County and serve a four year term. The District observes the same precincts as the Bell County Commissioners—four precincts with one at-large position. Director terms are staggered with a two year interval. Directors from Precincts 1 and 3 serve the same term while directors from Precincts 2, 4 and the at-large position serve the same term. Elections are held in May in even numbered years.

C. Authority

The District is governed primarily by the provisions of TWC Chapter 36 and 31 Texas Administrative Code (TAC) Chapter 356. The District has the power and authority to undertake various hydrogeological studies, to adopt a management plan, to establish a program for the permitting of certain water wells, and to implement programs to achieve its statutory mandates. The District has rule-making authority to implement its policies and procedures and to help ensure the management of the groundwater resources of Bell County.

D. Location and Extent

The jurisdiction of the District includes all territory located within Bell County (Exhibit A). This area encompasses approximately 1,055 square miles. The district is bounded by McLennan County to the north, Falls and Milam Counties to the east, Williamson County to the south, and Burnet, Lampasas and Coryell Counties to the west. Bell County has a vibrant economy dominated by the military, medical, manufacturing and agricultural communities. Based on the 2002 Census of Agriculture, approximately 450,923 of Bell County's 675,200 acres, or 66.8% of this area, is farmland.

E. Topography and Drainage

Bell County is divided into two separate ecological regions by the Balcones Escarpment, which runs from the southeast part of the county to the northwest. The region east of the Balcones Escarpment is the Blackland Prairie while the Grand Prairie is located to the west.

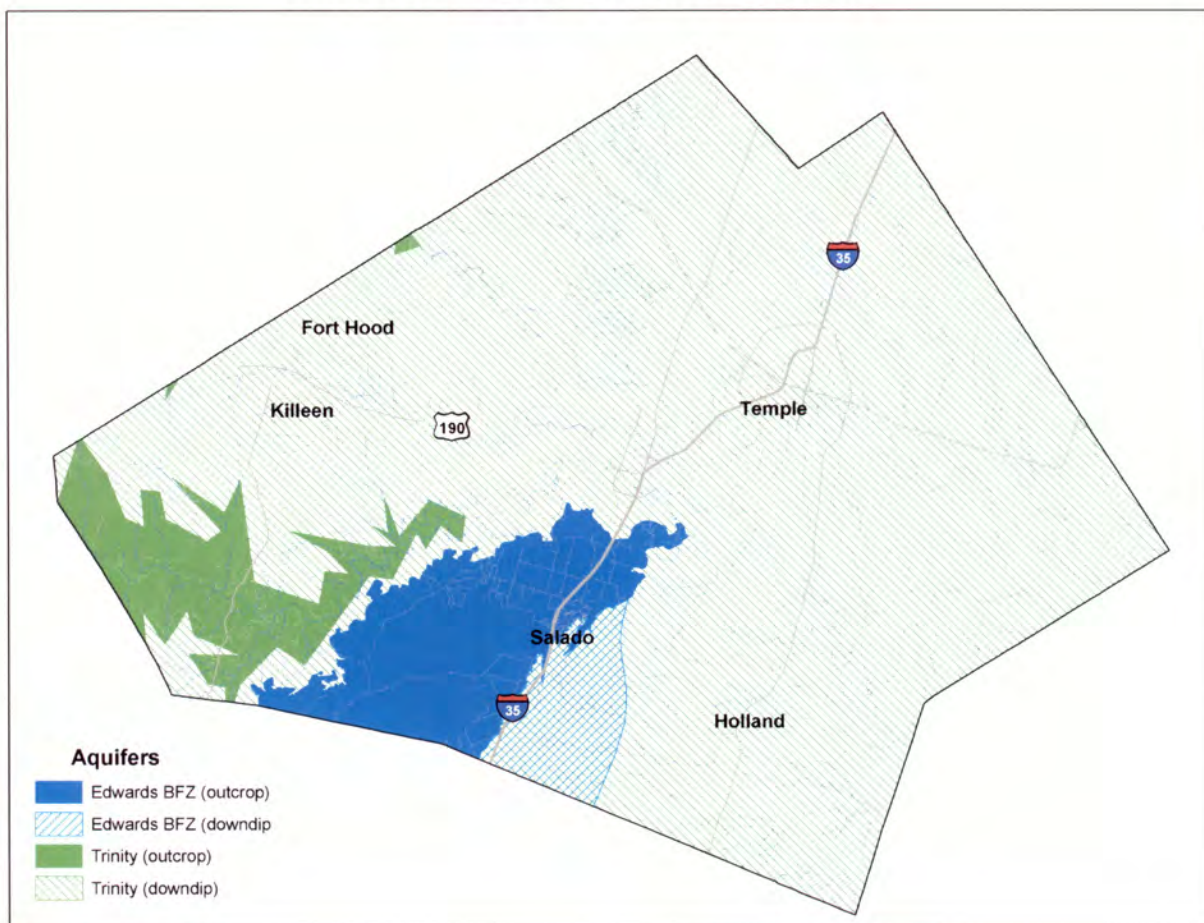
In the Grand Prairie area drainage flows to the Little River and its tributaries. The Leon and Lampasas Rivers and Salado Creek converge at Three Forks.

F. Groundwater Resources of Bell County

Bell County enjoys a variety of groundwater resources. The two primary sources of groundwater in Bell County are the Edwards Balcones Fault Zone (BFZ) aquifer and the Trinity aquifer. These aquifers are recognized as major aquifers by the Texas Water Development Board. The Edwards aquifer is the source of Salado Springs and is the

primary source of water supply for the City of Salado. The Trinity aquifer consists of three distinct subdivisions. It is the primary source of groundwater in much of western Bell County. The deepest subdivision of the Trinity aquifer also serves or has served the Cities of Rogers, Holland and Bartlett in eastern Bell County. The portion of Bell County east of IH-35 also has a number of groundwater sources that are not widely recognized as aquifers outside of the County but are of vital importance. Approximately 40 percent of the wells registered with the District are located in eastern Bell County and produce water from alluvium, terrace deposits, the Marlbrook Marl, the Ozan Formation, the Pecan Gap Chalk, the Austin Chalk or the Buda Limestone. See Appendix A for a more detailed discussion of Bell County's groundwater resources.

Exhibit B -- Major Aquifers in Bell County



IV. STATEMENT OF GUIDING PRINCIPLES

The District recognizes that the groundwater resources of Bell County and the Central Texas region are of vital importance. The preservation of this most valuable resource can be managed in a prudent and cost effective manner through education, cooperation and developing a comprehensive understanding of the aquifers. The greatest threat to the District in achieving its stated mission is the inappropriate management of its groundwater resources, based on a lack of understanding of local conditions. 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 executive administrator or, if appealed, on approval by the TWDB. The original management plan was certified by the TWDB in February 2001. This plan is being submitted as part of the five-year review and re-adoption process as required by TWC 36.1072(e). The District's Board of Directors adopted this revised groundwater management plan on December 13 2005, and anticipates approval by the executive administrator of the TWDB in February 2006. This management plan will remain in effect until a revised management plan is approved by the executive administrator or the TWDB. The Plan shall be reviewed (annually), and updated and readopted in accordance with the requirements of the Texas Water Code.

B. Board Resolution

Certified copy of the Clearwater Underground Water Conservation District resolution adopting the plan 31 TAC §356.6(a)(2)

A certified copy of the Clearwater Underground Water Conservation District resolution adopting the plan is located in Appendix B - District Resolution.

C. Plan Adoption

Evidence that the plan was adopted after notice and hearing 31 TAC §356.6(a)(3)

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

Evidence that following notice and hearing the District coordinated in the development of its management plan with surface water management entities. TWC 36.1071(a)

A letter transmitting a copy of this plan to the Brazos River Authority is located in Appendix D – Letter 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. The District is unable to present a value for the managed available groundwater in the aquifers of Bell County as of the date of this plan document.

Prior to the enactment of the GMA joint planning provision the District identified selected groundwater management conditions as a benchmark to establish groundwater availability in the major 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 major aquifers in preparation to meeting the requirement that the District’s management plan be submitted for re-certification or approval by TWDB by February 2006. The identified benchmark management conditions were applied to the TWDB groundwater availability models (GAMs) for the major aquifers in Bell County. Using the GAMs the District established groundwater availability values for the major aquifers in Bell County, based on maintaining the identified local conditions. Future revisions to this plan will incorporate coordination with the other districts and joint planning in GMA 8. See Appendix E for a map of the GMA boundaries.

To determine groundwater availability, the District conducted a series of simulations using the TWDB’s Groundwater Availability Models (GAMs) for the Northern Edwards (BFZ) and the Northern Trinity/Woodbine aquifers. Each series of GAM simulations was conducted by iteratively applying 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 worst year of the simulated drought of record was identified.

1. Edwards (BFZ) Aquifer

a. Selected Management Conditions

The selected management condition of the Edwards (BFZ) aquifer is based on maintaining Salado Spring discharge into Salado Creek during a repeat of conditions similar to the 1950's drought of record. Under the drought of record conditions, a spring discharge of 200 acre-feet per month is preferred and 100 acre-feet per month is the minimum acceptable spring flow. The District conducted GAM simulations during the fall of 2004 based on these minimum standards.

b. Groundwater Availability

Groundwater availability for the Edwards (BFZ) in Bell County is 7,500 acre-feet per year, which is based on the selected management conditions discussed above. The application of the Northern Edwards (BFZ) aquifer GAM assumed that pumping would be reduced by 20 percent during periods of climatic stress. For the purpose of the simulations, a climatic stress period was defined as a two-month period when the rainfall was less than 50 percent of the long term average monthly rainfall. In determining the groundwater available for permitting, 500 acre-feet per year is allocated for exempt well users. This leaves **7,000 acre-feet per year as the volume of groundwater available for permitting in the Edwards (BFZ) aquifer.**

2. Trinity Aquifer

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 conducted GAM simulations during the spring of 2005 with the following selected management conditions of the aquifer: 1) maintaining at least 50% of the available drawdown after 50 years in the confined portions of the aquifer (Paluxy, Hensell, and Hosston); and 2) maintaining at least 95% of the saturated thickness in the unconfined portion of the aquifer (Glen Rose) after 50 years. The available draw down was indexed to the westernmost extent of each model layer in the District and year 2000 water levels. The saturated thickness was indexed to the Killeen area of the District and year 2000 water levels.

b. Groundwater Availability

Groundwater availability for the Trinity aquifer in Bell County is 7,092 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 **5,592 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 layers, if determined appropriate. If management by layers is implemented, the groundwater availability figure for each layer will need to consider allocating water for exempt well use. See Appendix F for availability figures for the upper, middle, and lower Trinity based on the GAM simulations.

3. Other Water Bearing Formations

Other geologic units in Bell County from which groundwater is produced include Stream Alluvium or Terrace Deposits, the Austin Chalk, The Buda Limestones, the Edwards Group and equivalent rocks outside of the recognized bounds of the Edwards (BFZ) aquifer, Kemp Fm., Lake Waco Fm., Ozan Fm., and Pecan Gap Fm. These sources of groundwater are minor sources of water supply that are used in only limited areas within the District. There is currently no GAM available for these minor groundwater sources and simulations have not been conducted to determine groundwater availability. As a result, selected management conditions and groundwater availability figures are not available for these sources of groundwater. See Appendix G for a more detailed discussion of these water bearing formations.

**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))**

The amount of groundwater used in Bell County during year 2004 is shown in the table below. Data from 1980 to 2000 is provided by the Texas Water Development Board from their Water Use Survey database. This data does not distinguish between exempt and non-exempt wells.

Data for 2003 and 2004 is provided from the District's records. The District began registering wells in February 2002 and began recording production from non-exempt wells during 2003. At the end of 2004, approximately 4,228 wells were registered. Although the District has made considerable progress in registering wells, there are still several wells in Bell County that are not registered, and are therefore not considered in the table below. The District requires monthly production reports for all Classification 2 non-exempt wells (commercial). Classification 1 non-exempt wells are wells that would otherwise be considered exempt but are located on a tract of land of less than 10 acres.

Production reports are not required for Classification 1 wells; however, production cannot exceed 25,000 gallons per day. There is currently only one Classification 1 non-exempt well. Production from this well has been estimated at approximately 0.5 acre-feet per year and is included with the non-exempt wells under “Other” groundwater sources shown in the table below. With the exception of this Class 1 well, the figures for the non-exempt wells represent actual production that was reported to the District. In 2004, the District began estimating production from exempt wells based upon information that was provided to the District on the registration forms. Therefore, production from the exempt wells is shown only for 2004.

**Exhibit C -- Estimates of the Annual Amount of Groundwater
Being Used in Bell County in Acre-Feet per Year**

Year	Edwards (BFZ)			Trinity			Other			Total All Aquifers
	Non-Exempt	Estimated Exempt	Total	Non-Exempt	Estimated Exempt	Total	Non-Exempt	Estimated Exempt	Total	
1980	--	--	115	--	--	581	--	--	--	696
1985	--	--	363	--	--	855	--	--	--	1,218
1990	--	--	193	--	--	833	--	--	--	1,026
1995	--	--	119	--	--	998	--	--	--	1,117
2000	--	--	110	--	--	889	--	--	--	999
2003	1,388	--	1,388	997	--	997	222.5	--	222.5	2,607.5
2004	1,371	285	1,656	934	811	1,745	53	902	955	4,356.5

Source: TWDB Water Use Survey Data 1980 – 2000, and District Estimates 2003 – 2004

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 estimates of the annual amount of recharge to the groundwater resources of the District that are recognized as Major Aquifers by TWDB are based on the GAM simulations conducted to assess the amount of available groundwater in each aquifer. The Northern Edwards (BFZ) aquifer GAM application simulated the actual climatic conditions of Bell County during the drought of record decade of the 1950’s and ended with a simulation of the climatic conditions of 1960 which may be considered an average year. 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 recharge to these aquifers may vary significantly due to climatic conditions.

Recharge estimates reflecting both the worst year of the drought of record and average years are presented for the Edwards (BFZ) and Upper Trinity aquifers. No estimate of annual recharge from precipitation is presented for the Middle and Lower Trinity aquifers because there is no outcrop of either of these hydrologic units in the District. The District has made no estimate of the amount of annual recharge to the minor sources of groundwater in the District.

1. Edwards (BFZ) Aquifer Recharge
 - a. Average Year (simulated 1960):
47,464 acre-feet per year
 - b. Drought of Record (simulated 1954):
9,418 acre-feet per year
2. Upper Trinity Aquifer Recharge
 - a. Average Year (unspecified):
4,546 acre-feet per year
 - b. Drought of Record (simulated 1954):
2,262 acre-feet per year

Trinity aquifer estimate source: Turner, Collie & Braden GAM Run #7; August 28, 2005

**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 estimates of the annual amount of water discharged to surface water systems by the groundwater resources of the District that are recognized as Major Aquifers by TWDB are based on the GAM simulations conducted to assess the amount of available groundwater in each aquifer. The Northern Edwards (BFZ) aquifer GAM application simulated the actual climatic conditions of Bell County during the drought of record decade of the 1950's and ended with a simulation of the climatic conditions of 1960 which may be considered an average year. 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 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 Edwards (BFZ) and Upper Trinity aquifers. No estimate of annual discharge to surface water systems is presented for the Middle and Lower Trinity aquifers because there is no outcrop of either

of these hydrologic units in the District. The values presented for the Edwards (BFZ) aquifer are taken from the Drains value of the GAM Water Budget. The values presented for the Upper Trinity aquifer are the sum of the Stream Leakage and Drains values in the GAM Water Budget. The District has made no estimate of the amount of the annual discharge to surface water systems by the minor sources of groundwater in the District.

1. Edwards (BFZ) Aquifer
 - a. Average Year (simulated 1960):
44,553 acre-feet per year
 - b. Drought of Record (simulated 1954):
14,717 acre-feet per year
2. Upper Trinity aquifer
 - a. Average Year (unspecified):
952 acre-feet per year
 - b. Drought of Record (simulated 1954):
805 acre-feet per year

Trinity aquifer estimate source: Turner, Collie & Braden GAM Run #7; August 28, 2005

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 5
— TWC §36.1071(e)(3)(E)

There are only two aquifers in the District for which a TWDB GAM is available. The aquifers are the Trinity aquifer (Northern Trinity/Woodbine aquifer GAM) and the Edwards BFZ aquifer (Northern Edwards BFZ aquifer GAM). 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 for each aquifer to assess the availability of groundwater. The Northern Edwards BFZ aquifer GAM is a single layer model and does not have the ability to resolve vertical water movement from one portion of the aquifer to another within the District. The Northern Edwards BFZ aquifer GAM does resolve vertical leakage of the Edwards aquifer to overlying formations. The Northern Trinity/Woodbine aquifer GAM is a 7-layer model and does have the ability to resolve vertical movement of water within subdivisions of the aquifer. The Northern Trinity/Woodbine aquifer GAM includes the Edwards aquifer as Layer 2 of the model and has the ability to resolve the leakage of water from the Trinity aquifer to the Edwards aquifer in Bell County.

The Northern Edwards (BFZ) aquifer GAM application simulated the actual climatic conditions of Bell County during the drought of record decade of the 1950's and ended

with a simulation of the climatic conditions of 1960 which may be considered an average year. 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 Edwards (BFZ) and Trinity aquifers.

1. Edwards (BFZ) Aquifer

a. Average Year (simulated 1960)

Flow into the aquifer within the District:

13,296 acre-feet per year

Leakage out of the aquifer in the District:

3,120 acre-feet per year

b. Drought of Record (simulated 1954)

Flow into the aquifer within the District:

7,388 acre-feet per year

Leakage out of the aquifer in the District:

2,913 acre-feet per year

Edwards aquifer estimate source: Turner, Collie & Braden GAM Run #6; September 13, 2004

2. Trinity Aquifer

a. Average Year (unspecified)

Flow into the aquifer within the District:

Upper Trinity aquifer—Layers 3 + 4 = 1,477 acre-feet per year

Middle Trinity aquifer—Layer 5 = 3,170 acre-feet per year

Lower Trinity aquifer—Layer 7 = 6,158 acre-feet per year

Flow out of the aquifer within the District:

Upper Trinity aquifer—Layers 3 + 4 = 442 acre-feet per year

Middle Trinity aquifer—Layer 5 = 1,185 acre-feet per year

Lower Trinity aquifer—Layer 7 = 1,706 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 = 164 acre-feet per year

Leakage from the Upper Trinity aquifer downward to the Middle Trinity aquifer (Layer 5) = 1,215 acre-feet per year
Leakage from the Middle Trinity aquifer downward to the Lower Trinity aquifer confining zone (Layer 6) = 1,842 acre-feet per year
Leakage from the Lower Trinity aquifer confining zone downward into the Lower Trinity aquifer (Layer7) = 1,988 acre-feet per year

b. Drought of Record (simulated 1954)

Flow into the aquifer within the District:

Upper Trinity aquifer—Layers 3 + 4 = 1,007 acre-feet per year
Middle Trinity aquifer—Layer 5 = 2,045 acre-feet per year
Lower Trinity aquifer—Layer 7 = 4,453 acre-feet per year

Flow out of the aquifer within the District:

Upper Trinity aquifer—Layers 3 + 4 = 139 acre-feet per year
Middle Trinity aquifer—Layer 5 = 607 acre-feet per year
Lower Trinity aquifer—Layer 7 = 2,568 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 = 179 acre-feet per year
Leakage from the Upper Trinity aquifer downward to the Middle Trinity aquifer (Layer 5) = 1,244 acre-feet per year
Leakage from the Middle Trinity aquifer downward to the Lower Trinity aquifer confining zone (Layer 6) = 1,899 acre-feet per year
Leakage from the Lower Trinity aquifer confining zone downward into the Lower Trinity aquifer (Layer7) = 2,019 acre-feet per year

Trinity aquifer estimate source: Turner, Collie & Braden GAM Run #7; August 28, 2005

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 2002 State Water Plan. In the 2002 Plan, Table 5 indicates a projected water supply for Bell County of 96,953 acre-feet/year for year 2010. This information is shown below in Exhibit D. Since the planning cycle for the 2007 State Water Plan is in progress, this management plan will also incorporate figures for projected surface water supply from the 2005 Initially Prepared Plan of the Brazos G Regional Water Planning Group (RWPG). The 2005 Initially Prepared Plan for Brazos G RWPG was adopted by the regional water planning group and submitted to the TWDB during the summer of 2005 for inclusion in the 2007 State Water Plan which will be adopted in 2006.

Two major water reservoirs located in Bell County are Lake Belton and Lake Stillhouse Hollow. The Brazos G RWPG Plan (Table 3.1-1, Major Reservoirs of the Brazos River Basin) identifies 100,257 acre-feet/year as the authorized diversion, or permitted yield, from Lake Belton, and 67,768 acre-feet/year for Lake Stillhouse Hollow. This provides a total yield of 168,025 acre-feet/year for the two lakes. However, the firm yield for these two lakes for year 2060 is reflected in Table 3.2-2, Yields for Large Reservoirs in the Brazos G Area, and identifies 97,217 acre-feet/year for Lake Belton and 67,768 acre-feet/year for Lake Stillhouse Hollow, for a total of 164,985 acre-feet/year. Firm yield is the maximum quantity of water that can be guaranteed from a reservoir during each year of the drought of record. Currently, the Brazos River Authority has under contract approximately 93,700 acre-feet/year to Bell County entities.

Exhibit D -- Total Projected Bell County Surface Water Supplies

WUG	Source Name	2000	2010	2020	2030	2040	2050
Belton	Brazos River Authority System	2,500	2,500	2,500	2,500	2,500	2,500
Belton	Brazos River Authority System	4,966	4,966	4,966	4,966	4,966	4,966
Fort Hood	Brazos River Authority System	1,668	1,668	1,668	1,668	1,668	1,668
Harker Heights	Brazos River Authority System	3,150	3,150	3,150	3,150	3,150	3,150
Harker Heights	Brazos River Authority System	5,265	5,265	5,265	5,265	5,265	5,265
Holland	Brazos River Authority System	258	258	258	258	258	258
Killeen	Brazos River Authority System	29,964	29,964	29,964	29,964	29,964	29,964
Little River-Academy	Brazos River Authority System	68	68	68	68	68	68
Morgans Point Resort	Brazos River Authority System	291	291	291	291	291	291
Nolanville	Brazos River Authority System	740	740	740	740	740	740
Rogers	Brazos River Authority System	368	368	368	368	368	368
Salado	Brazos River Authority System	0	0	0	0	0	0
Temple	Leon River Run-of-River	496	496	496	496	496	496
Temple	Brazos River Authority System	27,447	27,447	27,447	27,447	27,447	27,447
Troy	Brazos River Authority System	124	124	124	124	124	124
County-Other	Brazos River Authority System	5,640	5,518	5,418	4,181	4,097	4,022
County-Other	Brazos River Authority System	8,102	8,102	8,102	8,102	8,102	8,102
Irrigation	Irrigation Local Supply	4,332	4,332	4,332	4,332	4,332	4,332
Irrigation	Brazos River Authority System	337	182	182	182	182	182
Irrigation	Brazos River Authority System	400	200	200	200	200	200
Livestock	Livestock Local Supply	1,014	1,014	1,014	1,014	1,014	1,014
Manufacturing	Brazos River Authority System	300	300	300	300	300	300
Mining	Brazos River Authority System	20	0	0	0	0	0
Mining	Brazos River Authority System	200	0	0	0	0	0
Total Surface Water Supplies (ac-ft per year) =		97,650	96,953	96,853	95,616	95,532	95,457

Source: Exhibit B, Table 5, Water for Texas, 2002

The US Corps of Engineers is the owner and operator of Lakes Belton and Stillhouse Hollow. The Brazos River Authority manages water rights from both lakes as well as all tributaries of the Brazos River. The Department of the Army (Fort Hood) also manages the water rights from Lake Belton.

G. Projected total demand for water in the district according to the most recently adopted state water plan— TWC §36.1071(e)(3)(G) 7

The most recently adopted state water plan is the 2002 State Water Plan. In the 2002 State Water Plan, Exhibit B, Table 2 indicates a projected total water demand for Bell County of 76,703 acre-feet/year for year 2010. This information is shown below in Exhibit E. Since the planning cycle for the 2007 State Water Plan is in progress, this management plan will also incorporate figures for projected total water demand from the 2005 Initially Prepared Plan of the Brazos G Regional Water Planning Group (RWPG).

Water demand projections and population projections for Bell County from the 2005 Initially Prepared Plan of the Brazos G RWPG are shown below in Exhibit E. The projections are from year 2000 to 2060 and include demands that may be met by water from either or both surface water and groundwater. District records indicate that groundwater usage in Bell County during year 2004 totaled 4,356 acre-feet or approximately 8% of the County's total demand.

Exhibit E -- Total Projected Bell County Water Demand

WUG	Category	2000	2010	2020	2030	2040	2050
Bartlett	Municipal	173	219	261	293	310	308
Belton	Municipal	2,727	3,713	4,685	5,390	5,683	5,801
Fort Hood	Municipal	4,766	4,766	4,766	4,766	4,766	4,766
Harker Heights	Municipal	3,997	4,894	5,528	6,037	6,416	6,676
Holland	Municipal	178	247	333	376	385	383
Killeen	Municipal	11,935	18,391	24,631	27,185	28,884	28,509
Little River-Academy	Municipal	255	340	444	486	500	483
Morgans Point Resort	Municipal	429	607	772	875	935	939
Nolanville	Municipal	297	419	577	666	698	709
Rogers	Municipal	179	237	300	343	356	357
Salado	Municipal	755	910	1,057	1,220	1,356	1,470
Temple	Municipal	13,094	16,419	19,407	21,178	21,819	21,721
Troy	Municipal	235	311	393	449	466	468
County-Other	Municipal	8,369	7,379	7,242	7,836	7,986	9,073
Irrigation	Irrigation	745	735	725	715	706	696
Livestock	Livestock	1,119	1,119	1,119	1,119	1,119	1,119
Manufacturing	Manufacturing	4,040	4,640	6,320	7,620	8,380	8,700
Mining	Mining	155	157	162	166	171	176
Steam Electric Power	Power	0	11,200	11,200	11,200	11,200	11,200
Total Projected Water Demands (acre-feet per year) =		53,448	76,703	89,922	97,920	102,136	103,554

Source: Exhibit B, Table 2 of Water for Texas, 2002

Exhibit F -- Bell County Population and Water Demand Projection

Year	2000	2010	2020	2030	2040	2050	2060
Population	237,974	279,313	315,766	351,336	381,839	408,408	432,418
Water Demand							
Manufacturing	800	980	1,085	1,180	1,273	1,355	1,463
Steam-Electric	0	0	3,674	4,296	5,053	5,977	7,102
Mining	174	155	150	147	144	141	139
Irrigation	1,679	1,656	1,634	1,611	1,591	1,569	1,546
Livestock	953	953	953	953	953	953	953
Municipal	45,030	55,113	64,401	70,405	75,177	79,480	83,728
Total Water Demands (ac-ft per year) =	48,636	58,857	71,897	78,592	84,191	89,475	94,931

Source: Exhibit D of Region G Initially Prepared Water Plan, 2005

VII. CONSIDER THE WATER SUPPLY NEEDS AND WATER MANAGEMENT STRATEGIES INCLUDED IN THE ADOPTED STATE WATER PLAN— TWC §36.1071(E)(4) 13

The most recently adopted state water plan is the 2002 State Water Plan. In the 2002 State Water Plan, water management strategies (WMSs) were recommended for 7 Water User Groups (WUGs). Each of these recommended WMSs involved the increase of surface water supplies of the WUG. For one additional WUG (Fort Hood); recommending a WMS was considered not applicable to the Regional Water Planning process. There were no groundwater based WMS recommended in the 2002 State Water plan to supply WUGs in Bell County or to supply WUGs in other counties with groundwater from Bell County. See Exhibit G below.

The District has employed the TWDB GAMs for the Edwards and Trinity aquifer in the District to determine the amount of groundwater which could be used on an annual basis while maintaining the aquifer management criteria adopted by the District. The amounts of groundwater that the District determined are available for use in the Edwards and Trinity aquifers in the District exceeds the amount of water considered available from these aquifers in Exhibit B, Table 4 of the 2002 State Water Plan. See Exhibit H below. The amounts of groundwater available for annual use in the Edwards and Trinity aquifers in the District will not prevent the implementation of any recommended WMS or restrict the amount of groundwater considered available in the 2002 State Water Plan.

Exhibit G -- Bell County Recommended Water Management Strategies

WUG	Water Management Strategy	Source	2000	2010	2020	2030	2040	2050
Fort Hood	N/A	Demand is based on full staffing; if needed get water from Gatesville and/or Bell County WCID #1						
Holland	Voluntary Redistribution	Central Texas WSC (Lake Stillhouse Hollow)			100	100	100	100
Little River Academy	Voluntary Redistribution	Temple (Lake Belton)		150	150	150	150	150
Morgans Point	Voluntary Redistribution	Temple (Lake Belton)	650	650	650	650	650	650
Salado (CDP)	Southwest Bell County Regional Water System	Central Texas WSC		1,600	1,600	1,600	1,600	1,600
Troy	Voluntary Redistribution	Temple (Lake Belton)	150	150	150	150	150	150
Manufacturing	Voluntary Redistribution M&I	Possum Kingdom Reservoir	3,735	4,335	6,015	7,315	8,075	8,395
Steam Electric Power	Voluntary Redistribution M&I	Possum Kingdom Reservoir		11,200	11,200	11,200	11,200	11,200

Source: Exhibit B, Table 12 of Water for Texas, 2002

Exhibit H -- Projected Amount of Groundwater in Edwards and Trinity Aquifers

Aquifer	Estimate Source	2000	2010	2020	2030	2040	2050
Edwards-BFZ Aquifer	SWP	1,315	1,315	1,315	1,315	1,315	1,315
Edwards-BFZ Aquifer	CUWCD	7,500	7,500	7,500	7,500	7,500	7,500
Trinity Aquifer	SWP	2,169	2,169	2,169	2,169	2,169	2,169
Trinity Aquifer	CUWCD	7,092	7,092	7,092	7,092	7,092	7,092

Source: Exhibit B, Table 4 of the Water for Texas, 2002 and from District Projections

Since the planning cycle for the 2007 State Water Plan is in progress, this management plan will also incorporate figures for water supply needs and water management strategies from the 2005 Initially Prepared Plan of the Brazos G Regional Water Planning Group. The proposed management strategies identified in the Brazos G RWPG Plan do not involve increased use of groundwater. According to Section 4C.1, Bell County Water Supply Plan, there is sufficient groundwater identified in this plan under managed available groundwater to meet the current identified needs as well as additional needs.

An overview of the water supply needs and water management strategies identified in the Brazos G RWPG Plan is provided below.

A. Water Shortages

Of the 26 Water User Groups identified in the Brazos G RWPG Plan, seven were projected to have water shortages by the year 2060. The projected shortage of water for these seven users totals 5,314 acre-feet/year. Three of these users use only surface water (Dog Ridge WSC; City of Killeen; City of Morgan's Point Resort), three use a mixture of groundwater and surface water (Bell-Milam-Falls WSC; Elm Creek WSC; City of Little River-Academy), and one uses only groundwater (Manufacturing). The source of groundwater for these users is identified as the Trinity aquifer. All of the management strategies involve purchasing additional surface water and observing conservation measures. Additional use of groundwater is not identified as part of the management strategy.

Jarrell-Schwertner Water Supply Corporation's service area includes southern Bell County and northern Williamson County. The Brazos G RWPG Plan identifies them as a water user in Williamson County (Section 4C.36, Williamson County Water Supply Plan). By the year 2060, they are projected to have a shortage of water of 1,416 acre-feet/year. Their water supply is groundwater from the Edwards (BFZ) aquifer. Their management strategy includes observing conservation measures, purchasing surface water, and BRA System Operations—Lake Granger Conjunctive Use Project. Additional use of groundwater is not identified as part of the management strategy.

B. Water Surplus

Nineteen of the Water User Groups identified in the Brazos G RWPG Plan are projected to have surplus water through the year 2060. Four of these are identified as using both surface water and groundwater (East Bell WSC; Moffat WSC; Salado WSC; City of Troy). With the exception of Salado WSC, the source of groundwater is identified as the Trinity aquifer. Salado WSC uses water from the Edwards (BFZ). However, District records indicate six others also use or have the potential to use groundwater (City of Holland; Pendleton WSC; City of Rogers; Mining; Irrigation; Livestock). Since these users are projected to have a surplus of water or no projected needs, no changes in water supply are recommended.

VIII. MANAGEMENT OF GROUNDWATER SUPPLIES

TWC Section 36.0015 states that groundwater conservation districts (GCDs) are the state's preferred method of groundwater management and establishes that GCDs will manage groundwater resources through rules developed and implemented in accordance with TWC Chapter 36. Chapter 36 gives directives to GCDs and the statutory authority to carry out such

directives, so that GCDs are provided the proper tools to protect and manage the groundwater resources within their boundaries.

The District will manage the supply of groundwater within the District in order to conserve the groundwater resources while seeking to maintain the economic viability of all groundwater user groups - public and private. In consideration of the economic and cultural activities occurring within the District, the District will identify and engage in such activities and practices which, if implemented, would result in a reduction of groundwater use. The existing observation network of groundwater wells will be used to monitor the changing conditions of the groundwater resources within the District. If necessary, the observation network may be expanded.

The regulatory tools granted to GCDs by TWC Chapter 36 enable GCD's to preserve historic and existing users of groundwater. The District protects historic and existing users by granting such groundwater users historic and existing use permits that have priority over operating permits. TWC Chapter 36 also allows GCDs to establish management zones within an aquifer or aquifer subdivision. The District's rules provide for the designation of management areas as needed to better manage and regulate the groundwater resources of Bell County.

The District may deny a water well drilling permit or limit groundwater withdrawals in accordance with the requirements stated in the rules of the District. In making a determination to deny a permit or limit groundwater withdrawals, the District will consider criteria identified in TWC Section 36.113.

In accordance with the District's mission of protecting the groundwater resources of Bell County, the District may require reduction of groundwater withdrawals to amounts that will not cause harm to the aquifer when considering the desired future condition of the District's aquifers and the amount of managed available groundwater within the District. To achieve this purpose, the District may, at the discretion of the Board, amend or revoke any permits after notice and hearing. The determination to seek the amendment or revocation of a permit by the District will be based on aquifer conditions as observed by the District. The District will enforce the terms and conditions of permits and the rules of the District by injunction or other appropriate relief in a court of competent jurisdiction as provided for in TWC §36.102.

A contingency plan to cope with the effects of water supply deficits due to climatic or other conditions may be developed by the District and adopted by the Board after notice and hearing. In developing the contingency plan, the District will consider the economic effect of conservation measures upon all water resource user groups, the local implications of the extent and effect of changes in water storage conditions, the unique hydrogeologic conditions of the aquifers within the District and the appropriate conditions under which the contingency plan will be implemented. The District will evaluate the groundwater resources available within the District and determine the effectiveness of regulatory or conservation measures. A public or private user may appeal to the Board for discretion in enforcement of the provisions of the water supply deficit contingency plan on grounds of adverse economic hardship or unique local conditions. The exercise of 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

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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 production 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 manager 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 FY06. The Board will maintain the report on file, for public inspection at the District's offices upon adoption.

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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.

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Management Goals

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

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- 1. Objective: Each year, 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, the District will require permits for all non-exempt use of groundwater in the District as defined in the District 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 presented in the District's annual report.

3. Objective: Each year, the District will maintain a groundwater database to include information relating to well location, production volume, and other pertinent information deemed necessary by the District to enable effective monitoring of groundwater in Bell County.

Performance Standard:

- a. Each year, the District's annual report will include a status report of the database development.
 - b. Each year, the District's annual report will include a summary of changes in the water level condition of the aquifers included in the district water-level monitoring program.
4. Objective: Each year, the District will disseminate educational information regarding the water cycle and the status of the aquifers. This may be accomplished annually through at least two of the following methods:
 - a. conduct an annual contest on groundwater and the water cycle or other related topic;
 - b. compile literature packets for distribution to schools in Bell County;
 - c. conduct classroom presentations;
 - d. sponsor an educational program/curriculum;
 - e. post information on the District's web site;
 - f. provide newspaper articles for publication;
 - g. publish District newsletter;
 - h. conduct public presentations;
 - i. set up displays at public events;
 - j. distribute brochures/literature.

Performance Standard: The annual report will include a summary of the District activities during the year to disseminate educational information regarding the water cycle and the status of the aquifers.

**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 disseminate educational information on eliminating and reducing the wasteful use of groundwater focusing on water quality protection. This may be accomplished annually by two of the following methods:

- a. conduct an annual contest on water quality protection;
- b. compile literature packets for distribution to schools in Bell County;
- c. conduct classroom presentations;
- d. sponsor an educational program/curriculum;
- e. post information on the District's web site;
- f. provide newspaper articles for publication;

- g. publish District newsletter;
- h. conduct public presentations;
- i. set up displays at public events;
- j. 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))

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Objective: Each year, the District will participate in the regional planning process by attending a minimum of two meetings of the Brazos G Regional Water Planning Group per fiscal year.

Performance Standard: Each year, attendance at Region G 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))

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Objective: Each year the District will monitor water quality within the District by obtaining water samples from wells and testing the water quality of at least 6 wells.

Performance Standard: Each year, the District’s Annual Report will provide a status report on the number of wells tested and the testing results.

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

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1. 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.

2. Objective: Each month, the District will monitor drought conditions by reviewing data from the TWDB monitor wells in Bell County that are equipped with a continuous monitoring system.

Performance Standard: Each year, a graph summarizing the water-level changes

in the TWDB monitor wells located in Bell County and equipped with continuous monitoring equipment will be provided in the annual report.

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))

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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 Bell County.

1. 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 Bell 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;
 - j. distribute a 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.

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

3. 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.

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

N/A

This category of management goal is not applicable to the District because the desired future condition of the groundwater resources in GMA 8 has not been defined.

The District intends to coordinate 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 also intends to review and evaluate the GAM simulation results from the Northern Edwards BFZ aquifer GAM and the Northern Trinity/Woodbine aquifer GAM and other available data by September 1, 2010 to determine if revisions are needed regarding total aquifer storage and groundwater availability.

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.

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APPENDIX A

Groundwater Resources of Bell County

The Texas Water Development Board classifies groundwater sources as major or minor aquifers. Major aquifers are aquifers that are capable of producing large yields to wells or that produce groundwater over a large area. Minor aquifers are aquifers that may be capable of producing only limited yields to wells or that produce groundwater over a limited area. Many localized sources of groundwater may not be listed as a major or minor aquifer by TWDB. However, TWDB recognizes that whether an aquifer is classified as a major aquifer, a minor aquifer or not included in either list may have no bearing on the local importance of a particular source of groundwater.

Major Aquifers

Two major aquifers are located in Bell County. They are the Trinity and Edwards Balcones Fault Zone (BFZ) aquifers (Exhibit B). Several water supply corporations in Bell County have the ability to utilize groundwater in an emergency situation.

Edwards (BFZ) aquifer

The Edwards (BFZ) aquifer is composed of the Edwards and Associated Limestones. It is located in the southern part of the county and serves as the water supply for the City of Salado and other communities in the area. The outcrop of the aquifer is generally found to the west of I-35 and the downdip portion of the aquifer is generally to the east of I-35. Recharge to the Edwards aquifer generally is from percolation of storm run-off water in intermittent streams flowing across the outcrop area, as well as direct infiltration of rainfall over the outcrop area. Water quality in the Edwards aquifer is generally high; however, within a relatively short distance east of IH 35 the water quality is rapidly reduced. In Bell County water in the aquifer generally moves from the recharge zone toward natural discharge via the Salado Springs. Within Bell County the availability of groundwater from the Edwards aquifer water is based on maintaining at least a minimum spring flow at Salado Springs during a repeat of the drought of record.

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 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 western Bell County and is located generally west of the Edwards aquifer outcrop. The Middle and Lower Trinity aquifers do not outcrop in Bell County. However, the Trinity aquifer underlies all of Bell County. Water quality in the Trinity aquifer is good to moderate in western Bell County. East of IH 35 the water quality in the Upper and Middle Trinity aquifers deteriorates, but the water quality of the Lower Trinity aquifer remains useable for most purposes over most of Bell County. 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 Trinity aquifer has established management targets for the limit of acceptable draw down.

Exhibit I -- Geologic and Hydrologic Units of Bell County

Group	Formation	Member	Hydrologic Unit	
N/A	Alluvium		Alluvium and terrace deposits	
	Terrace deposits			
Navarro/Taylor	Marlbrook Marl		Marlbrook Marl	
	Pecan Gap Chalk		Pecan Gap Chalk	
	Ozan Formation		Ozan Formation	
Austin	Austin Chalk		Austin Chalk	
Eagle Ford	Eagle Ford Shale		Not recognized as a groundwater source	
Washita	Buda Formation		Buda Limestone	
	Del Rio Clay		Not recognized as a groundwater source	
Edwards	Georgetown		Edwards (Balcones Fault Zone) aquifer	
	Kiamichi			
	Edwards			
	Comanche Peak			
	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		

Source: Geologic and Hydrologic Units of Bell County, after Duffin and Musick, 1991

APPENDIX B
RESOLUTION
OF THE BOARD OF DIRECTORS OF THE
CLEARWATER UNDERGROUND WATER CONSERVATION DISTRICT
MEETING HELD DECEMBER 13, 2005

A RESOLUTION ADOPTING AMENDED MANAGEMENT PLAN

WHEREAS, the Clearwater Underground Water Conservation District (the "District") is a political subdivision of the State of Texas organized and existing under and by virtue of Article XVI, Chapter 59, of the Texas Constitution, and a groundwater conservation district acting under Chapter 36 of the Texas Water Code and the District's enabling act, Act of the 71st Legislature, Regular Session, Chapter 525, 1989;

WHEREAS, under the direction of the Board of Directors, and in accordance with Texas Water Code §§ 36.1071 and 36.1072, Title 31, Chapter 356 of the Texas Administrative Code, and the District's rules, the District has timely undertaken the requisite five-year review of its existing Management Plan, initially adopted by the District's Board on October 24, 2000, and certified by the Texas Water Development Board (the "TWDB") in February 2001;

WHEREAS, in conducting a five-year review of its existing Management Plan, the District and its consultants and attorneys reviewed, analyzed, and factored in the District's best available data, the groundwater availability modeling information provided by the TWDB, the technical information and estimates required by the TWDB, and the available site-specific information that has previously been provided by the District to the TWDB for review and comment;

WHEREAS, the District issued the appropriate notice and held a public hearing to receive public and written comments on the proposed amendments to the Management Plan at the District's Conference Room, #A-114, located in Building A of the Bell County Annex at 550 E. 2nd Avenue, Belton, Texas, on November 15, 2005;

WHEREAS, the District received, reviewed, and took into consideration comments from the TWDB, Barton Springs Edwards Aquifer Conservation District, and Brazos River Authority during preparation of the proposed, draft Management Plan; and

WHEREAS, the Board of Directors finds that the Management Plan meets all of the requirements of Chapter 36 of the Texas Water Code, the District's enabling act, Chapter 356, Title 31, Texas Administrative Code, and the District's rules; and

WHEREAS, the Board of Directors, upon proper notice and in an open meeting, seeks to readopt its existing Management Plan pursuant to Texas Water Code § 36.1072(e).

NOW THEREFORE BE IT RESOLVED THAT:

The Management Plan is hereby readopted with those changes reflected in the proposed, draft Management Plan before the District's Board of Directors on this date, along with those changes agreed upon during deliberation and after formal action on this date by the District's Board of Directors.

The Board of Directors further instructs the General Manager to compile a final, readopted Management Plan, and file it with the TWDB's Executive Director within 60 calendar days from the date of readoption, pursuant to Texas Water Code § 36.1072(e).

The Board of Directors and General Manager 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 Vice President Biskup, and seconded by Director Preston, and upon discussion, the Board of Directors voted 5 in favor and 0 opposed, 0 abstained, and 0 absent, and the motion thereby PASSED on this 13th day of December, 2005.

CLEARWATER UNDERGROUND WATER CONSERVATION DISTRICT

By: 
Horace Grace, Board President

ATTEST:


Leland Gersbach, Board Secretary

APPENDIX C

NOTICE OF PUBLIC HEARING

The Clearwater Underground Water Conservation District (CUWCD) will hold a public hearing on proposed revisions to the District Management Plan at 1:30 p.m., November 15, 2005 in the CUWCD Conference Room, located in Building A of the Bell County Courthouse Annex at 550 E. 2nd Avenue, Belton, Texas. Copies of the revised Management Plan are available for review at the CUWCD office and on the home page of the CUWCD website at www.clearwaterdistrict.org. Contact the CUWCD at 254/933-0120 for additional information.

Dated: October 24, 2005

CLEARWATER UNDERGROUND WATER CONSERVATION DISTRICT

By: Cheryl Maxwell, Administrative Manager and Assistant Secretary to the Board of Directors

FILED IN RECORD
2005 OCT 24 PM 1:10
BELL COUNTY CLERK

APPENDIX D



Clearwater Underground Water Conservation District

P.O. Box 729, Belton, Texas 76513
Phone: 254/933-0120 Fax: 254/939-0885
www.clearwaterdistrict.org

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*Horace Grace, President
Wallace Biskup
Leland Gersbach
Ricky Preston
Judy Parker*

October 24, 2005

Phil Ford, General Manager
Brazos River Authority
P.O. Box 7555
Waco, TX 76714-7555

Dear Mr. Ford:

The Clearwater Underground Water Conservation District is conducting a review of its management plan as required by Texas Water Code (TWC) Chapter 36.1071(e). Several revisions are proposed to update this plan. One component of the plan is evidence of its coordination with surface water management entities pursuant to TWC 36.1071 (a):

Evidence that following notice and hearing the Clearwater Underground Water Conservation District coordinated in the development of its Management plan with surface water management entities.

Attached you will find a draft copy of the revised management plan and notice that the District is conducting a public hearing on the plan on November 15, 2005 at 1:30 p.m. We are looking forward to your input regarding this plan. After your review, please provide us with a letter confirming your review of the revised plan and any comments or concerns you may have.

Sincerely,

A handwritten signature in cursive script that reads "Cheryl Maxwell".

Cheryl Maxwell, AICP
Administrative Manager

APPENDIX E

Groundwater Management Areas In Texas



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	992
Layer 4 (Glen Rose)		
Layer 5 (Hensell)	Middle Trinity aquifer	1,100
Layer 6 (Cow Creek, Hammett, Sligo)	Represented in model as aquitard	N/A
Layer 7 (Hosston)	Lower Trinity aquifer	5,000
Total Availability	All Units	7,092

APPENDIX G

Minor Aquifers and Other Sources of Groundwater

The sources of groundwater which are not recognized as major aquifers by TWDB are particularly important to Bell County. A significant percentage of the wells registered with CUWCD are completed in formations which are not widely recognized as aquifers but are vitally important sources of water. In the area of Bell County east of IH-35, the majority of wells registered with CUWCD are completed in these water bearing formations. A brief description of these groundwater sources follows:

Alluvium and Terrace deposits

Alluvium and Terrace deposits consist of sand, gravel, silt and clay deposited by streams. Alluvium deposits are unconsolidated; terrace deposits may have some cement. Alluvium is closely associated with stream channels and terrace deposits are found at higher elevation across the broader floodplain of the stream. Well yields range from low to moderate.

Marlbrook Marl/Pecan Gap/Ozan

These three geologic units are distinguishable from each other but consist of similar materials and have similar water bearing properties. They consist of thick beds of marl, chalky marl or calcareous clays containing thin beds of silt. Well yields are typically low with fresh to moderately saline water.

Austin Chalk

The Austin Chalk consists of nodular chalk and marl with some clay seams. Well yields are typically low with generally fresh water.

Buda Limestone

The Buda Limestone is a fine grained hard limestone with abundant fossils or fossil fragments. Wells completed in this formation may yield little or no water.

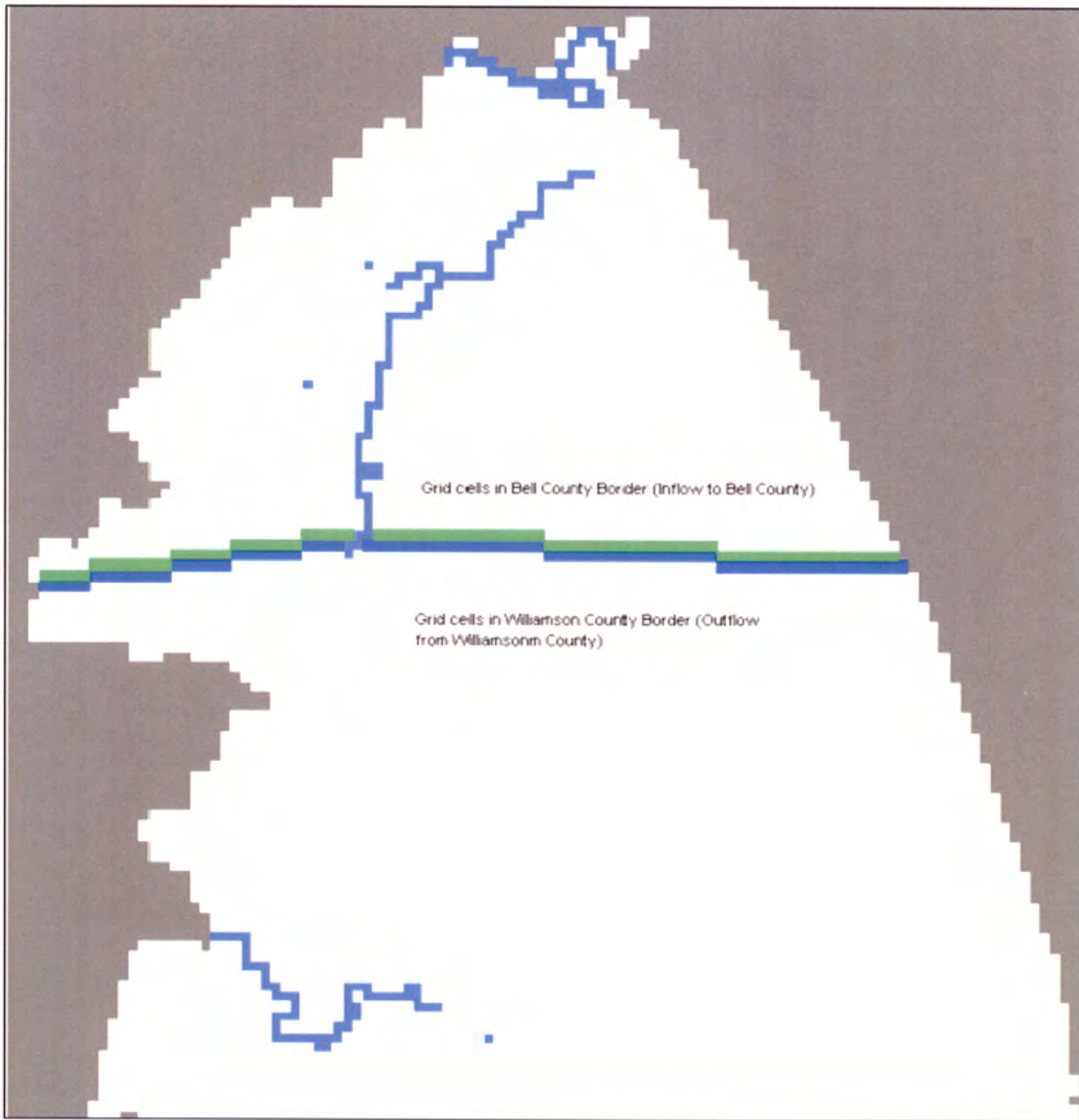
APPENDIX H

Additional Northern Edwards Aquifer GAM Information

Horizontal Exchange Values from N. Edwards aquifer GAM, Using
Historical Rainfall Time Step 300, January 1954 to Determine the
Amount of Water Entering Bell County

Bell County Pumpage (ac-ft/yr)	Horizontal Exchange into Bell County	
	(ft ³ /day)	(ac-ft/yr)
2,400	8.12E+05	6807
5,000	8.47E+05	7099
7,500	8.82E+05	7388
10,000	9.18E+05	7695

N. Edwards aquifer GAM Grid Cells Used to Determine Horizontal Exchange for the Amount of Water Entering Bell County



Clearwater Underground Water Conservation District

P. O. Box 729 Belton, Texas 76513 Phone-254/933-0120 Fax-254/939-0885

Fax

To:	Rima Petrossian, TWDB	From:	Cheryl Maxwell
Fax:	512-936-0889	Date:	January 3, 2006
Phone:		Pages:	3
Re:	Letter to BRA and Region G	CC:	

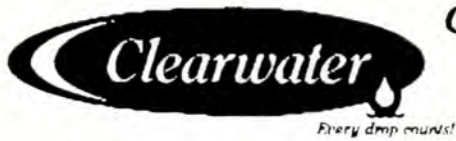
Urgent For Review Please Comment Please Reply Please Recycle

Rima,

Attached are cover letters to BRA and Region G providing them a copy of our approved management plan. Please let me know if you need anything else.

Thanks.

Cheryl Maxwell, AICP
Administrative Manager
Clearwater UWCD
P.O. Box 729
Belton, TX 76513
Phone: 254-933-0120
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January 3, 2006

Phil Ford, General Manager
Brazos River Authority
P.O. Box 7555
Waco, TX 76714-7555

Re: Approved Management Plan

Dear Mr. Ford:

Attached is the revised District Management Plan for the Clearwater Underground Water Conservation District (CUWCD). As required in Texas Water Code §36.1072, we have conducted a five year review and update of our Management Plan. The Directors of the CUWCD approved the revised plan on December 13, 2005 and have submitted it for review and approval by the Texas Water Development Board.

Please feel free to contact me if you have any questions regarding the Management Plan or need any additional information.

Sincerely,

A handwritten signature in cursive script that reads "Cheryl Maxwell".

Cheryl Maxwell, AICP
Administrative Manager

cm
attachment



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Horace Grace, President

Wallace Biskup

Leland Gersbach

Ricky Preston

Judy Parker

January 3, 2006

Michael Morrison, Chair
Brazos G Regional Water Planning Group
P.O. Box 7555
Waco, TX 76714-7555

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Dear Mr. Morrison:

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Cheryl Maxwell, AICP
Administrative Manager

cm
attachment