



**Barton Springs  
Edwards Aquifer**  
CONSERVATION DISTRICT

**PROPOSED**

**DISTRICT MANAGEMENT PLAN**

**ADOPTED BY BOARD RESOLUTION – September 27, 2012**

**TO BE APPROVED BY TWDB**

*This groundwater management plan has been prepared in accordance with Texas Water Code, Chapter 36, Section 1071, and Texas Water Development Board requirements under Texas Administrative Code, Chapter 356, Sections 5 and 6.*



**BARTON SPRINGS/EDWARDS AQUIFER CONSERVATION DISTRICT**



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# TABLE OF CONTENTS

<b>I.</b>	<b>BACKGROUND INFORMATION</b> .....	6
I.A.	DESCRIPTION OF DISTRICT.....	6
I.B.	MISSION, VISION, AND STRATEGIC PURPOSE OF THE DISTRICT.....	13
I.C.	CORE VALUES AND STAFF GUIDELINES.....	13
I.D.	CRITICAL SUCCESS FACTORS.....	14
I.E.	RATIONALE AND TIME FRAME OF THIS PLAN.....	14
I.F.	ORGANIZATION OF THIS PLAN DOCUMENT.....	15
<b>II.</b>	<b>PLANNING DATA AND REQUIRED INFORMATION</b> .....	19
II.A.	HYDROLOGICAL ESTIMATES.....	19
II.A.1.	MANAGED AVAILABLE GROUNDWATER, PER TWDB.....	19
II.A.2.	ANNUAL GROUNDWATER USE, BY AQUIFER.....	22
II.A.3.	ANNUAL RECHARGE FROM PRECIPITATION, BY AQUIFER.....	24
II.A.4.	ANNUAL DISCHARGES TO SPRINGS AND SURFACE-WATER BODIES, BY AQUIFER.....	26
II.A.5.	ANNUAL INTER-FORMATIONAL INFLOWS AND OUTFLOWS.....	27
II.B.	STATE WATER PLAN PROJECTIONS.....	29
II.B.1.	SURFACE WATER SUPPLY IN DISTRICT.....	31
II.B.2.	TOTAL DEMAND FOR WATER IN DISTRICT.....	32
II.B.3.	WATER SUPPLY NEEDS AND PLANNING STRATEGIES.....	33
II.B.4.	WATER MANAGEMENT STRATEGIES.....	34
II.B.5.	SYNTHESIS OF REGIONAL WATER SUPPLY AND DEMAND FOR DISTRICT PLANNING.....	36
<b>III.</b>	<b>PROGRAM PLANNING FOR DISTRICT</b> .....	38
III.A.	RELATIONSHIP OF THIS PLAN TO OTHER DISTRICT DOCUMENTS.....	38
III.B.	GENERAL APPROACH USED IN PROGRAMMING.....	38
III.C.	MANAGEMENT GOALS, OBJECTIVES, AND STANDARDS.....	41
III.C.1.	OBJECTIVE 1. ASSURE THE LONG-TERM SUSTAINABILITY OF THE DISTRICT TO CARRY OUT ITS MISSION AS A GCD WITH EXCELLENCE.....	52
III.C.2.	OBJECTIVE 2. PROMULGATE A FAIR AND EFFICIENT REGULATORY PROGRAM.....	58
III.C.3.	OBJECTIVE 3. DEVELOP AND IMPLEMENT AN EFFECTIVE DROUGHT MANAGEMENT PROGRAM THAT ACHIEVES THE ADOPTED DESIRED FUTURE CONDITIONS OF EACH RELEVANT AQUIFER IN THE DISTRICT.....	62
III.C.4.	OBJECTIVE 4. DEMONSTRATE LEADERSHIP IN EXTERNAL COMMUNICATION, COLLABORATION, COORDINATION AND JOINT PLANNING WITH RESPECT TO GROUNDWATER AND RELATED RESOURCES.....	65
III.C.5.	OBJECTIVE 5. EXTEND CURRENT GROUNDWATER SUPPLIES BY ENCOURAGING SUPPLY-SIDE AND DEMAND-SIDE IMPROVEMENTS. ....	69
III.C.6.	OBJECTIVE 6. INCREASE UNDERSTANDING OF ALL DISTRICT AQUIFERS SO THAT APPROPRIATE POLICY AND REGULATORY DECISIONS ARE MADE .....	73
<b>IV.</b>	<b>COORDINATION WITH OTHER WATER MANAGEMENT ENTITIES</b> .....	75
IV.A.	COORDINATION WITH REGIONAL SURFACE WATER MANAGEMENT ENTITIES.....	75
IV.B.	COORDINATION WITH REGIONAL GROUNDWATER MANAGEMENT ENTITIES.....	78



V.	BIBLIOGRAPHY.....	83
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## APPENDICES

APPENDIX I – SUPPORTING DOCUMENTATION .....	I-1
APPENDIX II – HYDROGEOLOGY AND WATER AVAILABILITY OF THE DISTRICT’S AQUIFERS.....	II-1
APPENDIX III – COUNTY-LEVEL DATA ON WATER SUPPLY AND DEMAND.....	III-1
APPENDIX IV – MODELED AVAILABLE GROUNDWATER ESTIMATES BY TWDB.....	IV-1
APPENDIX V – NOTICE OF ADOPTED PLAN AVAILABILITY .....	V-1

## TABLES

TABLE I-1 CROSS-REFERENCE TABLE SHOWING TWDB PLAN REQUIREMENTS AND THEIR LOCATION IN THIS <i>PLAN</i> DOCUMENT.....	16
TABLE II-1 SUMMARY OF MAGS.....	20
TABLE II-2 ACTUAL ANNUAL PUMPAGE FOR LAST FIVE YEARS .....	23
TABLE II-3 AREAL DISTRIBUTION OF DISTRICT, BY COUNTY.....	31
TABLE III-1 SUMMARY OF PLAN OBJECTIVES AND THEIR PERFORMANCE STANDARDS AND METRICS.....	42
TABLE III-2 GOALS,OBJECTIVES AND PERFORMANCE STANDARDS.....	51
TABLE IV-1 GROUNDWATER AVAILABLE IN 2022 FROM BSEACD DURING DROUGHT OF RECORD CONDITIONS .....	76
TABLE IV-2 DFCS AND MAGS APPLICABLE TO BSEACD IN 2012.....	80

## FIGURES AND GRAPHS

FIGURE I-1 LOCATION OF THE BARTON SPRINGS/EDWARDS AQUIFER CONSERVATION DISTRICT.....	7
FIGURE I-2 LOCATION OF OTHER GCDS ADJACENT TO THE DISTRICT .....	8
FIGURE I-3 TYPES OF GROUNDWATER USE AND THEIR PERCENT OF AUTHORIZED USE FOR PERMITTED WELLS IN THE DISTRICT.....	9
FIGURE I-4 SENATE DISTRICTS WITHIN THE DISTRICT.....	11
FIGURE I-5 HOUSE DISTRICTS WITHIN THE DISTRICT .....	12
FIGURE II-1 CONCEPTUAL DIAGRAM OF THE DISTRICT’S MODELED AVAILABLE GROUNDWATER AND THE EQUIVALENT EXTREME DROUGHT WITHDRAWAL LIMITATION FORMULATION FOR THE EDWARDS (FRESHWATER) AQUIFER .....	21
FIGURE II-2 REGIONAL WATER PLANNING AREAS WITHIN THE DISTRICT.....	30
FIGURE II-3 POPULATION GROWTH PREDICTIONS 2010-2035.....	34
FIGURE III-1 CONCEPTUAL MANAGEMENT ZONES AND CROSS-SECTION .....	40
FIGURE IV-1 GROUNDWATER MANAGEMENT AREAS .....	79

## I. BACKGROUND INFORMATION

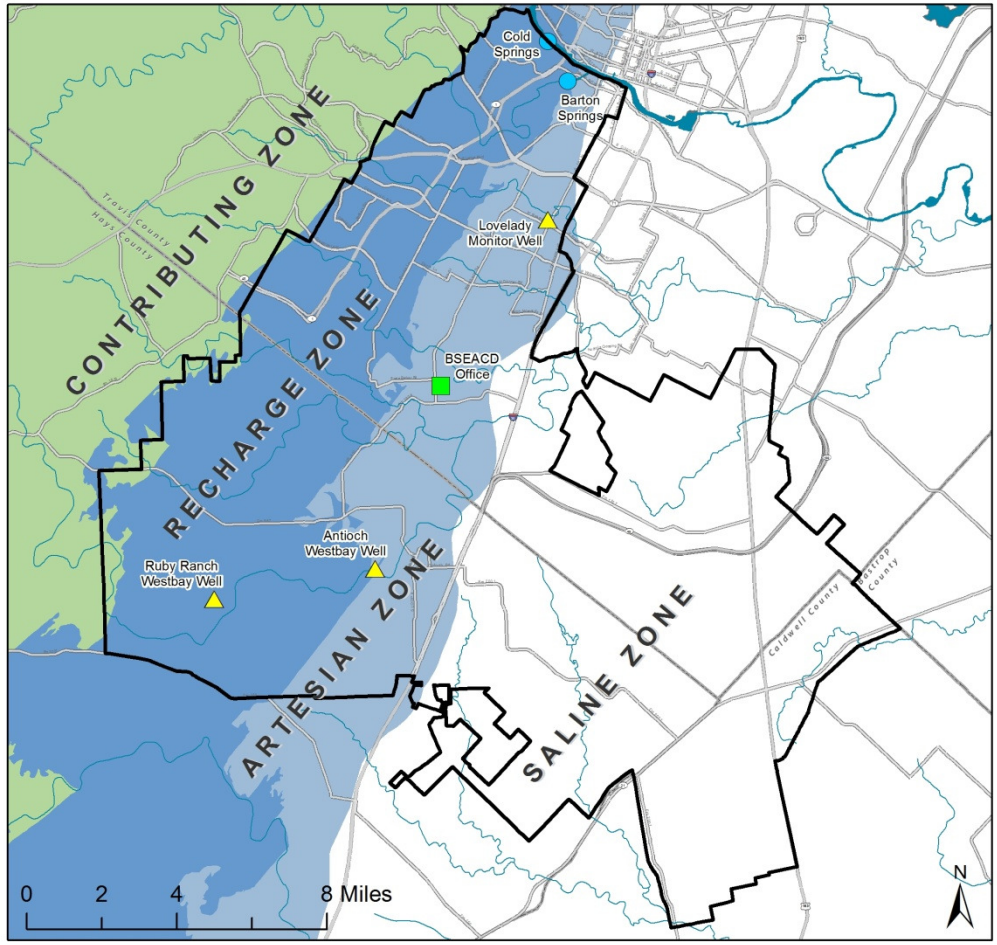
*This introductory section of the Management Plan sets the context for groundwater management planning in the District and describes how the rest of the Management Plan is organized.*

### I.A. DESCRIPTION OF DISTRICT

The Barton Springs/Edwards Aquifer Conservation District (hereinafter the “District”), was created in 1987 by the 70th Texas Legislature under Senate Bill 988 (now codified at Special District Local Laws Code, Chapter 8802) and Chapter 52 (revised to Chapter 36) of the Texas Water Code (TWC). The District's mandate is to conserve, protect, and enhance not only the groundwater resources of the Barton Springs segment of the Edwards Aquifer but also all other relevant groundwater resources located within the District boundaries. The District has the authority to undertake various studies and implement structural facilities and non-structural programs to achieve its statutory mandate. The District has rule-making authority to implement its policies and procedures and to help ensure the management of the groundwater resources.

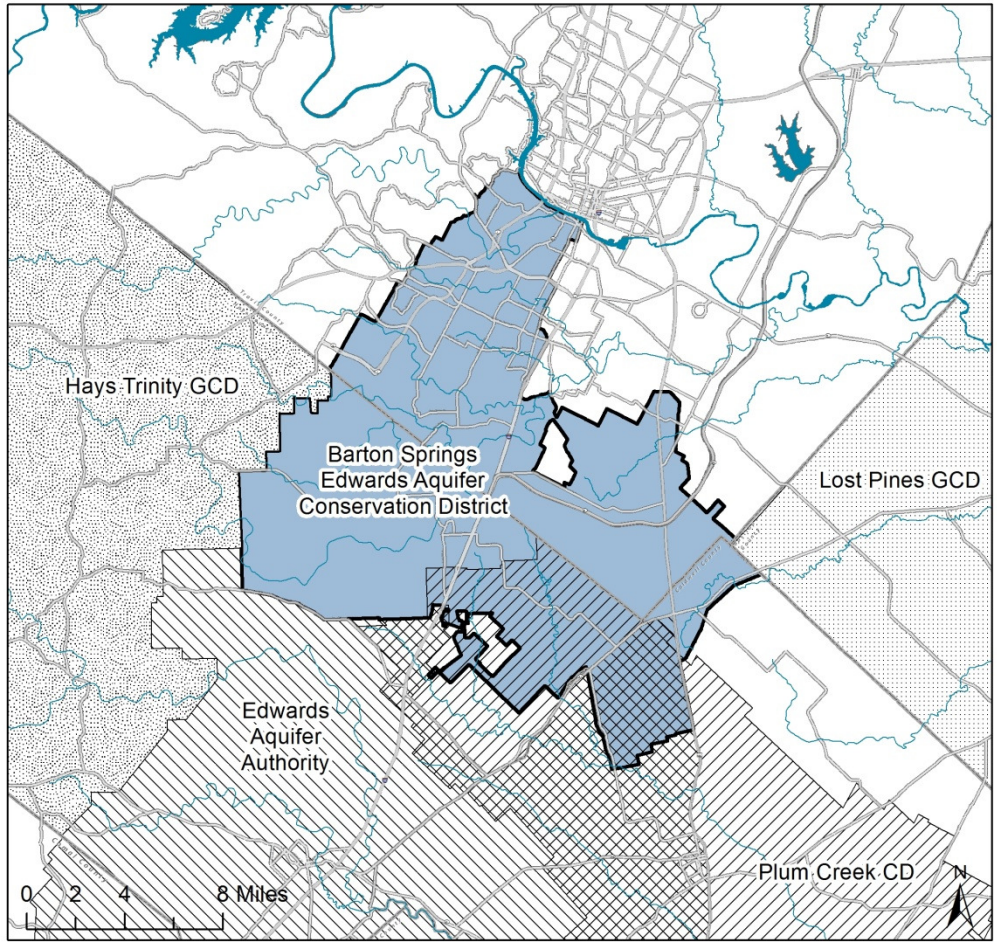
The District's jurisdictional area (Figure I-1) includes parts of three counties: northwestern Caldwell, northeastern Hays, and southeastern Travis Counties. (In 2011, that very small part of Bastrop County previously in the District was de-annexed and is now in Lost Pines GCD's sole jurisdiction.) It is bounded on the west by the western edge of the Edwards Aquifer outcrop and on the north by the impounded Colorado River. The eastern and southeastern boundary is generally formed by the easterly service area limits of the Creedmoor-Maha Water Supply Corporation and Goforth Special Utility District, as they existed when the District was formed. The District's southwestern boundary is generally along the “groundwater divide” that hydrologically separates the Barton Springs and the San Antonio segments of the Edwards Aquifer. Other groundwater conservation districts (GCDs), some of which currently overlap slightly with the District, and also several so-called unprotected areas that aren't covered by GCDs are adjacent to the District (Figure I-2). This area encompasses approximately 247 square miles and is estimated to be about 24 percent urban/suburban, 56 percent ranchland/farmland, 20 percent open space/conservation land/water, and 1 percent mining/landfill/other land use, on the basis of the 2006 National Land Cover Dataset, the most recent data available. The area has a long history of farming, ranching, and rural domestic use of groundwater, but it is increasingly and rapidly being converted to residential use owing to suburban and exurban development from Austin and San Marcos. Groundwater in the area is primarily utilized for domestic and public water supply purposes, with lesser amounts also being utilized for commercial, irrigation, and industrial use. See Figure I-3 for a breakdown of the types of wells in the District and percent of pumping of all wells by authorized use in 2011 for each classification category.

The Edwards Aquifer is a source of drinking water for approximately 70,000 people (the latest estimate, from 2010), residing both within and outside the District boundaries. Barton Springs provides significant recreational opportunities at Barton Springs Pool in Austin's Zilker Park, and receives one-half million visitors per year. The Springs complex provides habitat for the endangered Barton Springs salamander, *Eurycea sosorum*; and the Austin blind salamander, *Eurycea waterlooensis*, a candidate for imminent listing as endangered. Spring discharge from the Barton Springs segment contributes to Lady Bird Lake on the Colorado River System. Some








**FIGURE I-1: LOCATION OF THE BARTON SPRINGS/EDWARDS AQUIFER CONSERVATION DISTRICT**

*This map displays the District's boundaries, major aquifers, hydrogeologic zones, key springs and monitoring wells.*

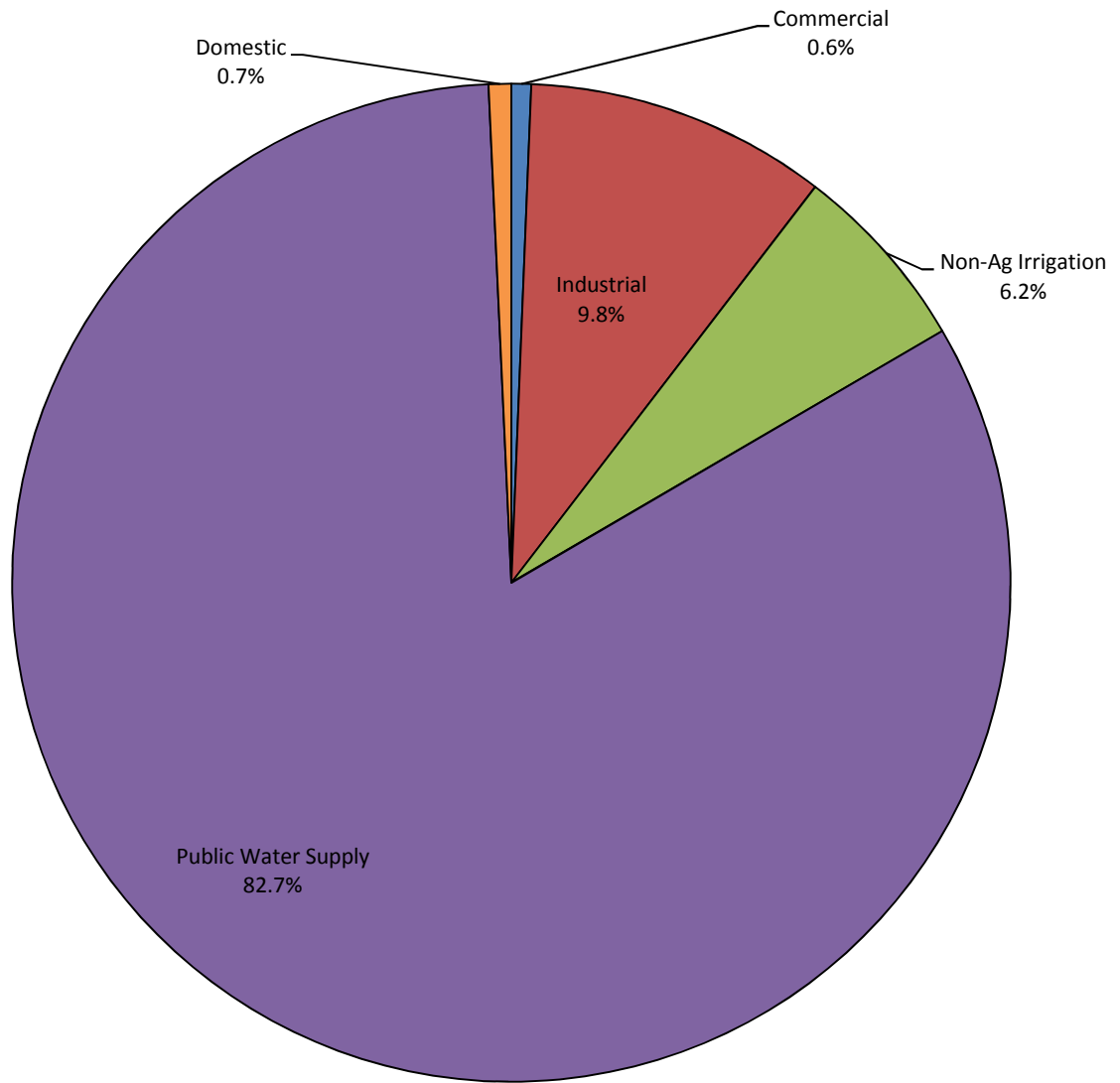


**Legend**

Groundwater Conservation District		Hays Trinity GCD
	Plum Creek CD	
	Edwards Aquifer Authority	
		Barton Springs/Edwards Aquifer Conservation District

**FIGURE I-2: OTHER GROUNDWATER CONSERVATION DISTRICTS ADJACENT TO THE DISTRICT**

*This map shows what other groundwater management entities exist in the areas just outside the District.*

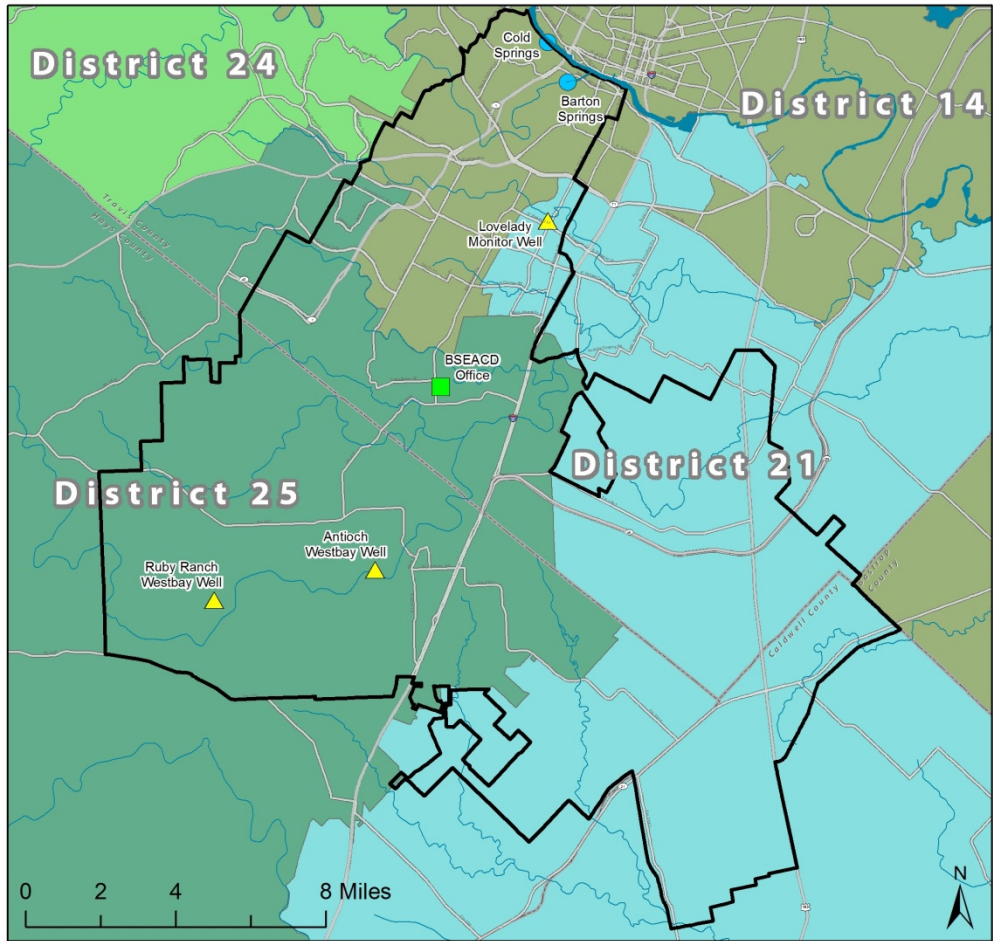


**FIGURE I-3: TYPES OF GROUNDWATER USE AND THEIR PERCENT OF AUTHORIZED USE FOR PERMITTED WELLS IN THE DISTRICT**

wells in the District also produce water from the Trinity Aquifer, and an incidental amount of groundwater is derived from the Taylor and Austin Groups and more geologically recent alluvial deposits.

While the area of the District is very small in comparison to other GCDs, its demographics have produced a rather complex set of legislative districts. Each of the State Senators and State Representatives that share constituencies with the District, as shown in Figures I-4 and I-5, represents a differing set of legislative priorities, yet each of them has expressed strong support for groundwater management, either on a general or a specific-issue basis. It is incumbent on the District to maintain accessible, constructive relationships with each of these legislators as a matter of course, as the future of both the District and of groundwater management in the state hang in that balance.

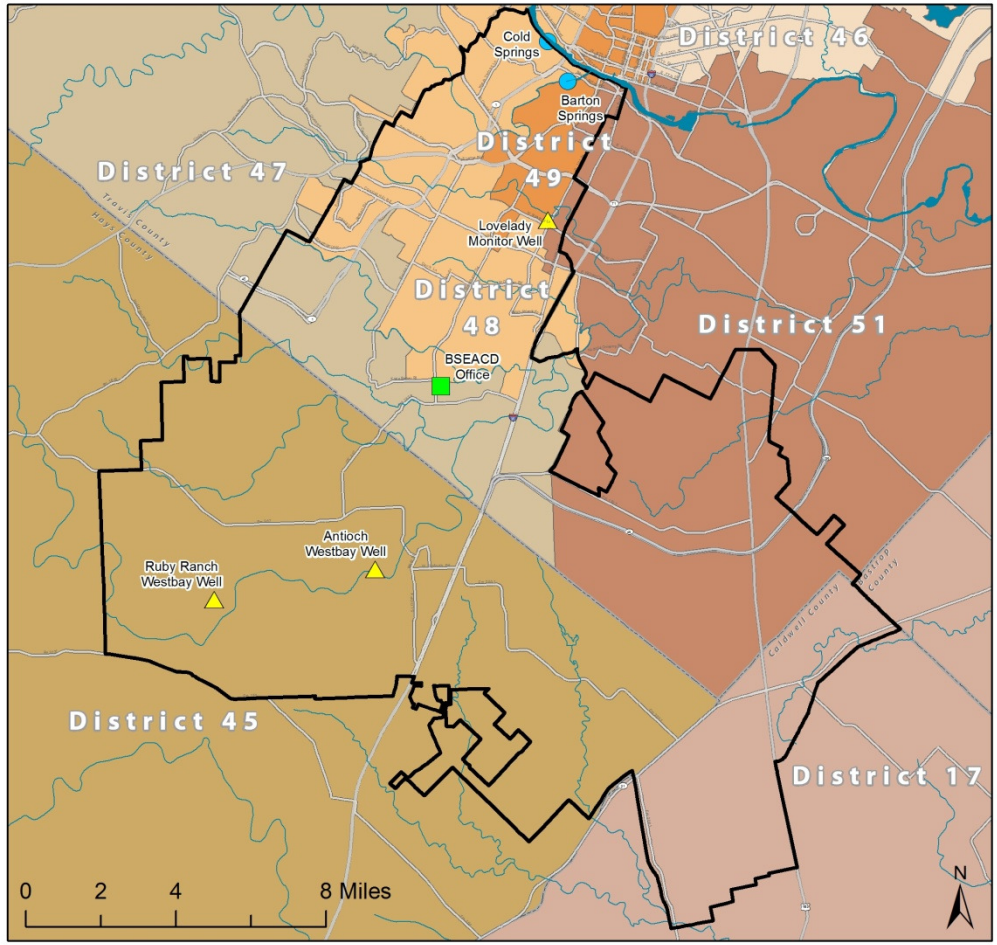




**Legend**

- BSEACD Boundary
- District 21: Judith Zaffirini (D)
- District 24: Troy Fraser (R)
- District 14: Kirk Watson (D)
- District 25: Jeff Wentworth (R)

**FIGURE I-4: SENATE DISTRICTS WITHIN OR ADJACENT TO THE DISTRICT'S BOUNDARY**  
*This map displays the boundaries of local Senate Districts in relation to the District's boundary.*



**Legend**

- BSEACD Boundary
- District 47: Paul Workman (R)
- District 48: Donna Howard (D)
- District 17: Tim Kleinschmidt (R)
- District 49: Elliott Naishtat (D)
- District 45: Jason Isaac (R)
- District 51: Eddie Rodriguez (D)
- District 46: Dawna Dukes (D)

**FIGURE I-5: HOUSE DISTRICTS WITHIN THE DISTRICT'S BOUNDARY**  
*This map displays the boundaries of local House Districts in relation to the District's boundary.*



## **I.B. MISSION, VISION, AND STRATEGIC PURPOSE OF THE DISTRICT**

Strategic planning by the staff and directors of the District has established the following strategic elements that serve as a backdrop and guide for planning and performance:

**Mission:** *“As the responsible authority, the Barton Springs/Edwards Aquifer Conservation District is committed to conserving, protecting, enhancing recharge, and preventing waste of groundwater and to preserving all aquifers within the District.”*

**Vision:** *“The Barton Springs/Edwards Aquifer Conservation District will excel in its operations and administration so that it is considered the model and standard for other groundwater districts.”*

**Overarching Strategic Purpose:** *“We will manage the District aquifers to optimize the sustainable uses of groundwater in satisfying community interests.”*

## **I.C. CORE VALUES AND STAFF GUIDELINES**

The Board has established the following tenets as the core values of the District that guide all of our internal and external interactions and operations:

- We operate on the basis of the highest integrity.
- We are committed to protection of the aquifers and to prudent stewardship of the groundwater resources of the District.
- We provide exceptional service that is consistently and equitably applied and is responsive to the needs of the public, interest groups, and other governmental agencies.
- We recognize that we are a public trust and operate on a sound legal basis and under a financially responsible philosophy.
- We encourage our employees to succeed by doing what they do best, both individually and as a team, in a supportive working environment.
- We value and work to ensure transparency of our operations and openness in our dealings with various stakeholder groups.
- We strive to communicate useful information on groundwater management when and where needed by the public.

These values have been translated into the following operational guidelines for all District staff:

**Integrity** - We maintain and exhibit the highest integrity in all of our dealings, both internally and externally.

**Quality** - We offer high-quality services that meet or exceed our Board’s expectations in providing support to their decision-making.

**Continuous Improvement** - We continuously look for innovative approaches and processes that improve the services we provide.

**Teamwork** - We build trust in our fellow workers and their roles, cultivate a harmonious and productive relationship among co-workers, and utilize the diversity of knowledge and perspective that reside in all of us to develop workable responses as shared solutions.

**Problem-solving** - We solve problems at the most immediate level first, while ensuring that problems are pursued to solution and that unresolved issues are elevated to successively higher levels.

**Decision-making** - In all decisions, we consider impacts on protection of the aquifer, on all users and other stewards of its resources, on District employees and Board members, and on other public and private entities.

**Working Environment** - We promote a safe, healthy work environment and foster a sense of care about our fellow workers' physical, mental, and emotional well-being.

**Staff Development** - We take advantage of those opportunities in which employees can grow professionally and/or personally, while allowing the District to apply new knowledge, skills, and expertise in accomplishing its mission.

**Relationship-building** - We build and maintain effective, bilateral relationships and communication with the regulated community, the scientific community, the public at-large and its special interest groups, and other state, federal, and local regulators.

**Community Outreach** - We communicate regularly and effectively with stakeholders and the public, to educate and disseminate information about groundwater use, conservation, protection, and resource value.

**Value Proposition** - As individual staff members, we provide the District with an honest day's work each working day and receive in return a competitive, fair compensation and benefits package and valued, challenging work assignments.

#### **I.D. CRITICAL SUCCESS FACTORS**

Through its continuing strategic and management planning process, the District Board has established the following as overall Critical Success Factors (CSFs) for the District that underpin the District's management objectives in this *Plan*:

- **Scientific CSF** - Providing sound science to support policy and tactical decisions made by the District that affect water supply users and endangered species habitat;
- **Business Administrative CSF** - Being highly efficient, accurate, and fair in administering transactional activities related to all District programs;
- **Regulatory CSF** - Developing and instituting an equitable and consistently administered regulatory program that is required to serve our mission;
- **Political CSF** - Being a respected, effective part of the state and local political landscape for water resource management and its stakeholder communities;
- **Educational CSF** - Serving our permittees, stakeholders, and the public at large as a readily accessible 'source of first resort' for reliable information about local water, groundwater, aquifer science, water use and conservation; and
- **Sustaining CSF** - Providing the programmatic and resource basis for innovative, cost-effective solutions to maintain and augment the sustainable quantity of water in the District and to protect the quality of District waters required for various existing uses.

These CSFs are expressed more quantitatively in the metrics, activities, and performance standards associated with the management objectives identified in Section III.C of this *Plan*.

#### **I.E. RATIONALE AND TIME FRAME OF THIS PLAN**

As required by TWC §36.1071 and §36.1072, a groundwater conservation district must submit to the Texas Water Development Board (TWDB) Executive Administrator a district management plan that meets the requirements of 31 Texas Administrative Code (TAC) §356.5 and §356.6. The TWDB Executive Administrator must review, comment for purposes of revision, and

ultimately approve the management plans submitted by districts. Districts may review and revise their plans annually, and must re-adopt their plan with or without revisions at least once every five years.

This groundwater management plan incorporates relevant regional water management strategies outlined in the current (2011) Regional Water Plans developed by the Lower Colorado Regional Planning Group and the South Central Texas Regional Planning Group, and included in the 2012 State Water Plan. Population and water demand projections cover the 50-year period from 2010 to 2060 and are consistent with those used by the TWDB for this area in statewide water planning. A 10-year planning period is required by 31 TAC §356.5(a) for groundwater management plans. This *District Management Plan (Plan)* covers the period from 2012-2022.

The Board of Directors of the District adopted this *Plan* by Board Resolution (in Appendix I) on September 27, 2012. Upon its approval by the TWDB, this *Plan* will remain in effect until a revised *Plan* is submitted and approved, or for five years from the approval date, whichever is earlier. Additional or revised Desired Future Conditions adopted by the Groundwater Management Areas 9 and 10, if any, *may* subsequently require revision of the current *Plan* upon determination of applicable Modeled Available Groundwater estimates by TWDB and assessment of the need for revised objectives, activities, and authorities by the District.

## **I.F. ORGANIZATION OF THIS PLAN DOCUMENT**

This initial introductory section has provided the statutory basis and some of the current output of the strategic planning that is a continuing initiative by the staff and Board, as a framework for the groundwater management plan that follows. The remainder of this plan is structured to provide information and data specifically requested in TWC 36.1071 and 1072 and in TAC 356.5 in a systematic, comprehensible fashion.

The next major section immediately below provides 1) hydrogeologic information as estimated on the basis of known geologic and hydrologic characteristics of various aquifers in and being managed by the District, and also 2) information on water supply and demand from the 2012 Texas Water Plan, as provided by the TWDB.

The third major section provides details of the program planning that comprise the primary basis for the District's *Rules and Bylaws (Rules)* and for day-to-day operations of the District. There are thirteen specific planning elements required to be addressed in the plan, and objectives, performance standards, and tracking methods are required to be established for eight "management goals." The applicable management goals articulated in TWC 36.1071 are addressed in aggregate by a set of specific management objectives, and each of these in turn are characterized by appropriate performance standards, activities, and metrics.

The fourth and final section of this *Plan* provides additional information required by TWDB concerning the coordination between the District and other water resource management entities.

For convenience of plan reviewers, Table I-1 cross-references the various planning elements specified by the TWDB in 31 TAC §356 with their location(s) in this *Plan*.

**Table I-1. Cross-reference table showing TWDB plan requirements as of September 1, 2011, and their location in this *Plan* document**

TAC REFERENCE	PLAN REQUIREMENTS	SECTION OF PLAN DOCUMENT
31 TAC §356.6(a)(1)	<b>A.</b> Is a hard copy of the Management Plan available?	This paper copy of entire document once furnished to TWDB
31 TAC §356.6(a)(1)	<b>B.</b> Is an electronic copy of the Management Plan available?	CD in envelope in document cover, once furnished to TWDB; also: <a href="http://www.bseacd.org/about-us/governing-documents/">http://www.bseacd.org/about-us/governing-documents/</a>
31 TAC §356.5(a)(5)(A)	<b>1.</b> Is an estimate of the managed (modeled) available groundwater in the District based on the desired future condition of the aquifer(s) included (if available from the TWDB)?	II.A.1; IV.B
31 TAC §356.5(a)(5)(B); §356.2(2)	<b>2.</b> Is an estimate of the amount of groundwater being used within the District on an annual basis for at least the most recent five years, included?	II.A.2
31 TAC §356.5(a)(5)(C)	<b>3.</b> Is an estimate of the annual amount of recharge, from precipitation, to the groundwater resources within the District included?	II.A.3
31 TAC §356.5(a)(5)(D)	<b>4.</b> For each aquifer in the district, is an estimate of the annual volume of water that discharges from the aquifer to springs and any surface water bodies, including lakes, streams and rivers, included?	II.A.4
31 TAC §356.5(a)(5)(E)	<b>5.</b> Is an estimate of the annual volume of flow: <b>a)</b> into the District within each aquifer, <b>b)</b> out of the District within each aquifer, <b>c)</b> and between aquifers in the District,  if a groundwater availability model is available, included?	II.A.5; Appendix II
31 TAC §356.5(a)(5)(F)	<b>6.</b> Is an estimate of the projected surface water supply within the District according to the most recently adopted state water plan included?	II.B.1
31 TAC §356.5(a)(5)(G)	<b>7.</b> Is an estimate of the projected total demand for water within the District according to the most recently adopted state water plan included?	II.B.2
31 TAC §356.5(a)(7)	<b>8.</b> Did the District consider the water supply needs that are included in the adopted state water plan?	II.B.3

31 TAC §356.5(a)(7)	<b>9.</b> Did the District consider the water management strategies that are included in the adopted state water plan?	II.B.3; II.B.4
31 TAC §356.5(a)(4); §356.6(a)(3)	<b>10.</b> Are the actions, procedures, performance, and avoidance necessary to effectuate the management plan, including specifications and proposed rules, all specified in as much detail as possible, included in the plan?	I.B; I.C III.A; III.B; III.C
31 TAC §356.6(a)(2)	<b>11.</b> Was a certified copy of the District's resolution adopting the plan included?	To Be Furnished Upon Board Approval of the Management Plan by its Resolution, in Appendix I
31 TAC §356.6(a)(5)	<b>12.</b> Was evidence that the plan was adopted, after notice and hearing, included?	To Be Furnished Upon Board Approval of the Management Plan, to be included in the Resolution, in Appendix I
31 TAC §356.6(a)(4)	<b>13.</b> Was evidence that, following notice and hearing, the District coordinated in the development of its management plan with all surface water management entities, included?	IV.A; Appendix I
31 TAC §356.5(b)	<b>14.</b> Has any available site-specific information been provided by the district to the executive administrator for review and comment before being used in the management plan when developing the estimates required in subsection 31 TAC §§356.5(a)(5)(C), (D), and (E)?	II.A.1; Drought-calibrated GAM Model and Sustainable Yield Study, in Appendix II
31 TAC §356.5(a)(2)&(3);	<b>C.</b> Are stipulated management goals, management objectives, and performance standards for effecting the plan identified?  Do they specifically include the goals of:	III.C.1 through III.C.6, collectively and individually; Use Correlation Table III-2 in III.C.
31 TAC §356.5(a)(1)(A)	1. Providing the most efficient use of groundwater?	Use Correlation Table III-2 in III.C.
31 TAC §356.5(a)(1)(B)	2. Controlling and preventing waste of groundwater?	Use Correlation Table III-2 in III.C.
31 TAC §356.5(a)(1)(C)	3. Controlling and preventing subsidence?	Not Applicable in the District
31 TAC §356.5(a)(1)(D)	4. Addressing conjunctive surface water management issues?	Use Correlation Table III-2 in III.C.
31 TAC §356.5(a)(1)(E)	5. Addressing natural resource management issues that impact the use of groundwater and are impacted by the use of groundwater?	Use Correlation Table III-2 in III.C.
31 TAC §356.5(a)(1)(F)	6. Addressing drought conditions?	Use Correlation Table III-2 in III.C.

31 TAC §356.5(a)(1)(G)	7. Addressing, where appropriate and cost-effective:	
	a. conservation?	Use Correlation Table III-2 in III.C.
	b. recharge enhancement?	Use Correlation Table III-2 in III.C.
	c. rainwater harvesting?	Use Correlation Table III-2 in III.C.
	d. precipitation enhancement?	Not appropriate or cost-effective in the District
	e. brush control?	Not appropriate or cost-effective in the District
31 TAC §356.5(a)(1)(H)	8. Addressing in a quantitative manner the desired future conditions of the groundwater resources in the District (if available from the districts in the groundwater management area)?	II.A.1; Use Correlation Table III-2 in III.C; IV.B

## II. PLANNING DATA AND REQUIRED INFORMATION

*This section of the plan document summarizes the data and information that form the basis for the Management Plan, and compiles specific information required by the Texas Water Development Board (TWDB) to be included in the plan.*

### II.A. HYDROLOGICAL ESTIMATES

#### 1. Modeled Available Groundwater, per TWDB

This Management Plan has been prepared and submitted to TWDB after the various Desired Future Conditions (DFCs) for the District's aquifers (coincident with the northern subdivision of GMA 10) were established by the joint planning process required by TWC 36.108. The DFCs for the northern subdivision of GMA 10 are as follows:

- Edwards Balcones Fault Zone (Freshwater) DFC dated August 24, 2010
  - Springflow of Barton Springs during average recharge conditions shall be no less than 49.7 cubic feet per second (cfs) averaged of an 84-month (seven-year) period; and
  - During extreme drought conditions, including those as severe as a recurrence of the 1950s drought of record, springflow of Barton Springs shall be no less than 6.5 cubic feet per second (cfs), averaged on a monthly basis.
- Saline Edwards Aquifer DFC adopted August 4, 2010
  - Well drawdown at the saline-freshwater interface (the so called Edwards “bad water line”) in the northern subdivision of GMA 10 that averages no more than 5 feet and does not exceed a maximum of 25 feet at any one point on the interface.
- Trinity Aquifer DFC adopted August 23, 2010 (for the entire GMA 10)
  - 1) Except as otherwise provided herein: regional average well drawdown during average recharge conditions that does not exceed 25 feet (including exempt and non-exempt well use); 2) within the jurisdiction of the Hays-Trinity GCD: regional average well drawdown during average recharge conditions of zero (0) feet (including exempt and non-exempt well use); 3) in the Uvalde County part of GMA 10: regional average well drawdown during average recharge conditions of no more than twenty (20) feet (including exempt and non-exempt well use); 4) declare the Trinity Aquifer in part of GMA 10 that is in the Trinity-Glen Rose GCD as a non-relevant aquifer.

The TWDB has determined the amount of Modeled Available Groundwater (MAG) that is available from the aquifers being managed by the District and that preserve the DFCs. The MAGs for the northern subdivision of GMA 10 are shown in Table II-1.

**Table II-1: Summary of MAGs**

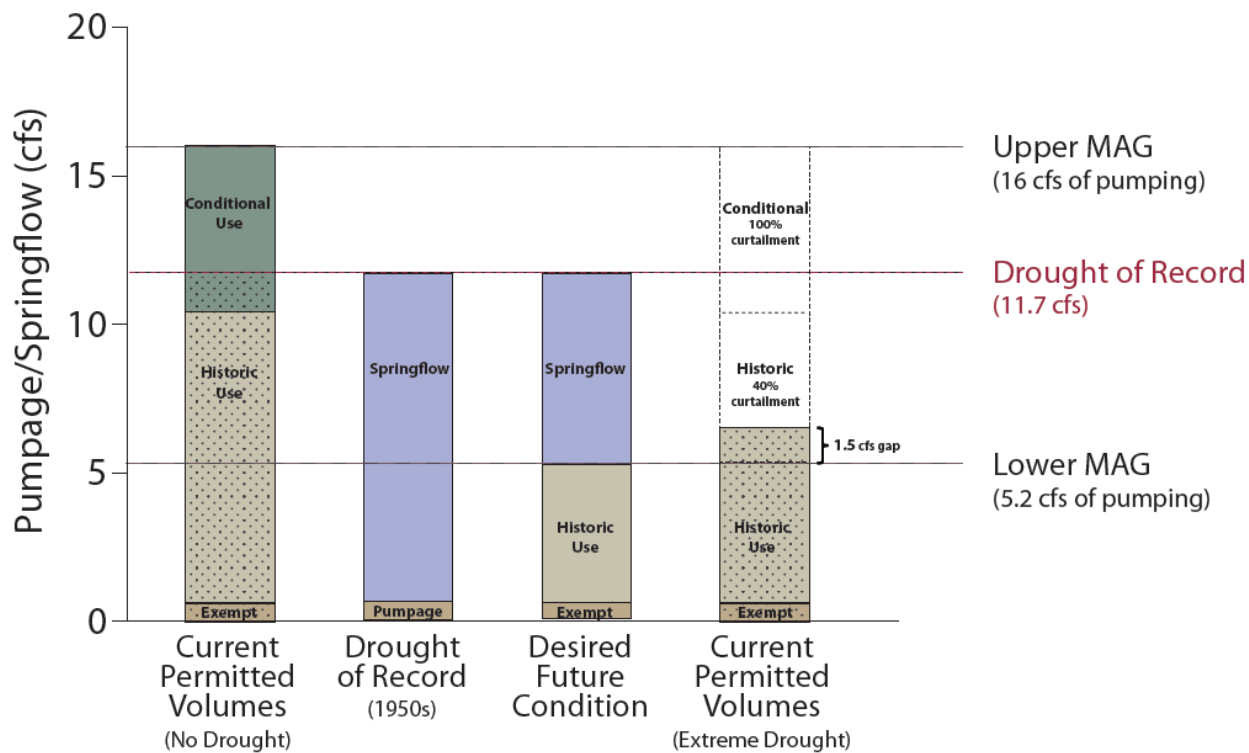
<b>AQUIFER</b>	<b>MAG (acre-ft/yr)</b>	<b>MAG (cfs)</b>	<b>TWDB GAM Report Citation</b>
<b>Edwards (Freshwater)</b>			
Average Conditions	11,528	16	Hutchison and Oliver, December 7, 2011
Drought Conditions	3,756	5.2	
<b>Edwards (Saline)</b>	523	0.72	Bradley, 2011
<b>Trinity Aquifer</b>	1,288	1.78	Thorkildsen and Backhouse, 2011

Prior to the MAG determination by TWDB for extreme drought conditions in the freshwater Edwards, the District relied on a modeling and water balance approach described in a study of the sustainable yield of the Barton Springs aquifer completed in 2004, and accepted by TWDB (Smith and Hunt, 2004). The results of that study and other numerical modeling efforts support an approximate one-to-one relationship between springflow and pumping under low-flow conditions (Hunt et al., 2011). These studies have informed the determination of the Drought MAG. The lowest measured daily value of springflow is 9.6 cfs, during the drought of record (DOR); the lowest monthly value is 11 cfs. Withdrawals of 10 cfs would produce a springflow of 1 cfs, and so forth. Any withdrawals more than 11 cfs would further increase impacts to wells as the aquifer is de-watered, and would increase the duration of no-flow conditions at Barton Springs. These levels of withdrawals have been determined by the District Board to lead to unsustainable conditions.

This *Plan* also has been prepared before the conclusion and promulgation of the District’s currently ongoing Habitat Conservation Plan (HCP). A draft of this plan (BSEACD 2007) is now available. The final HCP may modify the amount of water that can be withdrawn by wells in the District during a DOR in order to preserve endangered species populations at Barton Springs, the Edwards Aquifer’s major natural outlet in the segment. The requirements of the HCP as currently perceived have been used to establish the Edwards (Freshwater) DFCs for this aquifer segment and in turn the MAG. The District employs a groundwater management regulatory program that is designed to limit groundwater withdrawals from the Edwards (Freshwater) to no more than about 5.2 cfs during a recurrence of the DOR to comply with the DFC expression. This limitation is the Edwards (Freshwater) drought MAG and is nearly equivalent to the District’s Extreme Drought Withdrawal Limitation (EDWL) that was developed as a key output of the HCP. The EDWL maximizes, within current statutory authority and current rules, the amount of springflow during the worst part of a drought similar to the DOR. However, pumping under the EDWL needs to be reduced by a further 1.5 cfs to equal the drought MAG. Efforts are currently under way to meet that goal. Figure II-1 is a graphic that depicts the relationship of the DFC, MAGs, and the permitting structure for the Edwards (Freshwater) Aquifer.

Prehistoric climatic data indicate that there may be future droughts that will be worse than the 1950s’ DOR. Climate change associated with increased levels of greenhouse gases in the atmosphere may cause future droughts to be more severe than droughts that have occurred during the historic period (IPCC 2007, Nielsen-Gammon, 2008). The District has already begun to





**FIGURE II-1: CONCEPTUAL DIAGRAM OF THE DISTRICT'S MODELED AVAILABLE GROUNDWATER AND THE EQUIVALENT EXTREME DROUGHT WITHDRAWAL LIMITATION FORMULATION FOR THE EDWARDS (FRESHWATER) AQUIFER**

*This conceptual diagram shows the components and their restrictions associated with the Extreme Drought Withdrawal Limitation (EDWL) as incorporated in the District's drought management policy.*

review data relating to such conditions and may consider policies in the future that would address the need and options for regulatory responses to more intense droughts.

No sustainable yield assessments for the Trinity Aquifer and Edwards (Saline) aquifers have been conducted prior to this *Plan*. Initial assessments and evaluations of the Trinity and Edwards (Saline) aquifer were conducted as part of the DFC and MAG process. As more information becomes available, revisions to the DFC expressions and new aquifer assessments are expected.

## **2. Actual Annual Groundwater Use**

Groundwater use within the District is comprised primarily of pumpage and use from the freshwater Edwards Aquifers with a much smaller but increasing component of overall pumpage coming from the Trinity Aquifers. An incidental amount of groundwater is derived from the Taylor and Austin Groups and more geologically recent alluvial deposits. These withdrawals, however, are largely from exempt wells and are not permitted. Given the current management scheme of conditional permitting and the drought restrictions and curtailment requirements associated with new interruptible pumpage authorizations for the freshwater Edwards Aquifer, it is likely that future groundwater production will trend more towards pumpage from the Saline Edwards Aquifer and the Middle and Lower Trinity Aquifers.

The data presented below are a compilation of District monthly meter readings reported by District permittees and are therefore, a more accurate representation of actual in-District groundwater use than was provided by the TWDB in Appendix III. The following tables present the reported use data organized by Major Aquifer and Water Use Type (using the District's water use type designations) in Table II-2(a) and by County and Management Zone in Table II-2 (b). These data include neither Exempt Use, which is primarily from the Edwards Aquifer and is estimated to be about 105,000,000 gallons (322 AF) annually, nor Non-exempt Domestic Use (NDU) under the District's NDU general permit, which is also primarily from the Edwards Aquifer and is estimated to be about 20,600,000 gallons (63.2 AF) annually.

**Table II-2: Actual Annual Pumpage for Last Five Years (in gallons and acre-feet)**  
**(a) By Major Aquifer and Type of Use:**

	<b>PWS</b>	<b>Commercial</b>	<b>Irrigation</b>	<b>Industrial</b>	<b>Totals</b>
<b>Edwards Aquifer</b>					
<b>2007</b>	1,237,098,520	9,157,492	90,327,219	145,977,492	1,482,560,723
	3,797	28	277	448	4,550
<b>2008</b>	1,635,001,051	8,129,101	95,486,300	223,125,231	1,961,741,683
	5,018	25	293	685	6,020
<b>2009</b>	1,334,838,604	6,858,106	81,294,200	174,509,965	1,597,500,875
	4,096	21	249	536	4,903
<b>2010</b>	1,398,211,160	8,565,229	91,338,590	240,230,719	1,738,345,698
	4,291	26	280	737	5,335
<b>2011</b>	1,647,368,453	8,791,848	104,405,640	261,507,704	2,022,073,645
	5,056	27	320	803	6,206
<b>Trinity Aquifer</b>					
<b>2007</b>	0	129,680	3,508,300	0	3,637,980
	0	0.40	11	0	11
<b>2008</b>	0	111,640	9,107,100	0	9,218,740
	0	0.34	28	0	28
<b>2009</b>	0	139,510	5,801,300	0	5,940,810
	0	0.43	18	0	18
<b>2010</b>	0	81,520	6,449,900	0	6,531,420
	0	0.25	20	0	20
<b>2011</b>	8,937,000	124,810	7,072,700	0	16,134,510
	27	0.38	22	0	50

**(b) By County and District Management Zone**

	Edwards Aquifer		Trinity Aquifers		Totals
	Freshwater Zones	Saline Zone	Middle Trinity	Lower Trinity	
<b>Hays County</b>					
<b>2007</b>	862,705,785	0	0	-	<b>862,705,785</b>
	2,648	0	0	-	<b>2,648</b>
<b>2008</b>	1,130,608,005	0	0	-	<b>1,130,608,005</b>
	3,470	0	0	-	<b>3,470</b>
<b>2009</b>	892,759,134	0	0	-	<b>892,759,134</b>
	2,740	0	0	-	<b>2,740</b>
<b>2010</b>	1,079,339,042	0	0	-	<b>1,079,339,042</b>
	3,312	0	0	-	<b>3,312</b>
<b>2011</b>	1,171,615,241	0	8,937,000	-	<b>1,180,552,241</b>
	3,596	0	27	-	<b>3,623</b>
<b>Travis County</b>					
<b>2007</b>	619,854,938	0	129,680	3,508,300	<b>623,492,918</b>
	1,902	0	0.4	11	<b>1,913</b>
<b>2008</b>	831,133,678	0	111,640	9,107,100	<b>840,352,418</b>
	2,551	0	0.3	28	<b>2,579</b>
<b>2009</b>	704,741,741	0	139,510	5,801,300	<b>710,682,551</b>
	2,163	0	0.4	18	<b>2,181</b>
<b>2010</b>	659,006,656	0	81,520	6,449,900	<b>665,538,076</b>
	2,022	0	0.3	20	<b>2,042</b>
<b>2011</b>	850,458,404	0	1,502,910	5,694,600	<b>857,655,914</b>
	2,610	0	5	17	<b>2,632</b>

**3. Annual Recharge from Precipitation, by Aquifer**

**Edwards Aquifer**

For the Barton Springs segment of the Edwards Aquifer, the long-term mean surface recharge should approximately equal the mean natural (i.e., with no well withdrawals) spring discharge, or about 53 cubic feet per second (cfs) at Barton Springs (Slade et al., 1986). The distribution and volume of this recharge have been modeled by many scientists. The report by Scanlon et al. (2001) documents the official TWDB Groundwater Availability Model (GAM) for the Barton Springs segment. A recent draft report by TWDB, GAM Run 08-37 (June 20, 2008), included as Appendix IV, summarizes the estimated amount of recharge from precipitation, the amount of spring discharge, and the amount of flow into and out of the District for steady-state conditions in 1989. Annual recharge from precipitation for the modeling was 42,858 acre-ft (59.2 cfs).

The majority (as much as 85 percent) of recharge to the aquifer is derived from streams originating on the contributing zone, located up gradient to the west of the recharge zone. Water flowing onto the recharge zone sinks into numerous caves, sinkholes, and fractures along its six major, ephemeral losing streams. The remaining recharge (15 percent) occurs in the upland areas of the recharge zone (Slade et al., 1986). Current studies indicate that upland recharge may constitute a larger fraction of recharge (Hauwert, 2009; Hauwert, 2011). Studies have shown that recharge is highly variable in space and time, and is focused within discrete features (Smith et al., 2001). For example, Onion Creek is the largest contributor of recharge (34 percent) with maximum recharge rates up to 160 cfs (Slade et al., 1986; Fieseler, 1998). Antioch Cave is located within Onion Creek and is the largest-capacity recharge feature with an average recharge of 46 cfs and a maximum of 95 cfs during one 100-day study (Fieseler, 1998). Recent work at Antioch Cave has also documented greater than 100 cfs of recharge entering the aquifer through the entrance to Antioch Cave (Smith et al., 2011). Dye tracing studies have shown that some of this water flows directly and very rapidly to Barton Springs with an unknown percentage contributing to storage.

Groundwater divides delineate the boundaries of aquifer systems and influence not only the local aquifer hydrodynamics, but also the groundwater budget (recharge). The groundwater divide separating the San Antonio and Barton Springs segments of the Edwards Aquifer has historically been drawn along topographic or surface water divides between the Blanco River and Onion Creek in the recharge zone, and along potentiometric highs in the confined zone between the cities of Kyle and Buda in Hays County. Recent studies reveal that during wet conditions the groundwater divide is located generally along Onion Creek in the recharge zone, extending easterly along a potentiometric ridge between the cities of Kyle and Buda toward the saline zone boundary (Hunt et al. 2006). During dry conditions the hydrologic divide moves south and is located along the Blanco River in the recharge zone, extending southeasterly to San Marcos Springs (Johnson et al., 2011). Thus, the groundwater divide is a hydrodynamic feature dependent upon the hydrologic conditions (wet versus dry) and the resulting hydraulic heads between Onion Creek and the Blanco River. Recent studies also reveal that under extreme drought conditions, some groundwater may bypass San Marcos Springs and flow toward Barton Springs (Land et al., 2011).

### **Trinity Aquifer**

The Trinity Aquifer exposed in the Hill Country region (west of the District) receives recharge from rainfall on the outcrop, losing streams, and perhaps lakes during high levels (Mace et al., 2000). Mace et al. (2001) estimated recharge for the Upper and Middle Trinity Aquifers is equal to 4 to 6 percent of mean annual rainfall. Some of the Trinity units are recharged by vertical leakage from overlying strata (Ashworth, 1983). There are karst features, faults, and fractures throughout the Hill Country and such features may provide discrete recharge.

In the Balcones Fault Zone (BFZ), the amount of recharge to the Trinity Aquifer is generally unknown. The Trinity is composed of the Upper, Middle, and Lower Trinity aquifers. Potential sources of recharge include lateral flow from the Hill Country Trinity Aquifer, and vertical leakage from the Edwards Aquifer (stratigraphically above the Trinity). However, recent studies utilizing multiport monitoring wells (using Westbay® technologies) have provided a lot of

information about the hydrologic communication between the Edwards and Upper and Middle Trinity aquifers. Results of those studies indicate that the top 100 ft of the Upper Trinity appear to be in direct hydrologic communication with the overlying Edwards. However, the remaining 350 feet of the Upper Trinity units behave as an aquitard and are a confining unit between the Edwards and the Middle Trinity. These studies indicate that the Middle Trinity is hydrologically separate from the overlying Edwards Aquifer. The source of recharge to the Middle Trinity is likely west of the Edwards Recharge Zone and occurs where the Middle Trinity units are exposed at the surface. Geochemical and head data suggest that the Edwards and Middle Trinity aquifer systems can be managed independently because of the behavior of the Upper Trinity as an aquitard (Smith and Hunt, 2010; Kromann et al., 2011).

#### **4. Annual Discharges to Springs and Surface Water Bodies, by Aquifer**

##### **Edwards Aquifer**

The largest natural discharge point of the Barton Springs aquifer is Barton Springs, the fourth largest spring in Texas, and consists of four major outlets: Main, Eliza, Old Mill, and Upper. Main Spring is the largest and discharges directly into Barton Springs Pool. Springflow at Barton Springs is determined and reported by the U.S. Geological Survey (USGS). Discharge reported for Barton Springs is based on a rating-curve correlation between water levels in the Barton Well (State Well Number 5842903) and physical flow measurements from Main, Eliza, and Old Mill. Flow from Upper Barton Springs, which is located about 400 feet upstream of the pool, is not included in the reported discharge, and bypasses the pool. Upper Barton Springs is characterized as an “overflow” spring and only flows when discharge at Barton Springs exceeds about 40 cfs (Hauwert et al., 2004).

Barton Springs has a long period of continuous discharge data, beginning in 1917. Monthly mean data are available from 1917 to 1978 (Slade et al., 1986), and daily mean discharge data are available thereafter. The long-term average springflow at Barton Springs is 53 cfs based on data from 1917 to 1995 and is a widely reported value (Slade et al., 1986; Scanlon et al., 2001; Hauwert et al., 2004). The maximum and minimum measured discharges are 166 and 9.6 cfs, respectively. The lowest measured spring discharge value occurred on March 26, 1956 during the 1950s drought (Slade et al., 1986). Low flow periods are defined as discharge below 35 cfs, moderate flow conditions occur between 35 to 70 cfs, and high flow conditions correspond to flows greater than 70 cfs (Hauwert et al., 2004). Mahler et al. (2006) define low flow as below 40 cfs. A peak in the daily average flow occurs in June, following the average peak rainfall in May.

Barton Springs flow is typical of a spring in a karst system with dynamic responses to recharge events and integrating a combined conduit, fracture, and matrix flow from the system. Springflow recessions and discharge rates are in large part determined by pre-existing conditions, the magnitude of recharge, and location of recharge. Massei et al. (2007) identify several source water types contributing to the conductivity measured in Barton Springs. Sources include matrix, surface water, saline-water zone, and other unidentified sources. Their relative contribution is dependent upon aquifer response to climatic and hydrologic conditions. Generally speaking; however, base springflow during periods of drought is sustained by the discharge of the matrix flow system into the conduit system (White, 1988; Mahler et al., 2006).

The Barton Springs aquifer contains other smaller springs. Cold Springs discharges directly into the Colorado River and is partially submerged by Lady Bird Lake. There are very few discharge data for Cold Springs, but it is estimated to be about 5 percent of Barton Springs discharge (Scanlon et al., 2001). A small spring named Rollingwood Spring, near Cold Springs, discharges into the Colorado River at a rate of about 0.02 to 0.06 cfs. Backdoor Spring is a small, perched spring located on Barton Creek and has discharge of about 0.02 cfs. Bee Springs is a small, perched spring and seep horizon discharging along Bee Creek and into Lake Austin and discharges about 0.2 to 0.6 cfs (Hauwert et al., 2004).

The report by TWDB on GAM Run 08-37 (Appendix IV) states that discharge from springs (Barton and Cold) was 39,723 acre-ft/year (54.9 cfs) under steady-state conditions in 1989. The amount of water withdrawn from wells was 3,135 acre-ft (4.3 cfs).

### **Trinity Aquifer**

Most of the streams and rivers in the Central Texas Hill Country are characterized as net-gaining from the Trinity Aquifer (Ashworth, 1983). Recent modeling work suggests most discharge (57 percent of the Upper and Middle Trinity water budget) from the Trinity is to rivers and streams within the Hill Country (Mace et al., 2000). The discharge into the Hill Country streams and rivers is the source of baseflows in the streams and eventually a source of recharge to the Edwards Aquifer. Potentiometric maps in the Hill Country indicate lateral flow in the Upper and Middle Trinity Aquifers toward the Colorado River in northwestern Hays and western Travis Counties (Mace et al., 2000; Wierman et al., 2010). As described above, most of the lateral flow in the Middle Trinity aquifer stays within the Middle Trinity aquifer as it enters the Balcones Fault Zone and does not discharge as springflow or to surface water bodies in the District. Some of the flow within the upper-most portion of the Upper Trinity may flow laterally, and vertically, into the Edwards Aquifer, and ultimately contribute to wells and Barton Springs.

There are many small springs and seeps throughout the Hill Country that issue from the Upper and Middle Trinity Aquifers. One of the larger springs in the study area is Jacob's Well, near Wimberley. According to the USGS, discharge at Jacob's well since early 2005 ranges between near zero to 56 cfs, and averages 7 cfs. No major springs are known to issue from the Trinity Aquifer within the District, since only an incidental amount of the Trinity crops out in the District.

## **5. Annual Inflows, Outflows, and Inter-formational Flows**

### **Edwards Aquifer**

The amount of cross-formational inflow (sub-surface recharge) occurring through adjacent aquifers into the Barton Springs aquifer is unknown, although it is thought to be relatively small on the basis of water-budget analysis for surface recharge and discharge (Slade et al., 1985). Recent studies by the District and others have shown the potential for cross-formational flow both to and from the Barton Springs aquifer. Some sources of cross-formational flow are discussed below and include the saline-water zone, San Antonio segment, the Trinity Aquifer, and urban recharge.

Leakage from the saline-water zone into the freshwater zone is probably minimal, although leakage appears to influence water quality at Barton Springs during low-flow conditions (Senger and Kreitler, 1984; Slade et al., 1986). Recent studies indicate that the fresh-saline zone interface may be relatively stable over time (Lambert et al., 2010). On the basis of a geochemical evaluation, Hauwert et al. (2004) state that the saline-water zone contribution could be as high as 3% for Old Mill Springs and 0.5% for Main and Eliza Springs under low-flow conditions of 17cfs Barton Springs flow. These estimates were independently recalculated and corroborated by Johns (2006) and are similar to the results of Garner and Mahler (2005). Under normal flow conditions contribution from the saline-water zone would be smaller. Massei et al. (2007) noted that specific conductance of Barton Springs increased 20% under the 2000 drought condition, probably from saline-water zone contribution.

Subsurface flow into the Barton Springs aquifer from the adjacent San Antonio segment located to the south is limited when compared with surface recharge (Slade et al., 1985). Hauwert et al. (2004) indicated that flow across the southern boundary is probably insignificant under normal conditions. As discussed in Section II.A.3, recent studies have documented that the southern boundary of the Barton Springs Aquifer is hydrodynamic in nature and fluctuates between Onion Creek and the Blanco River. Accordingly, groundwater from the recharge zone of the San Antonio segment is flowing into the Barton Springs aquifer during drought conditions (Johnson et al., 2011). Results of recent dye-trace studies indicate that under certain high-flow conditions water recharging along Onion Creek flows from the Barton Springs aquifer to San Marcos Springs (Hunt et al., 2006b). Under moderate drought conditions, water recharged along the Blanco River can flow to both San Marcos and Barton Springs. Under extreme drought conditions, it has been estimated that up to 5 cfs of groundwater flow bypasses (underflows) San Marcos Springs and flows toward Barton Springs (Land et al., 2011).

Changes in land use influence the inflows of aquifers systems. Recent studies have shown that urbanization may increase recharge to the Edwards Aquifer (Sharp, 2010; Sharp et al., 2009). Sources of the increase in recharge include leaking infrastructure such as pressurized potable water lines, wastewater from both collector lines and septic tank drainfields, and stormwater in infiltration basins. Recharge is increased from the return flows of irrigation practices (e.g. lawn watering), and the increase in pervious cover decreases evapotranspiration (Sharp, 2010; Sharp et al., 2009).

### **Trinity Aquifer**

Flow (or leakage) from the Trinity Aquifer into the Barton Springs aquifer is thought to be relatively insignificant when compared with surface recharge (Slade et al., 1985). However, leakage from the Trinity Aquifer may nevertheless locally impact water quality and influence water levels (Senger and Kreitler, 1984; Slade et al., 1986). Estimates by Hauwert et al., 2004, based on water chemistry at Barton Springs, suggest that a small contribution of flow to the springs is from the Trinity Aquifer. As discussed in Section II.A.3., recent studies utilizing multiport monitoring wells have provided a lot of information about hydrologic communication between the Edwards and Upper and Middle Trinity aquifers. Results of those studies indicate that the top 100 ft of the Upper Trinity appear to be in direct hydrologic communication with the overlying Edwards. However, the remaining 350 feet of the Upper Trinity units behave effectively as an aquitard and represent a confining unit between the Edwards and the Middle



Trinity. These studies indicate that the Middle Trinity is hydrologically separate from the overlying Edwards Aquifer (Smith and Hunt, 2010; Kromann et al., 2011).

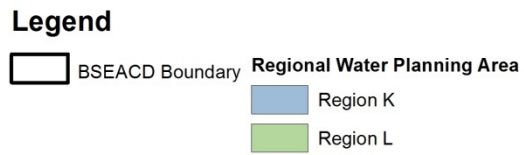
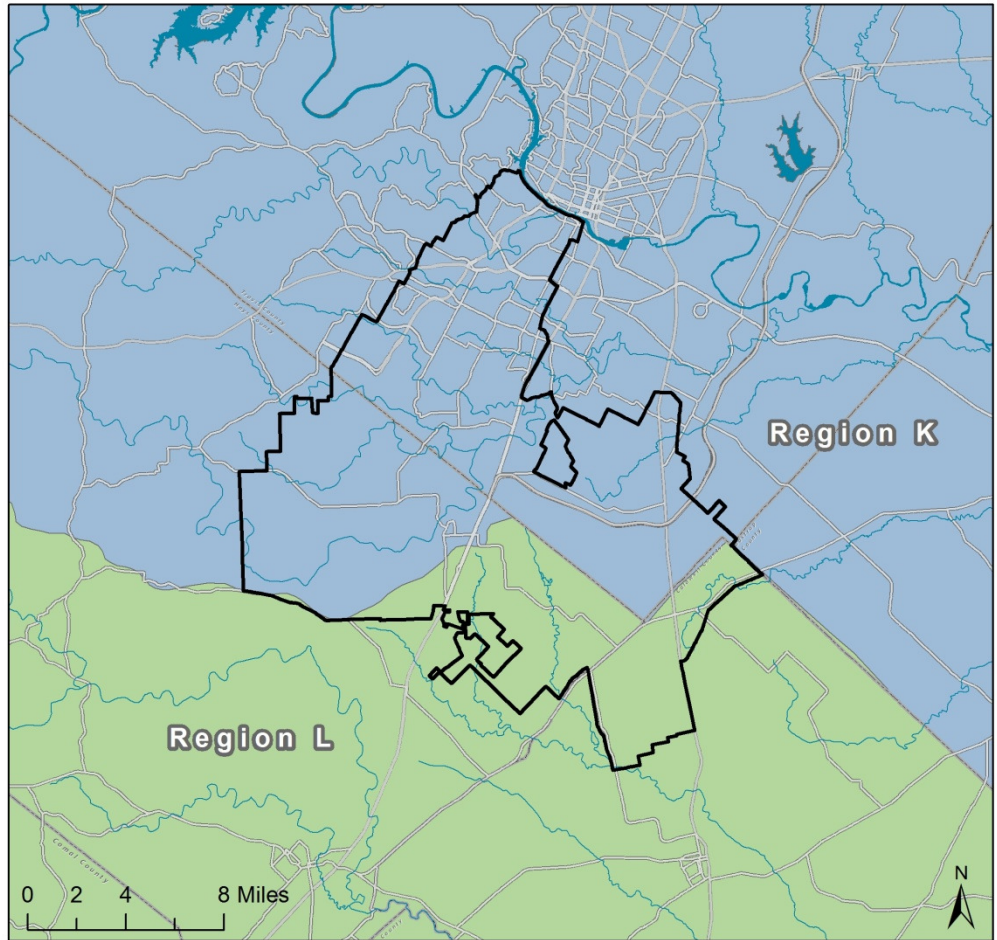
Previously it was presumed that the flow was from the Trinity into the Edwards Aquifer. A groundwater model of the (Hill Country) Trinity Aquifer includes lateral groundwater leakage into the Balcones Fault Zone in order for the model to simulate observed hydrogeologic conditions in the Hill Country Trinity. Steady-state modeling indicates that as much as 8,000 acre-feet/year discharge into the Edwards (BFZ) in Travis and Hays Counties (Mace et al., 2000). However, recent data suggest that the flow within the Middle Trinity units is laterally continuous (e.g. stays within the Middle Trinity) from the Hill Country into the Balcones Fault Zone (Smith and Hunt, 2010).

Very little information is available on the Lower Trinity Aquifer and the hydrologic relationship with the overlying Middle Trinity Aquifer in the District. The Hammett Shale is a very good aquitard, perhaps even an aquiclude in the District, and may inhibit flows into, or out of, the lower Trinity (Wierman et al., 2010).

## **II.B. STATE WATER PLAN PROJECTIONS**

As shown in Figure II-2, most of the District (including almost all of the freshwater groundwater production area) lies within the Lower Colorado Water Planning Region (Region K); a smaller part of the District, generally in the uppermost reaches of the Plum Creek watershed in the Guadalupe River basin, is within the South Central Texas Water Planning Region (Region L). The prevailing water strategies applicable to the area of the District in the two regions are similar.

This section of the Plan utilizes information provided by the Texas Water Development Board in the report entitled *Estimated Historical Water Use and 2012 State Water Plan Datasets: BSEACD*. The report provides county-level data that are applicable to the District and is included in this *Plan* as Appendix III.



**FIGURE II-2: REGIONAL WATER PLANNING AREAS WITHIN THE DISTRICT'S BOUNDARY**  
*This map displays the District's boundaries in relation to the Region L and Region K boundaries.*

## 1. Projected Surface Water Supply in District

The surface water supply in the District is provided primarily by run-of-river diversions and especially by reservoirs in the Colorado River basin. The southeastern-most part of the District in Hays County and Caldwell County is supplied by the Guadalupe-Blanco River system, especially water from main-stem reservoirs like Canyon Lake. Most of this Guadalupe-Blanco water is conveyed to some users in the District by the Hays County Pipeline.

Projected water supply data have been extracted from the 2012 State Water Plan (SWP) database and provided by the TWDB at the county level (Appendix III). The projections are estimated using an apportioning multiplier derived from the ratio of the land area of District in the county relative to the entire county area. The apportioning multiplier was used for all water user groups (WUGs) except for public water supplies (i.e. municipalities, water supply corporations, and utility districts). The derivation of these apportioning multipliers is shown in Table II-3.

**Table II-3: Areal Distribution of District by County.**

*Most of the District is in Travis and Hays Counties, in sub-equal amounts; the District comprises only a small part of any one county.*

<b>For County:</b>	<b>Total Acres in County</b>	<b>Acres in District</b>	<b>Percent in Co.</b>	<b>Apportioning Multiplier</b>
Travis	656,348	75,377	48%	11.5%
Hays	433,248	66,748	42%	15.4%
Caldwell	350,498	15,823	10%	4.5%
<b>Totals</b>	<b>1,440,094</b>	<b>157,948</b>	<b>100%</b>	<b>100%</b>

The total annual projected surface water supply in the counties of the District is estimated to be **293,027** acre-feet in 2020 (2020 is the closest decadal estimate to 2022, the final year of this *Plan*). These supplies refer to the firm-yield supplies from surface water sources during a recurrence of the drought of record. For comparison purposes, the projected surface water supplies from the three primary counties comprising the District (Bastrop was excluded because its area has been de-annexed since the previous management plan was approved) are provided in the following table by decade in acre-feet (Appendix III, page 6):

	<b>2010</b>	<b>2020</b>	<b>2030</b>	<b>2040</b>	<b>2050</b>	<b>2060</b>
Travis	287,687	286,132	277,118	263,891	254,337	244,503
Hays	4,120	4,680	4,680	4,680	4,680	4,680
Caldwell	195	195	195	195	195	195
<b>Total</b>	<b>294,012</b>	<b>293,027</b>	<b>284,023</b>	<b>270,806</b>	<b>261,262</b>	<b>251,438</b>

## 2. Projected Total Demand for Water in District

For estimating total water demand, the District has used data extracted from the SWP and provided by the TWDB (Appendix III). As with projected surface water supply data, county-level water demand data have been apportioned for certain WUGs using the apportioning multipliers described in Table II-3. The TWDB provides demand estimates by decade as well as by county. The decadal estimates for 2020 are used to approximate demand for the year 2022, the final year of this *Plan*. On these bases, the total annual demand by county for water arising from the District is shown below:

From Travis County in the District: 188,746 acre-feet  
From Hays County in the District: 6,659acre-feet  
From Caldwell County in the District: 846acre-feet

**TOTAL DEMAND IN DISTRICT: 198,271acre-feet in 2022**

The water demands arising from the County by decade in the prevailing SWP are provided in the following table by decade in acre-feet (Appendix III, page 11):

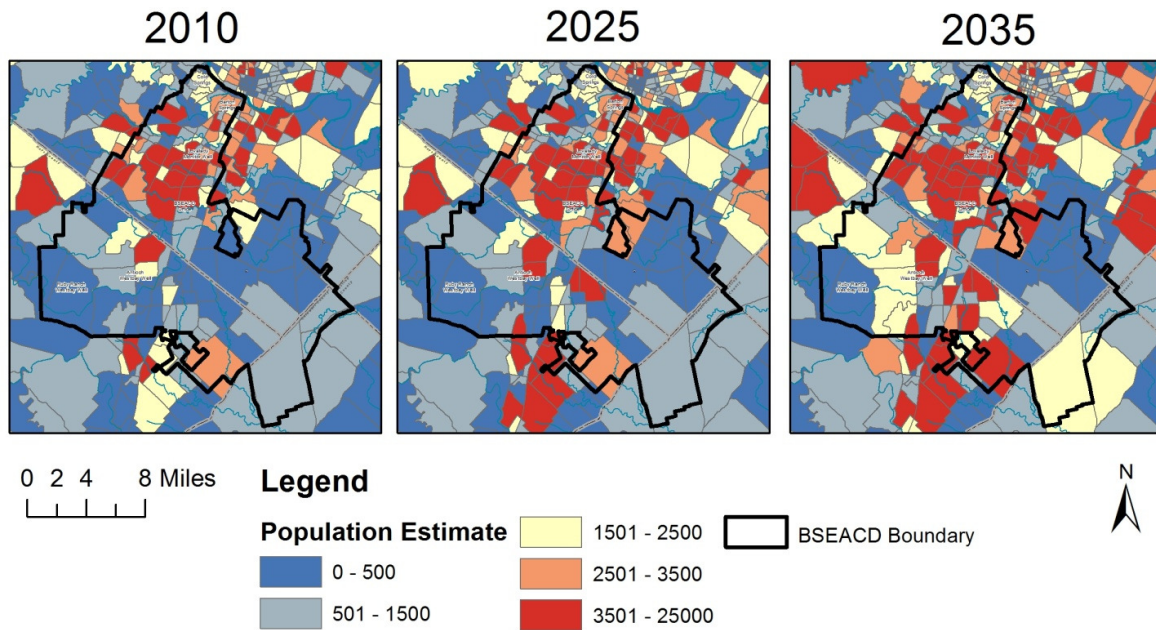
	<b>2010</b>	<b>2020</b>	<b>2030</b>	<b>2040</b>	<b>2050</b>	<b>2060</b>
Travis	158,162	188,746	222,698	253,180	284,819	307,727
Hays	4,978	6,659	8,181	9,837	11,808	13,442
Caldwell	655	846	1,014	1,185	1,359	1,536
<b>Totals</b>	<b>165,805</b>	<b>198,271</b>	<b>233,923</b>	<b>266,242</b>	<b>300,036</b>	<b>324,765</b>

### 3. Projected Water Supply Needs

For estimating projected water supply needs, the District has used data extracted from the SWP and provided by the TWDB (Appendix III). The TWDB provides water supply needs estimates by decade as well as by county. The decadal estimates for 2020 are used to approximate demand for the year 2022, the final year of this *Plan*. A summary of the projected water supply needs is provided in the following table by decade in acre-feet (Appendix III, page 15):

	<b>2010</b>	<b>2020</b>	<b>2030</b>	<b>2040</b>	<b>2050</b>	<b>2060</b>
Travis	-3,538	-11,053	-14,067	-18,134	-55,470	-92,045
Hays	-1,674	-5,738	-11,146	-18,871	-28,549	-36,273
Caldwell	-210	-892	-1,910	-3,054	-4,300	-5,694
<b>Totals</b>	<b>-5,422</b>	<b>-17,683</b>	<b>-27,123</b>	<b>-40,059</b>	<b>-88,319</b>	<b>-134,012</b>

The above projections show that for the SWP planning period (2010-2060), there is a progressively increasing water supply deficit, increasing from 5,422 acre/feet in 2020 up to 134,012 acre/feet in 2060. These water-supply needs in the District arise primarily from and are dominated by the burgeoning growth on the southern fringe of the Austin metropolitan area (Figure II-3), and also in the gradual diminution of the surface water supplies, as reservoir capacity decreases with time. As in prior plans, some of the water-demand deficits in the District area in the out-years (the later years in the planning period) include numerous contractual shortages. These contractual shortages will be addressed on an *ad-hoc* basis, through the renewal and expansion of contracts with wholesale water suppliers and the contractual reallocation of existing supplies in order to address the projected water demands for these and other area WUGs. But even so, it is projected that there will be unmet needs in the District, especially under DOR conditions and in the out-years.



**FIGURE II-3: POPULATION GROWTH PREDICTIONS 2010-2035**  
*Population density mapping based on population estimates from the  
 Capitol Area Metropolitan Planning Organization.*

#### 4. Water Management Strategies

The strategies to address the supply needs described above are identified in Appendix III (page 19). These data -- organized by decade, county, and WUG -- are extracted from the 2012 SWP and have been provided to the District by the TWDB. Key management strategies relevant to WUGs in the District and adjoining areas include:

- (Municipal Water) Conservation
- Drought Management
- Use of/Transfer from Available or Re-allocated Surface Water Supplies
- Purchase of Surface Water from Wholesale Water Providers (WWP)
- Purchase of Carrizo-Wilcox Aquifer Water, via Hays-Caldwell Public Utility Agency
- Development of Saline Zone of Edwards-BFZ Aquifer
- Development of Trinity Aquifer

In contrast to the previous regional planning, and perhaps telling to the supply crunch that now exists in this area of burgeoning growth, only one of the WUGs in the District has allocation or transfer as a continuing key water management strategy in the future. (An allocation strategy involves WUGs that have surplus water during the planning period and WUGs in the same county that have unavoidable deficiencies in water supplies; a transfer strategy applies to an individual WUG with an anticipated shortage that is located in multiple basins and/or counties.) That WUG is Creedmoor-Maha WSC, which will receive an allocation from LCRA's re-allocation of its run-of-river supply to meet shortfalls beginning in 2020 and increasing each decade through the planning period. Any other inter-basin transfers and/or allocations that might

be made in the District would likely be ones of opportunity rather than as planned elements of the overall strategy. It should also be noted that none of the WUGs in the District have a strategy in the current SWP that involves increased use of the freshwater Edwards-BFZ Aquifer, but that aquifer is a key existing supply for many WUGs.

All of the strategies listed above will be beneficial to the District in reducing demand and providing more, and more equitable distribution of water supplies. But the regional strategies addressing groundwater supplies and affecting groundwater use are of specific importance to this *Plan*. Those strategies are briefly characterized below.

#### Regional Strategies – Water Conservation, Municipal

The recurring droughts of the past five years have defined a “new normal” for the population centers in the District, especially those that depend on the drought-prone karst groundwater for all or a substantial part of their supply. Virtually every one of the municipalities and larger water supply providers in the District have instituted new conservation measures, including water use and conservation education, provision of low-use devices at reduced cost to their retail end-users, substitution of less water-demanding landscaping elements for water-thirsty ones, and more aggressive enforcement of wasteful water use during non-drought as well as drought periods. These measures are intended to be deployed on a full-time basis to develop a water conservation ethos and mind-set in the citizenry, so that water shortages can be as infrequent and as brief as possible.

#### Regional Strategies – Drought Management

Water providers in the District understand that “water conservation” measures alone will not be protective of their water supply during the more severe and prolonged droughts, and that special drought management measures are needed to ensure additional curtailment of water use during those periods, up to and including a recurrence of the 1950s’ drought of record. In addition to the development, implementation, and enforcement of drought contingency plans that set forth specific, temporary measures to reduce end-user water demand, both retail and wholesale water providers are attempting to diversify their water supply portfolios, so that they can rely on the less constrained, even if more expensive water resources during drought and on the more constrained resources when not in drought. These alternative supplies can be either surface water sources or other groundwater sources.

#### Regional Strategies – Purchase of Carrizo-Wilcox Aquifer Water, via Hays-Caldwell Public Utility Agency

While none are currently able to employ such a source, as it is not yet available in this area, a number of the larger WUGs in the eastern part of the District, notably City of Kyle, City of Buda, Goforth SUD, and Creedmoor-Maha WSC, and Mountain City WUG are intending to access imported Carrizo-Wilcox Aquifer water to meet future water demands, beginning in 2020. These are new groundwater supplies for the area of the District that are planned to be supplied by a new special district, the Hays-Caldwell Public Utility Agency. At a minimum, this new water supply will relieve pressures for over-drafting of the aquifers in the District.

### Regional Strategies – Development of Saline Zone of Edwards-BFZ Aquifer

The saline zone of the Edwards-BFZ Aquifer, which exists under much of the eastern portion of the District, is a potential new water supply for the area. While it is known that there is a relatively large volume of brackish to saline groundwater in this area, and in adjacent areas along the down-dip Edwards trend, it is not yet known how much water can be produced in the long-run as a reliable supply, what the effects of such withdrawals might be on the adjacent freshwater zone just updip of the saline zone, what the turn-key costs are of desalinating that water and disposing of any concentrate, and how well that aquifer might also serve as a host of an aquifer storage and recovery facility. To a considerable degree, development of this resource is not a matter of if, but when – when will it become economically feasible relative to the cost of providing supplies from other sources. The developmental uncertainties, which are identified above, need to be removed, and this task seems ripe for a public-private partnership response. Nevertheless, a number of WUGs in the District have such a supply as a strategy, including the City of Buda, Cimarron Park Water Company, and Hays County-Other WUGs; Hays County-Other would access such a supply by 2020 in its water management strategy.

### Regional Strategies – Development of the Trinity Aquifer

The Trinity underlies the Edwards throughout the District, and since the more accessible Edwards is fully subscribed as a firm-yield water supply, the Trinity is increasingly being accessed as an alternative groundwater supply, especially in the western part of the District where it is shallower. The Trinity is much more variable in quality and quantity, and the hydrogeologic controls on this aquifer's characteristics are only just now beginning to be understood; it deserves continued study but also serious consideration as a new water supply in many parts of the District. However, at this time, only one WUG in the District, Hays County-Manufacturing, is identified in the SWP using this resource, and not until 2030. The Trinity appears to represent an under-appreciated resource, and a not insignificant number of others are using it advantageously already, even for public water supply purposes. It also could serve as a host for an aquifer storage and recovery facility.

## **5. Synthesis of Regional Water Supply and Demand for District Planning**

The strategies for addressing water supply and demand identified by the regional water planning groups in the District's jurisdiction, summarized in the preceding sections, demonstrate the importance of local factors in determining what is available and feasible in any one area. It is under these conditions that local management of the water resources, such as is provided by local groundwater conservation districts, is of paramount importance in being a vehicle for making those things happen. Effective communication among local jurisdictions and among local, regional, and state levels of government will be required to meet the water challenges in the future.

In the District, first and foremost, the SWP strategies hinge on the protection of its aquifers, notably the freshwater Edwards Aquifer that is already at its sustainable yield and MAG-level usage, so that it may continue to serve as a reliable, high-quality water supply for its existing



users. In the District, aggressive drought management must complement the full-time water conservation efforts of the end users of the water system. To facilitate groundwater management during extreme drought stages, the District must foster the provision of alternative water supplies, including a) other available freshwater aquifers, such as the Trinity and the Carrizo-Wilcox; b) substitution of reclaimed water and rainwater-harvesting in lieu of higher-quality freshwater; and c) the development of new firm-yield supplies through technologies such as desalination and aquifer storage and recovery.

The contribution of groundwater within the District to the regional and state water planning process is discussed quantitatively in Section IV of this *Plan*.

### **III. PROGRAM PLANNING FOR DISTRICT**

*This major section of the plan document contains details of the implementation plan for the District, specifying the management objectives, performance standards, activities, and metrics.*

#### **III.A. RELATIONSHIP OF THIS PLAN TO OTHER DISTRICT DOCUMENTS**

The *District Management Plan (Plan)* is considered the “master guidance document” for the District and, once approved by the Texas Water Development Board (TWDB), establishes the entire scope of the District’s activities and, in concert with legal statutes, its authorities. The *District Rules and Bylaws (Rules)*, which direct and control the day-to-day activities of the District, flow from and must be consistent with the prevailing *Plan*. The District’s *Rules*, which are complementary with the policies approved by the District’s Board of Directors and the District staff’s implementation activities, is always located on the District webpage at: <http://www.bseacd.org/about-us/governing-documents/>; the current version of the District’s *Rules* is linked on that page and available for download at: [http://www.bseacd.org/uploads/Rules\\_and\\_Bylaws\\_Board\\_approved\\_9\\_17\\_11%281%29.pdf](http://www.bseacd.org/uploads/Rules_and_Bylaws_Board_approved_9_17_11%281%29.pdf).

From time to time during the term of this *Plan*, the District may make changes in its *Rules* to accommodate new and changing requirements, but all such changes in the *Rules* must maintain consistency with the TWDB-approved *Plan*. Similarly, program-specific plans associated with external parties, such as the Habitat Conservation Plan (HCP) with US Fish and Wildlife Service (USFWS), are not considered completely promulgated unless and until those plan provisions and measures are generally reflected in an approved *Plan*. Ongoing internal planning activities, such as the continuing strategic planning initiatives, may be used to consider the need and efficacy of certain changes to the *Plan*, but they do not have effect unless and until the changes are made in the *Plan* and the revised *Plan* is approved by TWDB.

By statute, while this is a ten-year *Plan*, it must be reviewed and re-adopted at least every five years to ensure its currency, and it may be amended or revised at any time, after appropriate public input and with Board approval. It is currently anticipated that the issuance of the final HCP *may* require a further revision of this *Plan* before the plan period is complete. However, the already defined outputs of the HCP process and the likely requirements to achieve and/or maintain compliance with the applicable Desired Future Conditions of the District’s aquifers in large part underpin the current objectives and strategies of this *Plan*, and therefore large substantive differences between this and the subsequent *Plans* are not anticipated.

#### **III.B. GENERAL APPROACH USED IN PROGRAMMING**

The activities of the District are intrinsically multi-disciplined and multi-lateral; virtually every one of the management goals and objectives identified in this *Plan* are best served by a combination of skill sets. The District staff is structured in a matrix approach where all staff members report to the General Manager but all work is undertaken through various standing, internal teams or external project teams. Currently, the internal teams, each with a staff member who serves as Team Leader, include: Aquifer Science, Regulatory Compliance, Education and

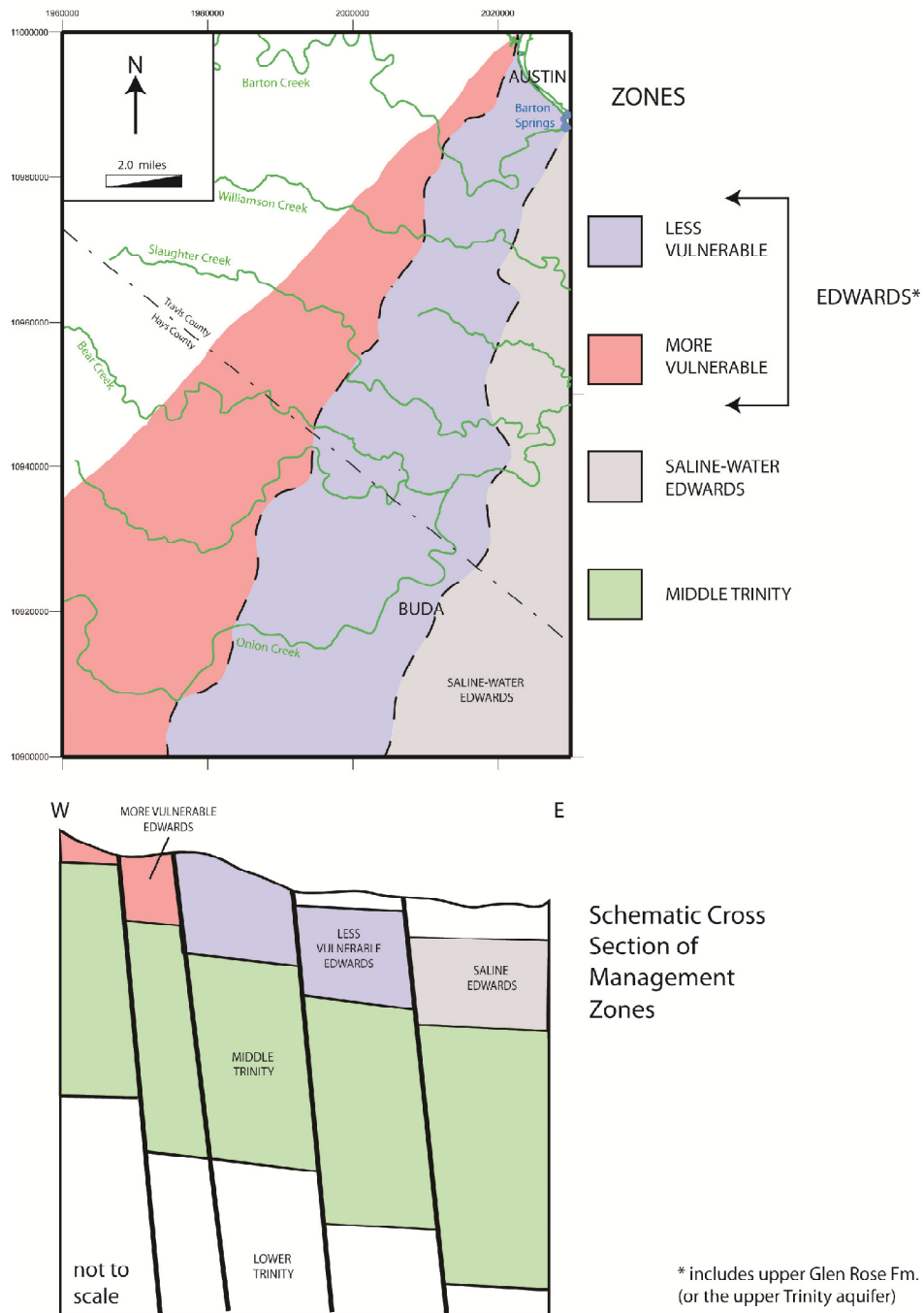
Outreach, General Services, and General Management. These teams can be reconfigured over time to meet evolving internal and external needs. Every staff member works on multiple teams. The Board of Directors of the District provides policy-level direction for District initiatives and various, *Rules*-specified approvals for implementation through the General Manager.

The District has multiple aquifers that it is currently managing, or could be in the future. These are described in more detail in Appendix II. The primary aquifer is the District's namesake, the freshwater portion of the Barton Springs segment of the Edwards Aquifer, called the Barton Springs aquifer. However, several other aquifers are used in the District. Increasingly, the Trinity Aquifer, and more specifically the Middle Trinity Aquifer, is being used in parts of the District where the Edwards is unreliable and/or completely committed. In the future, both the Lower Trinity and the saline-water zone of the Edwards may be more important groundwater supplies in the District than at present. In addition, small amounts of shallow groundwater are found in alluvium and terraces along downstream parts of the larger watercourses and are locally used from time to time. This *Plan* considers each of the following as a different "management zone:"

- Western Freshwater Edwards and Upper Trinity Aquifer: Western side of recharge zone where saturated thickness of Edwards is relatively thin (nominally, 100 feet or less in thickness). Saturated thickness of the Edwards is based in part on fault blocks, pumping, and drought conditions;
- Eastern Freshwater Edwards and Upper Trinity Aquifer: Eastern side of recharge zone and confined zone;
- Saline-Water Zone Edwards Aquifer: East of the line where concentration of total dissolved solids in Edwards groundwater equals 1,000 milligrams per liter;
- Middle Trinity Aquifer: Lower Glen Rose, Hensell Sand, Cow Creek Formation; and
- Lower Trinity Aquifer: Sligo and Hosston Formations.

These management zones within the District's boundaries are depicted schematically in Figure III-1. In addition, the Outcropping Trinity Aquifer (Undifferentiated), which exists in a very small area in the extreme western District and is not currently used as a significant water supply, is another possible management zone in the future. The District manages the other aquifers in the District (for example, the very minor alluvial aquifers, and the Austin Chalk aquifer) by convention as part of the Western Freshwater Edwards/Upper Trinity Aquifer management zone. Each of these management zones is promulgated through normal rule-making and delineated by geospatial boundaries for the geographically defined management zones and by the stratigraphic formation for the hydrogeologic management zones.

For each of the aquifers listed above, the *Plan* anticipates that certain rules may apply to one, but not to others, of these management zones; other rules will apply to all aquifers/management zones in the District. Accordingly, some of the performance standards and activities in the following section are or will be management zone-specific.



**FIGURE III-1: CONCEPTUAL MANAGEMENT ZONES AND CROSS-SECTION**  
 Portions of the aquifer where the saturated Edwards is thin are considered to be more vulnerable to having wells go dry during periods of extreme drought.

### III.C. MANAGEMENT GOALS, OBJECTIVES, AND STRATEGIES

The Texas Water Development Board (TWDB) has specified nine overarching management goals to be addressed in the groundwater management planning performed by all groundwater conservation districts (GCDs) in Texas; these goals are rooted in the statutory authority of Texas Water Code (TWC), Chapter 36. One of these goals, related to controlling and preventing subsidence, is not applicable to the District as there are no geologic strata in the District that are structurally affected by groundwater withdrawals from them. The TWDB has indicated that these overarching general goals provide the basis for district-specific objectives and strategies (performance standards and activities) that individual GCDs should use as the framework for their management plans.

In this section, each of the District’s current management objectives is identified and characterized by its relevant strategies, which include both performance standards and their activities. Each objective has two or more performance standards that are principally associated with it; these are designated herein as “Primary Performance Standards (Primary PS)” and each Primary PS “belongs” to one objective, under which it is further elaborated as to its suite of activities. A recap of the current *Plan*’s objectives and their corresponding primary performance standards and metrics is shown in Table III-1.

Much of what the District does is multi-dimensional and the activities under a particular performance standard might contribute to the accomplishment of more than one objective. So, in addition to its Primary PS, an objective generally will also have other performance standards with activities that contribute to that objective from time to time or in a supplemental fashion; these are designated “Supporting Performance Standards (Supporting PS).” A performance standard is the Primary PS for one, and only one, objective, but it may be a Supporting PS for one or more other objectives.

Certain performance standards and especially activities are further designated as aquifer-specific or management zone-specific; where not so designated, they apply to all relevant aquifers and management zones in the District. Some performance standards and activities have metrics associated with specifically stated time frames (e.g., intensity, frequency); if not, the context provides the time frame (e.g., each year, or within the plan period.) Using the identified metrics and their collective judgment, as appropriate, the District’s directors will evaluate all performance standards and assess the adequacy of progress toward the management objectives each year, in the program review that is part of the District’s *Annual Report* submitted to TCEQ.

Table III-2 below shows the correspondence between the TWDB’s groundwater management goals and the District’s objectives and performance standards that are characterized in this section of the *Management Plan*. This table is intended as an overall, at-a-glance indication of how the goals are being addressed in this plan in a multi-dimensional fashion. Further details are found under the respective subsections for a particular objective and performance standard. Note that essentially everything that the District does relates in some way to the three goals of providing efficient use of groundwater, of addressing natural resource management issues, and of addressing the Desired Future Conditions (DFCs) of District aquifers.

**TABLE III-1. Summary of Plan Objectives and Their Performance Standards and Metrics**

<b>Objective 1 – Assure the long-term sustainability of the District to carry out its mission as a GCD with excellence.</b>	
<u>Primary Performance Standards</u>	<u>Metrics</u>
1-1: Hire, equip, train, evaluate, and motivate appropriate staff to achieve the District’s mission within budgetary constraints.	Overall score of GM’s annual performance review for fiscal year; Number of instances of unresolved personnel issues referred to the Board; Staff turnover rate net of reductions-in-force.
1-2: Align District plans, policies and programs with the District’s mission and vision, and regularly review and revise them, as warranted, to respond to changing circumstances that affect their need, effectiveness or implementation.	Satisfactory progress toward or timely completion of revisions to the District’s Management Plan that are approved by TWDB; Establish a Contingency and Risk Management Plan and update it within one year of each Management Plan’s approval, and at least once every two years thereafter; Timely budgeting and amendments.
1-3: Ensure the District has the near-term and long-term financial basis and contractual wherewithal to support its mission.	A clean financial audit report each year; absence of vendor problems and contractual disputes; amount of activity concerning grant proposals and projects; and biannual receipt of official PFIA certificate for completing required training.

1-4: Provide efficient administrative support and infrastructure, such that District operations are executed reliably and accurately, meet staff and local stakeholder needs, and conform to District policies and with federal and state requirements.

Absence of claims of OMA and PIA violations by external parties; lack of staff complaints about continuing problems with support services and infrastructure.

1-5: Provide mechanisms to align District Rules, policies, and programs with the will of its collective and precinct-level constituencies, within the constraints of statutes governing the District.

Maintaining a full Board; effective participation in Board activities and representation of constituents by each of the five Board members; properly conducted director elections.

1-6: Provide leadership in promoting legislation and regulations that benefit the protection of the District's groundwater resources and opposing legislation and regulations that harm those resources.

Preparation of a Legislative Agenda report before the end of each even-numbered fiscal year that reflects the consensus of the Board concerning the next session; Preparation of a Legislative Session Debriefing report before the end of each odd-numbered fiscal year that assesses specific legislation that affects the District, both individually and as a GCD political subdivision, that passed and did not pass, and generally why that occurred; Collective judgment of the Board as to appropriateness of what was pursued legislatively, what actions were taken, and what outcomes were achieved; Collective judgment of the Board as to appropriateness of what litigation or contested-cases were pursued, what actions were taken, and what outcomes were achieved.

**Objective 2. Promulgate a fair and efficient regulatory program.**

**Primary Performance Standards**

**Metrics**

2-1: Review and modify the Rules as warranted to provide and maintain a sound statutory basis for continued District operations and to ensure consistency with both District authority and programmatic needs.

Rule making process is initiated and conducted in accordance with all statutory requirements and required timeframes; rules are in alignment with District policies and objectives as determined by the Board with PAC input in even-numbered years.

2-2: Process and review all well registrations, permit renewals, and applications for permits, permit amendments, and authorizations in accordance with the Rules, Well Construction Standards, and other District guidelines in accordance within specified procedural timeframes.

Requests for Permits and authorizations are processed in accordance with all statutory requirements and required timeframes.

2-3: Monitor existing District wells for compliance with the Rules, and Well Construction Standards.

Specified minimum number of permittee inspections completed or exceeded each year; the majority of all documented violations are brought into compliance or are addressed by a Board Order within six months of the staff-established compliance deadlines; during drought, all required meter readings are submitted or collected each month.

2-4: Efficiently process permittee meter readings, water use fee invoices and payments, conservation credits, permit renewals and related communications.

Timely processing of permit renewals, conservation credits, and meter readings within timeframes specified in Rules or policies.



**Objective 3. Develop and implement an effective drought management program that achieves the adopted Desired Future Conditions (DFCs) of each relevant aquifer in the District.**

**Primary Performance Standards**

**Metrics**

3-1: Assist permittees in developing drought and conservation planning strategies, permit conversion strategies, and pricing strategies, and enforce compliance with drought management rules during District-declared drought to achieve DFCs during extreme drought.

Achieve overall monthly pumpage reductions within 10% of the aggregate pumpage reduction (volumetric) goal of the prevailing drought stage.

3-2: Monitor and declare drought stages on the basis of the analysis of data from the District’s defined drought triggers and in accordance with the adopted drought trigger methodology.

Acceptable-to-Board proportion of timely updates of all drought related information during drought.

3-3: Inform and educate permittees and the public about declared drought stages and the severity of drought, and encourage practices and behaviors to reduce water use.

Timeliness and adequacy of response to requests for information.  
Absence of complaints received concerning water utility permittees’ unwarranted actions.

**Objective 4. Demonstrate leadership in external communication, collaboration, coordination and joint planning with respect to groundwater and related resources.**

**Primary Performance Standards**

**Metrics**

4-1: Cultivate and communicate effectively and routinely with stakeholders of all types that affect and are affected by the District’s programs and policies.

Collective judgment of the Board once each quarter as to whether communications between the District and its stakeholder community, including constituents and other public officials, are providing an effective basis for District decision-making and for identifying any needed remedial actions.

4-2: Collaborate with joint Groundwater Management Area (GMA) and regional water planning efforts on policies, regulations, and activities affecting water quality or desired future conditions of the aquifers managed by the District.

Percent of GMA meetings attended; timely provision of responsive comments on MPs of other GCDs in GMA 9 and 10; participation in public hearings on DFCs and MPs; timely discussion and voting on GMA items.

4-3: Provide technical assistance as warranted to federal, state and local entities; organizations; and individuals on the geology, hydrogeology, and karst features impacted by groundwater-utilizing land use activities.

Trends in number of requests for repeat/return participation in events.

4-4: Through education and public outreach, inform groundwater users and the general public of the connectivity of recharge and discharge, importance of water quality protection, and the relationship between surface water and groundwater.

Number of workshops/seminars with acknowledged District participation; number of District-sponsored outreach meetings and info distribution events; trends in number of page views and amount of “click-throughs” for District website; number of new subscriptions to the Friends of the Aquifers email contact list.

4-5: Prepare, submit, and maintain a draft and final Habitat Conservation Plan (HCP) and provide support of related National Environmental Policy Act documentation and processes for obtaining an Incidental Take Permit from the US Fish & Wildlife Service (FWS) for the endangered species at Barton Springs.

Satisfactory progress toward completion of the HCP that is acceptable to FWS, as judged by the Board and with the use of an annual HCP Status Report prepared by District Staff near the end of each fiscal year; Upon its receipt, success in maintaining a Section 10(a) Incidental Take Permit; Establishment and convening meetings at least annually of an HCP Management Advisory Committee; Promulgation of a regulatory program that achieves the Extreme Drought Withdrawal Limitation that is based on the MAG for the prevailing drought DFC for the Freshwater Edwards Aquifer.

**Objective 5. Extend current groundwater supplies by encouraging supply-side and demand-side improvements.**

**Primary Performance Standards**

**Metrics**

5-1: On at least a bi-annual basis, assess the availability and feasibility of regional alternative water supplies and encourage District permittees to diversify their water supplies by fostering arrangements with available water suppliers.

A report completed in odd-numbered years summarizing the above activities, grant activities, and active alternative supply projects in the District, and making recommendations.

5-2: Conduct investigations and, as warranted and feasible, physically alter discrete recharge features that will lead to an increase in recharge to the Edwards Aquifer.

Grant opportunities that have been researched and considered; excavation conducted in at least one cave, sinkhole, or recharge feature annually.

5-3: Conduct investigations, as warranted and feasible, to evaluate the potential for the saline zone of the Edwards Aquifer to provide water for a desalination facility, and to evaluate the potential for the Edwards saline zone and the Trinity aquifers beneath the freshwater Edwards as reservoirs for an Aquifer Storage and Recovery (ASR) system.

Completion of or significant progress on above activities; coordination accomplished with other partners, including outcome of funding requests and development of partnership agreements, as warranted; development of a budget/business and work plan.

5-4: Maintain and develop programs that inform and educate District groundwater users and area residents of all ages about water conservation practices and resources and use of alternate water sources including gray water / condensate reuse and rainwater harvesting.

Preparation and dissemination of material shared with District groundwater users and area residents that will inform them about water conservation and alternate water sources.

**Objective 6. Increase understanding of all District aquifers so that appropriate policy and regulatory decisions are made.**

**Primary Performance Standards**

**Metrics**

6-1: Assess aquifer conditions by sampling and collecting groundwater data from selected wells.

Information collected on wells within the District entered into District database.

6-2: Conduct scientific studies to better determine groundwater availability, to understand and prevent threats to water quality, to minimize impacts to water-supply wells and springs, and to provide sound science on which to base District policy.

Sufficient scientific studies are conducted and communicated each year so that the Board considers itself to be well advised of scientific basis and implications of Board policies.

**TABLE III-2. Goals, Objectives, and Performance Standards**

	<i>Goal 1</i> Providing the Most Efficient Use of Groundwater	<i>Goal 2</i> Controlling and Preventing Waste of Groundwater	<i>Goal 3</i> Addressing Conjunctive Surface Water Management Issues	<i>Goal 4</i> Addressing Natural Resource Management Issues	<i>Goal 5</i> Addressing Drought Conditions	<i>Goal 6</i> Addressing Demand Reduction Through Conservation	<i>Goal 7</i> Addressing Supply Increase Through Structural Enhancement	<i>Goal 8</i> Addressing Quantitatively the Desired Future Conditions				
<b>Objective 1</b>												
PS 1-1	●			●				●				
PS 1-2	●	●	●	●	●	●	●	●				
PS 1-3	●			●				●				
PS 1-4	●			●				●				
PS 1-5	●	●	●	●	●	●	●	●				
PS 1-6	●	●	●	●	●	●	●	●				
<b>Objective 2</b>												
PS 2-1	●	●	●	●	●	●		●				
PS 2-2	●	●	●	●	●	●		●				
PS 2-3	●	●	●	●	●	●		●				
PS 2-4	●	●		●	●	●		●				
<b>Objective 3</b>												
PS 3-1	●	●		●	●	●		●				
PS 3-2	●	●		●	●	●		●				
PS 3-3	●	●		●	●	●		●				
<b>Objective 4</b>												
PS 4-1	●	●	●	●	●	●	●	●				
PS 4-2	●		●	●		●	●	●				
PS 4-3	●		●	●			●	●				
PS 4-4	●	●	●	●			●	●				
<b>Objective 5</b>												
PS 5-1	●		●	●	●	●	●	●				
PS 5-2	●		●	●			●	●				
PS 5-3	●		●	●			●	●				
PS 5-4	●	●		●	●	●		●				
<b>Objective 6</b>												
PS 6-1	●		●	●				●				
PS 6-2	●	●	●	●	●	●	●	●				

**III.C.1. Objective 1 – Assure the long-term sustainability of the District to carry out its mission as a GCD with excellence.**

**Primary Performance Standards:**

**Performance Standard 1-1:** Hire, equip, train, evaluate, and motivate appropriate staff to achieve the District’s mission within budgetary constraints.

Board-level Activities:

- a. Hire, evaluate, and fairly compensate an effective General Manager.
- b. Address appropriately unresolved personnel issues between the General Manager and staff members, or upon request by the General Manager.
- c. Budget sufficient funds for salaries, wages, and benefits that will attract and maintain a staff that is sufficient to carry out the District’s mission according to the prevailing *Management Plan*.
- d. Communicate perceived concerns about staff performance issues and other personnel matters to the General Manager.

Staff-level Activities:

- a. Assign and supervise staff in roles that utilize their strengths and promote teamwork.
- b. Evaluate staff performance regularly and constructively.
- c. Develop and administer a staff compensation program that equitably rewards individual and team performance that advances the mission of the District.
- d. Provide opportunities for staff training and professional development.
- e. Maintain and improve staff morale and commitment to their job and the District.

Lead Team Responsible:           General Management  
Other Objectives Supported:    All

Metrics: Overall score of General Manager’s annual performance review for fiscal year; number of instances of unresolved issues referred to the Board; staff turnover rate net of reductions-in-force.

**Performance Standard 1-2:** Align District plans, policies and programs with the District’s mission and vision, and regularly review and revise them, as warranted, to respond to changing circumstances that affect their need, effectiveness or implementation.

Board-level Activities:

- a. Develop and be guided by a “Director Job Description” that sets forth the roles, responsibilities, and expectations of a District Director.
- b. Participate in development and updating of District strategic planning initiatives between approved revisions of management plans, including risk management and contingency planning.



- c. Participate in developing and updating and then approve District *Management Plan*, and *Rules & Bylaws*.
- d. Provide liaison to staff concerning policy-level guidance and requests of individual staff through the General Manager.
- e. Establish and effectively utilize standing and *ad hoc* public advisory groups.

Staff-level Activities:

- a. Participate in development and updating of District strategic planning initiatives between approved revisions of management plans, at Board's discretion and direction.
- b. Participate in developing recommendations as to approaches and content of the District's *Management Plan* and *Rules & Bylaws*, and their revisions and amendments.
- c. Provide liaison between Board policy-level guidance/requests and staff direction.
- d. Help identify and recruit members of standing and *ad hoc* public advisory groups and administer their use.
- e. Provide quality assurance of District work product and deliverables.
- f. Establish and maintain a continuous improvement ethos and program.

Lead Team Responsible:           General Management  
 Other Objectives Supported:    Objectives 2 and 4

Metrics: Satisfactory progress toward or timely completion of revisions to the District's *Management Plan* that are approved by TWDB; establish a Contingency and Risk Management Plan and update it within one year of each *Management Plan*'s approval, and at least once every two years thereafter; timely budgeting and amendments.

**Performance Standard 1-3:** Ensure the District has the near-term and long-term financial basis and contractual wherewithal to support its mission.

Board-level Activities:

- a. Proactively develop and support legislative and other initiatives that attach a more realistic value to the groundwater resources within the District, especially in comparison to the costs of other local water resources.
- b. Participate in developing and then approve fiscal-year budgets, including use of reserve funds and approval of budget amendments.
- c. Specify various financial-impact scenarios that should be included in contingency planning.
- d. Authorize and receive results of annual financial audits, and institute accepted recommendations on financial controls or procedures.
- e. Help identify and approve appropriate use of grant funding and resource commitments that will substantially enable progress toward District objectives.
- f. Establish purchasing policy and review and approve all contracts in accordance with the policy and upon legal review and approval as to form.

Staff-level Activities:

- a. Maintain finances in a manner that maximizes liquidity while maintaining the greatest return on District fund balances by investing in securities or investment pools that operate in low risk investments and are backed by the state and/or federal government.
- b. Provide effective and efficient accounting and financial records management and necessary investment training, in accordance with federal and state law, the *Rules*, and Board direction.
- c. Develop recommended elements and budgetary estimates for fiscal-year budgets and amendments.
- d. Contract for and participate in conducting an independent financial audit annually, including provision of financial records and preparation of management discussion and analysis, and submit year end reports to TCEQ and the Texas State Pension Review Board as required by law.
- e. Help identify appropriate grant funding and resource commitments and utilize grant resources to leverage existing resources substantially with minimum opportunity costs.
- f. Publish budgets, current-period, year-to-date summary financial information and transaction-level information on the District website as part of the Open Government initiative.
- g. Acquire and manage projects in accordance with good project accounting and management practice and in conformance with sponsoring agency requirements.
- h. Obtain contracts for services in accordance with established District standards, and coordinate acquisition activities ensuring cost-effectiveness and quality by utilizing purchasing procedures that meet both District policy, state law, and the *Rules*.

Lead Team Responsible:           General Services  
 Other Objectives Supported:    All

Metrics: A clean financial audit report each year; absence of vendor problems and contractual disputes; amount of activity concerning grant proposals and projects; and biannual receipt of official Public Funds Investment Act (PFIA) certificate for completing required training.

**Performance Standard 1-4:** Provide efficient administrative support and infrastructure, such that District operations are executed reliably and accurately, meet staff and local stakeholder needs, and conform to District policies and with federal and state requirements.

Board-level Activities:

- a. Receive training on and comply with Open Meetings Act (OMA) and Public Information Act (PIA) requirements.
- b. Provide budget allocation for the required administrative activities on continuing basis.

Staff-level Activities:

- a. Ensure that directors and appropriate staff receive training in and stay current with OMA and PIA requirements, and that daily District operations comply with those standards.
- b. As administrative liaison to Board, develop, post, and distribute District Board agendas, meeting materials, and backup documentation in a timely and required manner; post select documents on the District website, and maintain official records, files, and minutes of Board meetings appropriately.

- c. As Records Management Officer, maintain, retain, and control all District records in accordance with the Texas State Library and Archives Commission-approved District Records Retention Schedule to allow for safekeeping and efficient retrieval of any and all records, and annually audit records for effective management of use, maintenance, retention, preservation and disposal of the records' life cycle as required by the Local Government Code.
- d. As needed, update retention schedule in accordance with the Texas Administrative Code requirements, and file any amended retention schedule with the Texas State Library.
- e. Maintain the office building and grounds, office equipment, and supplies to provide an efficient work environment that meets the needs of the staff and stakeholder community.
- f. Perform cost-benefit analyses on all District insurance and employee-benefit policies before renewal, and acquire or renew all District policies in a timely fashion.
- g. Maintain District vehicles in good operational condition.
- h. Maintain and evaluate needed enhancements to the District computer system and network to facilitate District productivity and to support District programs and projects.

Lead Team Responsible: General Services

Other Objectives Supported: All

Metrics: Absence of claims of OMA and PIA violations by external parties; lack of staff complaints about continuing problems with support services and infrastructure.

**Performance Standard 1-5:** Provide mechanisms to align District *Rules*, policies, and programs with the will of its collective and precinct-level constituencies, within the constraints of statutes governing the District.

Board-level Activities:

- a. Regularly visit with a spectrum of stakeholder interests in the single-member precincts and with the legislative community being represented by the directors as to their needs and concerns.
- b. Solicit candidate(s) to campaign every four (4) years for each director precinct place on Board, authorize or cancel an election, and canvass election results, as warranted.
- c. Authorize and participate in decennial and other re-districting, ensuring Department of Justice (DOJ) pre-clearances and conformance with statutory requirements.
- d. Utilize advisory groups to calibrate stakeholder inputs and possible responses, as needed.

Staff-level Activities:

- a. Support District's general counsel in re-districting director precincts the year after each decennial census, including timely submission of all DOJ-required data and documents for successful pre-clearance, as necessary.
- b. Make internal preparations for and conduct elections for the two or three directorships up for election biennially in even-numbered years in concert with county election offices, and in accordance with state and federal election laws, and as required by TWC Chapter 36.
- c. Prepare all election contracts with associated entities including election services contracts and joint election agreements, and all necessary orders and notices to conduct or to cancel an election.

Lead Team Responsible: General Services  
Other Objective Supported: Objective 4

Metrics: Maintaining a full Board; effective participation in Board activities and representation of constituents by each of the five (5) Board members; properly conducted director elections.

**Performance Standard 1-6:** Provide leadership in promoting legislation and regulations that benefit the protection of the District’s groundwater resources and opposing legislation and regulations that harm those resources.

Board-level Activities:

- a. Propose and support legislation and regulatory initiatives that control and prevent point/nonpoint-sources of pollution and cross-formational contamination of the aquifers managed by the District.
- b. Oppose legislation or regulatory initiatives that don’t ensure protection of groundwater quantity and quality, including non-compliance with DFCs.
- c. Meet with local legislators and relevant committee members to foster an effective working relationship.
- d. Seek legal remedies as warranted and feasible to minimize or avoid impacts on groundwater quantity and quality of aquifers in the District.

Staff-level Activities:

- a. Work with District legislative liaison, as available, and other GCDs to effect needed legislation, at Board’s direction and discretion.
- b. Support District’s counsel in contested-cases and litigation, at Board’s direction and discretion.
- c. Keep Board informed of status and progress concerning legislative and litigation matters.

Lead Team Responsible: General Management  
Other Objective Supported: Objective 2

Metrics: Preparation of a *Legislative Agenda* report before the end of each even-numbered fiscal year that reflects the consensus of the Board concerning the next session; preparation of a *Legislative Session De-briefing* report before the end of each odd-numbered fiscal year that assesses specific legislation that affects the District, both individually and as a GCD political subdivision, that passed and did not pass, and generally why that occurred; collective judgment of the Board as to appropriateness of what was pursued legislatively, what actions were taken, and what outcomes were achieved; collective judgment of the Board as to appropriateness of what litigation or contested-cases were pursued, what actions were taken, and what outcomes were achieved.

**Supporting Performance Standards:**

<b>Performance Standard</b>	<b>Brief Description</b>
2-1	Review and modify the <i>Rules</i> as warranted to provide and maintain a sound statutory basis for continued District operations and to ensure consistency with both District authority and programmatic needs.
2-5	Efficiently process permittee meter readings, water use fee invoices and payments, conservation credits, permit renewals and related communications.
4-1	Cultivate and communicate effectively and routinely with stakeholders of all types that affect and are affected by the District's programs and policies.
4-2	Collaborate with joint Groundwater Management Area (GMA) and regional water planning efforts on policies, regulations, and activities affecting water quality or desired future conditions of the aquifers managed by the District.

### III.C.2. **Objective 2. Promulgate a fair and efficient regulatory program.**

#### **Primary Performance Standards:**

**Performance Standard 2-1:** Review and modify the *Rules* as warranted to provide and maintain a sound statutory basis for continued District operations and to ensure consistency with both District authority and programmatic needs.

#### Board-level Activities:

- a. Provide direction and input to staff to guide the development of proposed rule concepts and draft rules.
- b. Appoint and convene *ad hoc* policy advisory committees to review and comment on District policies and proposed rules revisions as warranted.
- c. Conduct public hearings for proposed rule changes.
- d. Adopt necessary rule updates and revisions as warranted.

#### Staff-level Activities:

- a. Periodically review and provide proposed rule concepts to the Board to address necessary updates and revisions.
- b. Consider rule updates and revisions needed to address specific needs of separate management zones for the different areas and aquifers within the District.
- c. Upon direction by the Board, prepare draft rules based on vetted rule concepts and Board input.
- d. Schedule and provide required notification of public hearings for proposed *Rule* changes.
- e. Make the adopted revised *Rules* available to the public after adoption by the Board.

Lead Team Responsible: Regulatory Compliance  
Other Objective Supported: Objective 1

Metrics: Rulemaking process is initiated and conducted in accordance with all statutory requirements and required timeframes; rules are in alignment with District policies and objectives as determined by the Board with PAC input in even-numbered years.

**Performance Standard 2-2:** Process and review all well registrations, permit renewals, and applications for permits, permit amendments, and authorizations in accordance with the *Rules*, *Well Construction Standards*, and other District guidelines in accordance within specified procedural timeframes.

#### Board-level Activities:

- a. Conduct public hearings for certain permits and authorizations.
- b. Take appropriate action on certain requested permits and authorizations presented to the Board considering application information, staff recommendations, and the District *Rules and Bylaws*.

Staff-level Activities:

- a. Register all new wells.
- b. Review and process well registration forms, plugging authorizations, and permit-by-rule authorizations.
- c. For all other applications, review and make determinations of administrative completeness.
- d. Require and receive results of aquifer tests for certain production permits and amendments.
- e. Assist applicants with planning and execution of all aquifer tests in accordance with the District's Aquifer Test Guidelines.
- f. Evaluate complete production and transport permit applications on the basis of: beneficial use, non-speculative needs, reasonable demand, the ability to comply with drought management requirements, and the ability to conform to management zone requirements.
- g. Evaluate all complete permit and authorization requests on the basis of potential for impact to sustainable groundwater quantity and quality, public health and welfare, contribution to waste, unreasonable well interference.
- h. Provide recommendation formed on the basis of staff evaluation for Board or General Manager consideration of certain permits and authorizations.
- i. Schedule and provide required notification of public hearings for certain requested permits and authorizations.
- j. Perform well site inspections before and after the drilling of each new well.
- k. Prior to permit renewal, review all permits for compliance with District *Rules and Bylaws*.

Lead Team Responsible: Regulatory Compliance  
Other Objective Supported: Objectives 1 and 6

Metrics: Requests for permits and authorizations are processed in accordance with all statutory requirements and required timeframes.

**Performance Standard 2-3:** Monitor existing District wells for compliance with the *Rules*, and *Well Construction Standards*.

Board-level Activities:

- a. Provide direction to staff for enforcement of unresolved violations of the *Rules* as warranted.

Staff-level Activities:

- a. Register all newly identified unregistered wells.
- b. Conduct inspections of at least ten selected permittee systems (not including NDUs) each fiscal year for compliance with the *Rules*.
- c. Identify and notify individual permittees of any rule violations and take appropriate steps to ensure compliance.
- d. Notify abandoned well owners and monitor to ensure wells are properly plugged or brought into compliance.
- e. Perform well site inspections before each well plugging.

- f. Obtain meters readings by site inspections from individual permittees who fail to submit after late submittal notification has been provided.
- g. Monitor usage of individually permitted wells monthly and NDUs at least annually.
- h. Provide compliance updates and enforcement recommendations to the Board as warranted in accordance with the adopted enforcement plan.

Lead Team Responsible: Regulatory Compliance

Other Objectives Supported: Objectives 1 and 6

Metrics: Specified minimum number of permittee inspections completed or exceeded each year; the majority of all documented violations are brought into compliance or are addressed by a Board Order within six (6) months of the staff-established compliance deadlines; during drought, all required meter readings are submitted or collected each month.

**Performance Standard 2-4:** Efficiently process permittee meter readings, water use fee invoices and payments, conservation credits, permit renewals and related communications.

Board-level Activities:

- a. Issue conservation credits annually based on the annual conservation credit audit and staff recommendations.

Staff-level Activities:

- a. Require timely-submitted monthly readings from individually permitted wells, enter all meter readings into the database, and file all monthly meter reading forms.
- b. Maintain permittee mailings lists and contact information in database.
- c. Annually renew compliant production and transport permits by September 1 of each year.
- d. Perform annual underpumpage analysis as warranted and provide recommendations for Board consideration.
- e. Perform annual conservation credit audit.

Lead Team Responsible: General Services

Other Objective Supported: Objectives 1 and 6

Metrics: Timely processing of permit renewals, conservation credits, and meter readings within timeframes specified in *Rules* or policies.



### Supporting Performance Standards:

<b>Performance Standard</b>	<b>Brief Description</b>
1-2	Align District plans, policies and programs with the District’s mission and vision, and regularly review and revise them, as warranted, to respond to changing circumstances that affect their need, effectiveness or implementation.
3-1	Assist permittees in developing drought and conservation planning strategies, permit conversion strategies, and pricing strategies, and enforce compliance with drought management rules during District-declared drought to achieve DFCs during extreme drought.
3-2	Monitor and declare drought stages on the basis of the analysis of data from the District’s defined drought triggers and in accordance with the adopted drought trigger methodology.
3-4	Inform and educate permittees and the public about declared drought stages and the severity of drought, and encourage practices and behaviors to reduce water use.

**III.C.3. Objective 3. Develop and implement an effective drought management program that achieves the adopted Desired Future Conditions (DFCs) of each relevant aquifer in the District.**

**Primary Performance Standards:**

**Performance Standard 3-1:** Assist permittees in developing drought and conservation planning strategies, permit conversion strategies, pricing strategies, and enforce compliance with drought management rules during District-declared drought to achieve DFCs during extreme drought.

Board-level Activities:

- a. Provide direction to staff for enforcement and fee assessment for permittee violations of the *Rules* and applicable provisions of permittee’s User Drought Contingency Plans (UDCPs).

Staff-level Activities:

- a. Assist and support permittees with the development, implementation, and interpretation of User Conservation Plans (UCPs) and UDCPs in accordance with the *Rules* and as warranted.
- b. Review and approve submitted UCPs and UDCPs in accordance with the *Rules*.
- c. Require that all outdated UCPs and UDCPs are updated prior to annual permit renewal in accordance with the *Rules*.
- d. Upon declaration of drought, send notification to all permittees of requirement to implement and comply with all applicable provisions of their prevailing UDCP.
- e. Perform monthly evaluation of individual permittee compliance with monthly pumpage limits in accordance with the adopted enforcement plan.
- f. Send notices of overpumpage to all noncompliant permittees each month.
- g. Evaluate, stipulate, and enforce conservation-tier pricing for water-provider permittees to reduce demand by end-users.
- h. Identify occurrences of noncompliance that warrant possible enforcement action and are subject to assessment of drought management fees.
- i. Provide compliance updates and enforcement recommendations to the Board in accordance with the adopted enforcement plan.

Lead Team Responsible: Regulatory Compliance

Other Objectives Supported: Objectives 1, 2, and 5

Metrics: Achieve overall monthly pumpage reductions within 10% of the aggregate pumpage reduction (volumetric) goal of the prevailing drought stage.

**Performance Standard 3-2:** Monitor and declare drought stages on the basis of the analysis of data from the District’s defined drought triggers and in accordance with the adopted drought trigger methodology.

Board-level Activities:

- a. Make drought declarations considering the current aquifer conditions relative to defined drought triggers, the adopted drought trigger methodology, and staff recommendations.

Staff-level Activities:

- a. Review relevant aquifer data on a monthly basis when not in drought.
- b. Periodically provide updates to the Board on current aquifer conditions and provide recommendations of drought declarations as warranted.
- c. Confirm drought flows from Barton Springs that are indicated by monitoring well data with in-stream discharge (e.g., flow-meter) measurements sufficient to produce or verify a reliable stage-discharge relationship.
- d. When any drought trigger drops below average levels, monitoring will be done biweekly, and estimates will be made as to when either indicator will reach drought levels.
- e. Produce and update charts showing the status of the defined triggers on a biweekly basis during a District-declared drought.
- f. Produce and update charts showing the status of the defined triggers on a weekly basis during an Emergency Response Period.
- g. Collect and evaluate data for the assessment of the Middle and Lower Trinity Aquifers and how they might be impacted and regulated by drought.

Lead Team Responsible: Aquifer Science  
 Other Objective Supported: Objective 6

Metrics: Acceptable-to-Board proportion of timely updates of all drought related information during drought.

**Performance Standard 3-3:** Inform and educate permittees and the public about declared drought stages and the severity of drought, and encourage practices and behaviors to reduce water use.

Board-level Activities:

- a. Authorize and participate in efforts to disseminate information related to aquifer conditions during drought and practices that could facilitate demand reduction.

Staff-level Activities:

- a. Provide public awareness of declared drought stages and drought severity by at least monthly communications which may include written and electronic correspondence, newspaper articles and advertisements, press releases, the District website, District newsletter, and special permittee newsletters.
- b. Support permittees' efforts to inform their end users of drought stages and water conservation measures with by creating general drought stage information and informational materials on water conservation.

Lead Team Responsible: Education and Outreach  
 Other Objectives Supported: Objectives 2, 4, and 5

Metrics: Timeliness and adequacy of response to requests for information. Absence of complaints received concerning water utility permittees' unwarranted actions.

**Supporting Performance Standard:**

<b>Performance Standard</b>	<b>Brief Description</b>
5-4	Maintain and develop programs that inform and educate District groundwater users and area residents of all ages about water conservation practices and resources and use of alternate water sources including gray water / condensate reuse and rainwater harvesting.

**III.C.4. Objective 4. Demonstrate leadership in external communication, collaboration, coordination and joint planning with respect to groundwater and related resources.**

**Primary Performance Standards:**

**Performance Standard 4-1:** Cultivate and communicate effectively and routinely with stakeholders of all types that affect and are affected by the District's programs and policies.

Board-level Activities:

- a. Cultivate balanced relationships with and among stakeholders, precinct residents, and policy makers to promote the District's mission.
- b. Represent the District with legislative community, other political subdivisions, and related groups.

Staff-level Activities:

- a. Cultivate balanced relationships between District staff and stakeholders.
- b. Represent the District with legislative community, other political subdivisions, and related groups.
- c. Represent the District in alliances and other organizations with common interests.

Lead Team Responsible:           General Management  
Other Objectives Supported:    Objectives 1 and 6

Metrics: Collective judgment of the Board once each quarter as to whether communications between the District and its stakeholder community, including constituents and other public officials, are providing an effective basis for District decision-making and for identifying any needed remedial actions.

**Performance Standard 4-2:** Collaborate with joint Groundwater Management Area (GMA) and regional water planning efforts on policies, regulations, and activities affecting water quality or desired future conditions of the aquifers managed by the District.

Board-level Activities:

- a. Utilize the data, results, and staff recommendations associated with water quality and/or desired future conditions to direct staff and develop policy in accordance with the District's mission.
- b. Designate a District representative to participate in and serve as a voting member of GMA 9 and GMA 10.
- c. Review and comment on management plans of other GMA member districts for consistency with DFCs of shared or hydrologically connected aquifers.

Staff-level Activities:

- a. Provide information and input to current and proposed rules, standards, and planning efforts related to regional development and water/wastewater management.

- b. Apply standards specified in the Regional Water Quality Protection Plan (2005) where applicable.
- c. Provide recommendations to the Board on management plans of other GMA member districts for consistency with DFCs of shared or hydrologically connected aquifers.
- d. Develop and implement a cost-effective method for evaluating and demonstrating compliance with the DFCs of the relevant aquifers in the District, in collaboration with other GCDs in the GMAs.
- e. Support by attendance and in-kind consultation services in meetings of GMAs 9 and 10, as appropriate.
- f. Seek public inputs on concerns that help articulate DFCs.
- g. Vote on applicable items requiring GMA joint planning approvals.

Lead Team Responsible: Regulatory Compliance  
 Other Objectives Supported: Objectives 1 and 6

Metrics: Percent of GMA meetings attended; timely provision of responsive comments on management plans of other GCDs in GMA 9 and 10; participation in public hearings on DFCs and management plans; timely discussion and voting on GMA items.

**Performance Standard 4-3:** Provide technical assistance as warranted to federal, state and local entities; organizations; and individuals on the geology, hydrogeology, and karst features impacted by groundwater-utilizing land use activities.

Board-level Activities:

- a. Establish standards and criteria specified in the Regional Water Quality Protection Plan to be used by District staff in evaluating deleterious impacts to recharge water quality.

Staff-level Activities:

- a. Provide information to developers, roadway contractors, the regulated community, and local and state agency personnel about the locations and sources of vulnerability of the District's groundwater resources, and the steps they can take to mitigate the threats of contamination.
- b. Apply standards and criteria specified in the Regional Water Quality Protection Plan (2005), as applicable and warranted, for the evaluation of various land uses requiring or affecting groundwater supplies and the associated potential for recharge water quality degradation or waste.
- c. Review and provide comments, where applicable, for Water Pollution Abatement Plans or other environmental site assessments associated with any permits or authorizations submitted to the TCEQ, COA, small cities, counties, or other political jurisdictions in order to mitigate potential degradation of the District's groundwater resources.

Lead Team Responsible: Aquifer Science  
 Other Objective Supported: Objective 6

Metrics: Qualitative judgment by the Board as to how well the District's directors are promoting groundwater protection with other entities.

**Performance Standard 4-4:** Through education and public outreach, inform groundwater users and the general public of the connectivity of recharge and discharge, importance of water quality protection, and the relationship between surface water and groundwater.

Board-level Activities:

- a. Communicate with constituents of their respective single-member precincts to ensure fair representation.
- b. Facilitate dissemination of education and public outreach information within respective single-member precincts.
- c. Help promote and/or participate in District-sponsored events.

Staff-level Activities:

- a. Offer and/or recommend workshop(s) and/or presentations that educate local residents on the District, its management, District aquifers, Texas groundwater and surface resources, and indoor/outdoor water conservation practices.
- b. Use electronic and printed media and in-person visits to deliver accurate and timely information to community groups that are interested in and/or affect the groundwater resource and its use, both upon request and on a proactive basis.
- c. Organize and conduct events that allow the District to work cooperatively with area residents, including youth, in demonstrating the important relationships between surface and groundwater quality.
- d. Maintain up-to-date District and aquifer information and literature that are available to the public via the website, print materials, and an electronic newsletter.

Lead Team Responsible: Education and Outreach  
Other Objectives Supported: Objectives 1, 5, and 6

Metrics: Number of workshops/seminars with acknowledged District participation; number of District-sponsored outreach meetings and info distribution events; trends in number of page views and amount of “click-throughs” for District website; number of new subscriptions to the Friends of the Aquifers email contact list.

**Performance Standard 4-5:** Prepare, submit, and maintain a draft and final Habitat Conservation Plan (HCP) and provide support of related National Environmental Policy Act documentation and processes for obtaining an Incidental Take Permit from the US Fish & Wildlife Service (FWS) for the endangered species at Barton Springs.

Board-level Activities:

- a. Assess and authorize needed measures within the District’s authority, on a continuing basis, to minimize take and prevent jeopardy of the endangered species that are specified in the HCP.
- b. Fund on a continuing basis the primary and adaptive management measures to minimize take and prevent jeopardy of the endangered species in the HCP.

Staff-level Activities:

- a. Prepare a draft HCP, respond to public comments, and prepare and submit a final HCP that are acceptable to FWS.
- b. Establish, periodically convene, and utilize an HCP Management Advisory Committee to assess independently the effectiveness of the HCP measures and recommend changes necessary to improve effectiveness, if warranted.
- c. Employ an adaptive management strategy to respond effectively to unforeseen and/or changed circumstances.

Lead Team Responsible:           General Management  
Other Objectives Supported:    All

Metrics: Satisfactory progress toward completion of the HCP that is acceptable to FWS, as judged by the Board and with the use of an annual HCP Status Report prepared by District Staff near the end of each fiscal year; upon its receipt, success in maintaining a Section 10(a) Incidental Take Permit; establishment and convening meetings at least annually of an HCP Management Advisory Committee; promulgation of a regulatory program that achieves the Extreme Drought Withdrawal Limitation that is based on the MAG for the prevailing drought DFC for the Freshwater Edwards Aquifer.

**Supporting Performance Standards:**

<b>Performance Standard</b>	<b>Brief Description</b>
3-3	Inform and educate permittees and the public about declared drought stages and the severity of drought, and encourage practices and behaviors to reduce water use.
5-4	Maintain and develop programs that inform and educate District groundwater users and area residents of all ages about water conservation practices and resources and use of alternate water sources including gray water / condensate reuse and rainwater harvesting.



**III.C.5. Objective 5. Extend current groundwater supplies by encouraging supply-side and demand-side improvements. Note: This scope includes water conservation, recharge enhancement, and alternative supplies such as desalination, Aquifer Storage and Recovery (ASR), use of reclaimed water, and substituted other groundwater.**

**Primary Performance Standards:**

**Performance Standard 5-1:** On at least a bi-annual basis, assess the availability and feasibility of regional alternative water supplies and encourage District permittees to diversify their water supplies by fostering arrangements with available water suppliers.

**Board-level Activities:**

- a. Provide input to District staff about policy considerations of alternative water supplies.
- b. Provide active leadership in promoting and pursuing alternative water supplies, including but not limited to participating in speakers' bureaus, working with water providers, legislative community and agencies such as TWDB and TCEQ, and assessing political and economic efficacy and paths.

**Staff-level Activities:**

- a. Identify available alternative water resources and supplies (e.g., saline Edwards desalination, ASR, reuse, rainwater, etc.).
- b. Evaluate viability of alternative water sources by considering:
  - available/proposed infrastructure
  - financial factors
  - logistical/engineering factors
  - potential secondary impacts (development density/intensity or recharge water quality).
- c. Develop relationships/agreements with area surface water providers and encourage service to District permittees during extreme drought where appropriate.
- d. Explore possible incentives to District permittees to implement the use of alternative water supplies through pricing, permit terms, and other mechanisms where appropriate.
- e. Remove/reduce institutional barriers to use of alternative sources as feasible.
- f. Produce a bi-annual report for the Board to serve as a summary of regional alternative supplies and activities conducted in accordance with this objective.

Lead Team Responsible: Regulatory Compliance  
Other Objectives Supported: None

**Metrics:** A report completed in odd-numbered years summarizing the above activities, grant activities, and active alternative supply projects in the District, and making recommendations.

**Performance Standard 5-2:** Conduct investigations and, as warranted and feasible, physically alter discrete recharge features that will lead to an increase in recharge to the Edwards Aquifer.

Board-level Activities:

- a. Participate in discussions about activities related to recharge enhancement.
- b. Establish policies concerning recharge enhancement projects.
- c. Fund approved projects, including seeking external funding partners.

Staff-level Activities:

- a. Determine locations, cost-effective methods, and efficacy of potential recharge maintenance and enhancement for at least one additional recharge feature during the five-year term of this *Plan*.
- b. Seek both internal and external funding to study and construct BMPs that are capable of diverting surface waters into the District aquifers.
- c. Excavate sediment and other material from at least one recharge feature, such as caves, sinkholes, and BMPs, each year so that the capacity of the feature to recharge the aquifer will be at least maintained if not increased.
- d. Identify and pursue grant funding, as appropriate, Board-authorized and available pertaining to recharge enhancement and nonpoint source pollution, and manage grant projects in accordance with grant requirements and good project management practice to meet milestones on budget and schedule.

Lead Team Responsible: Aquifer Science

Other Objectives Supported: None

Metrics: Annual oral presentation in even-numbered years on progress in these activities, to enable the Board to assess the progress; inclusion of these activities in the biennial Alternative Water Supplies Report in odd-numbered years; Number of excavations conducted in caves, sinkholes, or recharge features annually (with at least one being satisfactory).

**Performance Standard 5-3:** Conduct investigations, as warranted and feasible, to evaluate the potential for the saline zone of the Edwards Aquifer to provide water for a desalination facility, and to evaluate the potential for the Edwards saline zone and the Trinity aquifers beneath the freshwater Edwards as reservoirs for an Aquifer Storage and Recovery (ASR) system.

Board-level Activities:

- a. Provide input of the extent of investigations of the saline zone and the level of interest of the Board on desalination and ASR.
- b. Assist in developing and approve a business plan if and as necessary for co-funded investigations.
- c. Authorize funding for a portion or all of investigations on the Edwards saline zone.

Staff-level Activities:

- a. Install monitor well in saline zone for sampling and aquifer parameter testing.

- b. Cooperate with other organizations for installing a test well in the saline zone and for evaluating the feasibility of desalination and/or ASR in the saline zone.
- c. Conduct aquifer tests of Trinity aquifers to determine if they could serve as reservoirs for an ASR system.

Lead Team Responsible: Aquifer Science  
 Other Objectives Supported: None

Metrics: Annual oral presentation in even-numbered years on progress in these activities to enable the Board to assess the progress; inclusion of these activities in the biennial Alternative Water Supplies Report in odd-numbered years.

**Performance Standard 5-4:** Maintain and develop programs that inform and educate District groundwater users and area residents of all ages about water conservation practices and resources and use of alternate water sources including gray water/condensate reuse and rainwater harvesting.

Board-level Activities:

- a. Provide direction and input to staff on messages that the Board would like to convey to the public about water conservation and alternate water sources.

Staff-level Activities:

- a. Support and publicize other local-area water conservation initiatives using print and presentation opportunities.
- b. Maintain up-to-date water conservation and alternate water source information and literature that is available to the public via the website and print materials.
- c. Provide District groundwater permittees and end-users with water conservation and alternate water source presentations upon request where possible.
- d. Offer and/or recommend educational events annually that address topics such as leak detection, water audits, irrigation audits, indoor water conservation, water use behavior, native landscaping, or rainwater harvesting.
- e. Engage and solicit participation of permittees and other stakeholders on the District's conservation credit policy.

Lead Team Responsible: Education and Outreach  
 Other Objectives Supported: Objectives 1, 3, 4, and 6

Metrics: Preparation and dissemination of material shared with District groundwater users and area residents that will inform them about water conservation and alternate water sources.

**Supporting Performance Standards:**

<b>Performance Standard</b>	<b>Brief Description</b>
3-1	Assist permittees in developing drought and conservation planning strategies, permit conversion strategies, and pricing strategies, and complying with District drought rules to achieve DFCs during extreme drought.
3-2	Enforce compliance with drought management rules during District-declared drought.
3-4	Inform and educate permittees and the public about declared drought stages and the severity of drought, and encourage practices and behaviors to reduce water use.
4-4	Through education and public outreach, inform groundwater users and the general public of the connectivity of recharge and discharge, importance of water quality protection, and the relationship between surface water and groundwater.

**III.C.6. Objective 6. Increase understanding of all District aquifers so that appropriate policy and regulatory decisions are made.**

**Primary Performance Standards:**

**Performance Standard 6-1:** Assess aquifer conditions by sampling and collecting groundwater data from selected wells.

Board-level Activities:

- a. Provide direction and input to staff about how the Board would like to have data collected, maintained, and reported.

Staff-level Activities:

- a. Collect water-quality and groundwater-level information annually from:
  - All individually permitted wells (except for public supply wells) scheduled for routine compliance inspections
  - All newly drilled wells
  - Abandoned wells where sample collection is possible prior to District-authorized plugging
  - Five (5) other selected wells of interest.
- b. Record data in District databases and use to assess groundwater quality and quantity.

Lead Team Responsible: Regulatory Compliance  
Other Objectives Supported: None

Metrics: Information collected on wells within the District entered into District database.

**Performance Standard 6-2:** Conduct scientific studies to better determine groundwater availability, to understand and prevent threats to water quality, to minimize impacts to water-supply wells and springs, and to provide sound science on which to base District policy.

Publish District scientific and data-collection studies through various means ranging from local to international outlets.

Board-level Activities:

- a. Provide guidance on policy issues that involve scientific evaluation.
- b. Authorize funding for a portion or all of investigations related to aquifer science.

Staff-level Activities:

- a. Collect, maintain, and interpret relevant data such as water levels, water quality, stream flow, rainfall, and aquifer properties, including water-level information from at least ten (10) monitor wells and stream or spring flow measurements at least three (3) times annually.

- b. Periodically and regularly measure and evaluate the accuracy and precision of the discharges at the Barton Springs complex, and promote improvements in the reliability of such measurements.
- c. Identify and pursue grant funding, as appropriate and available to conduct aquifer studies, and manage grant projects in accordance with grant requirements and good project management practice to meet milestones on budget and schedule.
- d. Assess effects of “urban leakage” and its consequences for groundwater model calibration and outputs.
- e. Collaborate on aquifer studies with other agencies and institutions by participating in at least five meetings each year with other groundwater scientists and engineers to discuss topics of current and direct interest to the District staff.
- f. Evaluate the various groundwater models to determine which ones best suit the needs of the District for groundwater availability analyses, or consider other model software that has not yet been applied to District studies.
- g. Prepare presentations, abstracts, and papers to present at scientific meetings and conferences or for publication by the District or other scientific organizations.
- h. Appoint and convene when appropriate an *ad hoc* technical advisory committee to review and comment on District investigations and analyses.

Lead Team Responsible: Aquifer Science  
 Other Objectives Supported: Objectives 1 and 7

Metrics: An annual report of publications produced by the District that affects or will affect current or future Board decision-making; qualitative judgment by Board as to adequacy of the type of scientific information provided to them.

**Supporting Performance Standards:**

Performance Standard	Brief Description
2-4	Monitor <u>existing</u> District wells for compliance with the <i>Rules</i> , and Well Construction Standards.
4-3	Provide leadership and technical assistance to federal, state and local entities; organizations; and individuals on the geology, hydrogeology, and karst features impacted by groundwater-utilizing land use activities.
4-4	Through education and public outreach, inform groundwater users and the general public of the connectivity of recharge and discharge, importance of water quality protection, and the relationship between surface water and groundwater.
5-4	Maintain and develop programs that inform and educate District groundwater users and area residents of all ages about water conservation practices and resources and use of alternate water sources including gray water/condensate reuse and rainwater harvesting.

## **IV. COORDINATION WITH OTHER WATER MANAGEMENT ENTITIES**

*This final major section of this Management Plan (Plan) contains additional Texas Water Development Board (TWDB)-required information that details how planning by other water resource agencies will be incorporated and coordinated.*

### **IV.A. COORDINATION WITH REGIONAL SURFACE WATER MANAGEMENT ENTITIES**

Over the years, the District has contributed to and participated in the development of the Lower Colorado Regional Water Plan (Region K). Because significant population growth has occurred in the southeastern part of the District, the District has become similarly engaged in the development of the South Central Texas Regional Water Plan (Region L). Letters evidencing this coordination are in Appendix I of this *Plan*. Table IV-1 summarizes the contribution of District groundwater resources that would be available during a recurrence of the drought of record, by county and water planning region. This information in aggregate comports with the Modeled Available Groundwater (MAG) estimates provided by TWDB and has been provided to the regional water planning groups. Because the MAGs to achieve the adopted DFCs are substantially smaller than the production estimates in the prior plan, less groundwater (but more surface water) is being supplied by the District's aquifers; in terms of the overall water supply, the differences between the prior plan and this plan are very small. Both on its own and through its two Groundwater Management Areas, the District will continue to participate actively in the water planning activities of both Regions K and L during the term of this *Plan*.

#### **Region K**

The available groundwater supplies from the Barton Springs aquifer during drought-of-record (DOR) conditions, and the resulting springflows from Barton Springs that augment the surface water supplies in Region K, have been included in the 2011 Regional Water Plan and, in turn, the 2012 State Water Plan (SWP). The District's regulatory program incorporates production limitations required to meet the DFCs of the relevant aquifers during extreme drought conditions that are now reflected in the current water plans. The District's aquifers are projected to provide Region K about 3,458 acre-feet annually of freshwater Edwards groundwater and about 634 acre-feet of Trinity groundwater to satisfy the water demand in Region K during a DOR recurrence. The District also projects providing about 523 acre-feet from desalination of groundwater from the Saline Edwards Aquifer in the final years of this *Plan*. This amount of saline production is considered extremely conservative and the projection is expected to be revised upwards as new information becomes available, new DFCs are adopted, and this *Plan* is subsequently amended. But for now, the future needs from this source in the 2012 SWP are considerably in excess of this current supply.

The District's regulatory program is predicated on the fact that no "new" fresh Edwards Aquifer groundwater is available during extreme drought conditions. The authorized groundwater withdrawals from the Barton Springs aquifer are already at its sustainable yield. The groundwater supplies provided by the Edwards Aquifer are available to new demand sources, including amendments by existing permittees, only on an interruptible supply basis, up to and including complete curtailment, during extreme drought. The District's regulatory program

**Table IV-1. Groundwater Available in 2012-2022 from BSEACD During Drought of Record Conditions**

		<b>Edwards</b>		<b>Trinity</b>		<b>Saline Edwards</b>		<b>Total GW Available</b>																														
		cfs	AF/Yr	cfs	AF/Yr	cfs	AF/Yr	cfs	AF/Yr																													
<b>Region K</b>																																						
<i>Travis Co.</i>																																						
	Non-exempt	1.499	1085	0.05	34	0.72	523	<b>2.27</b>	<b>1642</b>																													
	Exempt	0.111	81		0		0	<b>0.11</b>	<b>81</b>																													
<i>Hays Co.</i>																																						
	Non-exempt	2.899	2099	0.83	600			<b>3.73</b>	<b>2699</b>																													
	Exempt	0.267	193		0		0	<b>0.27</b>	<b>193</b>																													
<b>Region L</b>																																						
<i>Hays Co.</i>																																						
	Non-exempt	0.357	259	0.90	654			<b>1.26</b>	<b>913</b>																													
	Exempt	0.067	48		0		0	<b>0.07</b>	<b>48</b>																													
<i>Caldwell Co.</i>																																						
	Non-exempt	0	0	0.00	0			<b>0.00</b>	<b>0</b>																													
	Exempt	0	0	0.00	0		0	<b>0.00</b>	<b>0</b>																													
		<b>0</b>																																				
<b>TOTALS</b>		<b>5.20</b>	<b>3765</b>	<b>1.78</b>	<b>1288</b>	<b>0.72</b>	<b>523</b>	<b>7.70</b>	<b>5576</b>																													
<b>Re-cap by Well Type, Water Planning Regions, and Source Counties</b>																																						
<table border="1"> <thead> <tr> <th></th> <th>cfs</th> <th>AF/Yr</th> </tr> </thead> <tbody> <tr> <td>Non-exempt</td> <td>7.258</td> <td>5254</td> </tr> <tr> <td>Exempt</td> <td>0.445</td> <td>322</td> </tr> </tbody> </table>				cfs	AF/Yr	Non-exempt	7.258	5254	Exempt	0.445	322	<table border="1"> <thead> <tr> <th></th> <th>cfs</th> <th>AF/Yr</th> </tr> </thead> <tbody> <tr> <td>Region K</td> <td>6.38</td> <td>4615</td> </tr> <tr> <td>Region L</td> <td>1.33</td> <td>961</td> </tr> </tbody> </table>				cfs	AF/Yr	Region K	6.38	4615	Region L	1.33	961	<table border="1"> <thead> <tr> <th></th> <th>cfs</th> <th>AF/Yr</th> </tr> </thead> <tbody> <tr> <td>Travis Co.</td> <td>2.38</td> <td>1723</td> </tr> <tr> <td>Hays Co.</td> <td>5.32</td> <td>3853</td> </tr> <tr> <td>Caldwell Co.</td> <td>0</td> <td>0</td> </tr> </tbody> </table>				cfs	AF/Yr	Travis Co.	2.38	1723	Hays Co.	5.32	3853	Caldwell Co.	0	0
	cfs	AF/Yr																																				
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Travis Co.	2.38	1723																																				
Hays Co.	5.32	3853																																				
Caldwell Co.	0	0																																				



requires that the permittee demonstrate an assured, feasible, and demonstrably available alternative water supply during drought in order to be permitted for additional groundwater use from the Barton Springs aquifer during non-drought. To the extent that less groundwater is made available during extreme drought by additional regulatory actions, authorized groundwater use and supplies will decrease, but springflow and therefore downstream surface water flows in the Colorado River system will be increased by an equivalent amount.

The Lower Colorado River Authority (LCRA), the City of Austin (COA), and the Guadalupe-Blanco River Authority (GBRA) provide surface water to parts of the District. The District is coordinating with these entities to serve as alternative water suppliers to existing groundwater permittees, especially during extreme drought, by encouraging the establishment of contractual service extensions and emergency interconnects during such groundwater droughts. The District has a goal of preserving any groundwater demand reductions accomplished through such means, such that additional environmental flows and a minimum flow of 6.5 cfs (the drought DFC) are available at Barton Springs during a DOR recurrence, and consequently additional surface water would be available in the Colorado River at Austin to offset the substituted surface water.

The District is partnering and cooperating with the LCRA and the COA in various water conservation educational programs and events (e.g., the Water IQ program).

## **Region L**

A small geographic part of the District, viz., the uppermost part of the Plum Creek watershed in the Guadalupe River basin, lies in State Water Planning Region L (South Central Texas Region), rather than in the Colorado River basin and Region K. However, some of the District's larger permittees provide water supplies to this part of the District, which has been undergoing tremendous growth, as depicted in the preceding Figure II-3. In addition, another large permittee, the City of Kyle, which also is a burgeoning growth area, imports Barton Springs aquifer water to satisfy part of its demand, which is located entirely in Region L. However, the water supply for the service areas of these permittees has been allocated between Region K and Region L by TWDB on the basis of the location of the source wells and land area, not the population served. For planning purposes, TWDB has projected that the District will provide only about 307 acre-feet annually of Edwards groundwater, plus about 654 acre-feet of Trinity groundwater (although this latter figure is more uncertain because of its depth and likely higher salinity), to satisfy the water demand in Region L during a DOR recurrence. These groundwater volumes supplied by the District to Region L are much smaller than in the prior plan, and in fact much smaller than the demand already being served. However, again, in terms of planning to meet overall regional demand, the difference in supplies from one plan to the next is very small.

Interestingly, water demand located in the District in Region L that is satisfied by Edwards Aquifer groundwater affects the surface water supplies of Region K by modifying the discharges at Barton Springs, tributary to the Colorado River. So, to the extent that GBRA water substitutes for Edwards groundwater during extreme drought, as described above, that substitution comprises a *de facto* inter-basin transfer of water from Region L to Region K. Currently, the volume of such transfers, which are just now being established institutionally and would only occur during extreme drought (including the DOR), would be negligibly small; but over time, such transfers could increase to an indeterminate degree.

## **Other Resource Management Agencies**

While not strictly a water management entity, the US Fish and Wildlife Service (USFWS) will likely be issuing a federal Endangered Species Act Section 10(a) permit to the District during the term of this *Plan*. This permit authorizes the specific groundwater management planning and associated measures used by the District to protect the endangered species that use the natural outflows of the Edwards Aquifer at Barton Springs as key habitat. Changes in the groundwater management measures used by the District must not only be consistent with the prevailing *Plan* but also potentially must be authorized by USFWS via a change to the Section 10(a) permit.

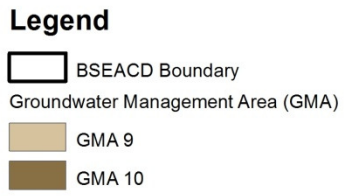
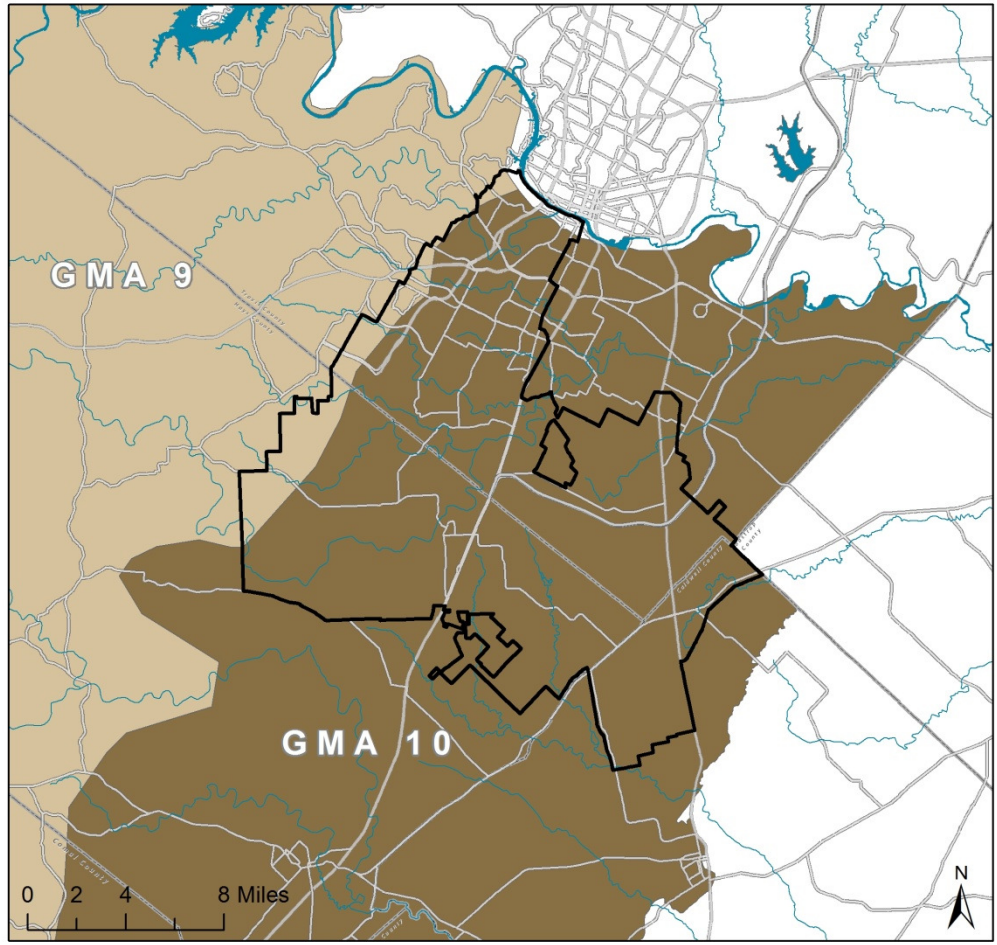
## **IV.B. COORDINATION WITH REGIONAL GROUNDWATER MANAGEMENT ENTITIES**

### **1. Joint Regional Groundwater Planning**

The District participates in and contributes to the joint regional planning being conducted by Groundwater Management Areas (GMAs) 9 and 10, as authorized and required by Texas Water Code §36.108. Figure IV-1 is a map that shows the spatial relationship of the District with these two GMAs. The purpose of this recurring joint planning is to develop and revise, as necessary, feasible Desired Future Conditions (DFCs) for all aquifers being managed by the groundwater conservation districts (GCDs) in the GMA; these represent consensus views of what characteristics are intended that the aquifers should have during and/or at the end of the 50-year planning term. TWDB in turn then converts those DFCs to estimates of the Modeled Available Groundwater (MAG), which comprise the approved volumetric basis for regional water planning, and constitute one of the important considerations in groundwater permitting and related regulatory programs for the GCDs.

GMA 9 focuses on the Trinity Aquifer, especially in the Hill Country Priority Groundwater Management Area (PGMA), but includes other minor aquifers in the GMA. GMA 10 focuses on the Edwards Aquifer, but includes other major and minor aquifers within its geographic boundaries. For the District, the Trinity Aquifers in both GMAs and the Edwards Aquifers, both its freshwater and saline-water zones, in GMA 10 are of regulatory interest and are therefore included in the joint planning.

The joint planning process has now produced the initial set of DFCs that are applicable to and relevant for the District, and the TWDB has estimated the corresponding MAGs for the District that now form key considerations in its permitting programs. The current DFCs and MAGs applicable to the District and the initial planned approach to monitoring the DFCs to demonstrate compliance are shown in Table IV-2. This *Plan* has regulatory, educational, and scientific programs that are consistent with achieving and/or maintaining these DFCs during the term of the *Plan*.



**FIGURE IV-1: GROUNDWATER MANAGEMENT AREAS**

*The District participates in Edwards Aquifer joint planning efforts with other groundwater planning efforts in GMA 9 and GMA 10.*

**Table IV-2. DFCs and MAGs Applicable to BSEACD in 2012**

<b>GMA</b>	<b>Aquifer</b>	<b>Adopted DFC Applicable to BSEACD</b>	<b>MAG in BSEACD</b>	<b>Initial Approach to Monitoring</b>	<b>Comments</b>
GMA 10 (Northern Subdivision)	Freshwater Edwards	The seven-year average springflow of Barton Springs shall not be less than 49.7 cfs during average recharge conditions.	16.0 cfs (monthly average)	Annual computation of 84-month rolling average of gaged springflow.	"Upper DFC" prevents unacceptably high acceleration into drought.
GMA 10 (Northern Subdivision)	Freshwater Edwards	During... a recurrence of the 1950s' drought of record, monthly average springflow at Barton Springs shall not be less than 6.5 cfs.	5.2 cfs (monthly average)	Monthly average of gaged daily springflow during extreme drought; at other times, average springflow not less than 5.2 cfs.	Extreme Drought DFC protects endangered species and well users in western part of district.
GMA 10 (Northern Subdivision)	Saline Edwards	Saline production shall produce no more than 5 feet of drawdown at any one point on the fresh-saline interface, and no more than an average 25 feet of drawdown along the interface.	523 acre-feet annually	Drawdown measured in multi-port well near TDS in comparison to modeled drawdown at that point and that produces five feet of drawdown at the interface.	Initial DFC is believed to be extraordinarily conservative.
GMA 10	Trinity (Undifferentiated)	Regional average well drawdown during average recharge conditions does not exceed 25 feet.	1,288 acre-feet annually	Computation of average areal difference in potentiometric surfaces with and without actual pumping in the District.	Initial DFC is believed to be very conservative.

GMA 9	Trinity (Undifferentiated)	Allow for increase in GMA- average drawdown of 30 feet through 2060, consistent with Scenario 6 of TWDB GAM Task 10-005.	Not estimated; equal to exempt use	Confirm location of new non-exempt wells as not being in GMA 9.	GMA 9 part of District is very small.
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## **2. Coordination with Adjacent GCDs**

The District enjoys “special” working relationships with adjoining GCDs, viz., the Edwards Aquifer Authority (EAA), Plum Creek CD, and Hays Trinity GCD, as shown earlier in Figure I-2. With EAA, District staff members regularly share information and cooperate with their EAA counterparts on hydrogeological and other technical matters, including serving as members of various advisory groups; in addition, the District and EAA coordinate on supporting or opposing legislative initiatives that would have shared outcomes for both entities. Plum Creek CD and the District have some substantial areas of overlapping jurisdictions, arising from differences in how the two GCDs were originally defined; the District is discussing with PCCD some joint special projects to benefit shared constituents in that area. The District also from time to time provides technical, administrative, and programmatic support to Hays Trinity GCD, which is severely resource-constrained by its enabling legislation; much of the jurisdiction of the Hays Trinity GCD is in the contributing zone of the Barton Springs aquifer and the recharge zone of the District’s Trinity aquifers.

## **3. Coordination with Other Regional and Statewide GCDs**

The District is a member and takes a leadership role in the Texas Alliance of Groundwater Districts (TAGD), a state-wide association that promotes and supports sound management of groundwater resources in the state on the basis of local conditions and good science. It is an educational and a shared-experience vehicle that helps GCDs be efficient in local operations, knowledgeable of new technical information and changing statutory and regulatory imperatives, informative to the public and key institutions, and perceptive of bigger-picture issues and challenges beyond their local jurisdictional areas.

The District is also a member and active participant in several other local, regional, and statewide associations, including the Austin Geological Society, Texas Water Conservation Association, Texas Rural Water Association, and the Texas Groundwater Districts Association.

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# **APPENDIX I**

## **Supporting Documentation**

District Resolution

Notices of Public Meetings and Hearings

Coordination with Regions K and L

Coordination with Surface Water Entities

Coordination with GMAs 9 and 10

**STATE OF TEXAS**

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§  
§  
§

**RESOLUTION #092712-01**

**COUNTIES OF HAYS, TRAVIS  
AND CALDWELL**

**A RESOLUTION OF THE BOARD OF DIRECTORS OF THE  
BARTON SPRINGS / EDWARDS AQUIFER CONSERVATION  
DISTRICT AUTHORIZING ADOPTION OF THE  
DISTRICT MANAGEMENT PLAN**

**WHEREAS**, the Management Plan of the Barton Springs/Edwards Aquifer Conservation District (District), attached hereto as Attachment A, has been developed for the purpose of conserving, preserving, protecting, and recharging the aquifers in the District, and this action is taken under the District’s statutory authority to prevent waste and protect rights of owners of interest in groundwater;

**WHEREAS**, the Management Plan meets the requirements of Texas Water Code § 36.1071 and § 36.1072 and 31 TAC § 356.5;

**WHEREAS**, the draft Management Plan was submitted for pre-review by the Texas Water Development Board, and has been revised to comport with the pre-review data and report provided by Texas Water Development Board staff;

**WHEREAS**, the proposed Management Plan was the subject of a public hearing before the Board of Directors of the District on July 26, 2012; and

**WHEREAS**, under no circumstances and in no particular case, will this Management Plan, or any part of it, be construed as a limitation or restriction upon the exercise of any discretion where such exists; nor will it in any event be construed to deprive the Board of an exercise of powers, duties and jurisdiction conferred by law, nor to limit or restrict the amount and character of data or information which may be required for the proper administration of the law:

**NOW, THEREFORE, BE IT RESOLVED** by the Board of Directors of the Barton Springs/Edwards Aquifer Conservation District that:

- 1) The “Management Plan of the Barton Springs/Edwards Aquifer Conservation District” contained in attachment A is hereby adopted;

- 2) This Management Plan will take effect upon approval by the Texas Water Development Board. It will remain in effect until a revised District Management Plan is adopted and approved, or December, 2017, whichever is earlier.

AND IT IS SO ORDERED.

In Favor 5 Opposed 0

PASSED AND APPROVED THIS 27th DAY OF SEPTEMBER 2012.

  
\_\_\_\_\_  
Mary Stone, President

ATTEST:

  
\_\_\_\_\_  
Craig Smith, Secretary



### NOTICE OF OPEN MEETING

Notice is given that a **Special Called Meeting and Work Session** of the Board of Directors of the Barton Springs/Edwards Aquifer Conservation District will be held at the District office, located at 1124 Regal Row, Austin, Texas, on **Saturday, January 15, 2011, commencing at 9:00 a.m.** for the following purposes:

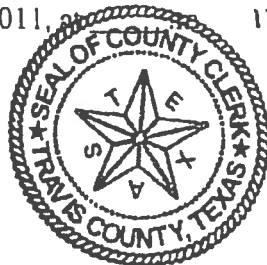
**Note:** The Board of Directors of the Barton Springs/Edwards Aquifer Conservation District reserves the right to adjourn into Executive Session at any time during the course of this meeting to discuss any of the matters listed on this agenda, as authorized by the Texas Government Code Sections §551.071 (Consultation with Attorney), 551.072 (Deliberations about Real Property), 551.073 (Deliberations about Gifts and Donations), 551.074 (Personnel Matters), 551.076 (Deliberations about Security Devices), 551.087 (Economic Development) 418.183 (Homeland Security). No final action or decision will be made in Executive Session.


1. Call to Order.
2. Citizens Communications.
3. Work Session.

The Board will recess into a Work Session for reviewing and assessing the FY 2010 performance of the District as to the goals, objectives and performance standards in the current District Management Plan, and for identifying possible needed changes to the District Management Plan for the future. Note: The Work Session is open to the public but there will not be opportunity for further public participation in this session.

4. Discussion and possible action related to approving the performance of the District as to the goals, objectives and performance standards in the current District Management Plan, for incorporation into the District's 2010 Annual Report. Note: This item will be taken up immediately after the Work Session in Item 3 above.
5. Adjournment.

Came to hand and posted on a Bulletin Board in the Courthouse, Travis County, Texas, on this, the 6th day of January, 2011, at 1:36 pm



  
Deputy Clerk  
**D. DAVIS** Travis County, TEXAS

Please note:

This agenda and available related documentation has been posted on our website, [www.bscacd.org](http://www.bscacd.org). The District Management Plan is also posted on the website.

The Barton Springs/Edwards Aquifer is committed to compliance with the Americans with Disabilities Act (ADA). Reasonable accommodations and equal opportunity for effective communications will be provided upon request. Please contact the District office at 512-282-8441 at least 24 hours in advance if accommodation is needed.

## Tammy Raymond

---

**From:** liaison@sos.state.tx.us  
**Sent:** Thursday, January 06, 2011 4:09 PM  
**To:** Tammy Raymond  
**Subject:** S.O.S. Acknowledgment of Receipt

Agency: Barton Springs/Edwards Aquifer Conservation District  
Liaison: Tammy Raymond

Acknowledgment of Receipt

The Office of the Secretary of State has posted notice of the following meeting:

**Meeting Information:**

Barton Springs Edwards Aquifer Conservation District

01/15/2011 09:00 AM "TRD# 2011000147"

Notice posted: 01/06/11 04:08 PM

Proofread your current open meeting notice at:

[http://info.sos.state.tx.us/pls/pub/pubomquery\\$omquery.queryTRD?p\\_trd=2011000147](http://info.sos.state.tx.us/pls/pub/pubomquery$omquery.queryTRD?p_trd=2011000147)



## Open Meeting Submission

*Success!*  
Row inserted

**TRD:** 2011000147  
**Date Posted:** 01/06/2011  
**Status:** Accepted  
**Agency Id:** 0775  
**Date of Submission:** 01/06/2011  
**Agency Name:** Barton Springs/Edwards Aquifer Conservation District  
**Board:** Barton Springs Edwards Aquifer Conservation District  
**Liaison Id:** 7  
**Date of Meeting:** 01/15/2011  
**Time of Meeting:** 09:00 AM (##:## AM Local Time)  
**Street Location:** 1124 Regal Row  
**City Location:** Austin  
**State Location:** TX  
**Liaison Name:** Tammy Raymond  
**Additional Information Obtained From:** Kirk Holland

Notice is given that a Special Called Meeting and Work Session of the Board of Directors of the Barton Springs/Edwards Aquifer Conservation District will be held at the District office, located at 1124 Regal Row, Austin, Texas, on Saturday, January 15, 2011, commencing at 9:00 a.m. for the following purposes:

**Agenda:** Note: The Board of Directors of the Barton Springs/Edwards Aquifer Conservation District reserves the right to adjourn into Executive Session at any time during the course of this meeting to discuss any of the matters listed on this agenda, as authorized by the Texas Government Code Sections §551.071 (Consultation with Attorney), 551.072 (Deliberations about Real Property), 551.073 (Deliberations about Gifts and Donations), 551.074 (Personnel Matters), 551.076 (Deliberations about Security Devices), 551.087 (Economic Development) 418.183 (Homeland Security). No final action or decision will be made in Executive Session.



1. Call to Order.
2. Citizens Communications.
3. Work Session.

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4. Discussion and possible action related to approving the performance of the District as to the goals, objectives and performance standards in the current District Management Plan, for incorporation into the District's 2010 Annual Report. Note: This item will be taken up immediately after the Work Session in Item 3 above.

5. Adjournment.

New

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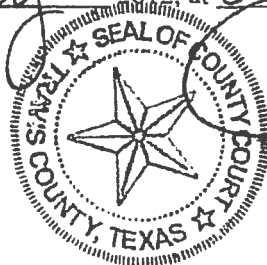


## NOTICE OF PUBLIC HEARING

Notice is given that the Barton Springs/Edwards Aquifer Conservation District Board of Directors will hold a public hearing on proposed revisions to its Management Plan at its regularly scheduled meeting on Thursday, July 26, 2012, at the District office, 1124 Regal Row, Austin, TX 78748. The public hearing will begin about but no earlier than 6:30 pm.

The revisions to the Management Plan address changes in response to new statutory requirements; changes to incorporate new planning data and to achieve and maintain the Desired Future Conditions of the District's aquifers; and changes to effect operational efficiencies and other improvements, including improved performance metrics. A copy of the revised and proposed Management Plan is available for inspection at the District office and may be downloaded and copied from the District's website at [www.bseacd.org](http://www.bseacd.org).

Came to hand and posted on a Bulletin Board in the Travis County, Texas, on this, the 13th day of July, 2012, at 3:58 pm.



*K. Haywood*  
K. HAYWOOD  
Deputy Clerk  
Travis County, TEXAS

### Please note:

The Barton Springs/Edwards Aquifer Conservation District is committed to compliance with the Americans with Disabilities Act (ADA). Reasonable accommodations and equal opportunity for effective communications will be provided upon request. Please contact the District office at 512-282-8441 at least 24 hours in advance if accommodation is needed.



Accepted for Filing in:  
Hays County  
On: Jul 13, 2012 at 08:26A  
By:  
Samantha Breland

## NOTICE OF PUBLIC HEARING

Notice is given that the Barton Springs/Edwards Aquifer Conservation District Board of Directors will hold a public hearing on proposed revisions to its Management Plan at its regularly scheduled meeting on Thursday, July 26, 2012, at the District office, 1124 Regal Row, Austin, TX 78748. The public hearing will begin about but no earlier than 6:30 pm.

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Came to hand and posted on a Bulletin Board in the Courthouse, Hays County, Texas, on this, the \_\_\_\_\_ day of \_\_\_\_\_ 2012, at \_\_\_\_\_ p.m.

\_\_\_\_\_, Deputy Clerk

Hays County, TEXAS

### Please note:

The Barton Springs/Edwards Aquifer Conservation District is committed to compliance with the Americans with Disabilities Act (ADA). Reasonable accommodations and equal opportunity for effective communications will be provided upon request. Please contact the District office at 512-282-8441 at least 24 hours in advance if accommodation is needed.



### NOTICE OF PUBLIC HEARING

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Come to hand and posted on a Bulletin Board in the Courthouse, Caldwell County, Texas, on this, the \_\_\_\_ day of \_\_\_\_\_ 2012, at \_\_\_\_\_ p.m.

\_\_\_\_\_, Deputy Clerk  
Caldwell County,  
TEXAS

**Please note:**

The Barton Springs/Edwards Aquifer Conservation District is committed to compliance with the Americans with Disabilities Act (ADA). Reasonable accommodations and equal opportunity for effective communications will be provided upon request. Please contact the District office at 512-282-8441 at least 24 hours in advance if accommodation is needed.

FILED this 13<sup>th</sup> day of July 2012  
10:10 a.m.  
CAROL HOLCOMB  
COUNTY CLERK, CALDWELL COUNTY, TEXAS  
By Robrena Keena Deputy

PO#:
Ad ID#: 5403222
Acct#: 5122828441

Account Name: BARTON S

Public Hearing
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BARTON SPRINGS EDWARDS
1124 REGAL ROW #A
AQUIFER CONS DIST STE F
AUSTIN, TX 78748

Attn: Tammy Raymond

AFFIDAVIT OF PUBLICATION

THE STATE OF TEXAS
COUNTY OF TRAVIS

Before me, the undersigned authority, a Notary Public in and for the County of Travis, State of Texas, on this day personally appeared:

[Signature of Sherry Fowler]

Advertising Agent of the Austin American-Statesman, a daily newspaper published in said County and State that is generally circulated in Bastrop, Bell, Blanco, Brazos, Burleson, Burnet, Caldwell, Colorado, Comal, Coryell, Fayette, Gillespie, Gonzales, Guadalupe, Hays, Kerr, Lampasas, Lee, Llano, Milam, Nueces, San Saba, Travis, Washington, and Williamson Counties, who being duly sworn by me, states that the attached advertisement was published at the lowest published rate for Classified advertising in said newspaper on the following date(s), to wit:

First Published: 7/16/2012 Last Published: 7/16/2012
Times Published: 1 Classification: Legal Notices (9980)
Lines: 22 Cost: \$210.56

and that the attached is a true copy of said advertisement.

SWORN AND SUBSCRIBED TO BEFORE ME, this the 16 day of July, 2012



[Signature of Notary Public]
Notary Public in and for
TRAVIS COUNTY, TEXAS

Austin American-Statesman
305 South Congress Ave., P.O. Box 670, Austin, Texas 78767-0670 512-445-3832

# Hays Free Press

109 West Center Street § 122 N. Main St.  
P.O. Box 2530 • Kyle, Texas 78640 § P.O. Box 339 • Buda, Texas 78610

(512) 262-NEWS (Kyle office) • (512) 295-9760 (Buda office) • (512) 268-0262 (fax)

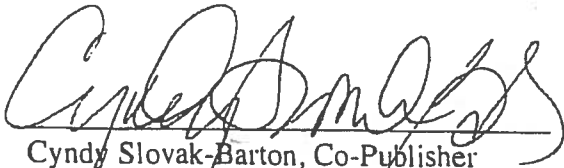
State of Texas §  
County of Hays § *Affidavit of Publication*

My name is Cyndy Slovak-Barton, and I am Publisher of the Hays Free Press. I am over the age of 18, have personal knowledge of the facts stated herein, and am otherwise competent to make this affidavit.

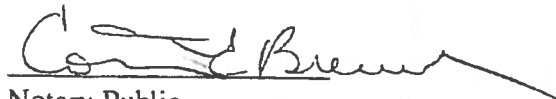
The Hays Free Press is a legal newspaper publication under Texas law, headquartered and regularly published in Hays County, Texas. It is a newspaper of general circulation, and is generally circulated in Hays, Travis, and Caldwell Counties.

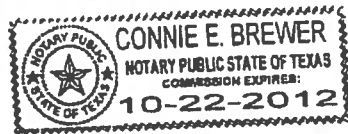
The attachment hereto was published in the Hays Free Press on the following dates at or below the classified legals rate:

July 18, 2012  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

  
Cyndy Slovak-Barton, Co-Publisher  
Hays Free Press

Subscribed and sworn before me this the 20 day of July, 2012.

  
Notary Public  
Connie Brewer



County Purchasing Office,  
1124 Stagecoach Trail, Suite  
100, San Marcos, TX 78666.

To submit Proposals for this Contract, prospective bidder should appear in person at the District Office, 1124 Regal Row, Austin, TX 78748, on Tuesday, July 17, 2012, to meet the following requirements: (1) be qualified via "Full Participation" or "Bidder's Questionnaire" by the Texas Department of Transportation (TxDOT) for bidding on State projects or within the 90 day grace period for the preparation of a new qualification statement, or have submitted the Bidder's Questionnaire or the Confidential Questionnaire and have it on file with TxDOT at least 10 days before the date proposals are to be opened; (2) be registered with the State of Texas; and (3) provide suitable evidence of prior experience for similar work and be able to provide written documentation of successfully completed similar contracts.

Plans, Specifications, and Bidding documents for pre-qualified bidders and interested non-bidders may be secured from CivCast's website ([www.civcastusa.com](http://www.civcastusa.com)) beginning Monday, June 25, 2012. To receive the official Bid Form, contact Cindy Malorka at 512-393-2273 or [cindym@co.hays.tx.us](mailto:cindym@co.hays.tx.us).

Bid security in the amount not less than five percent (5%) of the total amount of the bid, issued by an acceptable surety company or in the form of a certified or cashier's check, must accompany each bid as a guarantee that the successful bidder will enter into a proper contract and execute bonds and guaranties within ten (10) days after the date contract documents are received by the awarded contractor. Performance and Payment Bonds will be required as stated in the bidding documents.

Hays County is an Affirmative Action/Equal Opportunity Employer.

Any bid may be withdrawn prior to the above scheduled time for the opening of the bids or authorized postponement thereof. Any bid received after the time and date specified shall not be accepted.

Issued by order of the Hays County Commissioners Court on Tuesday, May 22, 2012.

# PUBLIC HEARING

The Barton Springs/Edwards Aquifer Conservation District Board of Directors will hold a Public Hearing in its regularly scheduled meeting on **Thursday, July 26, 2012**, at 1124 Regal Row, Austin, TX 78748. The Board Meeting will commence at 6:00 p.m., and the Public Hearing will begin shortly thereafter.

The Public Hearing concerns the District's proposed fiscal year 2013 Annual Budget, and the proposed 2013 District Fee Schedule. At the conclusion of this Public Hearing the Board may approve the fiscal year 2013 Fee Schedule by resolution and the fiscal year 2013 budget.

The proposed budget and fee schedule are available for inspection and copying in the District office at 1124 Regal Row, Austin, TX 78748. For more information about these items, please contact the District at (512) 282-8441.

(fax)

over the  
content to

and  
bid is

or below

*Management Plan*

# PUBLIC HEARING

Notice is given that the Barton Springs/Edwards Aquifer Conservation District Board of Directors will hold a public hearing on proposed revisions to its Management Plan at its regularly scheduled meeting on Thursday, July 26, 2012, at the District office, 1124 Regal Row, Austin, TX 78748. The public hearing will begin about but no earlier than 6:30 p.m.

The revisions to the Management Plan address changes in response to new statutory requirements; changes to incorporate new planning data and to achieve and maintain the Desired Future Conditions of the District's aquifers; and changes to effect operational efficiencies and other improvements, including improved performance metrics.

A copy of the revised and proposed Management Plan is available for inspection at the District office and may be downloaded and copied from the District's website at [www.bseacd.org](http://www.bseacd.org).

## NOTICE OF OPEN MEETING

Notice is given that a **Regular Meeting and two Public Hearings** of the Board of Directors of the Barton Springs/Edwards Aquifer Conservation District will be held in **the District office, 1124 Regal Row, Austin, TX, on Thursday, July 26, 2012, commencing at 6:00 p.m.** for the following purposes, which may be taken in any order at the discretion of the Board:

Note: The Board of Directors of the Barton Springs/Edwards Aquifer Conservation District reserves the right to adjourn into Executive Session at any time during the course of this meeting to discuss any of the matters listed on this agenda, as authorized by the Texas Government Code Sections §551.071 (Consultation with Attorney), 551.072 (Deliberations about Real Property), 551.073 (Deliberations about Gifts and Donations), 551.074 (Personnel Matters), 551.076 (Deliberations about Security Devices), 551.087 (Economic Development) 418.183 (Homeland Security). No final action or decision will be made in Executive Session.

1. **Call to Order.**
2. **Citizen Communications (Public Comments of a General Nature).**
3. **Routine Business.**
  - a. **Consent Agenda.** Note: These items may be considered and approved as one motion. Directors or citizens may request any consent item be removed from the consent agenda, for consideration and possible approval as an item of Regular Business.
    1. Approval of Financial Reports under the Public Funds Investment Act, Directors' Compensation Claims, and Specified Expenditures greater than \$5,000.
    2. Approval of minutes from the Board's July 12, 2012, Regular Meeting.
    3. Approval of purchasing a down-hole camera using up to \$12,500 in FY 2012-budgeted funds, in lieu of \$9,000 of FY 2013-budgeted funds as now proposed.
    4. Approval of issuing a letter of intent to join with other GCDs in GMA 9 in participating in jointly contracted studies related to DFC monitoring, with financial participation of \$1000 in FY 2012-budgeted funds and up to \$1500 in proposed FY 2013-budgeted funds.
    5. Approval of modifying the currently proposed FY 2013 Budget before adoption by: reducing the Regulatory Compliance Team expenses by \$9,000 for the included down-hole camera cost, now to be expensed in FY 2012 (item 3 above); increasing the General Management Team expenses by up to \$2,000 for actual GMA-related contractual expenses associated with DFC monitoring (item 4 above); and moving the balance of \$7,000 as a transfer from the operational budget into reserves.



- b. **General Manager's Report.** Note: Topics discussed in the General Manager's Report are intended for general administrative and operational information-transfer purposes. The Directors will not take any action on them in this meeting, unless the topic is specifically listed elsewhere in this as-posted agenda.

1. **Standing Topics.**

- i. Personnel matters and utilization;
- ii. Upcoming public events of possible interest;
- iii. Aquifer conditions and status of drought indicators.

2. Discussion related to current staff work areas and specific activities of staff teams and directors. Note: Individual topics listed below may be discussed by the Board in this meeting, but no action will be taken unless a topic is specifically posted elsewhere in this agenda as an item for possible action. A Director may request an individual topic that is presented only under this agenda item be placed on the posted agenda of some future meeting for Board discussion and possible action.

- i. Review of Status Update Report – at Directors' discretion.
- ii. Update on activities of GMA 9 and GMA 10.
- iii. Update on coordination with TDS and possibly other parties concerning saline zone investigations.

- c. **Directors' Reports.** Note: Board Member comments in this part of the agenda cannot address any aspect of an agenda item posted elsewhere on this agenda, and no substantive discussion among the Board Members or action by the Board on these comments will be allowed in this meeting.

Individual Board Members may, on a voluntary basis, make a brief report to the entire Board on their personal involvement in activities and dialogue that are of likely interest to the rest of the Board, in one or more of the following topical areas:

- Meetings and conferences attended or that will be attended;
- Conversations with public officials, permittees, other stakeholders, and private citizens;
- Kudos and recognition of people doing good things for groundwater management in the District;
- Concerns about specific issues or problems for groundwater management in the District.

**4. Public Hearings.**

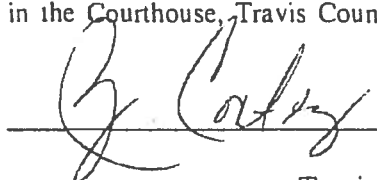
- a. The Board will hold a public hearing on the Proposed FY 2013 Budget and Proposed FY 2013 Fee Schedule. At the conclusion of the public hearing, the Board may take action to approve and adopt the Proposed FY 2013 Budget and to approve by resolution the Proposed FY 2013 Fee Schedule. **(6:05 p.m.)**
- b. The Board will hold a public hearing on the Proposed District Management Plan. **(6:30 p.m.)**

5. **Board Discussion and Possible Action.**

- a. Discussion and possible action related to the application submitted by the DDC Creekside Villas, Ltd. for a Class C Conditional Production Permit to withdraw an annual permitted volume of approximately 1,998,200 gallons per year of groundwater from an existing water well producing from the freshwater Edwards Aquifer. DDC Creekside Villas, Ltd. will operate the well, located at 590 FM 967, Buda, TX, as an irrigation well, providing water only for landscape irrigation of grass, shrubs, bushes and trees during non-drought conditions.
- b. Discussion and possible action on approving the resolution adopting the Proposed FY 2013 Fee Schedule, as revised if warranted.
- c. Discussion and possible action on revising, approving and adopting the Proposed FY 2013 Budget as the Annual Budget for FY 2013.

6. **Adjournment.**

Came to hand and posted on a Bulletin Board in the Courthouse, Travis County, Texas, on this, the 19<sup>th</sup> day of July, 2012, at 12:45 P. m.

  
\_\_\_\_\_, Deputy Clerk  
Travis County, TEXAS

**Please note:**

This agenda and available related documentation have been posted on our website. [www.hscacd.org](http://www.hscacd.org). If you have a special interest in a particular item on this agenda and would like any additional documentation that may be developed for Board consideration, please let staff know at least 24 hours in advance of the Board Meeting so that we can have those copies made for you.

The Barton Springs/Edwards Aquifer Conservation District is committed to compliance with the Americans with Disabilities Act (ADA). Reasonable accommodations and equal opportunity for effective communications will be provided upon request. Please contact the District office at 512-282-8441 at least 24 hours in advance if accommodation is needed.



Came to hand and posted on a Bulletin Board in the Courthouse,  
Austin, Travis County, Texas on this the 19<sup>th</sup> day of  
July, 2012  
Dana DeBeauvoir  
County Clerk, Travis County, Texas  
By J. Cortez Deputy

Y. CORTEZ

**FILED AND RECORDED**

OFFICIAL PUBLIC RECORDS



Jul 19, 2012 12:35 PM 201281614

CORTEZ: \$3.00

Dana DeBeauvoir, County Clerk  
Travis County TEXAS

## NOTICE OF OPEN MEETING

Accepted for Filing in:  
Hays County  
On: Jul 20, 2012 at 08:10A  
By:  
Alisha Herzog

Notice is given that a **Regular Meeting and two Public Hearings** of the Board of Directors of the Barton Springs/Edwards Aquifer Conservation District will be held in **the District office**, 1124 Regal Row, Austin, TX, on **Thursday, July 26, 2012**, commencing at **6:00 p.m.** for the following purposes, which may be taken in any order at the discretion of the Board:

Note: The Board of Directors of the Barton Springs/Edwards Aquifer Conservation District reserves the right to adjourn into Executive Session at any time during the course of this meeting to discuss any of the matters listed on this agenda, as authorized by the Texas Government Code Sections §551.071 (Consultation with Attorney), 551.072 (Deliberations about Real Property), 551.073 (Deliberations about Gifts and Donations), 551.074 (Personnel Matters), 551.076 (Deliberations about Security Devices), 551.087 (Economic Development) 418.183 (Homeland Security). No final action or decision will be made in Executive Session.

1. **Call to Order.**
2. **Citizen Communications (Public Comments of a General Nature).**
3. **Routine Business.**
  - a. **Consent Agenda.** Note: These items may be considered and approved as one motion. Directors or citizens may request any consent item be removed from the consent agenda, for consideration and possible approval as an item of Regular Business.
    1. Approval of Financial Reports under the Public Funds Investment Act, Directors' Compensation Claims, and Specified Expenditures greater than \$5,000.
    2. Approval of minutes from the Board's July 12, 2012, Regular Meeting.
    3. Approval of purchasing a down-hole camera using up to \$12,500 in FY 2012-budgeted funds, in lieu of \$9,000 of FY 2013-budgeted funds as now proposed.
    4. Approval of issuing a letter of intent to join with other GCDs in GMA 9 in participating in jointly contracted studies related to DFC monitoring, with financial participation of \$1000 in FY 2012-budgeted funds and up to \$1500 in proposed FY 2013-budgeted funds.
    5. Approval of modifying the currently proposed FY 2013 Budget before adoption by: reducing the Regulatory Compliance Team expenses by \$9,000 for the included down-hole camera cost, now to be expensed in FY 2012 (item 3 above); increasing the General Management Team expenses by up to \$2,000 for actual GMA-related contractual expenses associated with DFC monitoring (item 4 above); and moving the balance of \$7,000 as a transfer from the operational budget into reserves.

- b. **General Manager's Report.** Note: Topics discussed in the General Manager's Report are intended for general administrative and operational information-transfer purposes. The Directors will not take any action on them in this meeting, unless the topic is specifically listed elsewhere in this as-posted agenda.

1. **Standing Topics.**

- i. Personnel matters and utilization;
- ii. Upcoming public events of possible interest;
- iii. Aquifer conditions and status of drought indicators.

2. Discussion related to current staff work areas and specific activities of staff teams and directors. Note: Individual topics listed below may be discussed by the Board in this meeting, but no action will be taken unless a topic is specifically posted elsewhere in this agenda as an item for possible action. A Director may request an individual topic that is presented only under this agenda item be placed on the posted agenda of some future meeting for Board discussion and possible action.

- i. Review of Status Update Report – at Directors' discretion.
- ii. Update on activities of GMA 9 and GMA 10.
- iii. Update on coordination with TDS and possibly other parties concerning saline zone investigations.

- c. **Directors' Reports.** Note: Board Member comments in this part of the agenda cannot address any aspect of an agenda item posted elsewhere on this agenda, and no substantive discussion among the Board Members or action by the Board on these comments will be allowed in this meeting.

Individual Board Members may, on a voluntary basis, make a brief report to the entire Board on their personal involvement in activities and dialogue that are of likely interest to the rest of the Board, in one or more of the following topical areas:

- Meetings and conferences attended or that will be attended;
- Conversations with public officials, permittees, other stakeholders, and private citizens;
- Kudos and recognition of people doing good things for groundwater management in the District;
- Concerns about specific issues or problems for groundwater management in the District.

**4. Public Hearings.**

- a. The Board will hold a public hearing on the Proposed FY 2013 Budget and Proposed FY 2013 Fee Schedule. At the conclusion of the public hearing, the Board may take action to approve and adopt the Proposed FY 2013 Budget and to approve by resolution the Proposed FY 2013 Fee Schedule. **(6:05 p.m.)**
- b. The Board will hold a public hearing on the Proposed District Management Plan. **(6:30 p.m.)**

**5. Board Discussion and Possible Action.**

- a. Discussion and possible action related to the application submitted by the DDC Creekside Villas, Ltd. for a Class C Conditional Production Permit to withdraw an annual permitted volume of approximately 1,998,200 gallons per year of groundwater from an existing water well producing from the freshwater Edwards Aquifer. DDC Creekside Villas, Ltd. will operate the well, located at 590 FM 967, Buda, TX, as an irrigation well, providing water only for landscape irrigation of grass, shrubs, bushes and trees during non-drought conditions.
- b. Discussion and possible action on approving the resolution adopting the Proposed FY 2013 Fee Schedule, as revised if warranted.
- c. Discussion and possible action on revising, approving and adopting the Proposed FY 2013 Budget as the Annual Budget for FY 2013.

**6. Adjournment.**

Came to hand and posted on a Bulletin Board in the Courthouse, Hays County, Texas, on this, the \_\_\_\_\_ day of July, 2012, at \_\_\_\_\_ .m.

\_\_\_\_\_, Deputy Clerk

Hays County, TEXAS

**Please note:**

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FILED this 19<sup>th</sup> day of July 2012  
4:30 P.M.  
CAROL HOLCOMB  
COUNTY CLERK, CALDWELL COUNTY, TEXAS  
By Kathrina Reym Deputy

**NOTICE OF OPEN MEETING:**

Notice is given that a Regular Meeting and two Public Hearings of the Board of Directors of the Barton Springs/Edwards Aquifer Conservation District will be held in the District office, 1124 Regal Row, Austin, TX, on Thursday, July 26, 2012, commencing at 6:00 p.m. for the following purposes, which may be taken in any order at the discretion of the Board:

Note: The Board of Directors of the Barton Springs/Edwards Aquifer Conservation District reserves the right to adjourn into Executive Session at any time during the course of this meeting to discuss any of the matters listed on this agenda, as authorized by the Texas Government Code Sections §551.071 (Consultation with Attorney), 551.072 (Deliberations about Real Property), 551.073 (Deliberations about Gifts and Donations), 551.074 (Personnel Matters), 551.076 (Deliberations about Security Devices), 551.087 (Economic Development) 418.183 (Homeland Security). No final action or decision will be made in Executive Session.

1. **Call to Order.**
2. **Citizen Communications (Public Comments of a General Nature).**
3. **Routine Business.**
  - a. **Consent Agenda.** Note: These items may be considered and approved as one motion. Directors or citizens may request any consent item be removed from the consent agenda, for consideration and possible approval as an item of Regular Business.
    1. Approval of Financial Reports under the Public Funds Investment Act, Directors' Compensation Claims, and Specified Expenditures greater than \$5,000.
    2. Approval of minutes from the Board's July 12, 2012, Regular Meeting.
    3. Approval of purchasing a down-hole camera using up to \$12,500 in FY 2012-budgeted funds, in lieu of \$9,000 of FY 2013-budgeted funds as now proposed.
    4. Approval of issuing a letter of intent to join with other GCDs in GMA 9 in participating in jointly contracted studies related to DFC monitoring, with financial participation of \$1000 in FY 2012-budgeted funds and up to \$1500 in proposed FY 2013-budgeted funds.
    5. Approval of modifying the currently proposed FY 2013 Budget before adoption by: reducing the Regulatory Compliance Team expenses by \$9,000 for the included down-hole camera cost, now to be expensed in FY 2012 (item 3 above); increasing the General Management Team expenses by up to \$2,000 for actual GMA-related contractual expenses associated with DFC monitoring (item 4 above); and moving the balance of \$7,000 as a transfer from the operational budget into reserves.
  - b. **General Manager's Report.** Note: Topics discussed in the General Manager's Report are intended for general administrative and operational information-transfer purposes. The Directors will

nor take any action on them in this meeting, unless the topic is specifically listed elsewhere in this as-posted agenda.

1. Standing Topics.

- i. Personnel matters and utilization;
- ii. Upcoming public events of possible interest;
- iii. Aquifer conditions and status of drought indicators.

1.

2. Discussion related to current staff work areas and specific activities of staff teams and directors. Note: Individual topics listed below may be discussed by the Board in this meeting, but no action will be taken unless a topic is specifically posted elsewhere in this agenda as an item for possible action. A Director may request an individual topic that is presented only under this agenda item be placed on the posted agenda of some future meeting for Board discussion and possible action.

- i. Review of Status Update Report – at Directors’ discretion.
- ii. Update on activities of GMA 9 and GMA 10.
- iii. Update on coordination with TDS and possibly other parties concerning saline zone investigations.

- c. Directors’ Reports. Note: Board Member comments in this part of the agenda cannot address any aspect of an agenda item posted elsewhere on this agenda, and no substantive discussion among the Board Members or action by the Board on these comments will be allowed in this meeting

Individual Board Members may, on a voluntary basis, make a brief report to the entire Board on their personal involvement in activities and dialogue that are of likely interest to the rest of the Board, in one or more of the following topical areas:

- Meetings and conferences attended or that will be attended;
- Conversations with public officials, permittees, other stakeholders, and private citizens;
- Kudos and recognition of people doing good things for groundwater management in the District;
- Concerns about specific issues or problems for groundwater management in the District.

4. Public Hearings.

- a. The Board will hold a public hearing on the Proposed FY 2013 Budget and Proposed FY 2013 Fee Schedule. At the conclusion of the public hearing, the Board may take action to approve and adopt the Proposed FY 2013 Budget and to approve by resolution the Proposed FY 2013 Fee Schedule. (6:05 p.m.)
- b. The Board will hold a public hearing on the Proposed District Management Plan. (6:30 p.m.)

5. Board Discussion and Possible Action.

- a. Discussion and possible action related to the application submitted by the DIX' Creekside Villas, Ltd. for a Class C Conditional Production Permit to withdraw an annual permitted volume of approximately 1,998,200 gallons per year of groundwater from an existing water well producing from the freshwater Edwards Aquifer. DDC' Creekside Villas, Ltd. will operate the well, located at 500 FM 267, Buda, TX, as an irrigation well, providing water only for landscape irrigation of grass, shrubs, bushes and trees during non-drought conditions.
- b. Discussion and possible action on approving the resolution adopting the Proposed FY 2013 Fee Schedule, as revised if warranted.
- c. Discussion and possible action on revising, approving and adopting the Proposed FY 2013 Budget as the Annual Budget for FY 2013.

6. Adjournment.

Come to hold and passed on a Bulletin Board in the Courthouse, Caldwell County, Texas, on this the \_\_\_\_\_ day of July, 2012, at \_\_\_\_\_ m.

\_\_\_\_\_  
Deputy Clerk

Caldwell County TEXAS

Please note:

This agenda and website related documentation lists fees posted on our website, [www.caldwelltx.com](http://www.caldwelltx.com). If you have a special interest in a particular item on this agenda and request any additional documentation that may be desirable for Board consideration, please let staff know at least 72 hours in advance of the Board Meeting so that we can have those copies made for you.

The Hanger Springs Edwards Aquifer Conservation District is committed to compliance with the Americans with Disabilities Act (ADA). Reasonable accommodations and equal opportunity for effective communication will be provided upon request. Please contact the Tolson office at 817-767-8441 at least 72 hours in advance if an accommodation is needed.



## NOTICE OF OPEN MEETING

Accepted for Filing in:  
Hays County  
On: Sep 07, 2012 at 01:42P  
By:  
Alisha Herzog

Notice is given that a **Regular Meeting** of the Board of Directors of the Barton Springs/Edwards Aquifer Conservation District will be held in the **District office**, 1124 Regal Row, Austin, TX, on **Thursday, September 13, 2012**, commencing at **6:00 p.m.** for the following purposes, which may be taken in any order at the discretion of the Board:

Note: The Board of Directors of the Barton Springs/Edwards Aquifer Conservation District reserves the right to adjourn into Executive Session at any time during the course of this meeting to discuss any of the matters listed on this agenda, as authorized by the Texas Government Code Sections §551.071 (Consultation with Attorney), 551.072 (Deliberations about Real Property), 551.073 (Deliberations about Gifts and Donations), 551.074 (Personnel Matters), 551.076 (Deliberations about Security Devices), 551.087 (Economic Development) 418.183 (Homeland Security). No final action or decision will be made in Executive Session.

1. **Call to Order.**
2. **Citizen Communications (Public Comments of a General Nature).**
3. **Routine Business.**
  - a. **Consent Agenda.** Note: These items may be considered and approved as one motion. Directors or citizens may request any consent item be removed from the consent agenda, for consideration and possible approval as a separate item of Regular Business on this agenda.
    1. Approval of Financial Reports under the Public Funds Investment Act, Directors' Compensation Claims, and Specified Expenditures greater than \$5,000.
    2. Approval of minutes from the Board's August 23, 2012, Regular Meeting.
    3. Approval and setting of new dates for the November 2012 and December 2012 Regular Meetings of the Board.
    4. Approval of sponsorship of the Austin Youth River Watch's 20<sup>th</sup> Anniversary Celebration and selection of the desired sponsorship level within existing FY 2013 budget.
    5. Approval of a small, fixed-price contract with former intern Richard Casteel to complete the grant project report titled "Evaluating the Hydrologic Connection of the Blanco River and Barton Springs Using Discharge and Geochemical Data."
  - a. **General Manager's Report.** Note: Topics discussed in the General Manager's Report are intended for general administrative and operational information-transfer purposes. The Directors will not take any action on them in this meeting, unless the topic is specifically listed elsewhere in this as-posted agenda.
    1. Standing Topics.

- i. Personnel matters and utilization;
- ii. Upcoming public events of possible interest;
- iii. Aquifer conditions and status of drought indicators.

- 1.
- 2. Discussion related to current staff work areas and specific activities of staff teams and directors. Note: Individual topics listed below may be discussed by the Board in this meeting, but no action will be taken unless a topic is specifically posted elsewhere in this agenda as an item for possible action. A Director may request an individual topic that is presented only under this agenda item be placed on the posted agenda of some future meeting for Board discussion and possible action.

- i. Review of recent activities of staff and teams.
- ii. Update on recent permitting and non-drought regulatory activities.

- c. Directors' Reports. Note: Board Member comments in this part of the agenda cannot address any aspect of an agenda item posted elsewhere on this agenda, and no substantive discussion among the Board Members or action by the Board on these comments will be allowed in this meeting.

Individual Board Members may, on a voluntary basis, make a brief report to the entire Board on their personal involvement in activities and dialogue that are of likely interest to the rest of the Board, in one or more of the following topical areas:

- Meetings and conferences attended or that will be attended;
- Conversations with public officials, permittees, other stakeholders, and private citizens;
- Kudos and recognition of people doing good things for groundwater management in the District;
- Concerns about specific issues or problems for groundwater management in the District.

**4. Board Discussion and Possible Action.**

- a. Discussion and possible action related to the November 6, 2012, director elections including amending the order calling the general election on November 6, 2012, for Directors of Precinct 1, 3 & 4; approving election services contracts and joint election agreements; approving election day polling places; approving location, dates and times of early voting; and, any other action necessary for the November 6, 2012, general election.
- b. Discussion and possible action related to establishing the FY 2013 District goals and objectives and approving the FY 2013 goals and objectives for the General Manager.
- c. Discussion and possible action related to planned saline zone investigations and initiatives, including engaging a drilling contractor for minor well rehabilitation and/or sampling.

- d. Discussion and possible action related to comments received from TWDB on the proposed revisions to the District Management Plan and authorizing a course of action.
- e. Discussion and possible action related to the Austin Court of Appeals decision in *SOS Alliance v. City of Kyle, Goodman et al., and the Barton Springs/Edwards Aquifer Conservation District*.

**5. Adjournment.**

Came to hand and posted on a Bulletin Board in the Courthouse, Hays County, Texas, on this, the \_\_\_\_\_ day of September, 2012, at \_\_\_\_\_ .m.

\_\_\_\_\_, Deputy Clerk

Hays County, TEXAS

**Please note:**

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## NOTICE OF OPEN MEETING

Notice is given that a **Regular Meeting** of the Board of Directors of the Barton Springs/Edwards Aquifer Conservation District will be held in the **District office**, 1124 Regal Row, Austin, TX, on **Thursday, September 13, 2012**, commencing at **6:00 p.m.** for the following purposes, which may be taken in any order at the discretion of the Board:

Note: The Board of Directors of the Barton Springs/Edwards Aquifer Conservation District reserves the right to adjourn into Executive Session at any time during the course of this meeting to discuss any of the matters listed on this agenda, as authorized by the Texas Government Code Sections §551.071 (Consultation with Attorney), 551.072 (Deliberations about Real Property), 551.073 (Deliberations about Gifts and Donations), 551.074 (Personnel Matters), 551.076 (Deliberations about Security Devices), 551.087 (Economic Development) 418.183 (Homeland Security). No final action or decision will be made in Executive Session.

1. **Call to Order.**
2. **Citizen Communications (Public Comments of a General Nature).**
3. **Routine Business.**
  - a. **Consent Agenda.** Note: These items may be considered and approved as one motion. Directors or citizens may request any consent item be removed from the consent agenda, for consideration and possible approval as a separate item of Regular Business on this agenda.
    1. Approval of Financial Reports under the Public Funds Investment Act, Directors' Compensation Claims, and Specified Expenditures greater than \$5,000.
    2. Approval of minutes from the Board's August 23, 2012, Regular Meeting.
    3. Approval and setting of new dates for the November 2012 and December 2012 Regular Meetings of the Board.
    4. Approval of sponsorship of the Austin Youth River Watch's 20<sup>th</sup> Anniversary Celebration and selection of the desired sponsorship level within existing FY 2013 budget.
    5. Approval of a small, fixed-price contract with former intern Richard Casteel to complete the grant project report titled "Evaluating the Hydrologic Connection of the Blanco River and Barton Springs Using Discharge and Geochemical Data."
  - b. **General Manager's Report.** Note: Topics discussed in the General Manager's Report are intended for general administrative and operational information-transfer purposes. The Directors will not take any action on them in this meeting, unless the topic is specifically listed elsewhere in this as-posted agenda.

1. Standing Topics.

- i. Personnel matters and utilization;
- ii. Upcoming public events of possible interest;
- iii. Aquifer conditions and status of drought indicators.

2. Discussion related to current staff work areas and specific activities of staff teams and directors. Note: Individual topics listed below may be discussed by the Board in this meeting, but no action will be taken unless a topic is specifically posted elsewhere in this agenda as an item for possible action. A Director may request an individual topic that is presented only under this agenda item be placed on the posted agenda of some future meeting for Board discussion and possible action.

- i. Review of recent activities of staff and teams.
- ii. Update on recent permitting and non-drought regulatory activities.

c. Directors' Reports. Note: Board Member comments in this part of the agenda cannot address any aspect of an agenda item posted elsewhere on this agenda, and no substantive discussion among the Board Members or action by the Board on these comments will be allowed in this meeting.

Individual Board Members may, on a voluntary basis, make a brief report to the entire Board on their personal involvement in activities and dialogue that are of likely interest to the rest of the Board, in one or more of the following topical areas:

- Meetings and conferences attended or that will be attended;
- Conversations with public officials, permittees, other stakeholders, and private citizens;
- Kudos and recognition of people doing good things for groundwater management in the District;
- Concerns about specific issues or problems for groundwater management in the District.

**4. Board Discussion and Possible Action.**

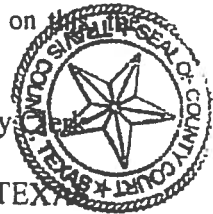
- a. Discussion and possible action related to the November 6, 2012, director elections including amending the order calling the general election on November 6, 2012, for Directors of Precinct 1, 3 & 4; approving election services contracts and joint election agreements; approving election day polling places; approving location, dates and times of early voting; and, any other action necessary for the November 6, 2012, general election.
- b. Discussion and possible action related to establishing the FY 2013 District goals and objectives and approving the FY 2013 goals and objectives for the General Manager.

- c. Discussion and possible action related to planned saline zone investigations and initiatives, including engaging a drilling contractor for minor well rehabilitation and/or sampling.
- d. Discussion and possible action related to comments received from TWDB on the proposed revisions to the District Management Plan and authorizing a course of action.
- e. Discussion and possible action related to the Austin Court of Appeals decision in *SOS Alliance v. City of Kyle, Goodman et al., and the Barton Springs/Edwards Aquifer Conservation District*.

5. Adjournment.

Carried to hand and posted on a Bulletin Board in the Courthouse, Travis County, Texas, on the 6 day of September, 2012, at 1:18 m.

  
 MICHAEL P. GONZALES, Deputy Clerk  
 Travis County, TEXAS



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**FILED AND RECORDED**

OFFICIAL PUBLIC RECORDS



Sep 06, 2012 01:18 PM 201282028

GONZALESM: \$3.00

Dana DeBeauvoir, County Clerk

Travis County TEXAS

### NOTICE OF OPEN MEETING

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1. Call to Order.
2. Citizen Communications (Public Comments of a General Nature).
3. Routine Business.
  - a. Consent Agenda. Note: These items may be considered and approved as one motion. Directors or citizens may request any consent item be removed from the consent agenda, for consideration and possible approval as a separate item of Regular Business on this agenda.
    1. Approval of Financial Reports under the Public Funds Investment Act, Directors' Compensation Claims, and Specified Expenditures greater than \$5,000.
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    4. Approval of sponsorship of the Austin Youth River Watch's 20<sup>th</sup> Anniversary Celebration and selection of the desired sponsorship level within existing FY 2013 budget.
    5. Approval of a small, fixed-price contract with former intern Richard Casteel to complete the grant project report titled "Evaluating the Hydrologic Connection of the Blanco River and Barton Springs Using Discharge and Geochemical Data."
  - a. General Manager's Report. Note: Topics discussed in the General Manager's Report are intended for general administrative and operational information-transfer purposes. The Directors will not take any action on them in this meeting, unless the topic is specifically listed elsewhere in this as-posted agenda.
    1. Standing Topics.

FILED this 7<sup>th</sup> day of Sep. 2012  
9:50 a.m.  
 CAROL HOLCOMB  
 COUNTY CLERK, CALDWELL COUNTY, TEXAS  
 By Katrina Rejzha Deputy

- i. Personnel matters and utilization;
- ii. Upcoming public events of possible interest;
- iii. Aquifer conditions and status of drought indicators.

- 1.
2. Discussion related to current staff work areas and specific activities of staff teams and directors. Note: Individual topics listed below may be discussed by the Board in this meeting, but no action will be taken unless a topic is specifically posted elsewhere in this agenda as an item for possible action. A Director may request an individual topic that is presented only under this agenda item be placed on the posted agenda of some future meeting for Board discussion and possible action.

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- ii. Update on recent permitting and non-drought regulatory activities.

- c. Directors' Reports. Note: Board Member comments in this part of the agenda cannot address any aspect of an agenda item posted elsewhere on this agenda, and no substantive discussion among the Board Members or action by the Board on these comments will be allowed in this meeting.

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- Kudos and recognition of people doing good things for groundwater management in the District;
- Concerns about specific issues or problems for groundwater management in the District.

4. Board Discussion and Possible Action.
  - a. Discussion and possible action related to the November 6, 2012, director elections including amending the order calling the general election on November 6, 2012, for Directors of Precinct 1, 3 & 4; approving election services contracts and joint election agreements; approving election day polling places; approving location, dates and times of early voting; and, any other action necessary for the November 6, 2012, general election.
  - b. Discussion and possible action related to establishing the FY 2013 District goals and objectives and approving the FY 2013 goals and objectives for the General Manager.
  - c. Discussion and possible action related to planned saline zone investigations and initiatives, including engaging a drilling contractor for minor well rehabilitation and/or sampling.



- d. Discussion and possible action related to comments received from TWDB on the proposed revisions to the District Management Plan and authorizing a course of action.
- e. Discussion and possible action related to the Austin Court of Appeals decision in *SOS Alliance v. City of Kyle, Goodman et al., and the Barton Springs/Edwards Aquifer Conservation District*.

5. Adjournment.

Came to hand and posted on a Bulletin Board in the Courthouse, Caldwell County, Texas, on this, the \_\_\_\_\_ day of September, 2012, at \_\_\_\_\_ .m.

\_\_\_\_\_, Deputy Clerk

Caldwell County, TEXAS

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1. **Call to Order.**
2. **Citizen Communications (Public Comments of a General Nature).**
3. **Routine Business.**
  - a. **Consent Agenda.** Note: These items may be considered and approved as one motion. Directors or citizens may request any consent item be removed from the consent agenda, for consideration and possible approval as a separate item of Regular Business on this agenda.
    1. Approval of Financial Reports under the Public Funds Investment Act, Directors' Compensation Claims, and Specified Expenditures greater than \$5,000.
    2. Approval of minutes from the Board's September 13, 2012, Regular Meeting.
    3. Approval of issuing the earned Conservation Credits to permittees for FY 2012.
    4. Review and approval of FY 2012 financial performance reports: Actual Receipts and Expenses vs. Budgeted Amounts, and EoY Balance Sheet.
    5. Approval of amendments to the District's Purchasing Policy related to authorizations by the new Assistant General Manager position.
    6. Re-designation of Brian Hunt as the District Representative on the GMA 9 Joint Planning Committee, and the designation of John Dupnik as the District Representative on the GMA 10 Joint Planning Committee, replacing the GM on that Committee.
    7. Approval of the date, time, and place for the District's Holiday Party.

8. Approval of a task order to Dave Anderson d/b/a FormYourPlanet, for stakeholder engagement and coordination consulting services in support of the District HCP process, using budgeted funds.
  
- b. **General Manager's Report.** Note: Topics discussed in the General Manager's Report are intended for general administrative and operational information-transfer purposes. The Directors will not take any action on them in this meeting, unless the topic is specifically listed elsewhere in this as-posted agenda.
  1. **Standing Topics.**
    - i. Personnel matters and utilization;
    - ii. Upcoming public events of possible interest;
    - iii. Aquifer conditions and status of drought indicators.
  
  2. Discussion related to current staff work areas and specific activities of staff teams and directors. Note: Individual topics listed below may be discussed by the Board in this meeting, but no action will be taken unless a topic is specifically posted elsewhere in this agenda as an item for possible action. A Director may request an individual topic that is presented only under this agenda item be placed on the posted agenda of some future meeting for Board discussion and possible action.
    - i. Review of Status Update Report – at directors' discretion.
    - ii. Update on GMA 9 and GMA 10 activities.
    - iii. Update on the status of the Jeremiah Venture's contested Texas Land Application Permit application.
  
- c. **Directors' Reports.** Note: Board Member comments in this part of the agenda cannot address any aspect of an agenda item posted elsewhere on this agenda, and no substantive discussion among the Board Members or action by the Board on these comments will be allowed in this meeting.

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- Kudos and recognition of people doing good things for groundwater management in the District;
- Concerns about specific issues or problems for groundwater management in the District.

#### **4. Public Hearing.**

The Board will hold a public hearing on proposed revisions to the District Rules and Bylaws related generally to: definitions, permit application requirements, considerations for actions on permits, provisions related to adjusting permitted volumes, multi-user well requirements, nonexempt domestic use wells, temporary transfer permits, designation and retirement of historic-use status, Desired Future Conditions (DFCs) and Modeled Available Groundwater (MAG) estimates for District aquifers, permit and drought requirements for conditional permits, conservation-oriented rate structures for public water systems, drought stage triggers, drought contingency plans, curtailment of historical permits in Emergency Response Periods (ERP), alternate curtailment schedules for historical permits, enforcement of drought rules, officer election dates, hearing and protest procedures, well construction standards, and other general administrative clarifications and corrections. (6:05 p.m.)

#### **5. Board Discussion and Possible Action.**

- a. Discussion and possible action related to approving the proposed revisions to the District Rules and Bylaws related generally to: definitions, permit application requirements, considerations for actions on permits, provisions related to adjusting permitted volumes, multi-user well requirements, nonexempt domestic use wells, temporary transfer permits, designation and retirement of historic-use status, Desired Future Conditions (DFCs) and Modeled Available Groundwater (MAG) estimates for District aquifers, permit and drought requirements for conditional permits, conservation-oriented rate structures for public water systems, drought stage triggers, drought contingency plans, curtailment of historical permits in Emergency Response Periods (ERP), alternate curtailment schedules for historical permits, enforcement of drought rules, officer election dates, hearing and protest procedures, well construction standards, and other general administrative clarifications and corrections.
- b. Discussion and possible action related to approving minor revisions made to the proposed Management Plan in response to comments provided by the TWDB, and then adoption of the proposed District Management Plan and direction to the general manager to transmit the adopted plan to GMA 9 and 10 GCDs for acknowledgement and then to the TWDB for approval.
- c. Discussion and possible action related to the November 6, 2012, director elections including: approval of joint election agreements and election services contracts with Hays, Caldwell and Travis Counties; approval of election day polling places; approval of locations, dates and times of early voting; ratification of Board President's actions on election matters since September 13, 2012 Board meeting, adopting orders or amendments to prior Board orders in connection with the election; and, any other action necessary for the November 6, 2012, director elections.
- d. Discussion and possible action related to the Austin Court of Appeals decision in *SOS Alliance v. City of Kyle, Goodman et al., and the Barton Springs/Edwards Aquifer Conservation District*.

**6. Adjournment.**

Came to hand and posted on a Bulletin Board in the Courthouse, Hays County, Texas, on this, the \_\_\_\_\_ day of September, 2012, at \_\_\_\_\_ .m.

\_\_\_\_\_, Deputy Clerk

Hays County, TEXAS

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ORIGINAL  
FILED FOR RECORD

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1. **Call to Order.**
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    6. Re-designation of Brian Hunt as the District Representative on the GMA 9 Joint Planning Committee, and the designation of John Dupnik as the District Representative on the GMA 10 Joint Planning Committee, replacing the GM on that Committee.
    7. Approval of the date, time, and place for the District's Holiday Party.

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- b. General Manager's Report. Note: Topics discussed in the General Manager's Report are intended for general administrative and operational information-transfer purposes. The Directors will not take any action on them in this meeting, unless the topic is specifically listed elsewhere in this as-posted agenda.

1. Standing Topics.

- i. Personnel matters and utilization;
- ii. Upcoming public events of possible interest;
- iii. Aquifer conditions and status of drought indicators.

2. Discussion related to current staff work areas and specific activities of staff teams and directors. Note: Individual topics listed below may be discussed by the Board in this meeting, but no action will be taken unless a topic is specifically posted elsewhere in this agenda as an item for possible action. A Director may request an individual topic that is presented only under this agenda item be placed on the posted agenda of some future meeting for Board discussion and possible action.

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- iii. Update on the status of the Jeremiah Venture's contested Texas Land Application Permit application.

- c. Directors' Reports. Note: Board Member comments in this part of the agenda cannot address any aspect of an agenda item posted elsewhere on this agenda, and no substantive discussion among the Board Members or action by the Board on these comments will be allowed in this meeting.

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#### **5. Board Discussion and Possible Action.**

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- d. Discussion and possible action related to the Austin Court of Appeals decision in *SOS Alliance v. City of Kyle, Goodman et al.*, and the Barton Springs/Edwards Aquifer Conservation District.



6. **Adjournment.**

Came to hand and posted on a Bulletin Board in the Courthouse, Travis County, Texas, on this, the 20 day of September, 2012, at 1:38 p.m.

*Michael P. Gonzales*

Deputy Clerk



MICHAEL P. GONZALES

Travis County, TEXAS

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**FILED AND RECORDED**

OFFICIAL PUBLIC RECORDS

*Dana DeBeauvoir*

Sep 20, 2012 01:38 PM 201282169

GONZALESM: \$3.00

Dana DeBeauvoir, County Clerk

Travis County TEXAS

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    7. Approval of the date, time, and place for the District's Holiday Party.

FILED this 20<sup>th</sup> day of Sep. 2012  
3:30 P.M.  
CAROL HOLCOMB  
COUNTY CLERK, CALDWELL COUNTY, TEXAS  
By Katrina Reyna Deputy

8. Approval of a task order to Dave Anderson d/b/a FormYourPlanet, for stakeholder engagement and coordination consulting services in support of the District HCP process, using budgeted funds.

a. General Manager's Report. Note: Topics discussed in the General Manager's Report are intended for general administrative and operational information-transfer purposes. The Directors will not take any action on them in this meeting, unless the topic is specifically listed elsewhere in this as-posted agenda.

1. Standing Topics.

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- iii. Aquifer conditions and status of drought indicators.

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- Concerns about specific issues or problems for groundwater management in the District.

4. Public Hearing.

The Board will hold a public hearing on proposed revisions to the District Rules and Bylaws related generally to: definitions, permit application requirements, considerations for actions on permits, provisions related to adjusting permitted volumes, multi-user well requirements, nonexempt domestic use wells, temporary transfer permits, designation and retirement of historic-use status, Desired Future Conditions (DFCs) and Modeled Available Groundwater (MAG) estimates for District aquifers, permit and drought requirements for conditional permits, conservation-oriented rate structures for public water systems, drought stage triggers, drought contingency plans, curtailment of historical permits in Emergency Response Periods (ERP), alternate curtailment schedules for historical permits, enforcement of drought rules, officer election dates, hearing and protest procedures, well construction standards, and other general administrative clarifications and corrections. (6:05 p.m.)

**5. Board Discussion and Possible Action.**

- a. Discussion and possible action related to approving the proposed revisions to the District Rules and Bylaws related generally to: definitions, permit application requirements, considerations for actions on permits, provisions related to adjusting permitted volumes, multi-user well requirements, nonexempt domestic use wells, temporary transfer permits, designation and retirement of historic-use status, Desired Future Conditions (DFCs) and Modeled Available Groundwater (MAG) estimates for District aquifers, permit and drought requirements for conditional permits, conservation-oriented rate structures for public water systems, drought stage triggers, drought contingency plans, curtailment of historical permits in Emergency Response Periods (ERP), alternate curtailment schedules for historical permits, enforcement of drought rules, officer election dates, hearing and protest procedures, well construction standards, and other general administrative clarifications and corrections.
- b. Discussion and possible action related to approving minor revisions made to the proposed Management Plan in response to comments provided by the TWDB, and then adoption of the proposed District Management Plan and direction to the general manager to transmit the adopted plan to GMA 9 and 10 GCDs for acknowledgement and then to the TWDB for approval.
- c. Discussion and possible action related to the November 6, 2012, director elections including: approval of joint election agreements and election services contracts with Hays, Caldwell and Travis Counties; approval of election day polling places; approval of locations, dates and times of early voting; ratification of Board President's actions on election matters since September 13, 2012 Board meeting, adopting orders or amendments to prior Board orders in connection with the election; and, any other action necessary for the November 6, 2012, director elections.
- d. Discussion and possible action related to the Austin Court of Appeals decision in *SOS Alliance v. City of Kyle, Goodman et al.*, and the *Barton Springs/Edwards Aquifer Conservation District*.

**6. Adjournment.**

Came to hand and posted on a Bulletin Board in the Courthouse, Caldwell County, Texas, on this, the  
\_\_\_\_\_ day of September, 2012, at \_\_\_\_\_ .m.

\_\_\_\_\_, Deputy Clerk

Caldwell County, TEXAS

**Please note:**

This agenda and available related documentation have been posted on our website, [www.bseacd.org](http://www.bseacd.org). If you have a special interest in a particular item on this agenda and would like any additional documentation that may be developed for Board consideration, please let staff know at least 24 hours in advance of the Board Meeting so that we can have those copies made for you.

The Barton Springs/Edwards Aquifer Conservation District is committed to compliance with the Americans with Disabilities Act (ADA). Reasonable accommodations and equal opportunity for effective communications will be provided upon request. Please contact the District office at 512-282-8441 at least 24 hours in advance if accommodation is needed.

Responses from Regions K and L  
as of November 26, 2012.

Dana Wilson

Region K

**Subject:** FW: proposed new BSEACD Management Plan

**From:** Fox, Jeff

**Sent:** Thursday, October 25, 2012 11:30 AM

**To:** 'John Burke'; Lutes, Teresa; 'Barbara Johnson'; 'Bill Neve'; 'info@fayettecountygroundwater.com'; 'Doug Powell'; 'Haskell Simon'; 'James Kowis'; 'Jennifer Walker'; 'jimbarho@gmail.com'; 'Karen Haschke'; 'Pansy Benedict(Billy Roeder)'; 'Ptybor@gmail.com'; 'Rob Ruggiero'; 'Ronald G. Fieseler'; 'judge@co.san-saba.tx.us'; 'Ronaldg59@gmail.com'; 'jsking@stpegs.com'; 'David Bradsby'; 'David Meesey ([David.Meesey@twdb.texas.gov](mailto:David.Meesey@twdb.texas.gov))'; 'richard.eyster@texasagriculture.gov'; 'Garren'; 'blcomm2@co.blanco.tx.us'; 'haschkk@LabCorp.com'; 'lpgcd@lostpineswater.org'; 'jim@ccgcd.net'; 'john@bseacd.org'; 'Bill Luedecke ([texasland.bill@gmail.com](mailto:texasland.bill@gmail.com))'; 'Burke, Jaime'; 'Martina Bluem ([Martina.Bluem@LCRA.ORG](mailto:Martina.Bluem@LCRA.ORG))'; 'Wilkinson, Virginia ([Virginia.Wilkinson@aecom.com](mailto:Virginia.Wilkinson@aecom.com))'; 'Krystal Cantu ([Krystal.Cantu@LCRA.ORG](mailto:Krystal.Cantu@LCRA.ORG))'; Martin, Danielle

**Subject:** proposed new BSEACD Management Plan

Planning Group Members,

Please see the attached letter from Kirk Holland, General Manager of the Barton Springs Edwards Aquifer Conservation District (BSEACD). Also attached is a copy of the proposed new BSEACD Management Plan which has been adopted by the BSEACD Board. The proposed plan substantially revises the existing BSEACD 2008 management plan. Also attached is a pdf of the plan appendices. BSEACD is making these documents available for Region K members to comment on the new proposed plan. Martina has loaded the letter and a link to the new proposed management plan on the Region K website under public announcements.

Jeff

**Dana Wilson**

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**From:** Con Mims [cmims@nueces-ra.org]  
**Sent:** Wednesday, October 24, 2012 2:20 PM  
**To:** Kirk Holland  
**Cc:** Dana Wilson; John Dupnik; Erin Newberry; Steve Raabe P. E.; Sam Vaugh; Brian Perkins  
**Subject:** RE: Notice of Availability of BSEACD Adopted Management Plan

Kirk:

This is to acknowledge my receipt of BSEACD's new Management Plan. By copy of this, I am asking Erin to provide copies of your letter to the Region L members for their comments back to you, if any. Let me know if we can be of further assistance.

Con Mims, Chair  
Region L

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**From:** Kirk Holland [mailto:kholland@bseacd.org]  
**Sent:** Wednesday, October 24, 2012 11:33 AM  
**To:** 'Con'  
**Cc:** Dana Wilson; Kirk Holland; John Dupnik  
**Subject:** Notice of Availability of BSEACD Adopted Management Plan

Con,

Please read the letter below, concerning the BSEACD's adoption of a new Management Plan. The letter includes two requests of you and the RWPG. A signed, .pdf version, as USPS-mailed to you yesterday along with a hard copy of the Plan, is also attached, for your records.

Regards,

Kirk Holland, P.G.  
General Manager  
Barton Springs/Edwards Aquifer Conservation District  
1124 Regal Row  
Austin, TX 78748  
Tel. 512.282.8441  
Cell 512.923.7416  
[kholland@bseacd.org](mailto:kholland@bseacd.org)

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**Barton Springs  
Edwards Aquifer**  
CONSERVATION DISTRICT



**By E-mail and USPS Mail**

October 23, 2012

Mr. Con Mims, Chair  
South Central Texas Regional Water Planning Group  
% Nueces River Authority  
P O Box 349  
Uvalde, TX 78801

Subject: New Management Plan Adopted by the Board of Directors of the  
Barton Springs/Edwards Aquifer Conservation District

Dear Con:

Pursuant to Texas Water Code §36.1071 and Texas Administrative Code §356.6(a)(4), the Barton Springs/Edwards Aquifer Conservation District (District) is hereby providing notice of the availability of the revised District Management Plan (Plan) to the South Central Texas Regional Water Planning Group (Region L). I am enclosing a hard copy of this Plan for your convenience; the Plan is also available electronically on our website, at the following location:

The Body of the Plan and Appendices are located at  
[www.bseacd.org/about-us/governing-documents#Revisions](http://www.bseacd.org/about-us/governing-documents#Revisions)

This Plan substantially revises the existing plan, dated August 2008, and it has now been adopted in a properly noticed meeting by Board resolution for review and comment by our two regional planning groups, by the individual GCDs in our two GMAs, and ultimately by the TWDB for its overall approval. Until such approval is received, we consider this a proposed Plan. The Plan authorizes and guides the groundwater management programs and activities of the District for the ten-year period of 2012-2022; it will be considered for revision no later than October 2017.

We have used the TWDB-supplied information from the current State Water Plan in preparing this Plan, in particular the demand projections, surface-water supplies, water needs, and water management strategies applicable to WUGs in our jurisdictional area. The groundwater supply projections contained in the Plan similarly conform to the latest TWDB-supplied Modeled Available Groundwater estimates for our District, which utilize the best available data and analytical methodologies and which achieve the applicable Desired Future Conditions for aquifers that provide groundwater in Region L. Region L may reliably utilize the supplies that the District's objectives and strategies provide, as enumerated in this Plan, for its groundwater supply planning.

As you know, the District staff has actively participated in Region L planning activities for some time. The District has been proactive in discussing the development of alternative water supplies in Region L, especially desalination and aquifer storage and recovery evaluations. We look forward to continuing and expanding that collaboration.

We would request that you disseminate notice of this Plan's availability to members of Region L for both their individual comments and their prospective use, as provided by statute. I would also appreciate a reply to this notice that the Plan has been received by Region L and distributed for use in its water planning activities. On the basis of the TWDB's pre-review comments that have been incorporated, we anticipate no differences between the Plan provided here and the

version that is officially approved by TWDB, except for the inclusion in the appendices of the required notices, such as this one, and their acknowledgments and other related communications. Once the Plan is approved by TWDB, I will notify you and provide you an electronic link to the approved Plan, complete with all appendices.

Please let me know if you have any questions, comments, or concerns about the Plan or this notice process.

Sincerely,

W F (Kirk) Holland, P.G.  
General Manager

Enclosure

The District has not yet received any responses from  
Surface Water Entities  
as of November 26, 2012.

Following are the responses received from  
Groundwater Conservation Districts within GMAs 9 and 10,  
as of November 26, 2012.

## Dana Wilson

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**From:** Kirk Holland  
**Sent:** Monday, October 29, 2012 3:28 PM  
**To:** Dana Wilson  
**Subject:** FW: BCragd Response  
**Attachments:** Barton Springs Ltr 10-29-12.pdf

Coordination with GMA 9's Bandera Co. River Authority and Groundwater District:

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**From:** Prari Blair [<mailto:PBlair@bcragd.org>]  
**Sent:** Monday, October 29, 2012 2:53 PM  
**To:** Kirk Holland  
**Cc:** Ron Fiesler; [dmauk@bcragd.org](mailto:dmauk@bcragd.org)  
**Subject:**

Dear Kirk,

We have received your revised Management Plan. We will forward the Plan to our board. I have attached the letter acknowledging our receipt of the revised Management Plan. We are also sending the original copy via US Mail.

Should you have any questions, please don't hesitate to contact myself or General Manager David Mauk. Thank you.

Sincerely,

Prari Blair

*Prari Blair  
Administrative Assistant/ Records Management Officer/ Finance Coordinator  
Bandera County River Authority & Groundwater District  
PO Box 177  
Bandera, TX 78003  
[pblair@bcragd.org](mailto:pblair@bcragd.org)  
(830) 796 7260*

## Dana Wilson

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**From:** Ronald G Fieseler [manager@blancocountygroundwater.org]  
**Sent:** Thursday, November 08, 2012 8:38 AM  
**To:** Kirk Holland  
**Cc:** Dana Wilson  
**Subject:** RE: BSEACD Adopted Management Plan

Kirk,

Per your request below, I am confirming that the Blanco-Pedernales GCD has received the new BSEACD Adopted Management Plan. I will provide our Board members with either a copy or the link to the online copy at our next Board Meeting.

We are in the process of working with GMA 9 GCDs to prepare a common review process for groundwater management plans. I will provide you with the results of any review conducted by the BPGCD Board or staff.

Regards,

Ron Fieseler  
General Manager, BPGCD

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**From:** Kirk Holland [mailto:kholland@bseacd.org]  
**Sent:** Wednesday, October 24, 2012 10:49 AM  
**To:** Ron Fiesler  
**Cc:** Dana Wilson; Kirk Holland  
**Subject:** BSEACD Adopted Management Plan

Dear Ron,

Please read the letter below, concerning the BSEACD's adoption of a new Management Plan. The letter includes two requests of your GCD. A signed, .pdf version, as USPS-mailed to you yesterday along with a hard copy of the Plan, is also attached, for your records.

Regards,

Kirk Holland, P.G.  
General Manager  
Barton Springs/Edwards Aquifer Conservation District  
1124 Regal Row  
Austin, TX 78748  
Tel. 512.282.8441  
Cell 512.923.7416  
[kholland@bseacd.org](mailto:kholland@bseacd.org)

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**Barton Springs  
Edwards Aquifer**  
CONSERVATION DISTRICT

**By E-mail and USPS Mail**

October 23, 2012

Ron Fieseler, General Manager  
Blanco-Pedernales Groundwater Conservation District  
601 West Main  
P.O. Box 1516  
Johnson City, Texas 78636-1516

Subject: New Management Plan Adopted by the Board of Directors of the  
Barton Springs/Edwards Aquifer Conservation District

Dear Ron:

Pursuant to Texas Water Code §36.108(b), Joint Planning in Management Area, the Barton Springs/Edwards Aquifer Conservation District (District) is providing notice of the availability of the revised District Management Plan (Plan) to the Board of Directors of Blanco-Pedernales Groundwater Conservation District, a fellow member of GMA 9. I am enclosing a hard copy of this Plan; for your convenience, the Plan is also available electronically on our website, at the following location:

The Body of the Plan and Appendices are located at  
[www.bseacd.org/about-us/governing-documents#Revisions](http://www.bseacd.org/about-us/governing-documents#Revisions)

This Plan substantially revises the existing plan, dated August 2008, and it has now been adopted in a properly noticed meeting by Board resolution for review and comment by our two regional planning groups, our two river authorities, and the individual GCDs in our two GMAs, at their discretion, and ultimately by the TWDB for its overall approval. Until such approval is received, we consider this a proposed Plan. The Plan once approved both authorizes and guides the groundwater management programs and activities by the District for the ten-year period of 2012-2022; it will be considered for revision no later than October 2017.

The Plan conforms in all material respects to the requisites of Texas Administrative Code §356.6. The groundwater supply projections contained in the Plan are consistent with the latest TWDB-supplied Modeled Available Groundwater estimates for our District, which utilize the best available data and analytical methodologies. The Plan's objectives and strategies, and the District's Rules that implement those strategies, are designed to achieve and maintain the applicable Desired Future Conditions for the District's regulated aquifers in GMA 9. On the basis of the TWDB's pre-review comments that have been incorporated, we anticipate no differences between the Plan provided here and the version that is officially approved by TWDB, except for the inclusion in the appendices of the required notices, such as this one, and their acknowledgments and other related communications. Once the Plan is approved by TWDB, I will notify you and provide an electronic link to the approved Plan, complete with all appendices.



As you know, when a GCD amends an existing or issues a new Management Plan, under TWC 36.108, each GCD in each GMA of which the GCD is a member must be notified and provided a copy of the revised Management Plan. Specifically, the board of each of the GCDs in those GMAs is statutorily charged with considering that plan individually and comparing it to other management plans of other GCDs in the GMA. Discretion is available in how each board accomplishes that assessment.

Accordingly, we are requesting that you disseminate notice of this Plan's availability to members of your board of directors so that your board and staff may offer any comments on this Plan, either individually or collectively as part of the agenda of some upcoming BPGCD board meeting. I would also appreciate a reply to this notice that the Plan has been received by BPGCD and that we thereby have provided an *opportunity* for BPGCD, at its discretion, to review, provide comments, and use this Plan.

Please let me know if you have any questions, comments, or concerns about the Plan or this notice process.

Sincerely,

W F (Kirk) Holland, P.G.  
General Manager

Enclosure



**Dana Wilson**

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**From:** Kirk Holland  
**Sent:** Wednesday, October 24, 2012 10:53 AM  
**To:** 'Micah Voulgaris'  
**Cc:** Dana Wilson; Kirk Holland; Ron Fiesler  
**Subject:** BSEACD Adopted Management Plan  
**Attachments:** Cow Creek GCD.pdf

Micah,

Please read the letter below, concerning the BSEACD's adoption of a new Management Plan. The letter includes two requests of your GCD. A signed, .pdf version, as USPS-mailed to you yesterday along with a hard copy of the Plan, is also attached, for your records.

Regards,

Kirk Holland, P.G.  
General Manager  
Barton Springs/Edwards Aquifer Conservation District  
1124 Regal Row  
Austin, TX 78748  
Tel. 512.282.8441  
Cell 512.923.7416  
[kholland@bseacd.org](mailto:kholland@bseacd.org)

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**Barton Springs  
Edwards Aquifer**  
CONSERVATION DISTRICT

**By E-mail and USPS Mail**

October 23, 2012

Mr. Micah Voulgaris, General Manager  
Cow Creek Groundwater Conservation District  
201 E. San Antonio Ave., Ste 100  
Boerne, Texas 78006

**Subject:** New Management Plan Adopted by the Board of Directors of the

Barton Springs/Edwards Aquifer Conservation District

Dear Micah:

Pursuant to Texas Water Code §36.108(b), Joint Planning in Management Area, the Barton Springs/Edwards Aquifer Conservation District (District) is providing notice of the availability of the revised District Management Plan (Plan) to the Board of Directors of Cow Creek Groundwater Conservation District, a fellow member of GMA 9. I am enclosing a hard copy of this Plan; for your convenience, the Plan is also available electronically on our website, at the following location:

The Body of the Plan and Appendices are located at  
[www.bseacd.org/about-us/governing-documents#Revisions](http://www.bseacd.org/about-us/governing-documents#Revisions)

This Plan substantially revises the existing plan, dated August 2008, and it has now been adopted in a properly noticed meeting by Board resolution for review and comment by our two regional planning groups, our two river authorities, and the individual GCDs in our two GMAs, at their discretion, and ultimately by the TWDB for its overall approval. Until such approval is received, we consider this a proposed Plan. The Plan once approved both authorizes and guides the groundwater management programs and activities by the District for the ten-year period of 2012-2022; it will be considered for revision no later than October 2017.

The Plan conforms in all material respects to the requisites of Texas Administrative Code §356.6. The groundwater supply projections contained in the Plan are consistent with the latest TWDB-supplied Modeled Available Groundwater estimates for our District, which utilize the best available data and analytical methodologies. The Plan's objectives and strategies, and the District's Rules that implement those strategies, are designed to achieve and maintain the applicable Desired Future Conditions for the District's regulated aquifers in GMA 9. On the basis of the TWDB's pre-review comments that have been incorporated, we anticipate no differences between the Plan provided here and the version that is officially approved by TWDB, except for the inclusion in the appendices of the required notices, such as this one, and their acknowledgments and other related communications. Once the Plan is approved by TWDB, I will notify you and provide an electronic link to the approved Plan, complete with all appendices.

As you know, when a GCD amends an existing or issues a new Management Plan, under TWC 36.108, each GCD in each GMA of which the GCD is a member must be notified and provided a copy of the revised Management Plan. Specifically, the board of each of the GCDs in those GMAs is statutorily charged with considering that plan individually and comparing it to other management plans of other GCDs in the GMA. Discretion is available in how each board accomplishes that assessment.

Accordingly, we are requesting that you disseminate notice of this Plan's availability to members of your board of directors so that your board and staff may offer any comments on this Plan, either individually or collectively as part of the agenda of some upcoming CCGCD board meeting. I would also appreciate a reply to this notice that the Plan has been received by CCGCD and that we thereby have provided an *opportunity* for CCGCD, at its discretion, to review, provide comments, and use this Plan.

Please let me know if you have any questions, comments, or concerns about the Plan or this notice process.

Sincerely,

W F (Kirk) Holland, P.G.  
General Manager

cc: Mr. Ron Fieseler, GMA 9 Committee Coordinator (without enclosure)

Enclosure

## Dana Wilson

---

**From:** Kirk Holland  
**Sent:** Wednesday, October 24, 2012 3:51 PM  
**To:** Dana Wilson  
**Subject:** FW: BSEACD Adopted Management Plan

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**From:** Gene Williams [<mailto:gene@hgcd.org>]  
**Sent:** Wednesday, October 24, 2012 3:45 PM  
**To:** Kirk Holland  
**Cc:** Ron Fiesler  
**Subject:** RE: BSEACD Adopted Management Plan

Thanks Kirk, I agree, and now might be a good time to move on that. I have had my review approved by TWDB on our management plan revision, so it won't be long I will need to send it out to everyone. I am willing to meet in participate in getting that done.

---

**From:** Kirk Holland [<mailto:kholland@bseacd.org>]  
**Sent:** Wednesday, October 24, 2012 3:22 PM  
**To:** 'Gene Williams'  
**Cc:** Dana Wilson; Kirk Holland; John Dupnik; Brian Hunt; Ron Fiesler  
**Subject:** RE: BSEACD Adopted Management Plan

Gene, there is no required timeline, or minimum participation requirement. We would welcome your (or your directors') thoughts on the Plan at anytime, whether before or after we submit it to the TWDB for approval.

We have suggested to the GMA 9 Coordinator that all of the member GCDs might benefit from having a similar approach, if not a standard checklist, for responding to new or amended management plans. We also don't want to suggest that the individual boards shouldn't have some discretion in how they go about such reviews. That said, I do think this is something that could be put on the agenda for an upcoming GMA 9 Committee meeting.

Kirk

---

**From:** Gene Williams [<mailto:gene@hgcd.org>]  
**Sent:** Wednesday, October 24, 2012 1:38 PM  
**To:** Kirk Holland  
**Subject:** RE: BSEACD Adopted Management Plan

Will do Kirk,

I will have to see how the board president wants to handle it, however he is going off the board end of December, we are in the middle of an election and we will have a minimum of 3 new directors out of 5. We are already short 1 director, with some out of town, we had to cancel our last meeting due to lack of a quorum, so it is an unsettled time for our district. I have a feeling it is all going to be my responsibility to review all the plans and report to the board my recommendation. Is there a timeline you need feedback and do you think the GMA 9 committee is going to pursue putting together a standard checklist for everyone?

Call me if you need to, I don't want to do anything to slow down your process in finishing up your plan revision.

Gene

---

**From:** Kirk Holland [<mailto:kholland@bseacd.org>]  
**Sent:** Wednesday, October 24, 2012 1:22 PM  
**To:** 'Gene Williams'  
**Cc:** Dana Wilson; Ron Fiesler; Kirk Holland  
**Subject:** RE: BSEACD Adopted Management Plan

Thanks, Gene.

Please let me know if there is any reason that someone from BSEACD should plan to attend one of your board meetings, if this becomes an agenda item.

Kirk Holland, P.G.

---

**From:** Gene Williams [<mailto:gene@hgcd.org>]  
**Sent:** Wednesday, October 24, 2012 12:12 PM  
**To:** Kirk Holland  
**Cc:** Dana Wilson; Ron Fiesler  
**Subject:** RE: BSEACD Adopted Management Plan

Kirk,

I acknowledge receipt of your revised Management Plan and will make it available to the HGCD Board of Directors.

Gene Williams, HGCD General Manger

---

**From:** Kirk Holland [<mailto:kholland@bseacd.org>]  
**Sent:** Wednesday, October 24, 2012 10:46 AM  
**To:** 'Gene Williams'  
**Cc:** Dana Wilson; Kirk Holland; Ron Fiesler  
**Subject:** BSEACD Adopted Management Plan

Dear Gene,

Please read the letter below, concerning the BSEACD's adoption of a new Management Plan. The letter includes two requests of your GCD. A signed, .pdf version, as USPS-mailed to you yesterday along with a hard copy of the Plan, is also attached, for your records.

Regards,

Kirk Holland, P.G.  
General Manager  
Barton Springs/Edwards Aquifer Conservation District  
1124 Regal Row  
Austin, TX 78748  
Tel. 512.282.8441  
Cell 512.923.7416  
[kholland@bseacd.org](mailto:kholland@bseacd.org)

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**Barton Springs  
Edwards Aquifer**  
CONSERVATION DISTRICT

**By E-mail and USPS Mail**

October 23, 2012

Mr. Gene Williams, General Manager  
Headwaters Groundwater Conservation District  
125 North Lehmann Drive  
Kerrville, TX 78028

Subject: New Management Plan Adopted by the Board of Directors of the  
Barton Springs/Edwards Aquifer Conservation District

Dear Gene:

Pursuant to Texas Water Code §36.108(b), Joint Planning in Management Area, the Barton Springs/Edwards Aquifer Conservation District (District) is providing notice of the availability of the revised District Management Plan (Plan) to the Board of Directors of Headwaters Groundwater Conservation District, a fellow member of GMA 9. I am enclosing a hard copy of this Plan; for your convenience, the Plan is also available electronically on our website, at the following location:

The Body of the Plan and Appendices are located at  
[www.bseacd.org/about-us/governing-documents#Revisions](http://www.bseacd.org/about-us/governing-documents#Revisions)

This Plan substantially revises the existing plan, dated August 2008, and it has now been adopted in a properly noticed meeting by Board resolution for review and comment by our two regional planning groups, our two river authorities, and the individual GCDs in our two GMAs, at their discretion, and ultimately by the TWDB for its overall approval. Until such approval is received, we consider this a proposed Plan. The Plan once approved both authorizes and guides the groundwater management programs and activities by the District for the ten-year period of 2012-2022; it will be considered for revision no later than October 2017.

The Plan conforms in all material respects to the requisites of Texas Administrative Code §356.6. The groundwater supply projections contained in the Plan are consistent with the latest TWDB-supplied Modeled Available Groundwater estimates for our District, which utilize the best available data and analytical methodologies. The Plan's objectives and strategies, and the District's Rules that implement those strategies, are designed to achieve and maintain the applicable Desired Future Conditions for the District's regulated aquifers in GMA 9. On the basis of the TWDB's pre-review

comments that have been incorporated, we anticipate no differences between the Plan provided here and the version that is officially approved by TWDB, except for the inclusion in the appendices of the required notices, such as this one, and their acknowledgments and other related communications. Once the Plan is approved by TWDB, I will notify you and provide an electronic link to the approved Plan, complete with all appendices.

As you know, when a GCD amends an existing or issues a new Management Plan, under TWC 36.108, each GCD in each GMA of which the GCD is a member must be notified and provided a copy of the revised Management Plan. Specifically, the board of each of the GCDs in those GMAs is statutorily charged with considering that plan individually and comparing it to other management plans of other GCDs in the GMA. Discretion is available in how each board accomplishes that assessment.

Accordingly, we are requesting that you disseminate notice of this Plan's availability to members of your board of directors so that your board and staff may offer any comments on this Plan, either individually or collectively as part of the agenda of some upcoming HGCD board meeting. I would also appreciate a reply to this notice that the Plan has been received by HGCD and that we thereby have provided an *opportunity* for HGCD, at its discretion, to review, provide comments, and use this Plan.

Please let me know if you have any questions, comments, or concerns about the Plan or this notice process.

Sincerely,

W F (Kirk) Holland, P.G.  
General Manager

cc: Mr. Ron Fieseler, GMA 9 Committee Coordinator (without enclosure)

Enclosure

## Dana Wilson

---

**From:** Kirk Holland  
**Sent:** Wednesday, October 24, 2012 1:20 PM  
**To:** 'Rick Broun'; '1 Jimmy Skipton'; '2 Mark Key'; '3 Dr. Joan Jernigan'; '4 Greg Nesbitt'; '5 Edward Pope'  
**Cc:** 'Broun Al'; 'Tressy Gumbert'; Ron Fiesler; Dana Wilson; Kirk Holland  
**Subject:** RE: BSEACD Adopted Management Plan

Thanks, Rick.

Please let me know if there is any reason that someone from BSEACD should plan to attend your Board meeting for that item.

Kirk Holland, P.G.

---

**From:** Rick Broun [mailto:manager2@haysgroundwater.com]  
**Sent:** Wednesday, October 24, 2012 11:28 AM  
**To:** '1 Jimmy Skipton'; '2 Mark Key'; '3 Dr. Joan Jernigan'; '4 Greg Nesbitt'; '5 Edward Pope'  
**Cc:** 'Broun Al'; 'Tressy Gumbert'; 'Rick Broun'; Kirk Holland; Ron Fiesler  
**Subject:** FW: BSEACD Adopted Management Plan

Board and Staff:

Please see the email below from Kirk Hollon, General Manager of BSEACD, concerning their proposed management plan. The email does provide a link to BSEACD's website to review their plan [www.bseacd.org/about-us/governing-documents#Revisions](http://www.bseacd.org/about-us/governing-documents#Revisions)

I can add their proposed management plan as an agenda item for our November meeting.

Thank you,

**Rick Broun, General Manager**

Hays Trinity Groundwater Conservation District  
Center Lake Business Park: 14101 Hwy 290 W. Bldg 100, Ste 212  
Mail: P. O. Box 1648: Dripping Springs, TX 78620  
E-mail: [manager2@haysgroundwater.com](mailto:manager2@haysgroundwater.com)  
Phone: 512-858-9253 Fax: 512-858-2384  
Website: [www.haysgroundwater.com](http://www.haysgroundwater.com)



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**From:** Kirk Holland [mailto:kholland@bseacd.org]  
**Sent:** Wednesday, October 24, 2012 11:01 AM  
**To:** 'Rick Broun'  
**Cc:** Dana Wilson; Kirk Holland; Ron Fiesler  
**Subject:** BSEACD Adopted Management Plan

Rick,



Please read the letter below, concerning the BSEACD's adoption of a new Management Plan. The letter includes two requests of your GCD. A signed, .pdf version, as USPS-mailed to you yesterday along with a hard copy of the Plan, is also attached, for your records.

Regards,

Kirk Holland, P.G.  
General Manager  
Barton Springs/Edwards Aquifer Conservation District  
1124 Regal Row  
Austin, TX 78748  
Tel. 512.282.8441  
Cell 512.923.7416  
[kholland@bseacd.org](mailto:kholland@bseacd.org)

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**Barton Springs  
Edwards Aquifer**  
CONSERVATION DISTRICT

**By E-mail and USPS Mail**

October 23, 2012

Mr. Rick Broun, General Manager  
Hays Trinity Groundwater Conservation District  
14101 Hwy 290 W. Bldg 100 Ste 212  
Austin, TX 78737

Subject: New Management Plan Adopted by the Board of Directors of the  
Barton Springs/Edwards Aquifer Conservation District

Dear Rick:

Pursuant to Texas Water Code §36.108(b), Joint Planning in Management Area, the Barton Springs/Edwards Aquifer Conservation District (District) is providing notice of the availability of the revised District Management Plan (Plan) to the Board of Directors of Hays Trinity Groundwater Conservation District, a fellow member of GMA 9. I am enclosing a hard copy of this Plan; for your convenience, the Plan is also available electronically on our website, at the following location:

The Body of the Plan and Appendices are located at  
[www.bseacd.org/about-us/governing-documents#Revisions](http://www.bseacd.org/about-us/governing-documents#Revisions)

This Plan substantially revises the existing plan, dated August 2008, and it has now been adopted in a properly noticed meeting by Board resolution for review and comment by our two regional planning groups, our two river authorities, and the individual GCDs in our two GMAs, at their discretion, and ultimately by the TWDB for its overall approval. Until such approval is received, we consider this a proposed Plan. The Plan once approved both authorizes and guides the groundwater management programs and activities by the District for the ten-year period of 2012-2022; it will be considered for revision no later than October 2017.

The Plan conforms in all material respects to the requisites of Texas Administrative Code §356.6. The groundwater supply projections contained in the Plan are consistent with the latest TWDB-supplied Modeled Available Groundwater estimates for our District, which utilize the best available data and analytical methodologies. The Plan's objectives and strategies, and the District's Rules that implement those strategies, are designed to achieve and maintain the applicable Desired Future Conditions for the District's regulated aquifers in GMA 9. On the basis of the TWDB's pre-review comments that have been incorporated, we anticipate no differences between the Plan provided here and the version that is officially approved by TWDB, except for the inclusion in the appendices of the required notices, such as this one, and their acknowledgments and other related communications. Once the Plan is approved by TWDB, I will notify you and provide an electronic link to the approved Plan, complete with all appendices.

As you know, when a GCD amends an existing or issues a new Management Plan, under TWC 36.108, each GCD in each GMA of which the GCD is a member must be notified and provided a copy of the revised Management Plan. Specifically, the board of each of the GCDs in those GMAs is statutorily charged with considering that plan individually and comparing it to other management plans of other GCDs in the GMA. Discretion is available in how each board accomplishes that assessment.

Accordingly, we are requesting that you disseminate notice of this Plan's availability to members of your board of directors so that your board and staff may offer any comments on this Plan, either individually or collectively as part of the agenda of some upcoming HTGCD board meeting. I would also appreciate a reply to this notice that the Plan has been received by HTGCD and that we thereby have provided an *opportunity* for HTGCD, at its discretion, to review, provide comments, and use this Plan.

Please let me know if you have any questions, comments, or concerns about the Plan or this notice process.

Sincerely,

W F (Kirk) Holland, P.G.  
General Manager

cc: Mr. Ron Fieseler, GMA 9 Committee Coordinator (without enclosure)

Enclosure

## Dana Wilson

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**From:** Ron Naumann [<mailto:ronnaumann@sbcglobal.net>]  
**Sent:** Thursday, October 25, 2012 11:20 AM  
**To:** Kirk Holland  
**Subject:** Re: BSEACD Adopted Management Plan

I don't see a need for anyone attending our meeting I will give the directors and those in attendance a copy of your plan  
Ron

**From:** Kirk Holland <[kholland@bseacd.org](mailto:kholland@bseacd.org)>  
**To:** Ron Naumann <[ronnaumann@sbcglobal.net](mailto:ronnaumann@sbcglobal.net)>  
**Cc:** Dana Wilson <[dana@bseacd.org](mailto:dana@bseacd.org)>; Kirk Holland <[kholland@bseacd.org](mailto:kholland@bseacd.org)>  
**Sent:** Wed, October 24, 2012 1:24:30 PM  
**Subject:** RE: BSEACD Adopted Management Plan

Thanks, Ron.

Please let me know if there is any reason at this juncture that someone from BSEACD should plan to attend your board meeting.

Kirk Holland, P.G.

**From:** Ron Naumann [<mailto:ronnaumann@sbcglobal.net>]  
**Sent:** Wednesday, October 24, 2012 11:25 AM  
**To:** Kirk Holland  
**Subject:** Re: BSEACD Adopted Management Plan

10-24-12

Kirk;

I have forwarded your e-mail to the Board of GCGCD and have placed this on our next agenda for meeting to be held on November 8, 2012

Ron

**From:** Kirk Holland <[kholland@bseacd.org](mailto:kholland@bseacd.org)>  
**To:** Ron Naumann <[ronnaumann@sbcglobal.net](mailto:ronnaumann@sbcglobal.net)>  
**Cc:** Dana Wilson <[dana@bseacd.org](mailto:dana@bseacd.org)>; Kirk Holland <[kholland@bseacd.org](mailto:kholland@bseacd.org)>; Rick Illgner <[rillgner@edwardsaquifer.org](mailto:rillgner@edwardsaquifer.org)>  
**Sent:** Wed, October 24, 2012 11:09:51 AM  
**Subject:** BSEACD Adopted Management Plan

Ron,

Please read the letter below, concerning the BSEACD's adoption of a new Management Plan. The letter includes two requests of your GCD. A signed, .pdf version, as USPS-mailed to you yesterday along with a hard copy of the Plan, is also attached, for your records.

Regards,

Kirk Holland, P.G.  
General Manager  
Barton Springs/Edwards Aquifer Conservation District  
1124 Regal Row  
Austin, TX 78748  
Tel. 512.282.8441  
Cell 512.923.7416  
[kholland@bseacd.org](mailto:kholland@bseacd.org)

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**Barton Springs  
Edwards Aquifer**  
CONSERVATION DISTRICT

**By E-mail and USPS Mail**

October 23, 2012

Mr. Ron Naumann, General Manager  
Guadalupe County Groundwater Conservation District  
PO Box 1221  
Seguin, Texas 78156

Subject: New Management Plan Adopted by the Board of Directors of the  
Barton Springs/Edwards Aquifer Conservation District

Dear Ron:

Pursuant to Texas Water Code §36.108(b), Joint Planning in Management Area, the Barton Springs/Edwards Aquifer Conservation District (District) is providing notice of the availability of the revised District Management Plan (Plan) to the Board of Directors of Guadalupe County Groundwater Conservation District, a fellow member of GMA 10. I am enclosing a hard copy of this Plan; for your convenience, the Plan is also available electronically on our website, at the following location:

The Body of the Plan and Appendices are located at  
[www.bseacd.org/about-us/governing-documents#Revisions](http://www.bseacd.org/about-us/governing-documents#Revisions)

This Plan substantially revises the existing plan, dated August 2008, and it has now been adopted in a properly noticed meeting by Board resolution for review and comment by our two regional planning groups, our two river authorities, and the individual GCDs in our two GMAs, at their discretion, and ultimately by the TWDB for its overall approval. Until such approval is received, we consider this a proposed Plan. The Plan once approved both authorizes and guides the

groundwater management programs and activities by the District for the ten-year period of 2012-2022; it will be considered for revision no later than October 2017.

The Plan conforms in all material respects to the requisites of Texas Administrative Code §356.6. The groundwater supply projections contained in the Plan are consistent with the latest TWDB-supplied Modeled Available Groundwater estimates for our District, which utilize the best available data and analytical methodologies. The Plan's objectives and strategies, and the District's Rules that implement those strategies, are designed to achieve and maintain the applicable Desired Future Conditions for the District's regulated aquifers in GMA 10. On the basis of the TWDB's pre-review comments that have been incorporated, we anticipate no differences between the Plan provided here and the version that is officially approved by TWDB, except for the inclusion in the appendices of the required notices, such as this one, and their acknowledgments and other related communications. Once the Plan is approved by TWDB, I will notify you and provide an electronic link to the approved Plan, complete with all appendices.

As you know, when a GCD amends an existing or issues a new Management Plan, under TWC 36.108, each GCD in each GMA of which the GCD is a member must be notified and provided a copy of the revised Management Plan. Specifically, the board of each of the GCDs in those GMAs is statutorily charged with considering that plan individually and comparing it to other management plans of other GCDs in the GMA. Discretion is available in how each board accomplishes that assessment.

Accordingly, we are requesting that you disseminate notice of this Plan's availability to members of your board of directors so that your board and staff may offer any comments on this Plan, either individually or collectively as part of the agenda of some upcoming GCGCD board meeting. I would also appreciate a reply to this notice that the Plan has been received by GCGCD and that we thereby have provided an *opportunity* for GCGCD, at its discretion, to review, provide comments, and use this Plan.

Please let me know if you have any questions, comments, or concerns about the Plan or this notice process.

Sincerely,

W F (Kirk) Holland, P.G.  
General Manager

cc: Mr. Rick Illgner, GMA 10 Committee Coordinator (without enclosure)

Enclosure

## Dana Wilson

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**From:** Kirk Holland  
**Sent:** Wednesday, October 24, 2012 3:04 PM  
**To:** 'Kinney County GCD'  
**Cc:** Dana Wilson; Kirk Holland; John Dupnik  
**Subject:** RE: BSEACD Adopted Management Plan

Thanks, Ken. Let us know if you believe it would be advantageous for someone from BSEACD to attend your Board meeting in this regard.

Kirk

---

**From:** Kinney County GCD [mailto:kcgcd@sbcglobal.net]  
**Sent:** Wednesday, October 24, 2012 1:39 PM  
**To:** Kirk Holland  
**Subject:** Re: BSEACD Adopted Management Plan

Kirk

We acknowledge that we at the Kinney County Groundwater Conservation District have received your revised Management Plan. I will distribute it to the Board of Directors and will place it on a Board Agenda for official conseration.

Thank you,  
Ken Carver, General Manager  
Kinney County Groundwater Conservation District  
(830)563-9969  
Fax: (830)563-6906  
Email: [kcgcd@sbcglobal.net](mailto:kcgcd@sbcglobal.net)

**The attached document, contains information from the KCGCD office that is confidential and privileged, or may contain attorney work product. The information is intended only for the use of the addressee named above. If you are not the intended recipient, you are hereby notified that any disclosure, copying, or distribution of this email or attached documents, or taking any action in reliance on the contents of this message or its attachments is strictly prohibited, and may be unlawful. If you have received this message in error, please (1) immediately notify me by reply email, (2) do not review, copy, save, forward, or print this email or any of its attachments, and (3) immediately delete and destroy this email, its attachments and all copies thereof. Unintended transmission does not constitute waiver of the attorney-client privilege or any other privilege.**

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**From:** Kirk Holland <kholland@bseacd.org>  
**To:** Ken Carver <kcgcd@sbcglobal.net>  
**Cc:** Dana Wilson <dana@bseacd.org>; Kirk Holland <kholland@bseacd.org>; Rick Illgner <rillgner@edwardsaquifer.org>  
**Sent:** Wed, October 24, 2012 11:12:28 AM  
**Subject:** BSEACD Adopted Management Plan

Ken,

Please read the letter below, concerning the BSEACD's adoption of a new Management Plan. The letter includes two requests of your GCD. A signed, .pdf version, as USPS-mailed to you yesterday along with a hard copy of the Plan, is also attached, for your records.

Regards,

Kirk Holland, P.G.  
General Manager  
Barton Springs/Edwards Aquifer Conservation District  
1124 Regal Row  
Austin, TX 78748  
Tel. 512.282.8441  
Cell 512.923.7416  
[kholland@bseacd.org](mailto:kholland@bseacd.org)

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\*\*\*\*\*



**Barton Springs  
Edwards Aquifer**  
CONSERVATION DISTRICT

**By E-mail and USPS Mail**

October 23, 2012

Mr. Ken Carver, General Manager  
Kinney County Groundwater Conservation District  
112 West Spring Street  
Brackettville TX 78832

Subject: New Management Plan Adopted by the Board of Directors of the  
Barton Springs/Edwards Aquifer Conservation District

Dear Ken:

Pursuant to Texas Water Code §36.108(b), Joint Planning in Management Area, the Barton Springs/Edwards Aquifer Conservation District (District) is providing notice of the availability of the revised District Management Plan (Plan) to the Board of Directors of Kinney County Groundwater Conservation District, a fellow member of GMA 10. I am enclosing a hard copy of this Plan; for your convenience, the Plan is also available electronically on our website, at the following location:

The Body of the Plan and Appendices are located at  
[www.bseacd.org/about-us/governing-documents#Revisions](http://www.bseacd.org/about-us/governing-documents#Revisions)

This Plan substantially revises the existing plan, dated August 2008, and it has now been adopted in a properly noticed meeting by Board resolution for review and comment by our two regional planning groups, our two river authorities, and the individual GCDs in our two GMAs, at their discretion, and ultimately by the TWDB for its overall approval. Until such approval is received, we consider this a proposed Plan. The Plan once approved both authorizes and guides the

groundwater management programs and activities by the District for the ten-year period of 2012-2022; it will be considered for revision no later than October 2017.

The Plan conforms in all material respects to the requisites of Texas Administrative Code §356.6. The groundwater supply projections contained in the Plan are consistent with the latest TWDB-supplied Modeled Available Groundwater estimates for our District, which utilize the best available data and analytical methodologies. The Plan's objectives and strategies, and the District's Rules that implement those strategies, are designed to achieve and maintain the applicable Desired Future Conditions for the District's regulated aquifers in GMA 10. On the basis of the TWDB's pre-review comments that have been incorporated, we anticipate no differences between the Plan provided here and the version that is officially approved by TWDB, except for the inclusion in the appendices of the required notices, such as this one, and their acknowledgments and other related communications. Once the Plan is approved by TWDB, I will notify you and provide an electronic link to the approved Plan, complete with all appendices.

As you know, when a GCD amends an existing or issues a new Management Plan, under TWC 36.108, each GCD in each GMA of which the GCD is a member must be notified and provided a copy of the revised Management Plan. Specifically, the board of each of the GCDs in those GMAs is statutorily charged with considering that plan individually and comparing it to other management plans of other GCDs in the GMA. Discretion is available in how each board accomplishes that assessment.

Accordingly, we are requesting that you disseminate notice of this Plan's availability to members of your board of directors so that your board and staff may offer any comments on this Plan, either individually or collectively as part of the agenda of some upcoming KCGCD board meeting. I would also appreciate a reply to this notice that the Plan has been received by KCGCD and that we thereby have provided an *opportunity* for KCGCD, at its discretion, to review, provide comments, and use this Plan.

Please let me know if you have any questions, comments, or concerns about the Plan or this notice process.

Sincerely,

W F (Kirk) Holland, P.G.  
General Manager

cc: Mr. Rick Illgner, GMA 10 Committee Coordinator (without enclosure)

Enclosure



## Dana Wilson

---

**From:** Kirk Holland  
**Sent:** Wednesday, October 24, 2012 3:05 PM  
**To:** 'Johnie Halliburton'  
**Cc:** Dana Wilson; Kirk Holland; John Dupnik  
**Subject:** RE: BSEACD Adopted Management Plan

Thanks, Johnie. Let us know if you think it would be beneficial for someone from BSEACD to visit with your Directors, either individually or in a Board meeting, to discuss our Plan further.

Kirk

---

**From:** Johnie Halliburton [mailto:johnie@pccd.org]  
**Sent:** Wednesday, October 24, 2012 1:39 PM  
**To:** Kirk Holland  
**Subject:** RE: BSEACD Adopted Management Plan

Kirk,

I will pass your proposed Management Plan on to our Directors.

Thank you,  
Johnie

Johnie Halliburton  
Executive Manager  
Plum Creek Conservation District  
1101 W. San Antonio  
Lockhart, Texas 78644  
512-398-2383 Office  
512-398-7776 Fax  
Email: [johnie@pccd.org](mailto:johnie@pccd.org)

---

**From:** Kirk Holland [mailto:kholland@bseacd.org]  
**Sent:** Wednesday, October 24, 2012 11:15 AM  
**To:** Johnie Halliburton; Daniel Meyer  
**Cc:** Dana Wilson; Kirk Holland; 'Rick Illgner'  
**Subject:** BSEACD Adopted Management Plan

Johnie and Daniel,

Please read the letter below, concerning the BSEACD's adoption of a new Management Plan. The letter includes two requests of your GCD. A signed, .pdf version, as USPS-mailed to you yesterday along with a hard copy of the Plan, is also attached, for your records.

Regards,

Kirk Holland, P.G.  
General Manager  
Barton Springs/Edwards Aquifer Conservation District  
1124 Regal Row  
Austin, TX 78748  
Tel. 512.282.8441  
Cell 512.923.7416  
[kholland@bseacd.org](mailto:kholland@bseacd.org)

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**Barton Springs  
Edwards Aquifer**  
CONSERVATION DISTRICT

**By E-mail and USPS Mail**

October 23, 2012

Mr. Johnie Halliburton, General Manager  
Plum Creek Conservation District  
1101 West San Antonio Street  
PO Box 328  
Lockhart, Texas 78644

Subject: New Management Plan Adopted by the Board of Directors of the  
Barton Springs/Edwards Aquifer Conservation District

Dear Johnie:

Pursuant to Texas Water Code §36.108(b), Joint Planning in Management Area, the Barton Springs/Edwards Aquifer Conservation District (District) is providing notice of the availability of the revised District Management Plan (Plan) to the Board of Directors of Plum Creek Conservation District, a fellow member of GMA 10. I am enclosing a hard copy of this Plan; for your convenience, the Plan is also available electronically on our website, at the following location:

The Body of the Plan and Appendices are located at  
[www.bseacd.org/about-us/governing-documents#Revisions](http://www.bseacd.org/about-us/governing-documents#Revisions)

This Plan substantially revises the existing plan, dated August 2008, and it has now been adopted in a properly noticed meeting by Board resolution for review and comment by our two regional planning groups, our two river authorities, and the individual GCDs in our two GMAs, at their discretion, and ultimately by the TWDB for its overall approval. Until such approval is received, we consider this a proposed Plan. The Plan once approved both authorizes and guides the

groundwater management programs and activities by the District for the ten-year period of 2012-2022; it will be considered for revision no later than October 2017.

The Plan conforms in all material respects to the requisites of Texas Administrative Code §356.6. The groundwater supply projections contained in the Plan are consistent with the latest TWDB-supplied Modeled Available Groundwater estimates for our District, which utilize the best available data and analytical methodologies. The Plan's objectives and strategies, and the District's Rules that implement those strategies, are designed to achieve and maintain the applicable Desired Future Conditions for the District's regulated aquifers in GMA 10. On the basis of the TWDB's pre-review comments that have been incorporated, we anticipate no differences between the Plan provided here and the version that is officially approved by TWDB, except for the inclusion in the appendices of the required notices, such as this one, and their acknowledgments and other related communications. Once the Plan is approved by TWDB, I will notify you and provide an electronic link to the approved Plan, complete with all appendices.

As you know, when a GCD amends an existing or issues a new Management Plan, under TWC 36.108, each GCD in each GMA of which the GCD is a member must be notified and provided a copy of the revised Management Plan. Specifically, the board of each of the GCDs in those GMAs is statutorily charged with considering that plan individually and comparing it to other management plans of other GCDs in the GMA. Discretion is available in how each board accomplishes that assessment.

Accordingly, we are requesting that you disseminate notice of this Plan's availability to members of your board of directors so that your board and staff may offer any comments on this Plan, either individually or collectively as part of the agenda of some upcoming PCCD board meeting. I would also appreciate a reply to this notice that the Plan has been received by PCCD and that we thereby have provided an *opportunity* for PCCD, at its discretion, to review, provide comments, and use this Plan.

Please let me know if you have any questions, comments, or concerns about the Plan or this notice process.

Sincerely,

W F (Kirk) Holland, P.G.  
General Manager

cc: Mr. Rick Illgner, GMA 10 Committee Coordinator (without enclosure)

Enclosure



## **APPENDIX II**

### **HYDROGEOLOGY AND WATER AVAILABILITY OF THE DISTRICT'S AQUIFERS**

#### **HYDROGEOLOGY AND SUSTAINABLE YIELD OF THE BARTON SPRINGS SEGMENT OF THE EDWARDS AQUIFER**

## APPENDIX II

### HYDROGEOLOGY AND WATER AVAILABILITY OF THE DISTRICT'S AQUIFERS

#### HYDROGEOLOGY AND SUSTAINABLE YIELD OF THE BARTON SPRINGS SEGMENT OF THE EDWARDS AQUIFER

##### **Hydrogeology Background**

The most prolific aquifers within the study area are composed of Cretaceous-age limestone and siliciclastic units that comprise the Edwards and Trinity Aquifers. These aquifers are defined as major aquifers of Texas (Ashworth and Hopkins, 1995). Both aquifers are discussed in some detail below. Regional geologic and hydrogeology information for the Edwards and Trinity Aquifer systems are summarized in Lindgren et al. (2004), Ryder (1996), and Barker et al. (1994).

Two regional structural features greatly influence the geology and hydrogeology of Central Texas. The San Marcos Arch, a SE-NW plunging structural high feature, provided detrital material and influenced deposition of the lower Cretaceous sediments of central Texas (Striklin et al., 1971). The San Marcos Arch is an extension of the Llano Uplift. The Balcones Fault Zone (BFZ) is an area of intense Miocene-age northeast-trending normal (down to the coast) faulting. Miocene-age normal faulting is not limited to the BFZ, but also extends west into the Hill Country.

##### **Central Texas Climate**

The climate of the study area is characterized as humid subtropical with an annual rainfall amount of 33.5 inches. Precipitation is fairly evenly distributed throughout the year with peaks occurring in May and September (Brune and Duffin, 1983). However, the region often receives a large portion of its annual rainfall in a very short period of time, resulting in flash flooding and periods of short, but intense recharge events.

Central Texas' worst drought on record was a 7-year period from 1950 through 1956. The lowest total annual rainfall for Austin's Camp Mabry in 1954 was 11.42 inches. During this drought, water levels reached historic low levels and many springs stopped flowing completely, including Comal Springs. The annual mean discharge for Barton Springs was 13 cubic feet per second (cfs) in 1956, with the lowest monthly mean discharge of 11 cfs occurring in July and August of 1956. The lowest measured spring discharge value was 9.6 cfs on March 26, 1956. Long-term average springflow values for Barton Springs are about 53 cfs (Slade et al., 1986; Scanlon et al., 2001).

## Edwards Aquifer

The Edwards Aquifer of Central Texas is a freshwater karst aquifer developed in faulted and fractured Cretaceous-age Edwards Group limestones and dolomites. The Edwards Aquifer system lies within the BFZ. Hydrologic divides separate the Edwards Aquifer into three segments. The smallest segment, the Barton Springs segment of the Edwards Aquifer (Barton Springs aquifer), is the segment managed by the District.

The Barton Springs segment provides water for about 60,000 people and currently has about 7,800 acre-feet/year (2.5 billion gallons; 11 cfs) of authorized pumping from 94 permit holders under non-drought conditions. Groundwater use is characterized as 80 percent public-supply, 13 percent industrial (quarry operations), and 7 percent irrigation (golf courses). The District contains about 1,230 operational wells, with the majority producing water from the Edwards (Hunt et al., 2006a).

The Barton Springs aquifer is 155 mi<sup>2</sup> in area, with about 80 percent of the aquifer under unconfined conditions, and a maximum thickness of about 450 feet. The primary natural discharge point is Barton Springs, located in Barton Creek about ¼ mile upstream of its confluence with the Colorado River. The Barton Springs aquifer is bounded to the north by the Colorado River and by the outcrop and saturated thickness of the Edwards Group to the west. The eastern boundary of the aquifer is the interface between freshwater and saline or brackish water (>1,000 mg/L total dissolved solids) and is a complex, three-dimensional, freshwater/saline-water boundary, often called the “bad water line.” The saline-water zone is also characterized by a decrease in the relative transmissivity (Flores, 1990). Hovorka et al. (1998) describe this boundary as hydrodynamically controlled rather than separated by a distinct hydrologic barrier, although local fault control was noted. The southern hydrologic divide between the Barton Springs and San Antonio segments is approximately located between Onion Creek and the Blanco River. This divide may fluctuate according to hydrologic conditions, as supported by potentiometric-surface elevations and recent tracer testing results (LBG-Guyton Associates, 1994; Hunt et al., 2005).

Mapping of the Barton Springs aquifer has delineated geologic faults and several informal stratigraphic members of the Kainer and Person Formations of the Edwards Group (Rose, 1972), each having distinctive hydrogeologic characteristics (Small et al., 1996). Formation of the aquifer was influenced significantly by fracturing and faulting associated with Miocene-age BFZ and dissolution of limestone and dolomite units by infiltrating meteoric water (Sharp, 1990; Barker et al., 1994; Hovorka et al., 1995). Faults trend predominantly to the northeast and are downthrown to the southeast, with total offset of about 1,100 feet across the study area. As a result of faulting and erosion, the aquifer ranges from about 450 feet at its thickest along the east side, to 0 feet along the west side of the recharge zone (Slade et al., 1986). Dissolution along

fractures, faults, and bedding plane partings and within certain lithologic units has created numerous sinkholes, sinking streams, springs, conduits, and caves.

### *Groundwater Flow*

The karstic Edwards Aquifer is inherently heterogeneous and anisotropic, which strongly influence groundwater flow and storage (Slade et al., 1985; Maclay and Small, 1986; Hovorka et al., 1996 and 1998; Hunt et al., 2005). Groundwater generally flows west to east across the recharge zone, converging with preferential groundwater flow paths subparallel to major faulting, and then flowing north toward Barton Springs.

The Edwards Aquifer can be described as a triple porosity and permeability system consisting of matrix, fracture, and conduit porosity (Hovorka et al., 1995; Halihan et al., 2000; Lindgren et al., 2004) reflecting an interaction between rock properties, structural history, and hydrologic evolution (Lindgren et al., 2004). Halihan et al., (1999) describe permeability that varies with the direction and scale of measurement and values ranging over nine orders of magnitude. Accordingly, the system is often characterized as having a slow flow system (diffuse or matrix flow) and a fast flow system (fracture/conduit flow). Mean hydraulic conductivities are two orders of magnitude higher in the confined zone compared to the unconfined zone (Lindgren et al., 2004). Median specific capacity of wells in the Barton Springs aquifer is higher within the confined zone compared to the unconfined zone (BSEACD, unpublished data). Matrix porosity and permeability is dwarfed by the fracture and conduit permeability. Fractures may control flow on the well-scale, with conduits controlling flow on the regional scale (Halihan et al., 2000). The probability of wells intersecting conduits is very low (Halihan et al., 2000), therefore most wells are influenced by matrix and fracture permeability, rather than conduit permeability, to varying degrees. This is consistent with a study by Hovorka et al (1998) that reported only 1 percent of flow is from the matrix. However, a trend of relatively high matrix permeability is observed on both sides of the freshwater/saline-water boundary. In contrast, the matrix permeability is relatively low for rocks in the outcrop (Hovorka et al., 1998). Groundwater dye-tracing and other studies demonstrate that a significant amount of groundwater flow is discrete, occurring in a well integrated network of conduits, caves, and smaller dissolution features (Hauwert et al., 2002a; Hauwert et al., 2002b). Interpreted flow paths from tracer testing generally coincide with troughs in the potentiometric surface and are parallel to the N40E (dominant) and N45W (secondary) fault and fracture trends presented on geologic maps, indicating the structural influence on groundwater flow. Rates of groundwater flow along preferential flow paths, determined from dye tracing, can be as fast as 4 to 7 miles/day under high-flow conditions or about 1 mile/day under low-flow conditions (Hauwert et al., 2002a). Tracer tests have also helped define groundwater basins such as the Cold Springs, Sunset Valley, and Manchaca sub-basins of the Barton Springs aquifer. Traces from two features in Onion Creek have produced divergent flow paths that appear to reconverge before discharging at Barton Springs. Despite the rapid groundwater flow rates within conduits, Kresic (2007) states that, “a disproportionately larger



volume of any karst aquifer has relatively low groundwater velocities (laminar flow) through small fissures and rock matrix.”

### *Water Quality*

The U.S. Environmental Protection Agency (USEPA) has identified karst aquifers, such as the Barton Springs aquifer, as one of the aquifer types most vulnerable to pollution (Schindel et al., 1996). Karst aquifers are noted for their rapid groundwater velocities and limited ability to filter contaminants. Despite that fact, water quality in the freshwater Barton Springs aquifer is currently very good. Contaminant levels in most of the sampled wells and springs are low compared to EPA MCLs (Smith et al., 2001). However, recent studies have begun to detect persistent, but low levels of contaminants in discharge from Barton Springs (Mahler et al., 2006).

The Edwards Group limestone contains saline water east of the Barton Springs aquifer and may also provide a source of water in the future with desalinization, or a reservoir for freshwater injected through an aquifer storage and recovery system. Studies are underway to evaluate that potential.

### **Trinity Aquifer**

The Trinity Aquifer is a major aquifer of Texas composed of Cretaceous-age limestones and sandstones subdivided into the Upper, Middle, and Lower Trinity Aquifers. The Trinity Aquifer in the Central Texas Hill Country dips and thickens to the southeast off the Llano Uplift toward the BFZ. The aquifer extends into the BFZ, below the Barton Springs aquifer, although the eastern boundary of the Trinity Aquifer is a line demarking total dissolved solids greater than 3,000 mg/L (Ashworth and Hopkins, 1995). The District has five permittees that pumped about 44.3 million gallons from the Middle Trinity Aquifer in 2005. This total represents about 2 percent of the total groundwater pumped in 2005 by all District permittees (Hunt et al., 2006a). In this document an attempt is made to distinguish between the Trinity Aquifer of the Hill Country and the Trinity Aquifer within the BFZ. Much more is known about the Trinity Aquifer in the Hill Country region, while investigations are under way to learn more about the Trinity Aquifer within the BFZ.

The Upper Trinity Aquifer consists solely of the Upper Glen Rose Formation. The Upper Glen Rose Formation is about 350 to 400 feet thick with beds of alternating limestone, dolomite, marl, and shale; gypsum and anhydrite are common. Repeating marl units within the Upper Trinity have low permeability and impede vertical flow so that flow is generally lateral to incised streams and rivers providing base flow (Mace et al., 2000). This aquifer satisfies, almost exclusively, domestic and livestock needs with very small (less than 5 gpm) to small (5 to 20 gpm) yields of highly mineralized water (relative to the Edwards Aquifer) in the Central Texas Hill Country, and within the western portion of the District (DeCook, 1960; Ashworth, 1983;

Muller and McCoy, 1987). The division between the Upper and Middle Trinity Aquifers is defined by the geologically distinctive “Corbula Bed” (Bluntzer, 1992). In the Hill Country, the Upper Trinity Aquifer is generally unconfined.

The Middle Trinity Aquifer consists of (from stratigraphically lowest to highest) the Cow Creek, Hensell Sand, and the Lower Glen Rose Formation. The Cow Creek is a massive, sandy dolomitic limestone. The Hensell Sand is lithologically diverse and composed of gravel, sand, silt, limestone, and shale. The Lower Glen Rose Formation is composed of massive fossiliferous limestone and dolomite that grade upward into thin beds of limestone, shale, and marl. The thickness of the Middle Trinity averages about 320 feet (Al Broun, unpublished data). The Middle Trinity Aquifer yields small to moderate quantities of freshwater to moderately saline water (Brune and Duffin, 1983). The Middle Trinity Aquifer in the Hill Country varies from unconfined in the west to partially confined conditions to the east. The Middle Trinity Aquifer is confined in the BFZ.

The Lower Trinity Aquifer is separated from the overlying Middle Trinity Aquifer by the Hammett Shale, which is about 30-60 feet thick (Al Broun, unpublished data). The Lower Trinity Aquifer is composed of the Hosston and overlying Sligo Formations. The Hosston is composed of conglomerate, sand, siltstone, and shale. The Sligo is composed of limestone and dolomite with locally sandy units. The average thickness of the Lower Trinity Aquifer is about 190 feet, however due to depth, the Lower Trinity Aquifer is rarely fully penetrated, so this may underestimate the thickness (Al Broun, unpublished data). This aquifer yields small to large amounts of freshwater to moderately saline water in the Hill Country (Brune and Duffin, 1983). The water quality and yield from wells in the Lower Trinity of the BFZ is unknown at this time.

#### *Regional Groundwater Flow*

Groundwater flow in the Trinity Aquifer of the Hill Country is generally from the west, where Trinity units are exposed on the structurally high Llano Uplift, to the east toward the BFZ. Potentiometric maps of the Hill Country area indicate lateral flow from the Upper and Middle Trinity Aquifer toward the Colorado River in northwestern Hays and western Travis Counties (Mace et al., 2000). Groundwater modeling indicates flow into the BFZ in Hays and Travis counties is much less (only 3 percent of the budget) than the rest of the Hill Country (Mace et al., 2000). The Trinity Aquifer is described as a leaky aquifer system with potential for vertical groundwater flow downward in the Hill Country (Muller and McCoy, 1987).

#### *Water Quality*

Water quality is variable for the Trinity Aquifer and often contains high total dissolved solids and undesirable constituents such as sulfates, iron, and fluorides (Ashworth, 1983; Muller and McCoy, 1987). Although the water quality is generally considered acceptable, locally it can be

unsuitable for potable use. In particular there are two distinctive evaporite zones in the upper Glen Rose composed of gypsum and anhydrite (Bluntzer, 1992; Striklin et al., 1971) that are often the source of the sulfates. These units, coupled with poor well construction practices, have contributed to degraded water quality of the Middle Trinity Aquifer (Ashworth, 1983; Bluntzer, 1992). The boundary between fresh and slightly saline (1,000-3,000 mg/l) water is poorly defined for the Trinity Aquifer. Along the western part of the District, where the Edwards Aquifer is thin, water-supply wells commonly penetrate the lower Edwards units and are completed in the Upper and Middle Trinity Aquifers.

### **Sustainable Yield Analysis**

Texas state law requires water planning for DOR conditions and use of groundwater modeling information in conjunction with other studies or data about the aquifer. Results of the District's sustainable yield studies for the Barton Springs aquifer are presented in Smith and Hunt (2004a) and generally followed the approach outlined by the TWDB (Mace et al., 2000).

Evaluation of sustainable yield was based on modification of a Groundwater Availability Model developed for the Barton Springs segment by Scanlon et al. (2001). The model was recalibrated to better match simulated and measured springflow and water-level data from the 1950's drought (Smith and Hunt, 2004a). The recalibrated model was then used to predict springflow and water-level declines under 1950's drought conditions and various future (increasing) pumping scenarios. Hydrogeological data, such as saturated-thickness maps, potentiometric-surface maps, and well-construction and yield data, were evaluated along with the model results so that impacts to water-supply wells under 1950's drought conditions and various rates of pumping could be estimated (Hunt and Smith, 2004a).

Results of the evaluations indicate that water levels and spring flow are significantly affected by 1950's drought conditions and increased pumping rates. Simulations indicate that a given pumping rate applied under 1950's drought conditions would diminish Barton Springs flow by an amount equivalent to the pumping rate. At 10 cfs of pumping a small amount of spring flow (~1 cfs monthly average) would be maintained. However, according to a minimum daily discharge of 9.6 cfs, such as that measured in 1956, spring flow could temporarily cease for days or weeks. At 15 cfs of pumping, spring flow would cease for at least 4 months. As many as 19 percent of all water-supply wells in the District may have adverse impacts under 1950's drought conditions and a pumping rate of 10 cfs (Smith and Hunt, 2004a).



**APPENDIX III**

**TWDB REPORT**

**ESTIMATED HISTORICAL GROUNDWATER USE  
AND 2012 STATE WATER PLAN DATASETS:**

**BARTON SPRINGS/EDWARDS AQUIFER CONSERVATION DISTRICT**

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# Estimated Historical Groundwater Use and 2012 State Water Plan Datasets:

## Barton Springs/Edwards Aquifer Conservation District

by Stephen Allen  
Texas Water Development Board  
Groundwater Resources Division  
Groundwater Technical Assistance Section  
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(512) 463-7317  
September 24, 2012

### **GROUNDWATER MANAGEMENT PLAN DATA:**

This package of water data reports (part 1 of a 2-part package of information) is being provided to groundwater conservation districts to help them meet the requirements for approval of their five-year groundwater management plan. Each report in the package addresses a specific numbered requirement in the Texas Water Development Board's groundwater management plan checklist. The checklist can be viewed and downloaded from this web address:

<http://www.twdb.texas.gov/groundwater/docs/GCD/GMPchecklist0911.pdf>

The five reports included in part 1 are:

1. Estimated Historical Groundwater Use (checklist Item 2)  
from the TWDB Historical Water Use Survey (WUS)
2. Projected Surface Water Supplies (checklist Item 6)
3. Projected Water Demands (checklist Item 7)
4. Projected Water Supply Needs (checklist Item 8)
5. Projected Water Management Strategies (checklist Item 9)  
reports 2-5 are from the 2012 State Water Plan (SWP)

Part 2 of the 2-part package is the groundwater availability model (GAM) report. The District should have received, or will receive, this report from the Groundwater Availability Modeling Section. Questions about the GAM can be directed to Dr. Shirley Wade, shirley.wade@twdb.texas.gov or (512) 936-0883.

## **DISCLAIMER:**

The data presented in this report represents the most updated Historical Groundwater Use and 2012 State Water Planning data available as of 9/24/2012. Although it does not happen frequently, neither of these datasets are static and are subject to change pending the availability of more accurate data (Historical Water Use data) or an amendment to the 2012 State Water Plan (2012 State Water Planning data). District personnel must review these datasets and correct any discrepancies in order to ensure approval of their groundwater management plan.

The Historical Water Use dataset can be verified at this web address:

<http://www.twdb.texas.gov/waterplanning/waterusesurvey/estimates/>

The 2012 State Water Planning dataset can be verified by contacting Wendy Barron (wendy.barron@twdb.texas.gov or 512-936-0886).

The values presented in the data tables of this report are county-based. In cases where groundwater conservation districts cover only a portion of one or more counties the data values are modified with an apportioning multiplier to create new values that more accurately represent district conditions. The multiplier used as part of the following formula is a land area ratio: (data value \* (land area of district in county / land area of county)). For two of the four State Water Plan tables (Projected Surface Water Supplies and Projected Water Demands) only the county-wide water user group (WUG) data values (county other, manufacturing, steam electric power, irrigation, mining and livestock) are modified using the multiplier. WUG values for municipalities, water supply corporations, and utility districts are not apportioned; instead, their full values are retained if they are located within the district, and eliminated if they are located outside (we ask each district to identify these locations).

The two other SWP tables (Projected Water Supply Needs and Projected Water Management Strategies) are not apportioned because district-specific values are not statutorily required. Each district needs only "consider" the county values in those tables.

In the Historical Groundwater Use table every category of water use (including municipal) is apportioned. Staff determined that breaking down the annual municipal values into individual WUGs was too complex.

TWDB recognizes that the apportioning formula used is not perfect but it is the best available process with respect to time and staffing constraints. If a district believes it has data that is more accurate it has the option of including those data in the plan with an explanation of how the data were derived. Apportioning percentages are listed above each applicable table.

For additional questions regarding this data, please contact Stephen Allen (stephen.allen@twdb.texas.gov or 512-463-7317) or Rima Petrossian (rima.petrossian@twdb.texas.gov or 512-936-2420).

# Estimated Historical Groundwater Use

## TWDB Historical Water Use Survey (WUS) Data

Groundwater use estimates are currently unavailable for 2005. TWDB staff anticipates the calculation and posting of these estimates at a later date.

### CALDWELL COUNTY

*4.54 % (multiplier)*

All values are in acre-feet/year

Year	Source	Municipal	Manufacturing	Steam Electric	Irrigation	Mining	Livestock	Total
1974	GW	139	9	0	4	3	11	166
1980	GW	122	2	0	5	0	8	137
1984	GW	166	2	0	9	0	4	181
1985	GW	148	2	0	7	1	3	161
1986	GW	154	2	0	7	0	4	167
1987	GW	150	0	0	7	1	4	162
1988	GW	152	0	0	7	1	4	164
1989	GW	155	0	0	7	1	4	167
1990	GW	163	0	0	31	1	4	199
1991	GW	141	0	0	0	1	4	146
1992	GW	146	0	0	34	1	4	185
1993	GW	158	0	0	7	1	3	169
1994	GW	156	0	0	7	1	4	168
1995	GW	155	0	0	10	1	4	170
1996	GW	180	1	0	10	1	4	196
1997	GW	162	0	0	9	1	4	176
1998	GW	172	0	0	33	1	4	210
1999	GW	171	0	0	28	1	4	204
2000	GW	170	0	0	6	1	4	181
2001	GW	146	9	0	10	0	3	168
2002	GW	139	0	0	10	0	3	152
2003	GW	161	0	0	6	0	3	170
2004	GW	154	0	0	7	0	3	164
2006	GW	76	0	0	16	0	9	101
2007	GW	69	0	0	3	0	9	81
2008	GW	139	0	0	12	0	8	159
2009	GW	123	0	0	7	0	7	137



# Estimated Historical Groundwater Use

## TWDB Historical Water Use Survey (WUS) Data

Groundwater use estimates are currently unavailable for 2005. TWDB staff anticipates the calculation and posting of these estimates at a later date.

### HAYS COUNTY

*15.45 % (multiplier)*

All values are in acre-feet/year

Year	Source	Municipal	Manufacturing	Steam Electric	Irrigation	Mining	Livestock	Total
1974	GW	780	28	0	71	1	12	892
1980	GW	1,285	208	0	46	0	9	1,548
1984	GW	1,612	196	0	23	15	10	1,856
1985	GW	1,727	212	0	29	15	10	1,993
1986	GW	1,784	184	0	20	134	11	2,133
1987	GW	1,931	164	0	16	0	10	2,121
1988	GW	1,910	238	0	13	0	11	2,172
1989	GW	2,017	115	0	0	0	11	2,143
1990	GW	1,788	45	0	0	0	10	1,843
1991	GW	1,747	44	0	0	8	11	1,810
1992	GW	1,807	62	0	0	11	7	1,887
1993	GW	1,945	67	0	0	11	9	2,032
1994	GW	1,966	74	0	0	25	10	2,075
1995	GW	2,164	70	0	0	25	10	2,269
1996	GW	2,165	76	0	0	25	8	2,274
1997	GW	2,103	91	0	0	24	7	2,225
1998	GW	2,351	93	0	0	23	8	2,475
1999	GW	2,355	54	0	0	23	9	2,441
2000	GW	1,470	96	0	2	23	8	1,599
2001	GW	1,550	423	0	2	19	4	1,998
2002	GW	1,636	85	0	2	19	4	1,746
2003	GW	1,475	86	0	15	25	4	1,605
2004	GW	1,329	51	0	19	25	4	1,428
2006	GW	1,872	81	0	37	2	32	2,024
2007	GW	1,651	73	0	189	0	18	1,931
2008	GW	1,932	79	0	40	0	13	2,064
2009	GW	1,844	24	0	113	102	47	2,130

# Estimated Historical Groundwater Use

## TWDB Historical Water Use Survey (WUS) Data

Groundwater use estimates are currently unavailable for 2005. TWDB staff anticipates the calculation and posting of these estimates at a later date.

### TRAVIS COUNTY

*11.46 % (multiplier)*

All values are in acre-feet/year

Year	Source	Municipal	Manufacturing	Steam Electric	Irrigation	Mining	Livestock	Total
1974	GW	560	1	0	12	4	13	590
1980	GW	478	33	0	23	0	67	601
1984	GW	1,157	30	0	33	9	48	1,277
1985	GW	943	29	0	23	0	51	1,046
1986	GW	616	33	2	19	0	54	724
1987	GW	742	31	0	19	0	50	842
1988	GW	708	39	2	17	0	54	820
1989	GW	1,560	38	2	60	0	53	1,713
1990	GW	951	47	2	51	0	54	1,105
1991	GW	994	44	13	51	0	55	1,157
1992	GW	1,107	49	13	51	0	52	1,272
1993	GW	1,105	59	13	93	0	60	1,330
1994	GW	1,009	66	0	79	0	49	1,203
1995	GW	1,089	73	0	89	0	49	1,300
1996	GW	939	60	13	90	0	102	1,204
1997	GW	993	57	4	85	0	48	1,187
1998	GW	1,200	101	1	57	0	34	1,393
1999	GW	1,092	87	1	45	0	43	1,268
2000	GW	1,076	81	1	137	0	40	1,335
2001	GW	1,152	26	2	156	0	56	1,392
2002	GW	1,195	27	2	156	0	54	1,434
2003	GW	1,200	30	5	97	0	32	1,364
2004	GW	1,028	22	7	90	0	30	1,177
2006	GW	1,770	106	8	234	0	13	2,131
2007	GW	1,760	93	0	87	0	13	1,953
2008	GW	1,653	105	0	144	0	14	1,916
2009	GW	1,950	87	0	32	135	15	2,219

# Projected Surface Water Supplies

## TWDB 2012 State Water Plan Data

### CALDWELL COUNTY

*4.54 % (multiplier)*

All values are in acre-feet/year

RWPG	WUG	WUG Basin	Source Name	2010	2020	2030	2040	2050	2060
L	COUNTY LINE WSC	GUADALUPE	CANYON LAKE/RESERVOIR						
L	COUNTY LINE WSC	GUADALUPE	GUADALUPE RIVER RUN-OF-RIVER						
L	COUNTY-OTHER	GUADALUPE	GUADALUPE RIVER RUN-OF-RIVER	23	23	23	23	23	23
L	GOFORTH WSC	GUADALUPE	CANYON LAKE/RESERVOIR	151	151	151	151	151	151
L	GONZALES COUNTY WSC	GUADALUPE	CANYON LAKE/RESERVOIR						
L	LIVESTOCK	COLORADO	LIVESTOCK LOCAL SUPPLY	4	4	4	4	4	4
L	LIVESTOCK	GUADALUPE	LIVESTOCK LOCAL SUPPLY	17	17	17	17	17	17
L	MARTINDALE	GUADALUPE	GUADALUPE RIVER RUN-OF-RIVER						
L	MARTINDALE WSC	GUADALUPE	CANYON LAKE/RESERVOIR						
L	MARTINDALE WSC	GUADALUPE	GUADALUPE RIVER RUN-OF-RIVER						
L	MAXWELL WSC	GUADALUPE	CANYON LAKE/RESERVOIR						
L	MAXWELL WSC	GUADALUPE	GUADALUPE RIVER RUN-OF-RIVER						
<b>Sum of Projected Surface Water Supplies (acre-feet/year)</b>				<b>195</b>	<b>195</b>	<b>195</b>	<b>195</b>	<b>195</b>	<b>195</b>

### HAYS COUNTY

*15.45 % (multiplier) except for Kyle which is 4.0%*

All values are in acre-feet/year

RWPG	WUG	WUG Basin	Source Name	2010	2020	2030	2040	2050	2060
K	BUDA	COLORADO	CANYON LAKE/RESERVOIR	1,120	1,680	1,680	1,680	1,680	1,680
K	COUNTY-OTHER	COLORADO	CANYON LAKE/RESERVOIR	260	260	260	260	260	260
K	COUNTY-OTHER	COLORADO	HIGHLAND LAKES LAKE/RESERVOIR SYSTEM	220	220	220	220	220	220
K	DRIPPING SPRINGS	COLORADO	HIGHLAND LAKES LAKE/RESERVOIR SYSTEM						
K	DRIPPING SPRINGS WSC	COLORADO	HIGHLAND LAKES LAKE/RESERVOIR SYSTEM						

# Projected Surface Water Supplies

## TWDB 2012 State Water Plan Data

RWPG	WUG	WUG Basin	Source Name	2010	2020	2030	2040	2050	2060
K	HILL COUNTRY WSC	COLORADO	COLORADO RIVER RUN-OF-RIVER						
K	HILL COUNTRY WSC	COLORADO	HIGHLAND LAKES LAKE/RESERVOIR SYSTEM						
K	IRRIGATION	COLORADO	COLORADO RIVER COMBINED RUN-OF-RIVER IRRIGATION	6	6	6	6	6	6
K	LIVESTOCK	COLORADO	LIVESTOCK LOCAL SUPPLY	30	30	30	30	30	30
L	COUNTY LINE WSC	GUADALUPE	CANYON LAKE/RESERVOIR						
L	COUNTY LINE WSC	GUADALUPE	GUADALUPE RIVER RUN-OF-RIVER						
L	COUNTY-OTHER	GUADALUPE	CANYON LAKE/RESERVOIR	485	485	485	485	485	485
L	CRYSTAL CLEAR WSC	GUADALUPE	CANYON LAKE/RESERVOIR						
L	CRYSTAL CLEAR WSC	GUADALUPE	GUADALUPE RIVER RUN-OF-RIVER						
L	GOFORTH WSC	GUADALUPE	CANYON LAKE/RESERVOIR	899	899	899	899	899	899
L	IRRIGATION	GUADALUPE	GUADALUPE RIVER COMBINED RUN-OF-RIVER IRRIGATION	19	19	19	19	19	19
L	KYLE	GUADALUPE	CANYON LAKE/RESERVOIR	118	118	118	118	118	118
L	LIVESTOCK	GUADALUPE	LIVESTOCK LOCAL SUPPLY	22	22	22	22	22	22
L	MAXWELL WSC	GUADALUPE	CANYON LAKE/RESERVOIR						
L	MAXWELL WSC	GUADALUPE	GUADALUPE RIVER RUN-OF-RIVER						
L	PLUM CREEK WATER COMPANY	GUADALUPE	CANYON LAKE/RESERVOIR	560	560	560	560	560	560
L	SAN MARCOS	GUADALUPE	CANYON LAKE/RESERVOIR						
L	STEAM ELECTRIC POWER	GUADALUPE	CANYON LAKE/RESERVOIR	381	381	381	381	381	381
<b>Sum of Projected Surface Water Supplies (acre-feet/year)</b>				<b>4,120</b>	<b>4,680</b>	<b>4,680</b>	<b>4,680</b>	<b>4,680</b>	<b>4,680</b>

### TRAVIS COUNTY

*11.46 % (multiplier)*

All values are in acre-feet/year

RWPG	WUG	WUG Basin	Source Name	2010	2020	2030	2040	2050	2060
K	AUSTIN	COLORADO	COLORADO RIVER RUN-OF-RIVER	2,520	3,335	3,351	3,370	3,377	3,377

# Projected Surface Water Supplies

## TWDB 2012 State Water Plan Data

RWPG	WUG	WUG Basin	Source Name	2010	2020	2030	2040	2050	2060
K	AUSTIN	COLORADO	COLORADO RIVER RUN-OF-RIVER	162,310	152,237	142,035	127,378	116,897	106,234
K	AUSTIN	COLORADO	HIGHLAND LAKES LAKE/RESERVOIR SYSTEM	112,410	120,534	120,534	120,534	120,534	120,521
K	BARTON CREEK WEST WSC	COLORADO	HIGHLAND LAKES LAKE/RESERVOIR SYSTEM						
K	BEE CAVE VILLAGE	COLORADO	HIGHLAND LAKES LAKE/RESERVOIR SYSTEM						
K	BRIARCLIFF VILLAGE	COLORADO	HIGHLAND LAKES LAKE/RESERVOIR SYSTEM						
K	CEDAR PARK	COLORADO	HIGHLAND LAKES LAKE/RESERVOIR SYSTEM						
K	COUNTY-OTHER	COLORADO	COLORADO RIVER RUN-OF-RIVER	513	533	486	470	489	534
K	COUNTY-OTHER	COLORADO	HIGHLAND LAKES LAKE/RESERVOIR SYSTEM	2,197	2,197	2,198	2,198	2,198	2,198
K	CREEDMOOR-MAHA WSC	COLORADO	COLORADO RIVER RUN-OF-RIVER	596	0	0	0	0	0
K	CREEDMOOR-MAHA WSC	GUADALUPE	COLORADO RIVER RUN-OF-RIVER	16	0	0	0	0	0
K	HILL COUNTRY WSC	COLORADO	HIGHLAND LAKES LAKE/RESERVOIR SYSTEM						
K	IRRIGATION	COLORADO	COLORADO RIVER COMBINED RUN-OF-RIVER IRRIGATION	72	74	75	76	76	77
K	IRRIGATION	GUADALUPE	COLORADO RIVER COMBINED RUN-OF-RIVER IRRIGATION	14	13	12	11	10	9
K	JONESTOWN	COLORADO	HIGHLAND LAKES LAKE/RESERVOIR SYSTEM						
K	JONESTOWN WSC	COLORADO	HIGHLAND LAKES LAKE/RESERVOIR SYSTEM						
K	LAGO VISTA	COLORADO	HIGHLAND LAKES LAKE/RESERVOIR SYSTEM						
K	LAKEWAY	COLORADO	HIGHLAND LAKES LAKE/RESERVOIR SYSTEM						
K	LIVESTOCK	COLORADO	LIVESTOCK LOCAL SUPPLY	100	100	100	100	100	100

# Projected Surface Water Supplies

## TWDB 2012 State Water Plan Data

RWPG	WUG	WUG Basin	Source Name	2010	2020	2030	2040	2050	2060
K	LIVESTOCK	GUADALUPE	LIVESTOCK LOCAL SUPPLY						
K	LOOP 360 WSC	COLORADO	HIGHLAND LAKES LAKE/RESERVOIR SYSTEM						
K	LOST CREEK MUD	COLORADO	COLORADO RIVER RUN-OF-RIVER						
K	MANOR	COLORADO	COLORADO RIVER RUN-OF-RIVER						
K	MANOR	COLORADO	HIGHLAND LAKES LAKE/RESERVOIR SYSTEM						
K	MANUFACTURING	COLORADO	COLORADO RIVER RUN-OF-RIVER	2,557	3,163	4,334	5,706	6,533	7,330
K	MANUFACTURING	COLORADO	HIGHLAND LAKES LAKE/RESERVOIR SYSTEM	60	60	60	60	60	60
K	MANVILLE WSC	COLORADO	COLORADO RIVER RUN-OF-RIVER						
K	MANVILLE WSC	COLORADO	HIGHLAND LAKES LAKE/RESERVOIR SYSTEM						
K	MINING	COLORADO	OTHER LOCAL SUPPLY	539	596	658	729	810	810
K	NORTH AUSTIN MUD #1	COLORADO	COLORADO RIVER RUN-OF-RIVER						
K	NORTH TRAVIS COUNTY MUD #5	COLORADO	HIGHLAND LAKES LAKE/RESERVOIR SYSTEM						
K	PFLUGERVILLE	COLORADO	COLORADO RIVER RUN-OF-RIVER						
K	PFLUGERVILLE	COLORADO	HIGHLAND LAKES LAKE/RESERVOIR SYSTEM						
K	RIVER PLACE ON LAKE AUSTIN	COLORADO	HIGHLAND LAKES LAKE/RESERVOIR SYSTEM						
K	ROLLINGWOOD	COLORADO	COLORADO RIVER RUN-OF-RIVER	377	0	0	0	0	0
K	SAN LEANNA	COLORADO	COLORADO RIVER RUN-OF-RIVER	100	0	0	0	0	0
K	SHADY HOLLOW MUD	COLORADO	COLORADO RIVER RUN-OF-RIVER	747	731	716	700	694	694
K	STEAM ELECTRIC POWER	COLORADO	COLORADO RIVER RUN-OF-RIVER	113	113	113	113	113	113
K	STEAM ELECTRIC POWER	COLORADO	COLORADO RIVER RUN-OF-RIVER	707	707	707	707	707	707

# Projected Surface Water Supplies

## TWDB 2012 State Water Plan Data

RWPG	WUG	WUG Basin	Source Name	2010	2020	2030	2040	2050	2060
K	STEAM ELECTRIC POWER	COLORADO	HIGHLAND LAKES LAKE/RESERVOIR SYSTEM	1,739	1,739	1,739	1,739	1,739	1,739
K	THE HILLS	COLORADO	HIGHLAND LAKES LAKE/RESERVOIR SYSTEM						
K	TRAVIS COUNTY WCID #17	COLORADO	HIGHLAND LAKES LAKE/RESERVOIR SYSTEM						
K	TRAVIS COUNTY WCID #18	COLORADO	HIGHLAND LAKES LAKE/RESERVOIR SYSTEM						
K	TRAVIS COUNTY WCID #19	COLORADO	HIGHLAND LAKES LAKE/RESERVOIR SYSTEM						
K	TRAVIS COUNTY WCID #20	COLORADO	HIGHLAND LAKES LAKE/RESERVOIR SYSTEM						
K	WELLS BRANCH MUD	COLORADO	COLORADO RIVER RUN-OF-RIVER						
K	WEST LAKE HILLS	COLORADO	COLORADO RIVER RUN-OF-RIVER						
K	WEST TRAVIS COUNTY REGIONAL WS	COLORADO	HIGHLAND LAKES LAKE/RESERVOIR SYSTEM						
K	WILLIAMSON-TRAVIS COUNTY MUD #1	COLORADO	HIGHLAND LAKES LAKE/RESERVOIR SYSTEM						
K	WINDERMERE UTILITY COMPANY	COLORADO	COLORADO RIVER RUN-OF-RIVER						
<b>Sum of Projected Surface Water Supplies (acre-feet/year)</b>				<b>287,687</b>	<b>286,132</b>	<b>277,118</b>	<b>263,891</b>	<b>254,337</b>	<b>244,503</b>



# Projected Water Demands

## TWDB 2012 State Water Plan Data

Please note that the demand numbers presented here include the plumbing code savings found in the Regional and State Water Plans.

### CALDWELL COUNTY

*4.54 % (multiplier)*

All values are in acre-feet/year

RWPG	WUG	WUG Basin	2010	2020	2030	2040	2050	2060
L	COUNTY-OTHER	COLORADO	1	1	1	1	1	1
L	MINING	COLORADO	0	0	0	0	0	0
L	IRRIGATION	COLORADO	1	1	1	0	0	0
L	LIVESTOCK	COLORADO	7	7	7	7	7	7
L	CREEDMOOR-MAHA WSC	COLORADO	136	177	213	250	287	325
L	MUSTANG RIDGE	COLORADO	122	160	194	228	262	296
L	POLONIA WSC	COLORADO						
L	CREEDMOOR-MAHA WSC	GUADALUPE	98	127	154	181	207	235
L	POLONIA WSC	GUADALUPE						
L	MARTINDALE	GUADALUPE						
L	MAXWELL WSC	GUADALUPE						
L	MARTINDALE WSC	GUADALUPE						
L	LOCKHART	GUADALUPE						
L	LULING	GUADALUPE						
L	COUNTY-OTHER	GUADALUPE	10	9	8	7	6	6
L	MANUFACTURING	GUADALUPE	1	1	1	1	1	1
L	MINING	GUADALUPE	0	0	0	0	0	0
L	IRRIGATION	GUADALUPE	47	41	37	33	29	26
L	LIVESTOCK	GUADALUPE	35	35	35	35	35	35
L	MUSTANG RIDGE	GUADALUPE	13	18	21	25	29	33
L	NIEDERWALD	GUADALUPE						
L	AQUA WSC	GUADALUPE						
L	COUNTY LINE WSC	GUADALUPE						
L	GOFORTH WSC	GUADALUPE	184	269	342	417	495	571
L	GONZALES COUNTY WSC	GUADALUPE						
<b>Sum of Projected Water Demands (acre-feet/year)</b>			<b>655</b>	<b>846</b>	<b>1,014</b>	<b>1,185</b>	<b>1,359</b>	<b>1,536</b>

### HAYS COUNTY

*15.45 % (multiplier) except for Kyle which is 4.0%*

All values are in acre-feet/year

RWPG	WUG	WUG Basin	2010	2020	2030	2040	2050	2060
K	LIVESTOCK	COLORADO	34	34	34	34	34	34



# Projected Water Demands

## TWDB 2012 State Water Plan Data

Please note that the demand numbers presented here include the plumbing code savings found in the Regional and State Water Plans.

RWPG	WUG	WUG Basin	2010	2020	2030	2040	2050	2060
K	DRIPPING SPRINGS WSC	COLORADO						
K	MOUNTAIN CITY	COLORADO	118	116	116	115	115	115
K	HILL COUNTRY WSC	COLORADO						
K	BUDA	COLORADO	1,454	2,128	2,603	3,088	3,666	4,140
K	DRIPPING SPRINGS	COLORADO						
K	COUNTY-OTHER	COLORADO	519	751	959	1,170	1,433	1,640
K	MANUFACTURING	COLORADO	107	125	143	162	179	194
K	MINING	COLORADO	2	1	0	0	0	0
K	IRRIGATION	COLORADO	2	2	2	2	2	2
K	CIMARRON PARK WATER COMPANY	COLORADO	403	489	582	676	789	882
L	WOODCREEK UTILITIES INC	GUADALUPE						
L	CREEDMOOR-MAHA WSC	GUADALUPE	10	12	15	17	20	23
L	COUNTY-OTHER	GUADALUPE	223	254	287	321	365	399
L	CRYSTAL CLEAR WSC	GUADALUPE						
L	MOUNTAIN CITY	GUADALUPE	45	71	98	124	157	183
L	GOFORTH WSC	GUADALUPE	972	1,340	1,704	2,075	2,545	2,914
L	MANUFACTURING	GUADALUPE	33	38	44	50	55	60
L	STEAM ELECTRIC POWER	GUADALUPE	156	111	147	301	411	560
L	SAN MARCOS	GUADALUPE						
L	WIMBERLEY WSC	GUADALUPE						
L	WOODCREEK	GUADALUPE						
L	MAXWELL WSC	GUADALUPE						
L	PLUM CREEK WATER COMPANY	GUADALUPE	566	762	963	1,168	1,427	1,630
L	COUNTY LINE WSC	GUADALUPE						
L	NIEDERWALD	GUADALUPE	104	147	194	238	294	338
L	LIVESTOCK	GUADALUPE	43	43	43	43	43	43
L	IRRIGATION	GUADALUPE	55	54	54	53	53	52
L	MINING	GUADALUPE	22	23	24	25	25	25
L	KYLE	GUADALUPE	110	158	169	175	195	208
	<b>Sum of Projected Water Demands (acre-feet/year)</b>		<b>4,978</b>	<b>6,659</b>	<b>8,181</b>	<b>9,837</b>	<b>11,808</b>	<b>13,442</b>

# Projected Water Demands

## TWDB 2012 State Water Plan Data

Please note that the demand numbers presented here include the plumbing code savings found in the Regional and State Water Plans.

### TRAVIS COUNTY

11.46 % (multiplier)

All values are in acre-feet/year

RWPG	WUG	WUG Basin	2010	2020	2030	2040	2050	2060
K	AUSTIN	COLORADO	150,180	179,861	212,133	241,074	271,296	293,095
K	GOFORTH WSC	COLORADO	30	39	47	52	58	63
K	LIVESTOCK	COLORADO	77	77	77	77	77	77
K	SAN LEANNA	COLORADO	100	120	140	158	171	184
K	IRRIGATION	COLORADO	115	105	97	89	82	76
K	MINING	COLORADO	175	189	198	207	215	222
K	MANUFACTURING	COLORADO	2,636	3,242	4,413	5,785	6,613	7,409
K	STEAM ELECTRIC POWER	COLORADO	2,006	2,120	2,579	2,693	3,152	3,266
K	COUNTY-OTHER	COLORADO	956	993	906	876	911	994
K	JONESTOWN	COLORADO						
K	LAGO VISTA	COLORADO						
K	LAKEWAY	COLORADO						
K	MANOR	COLORADO						
K	PFLUGERVILLE	COLORADO						
K	ROLLINGWOOD	COLORADO	377	376	374	372	371	373
K	WEST LAKE HILLS	COLORADO						
K	JONESTOWN WSC	COLORADO						
K	LOST CREEK MUD	COLORADO						
K	NORTH AUSTIN MUD #1	COLORADO						
K	RIVER PLACE ON LAKE AUSTIN	COLORADO						
K	SHADY HOLLOW MUD	COLORADO	747	731	716	700	694	694
K	TRAVIS COUNTY WCID #17	COLORADO						
K	TRAVIS COUNTY WCID #18	COLORADO						
K	TRAVIS COUNTY WCID #19	COLORADO						
K	TRAVIS COUNTY WCID #20	COLORADO						
K	WEST TRAVIS COUNTY REGIONAL W5	COLORADO						
K	WILLIAMSON-TRAVIS COUNTY MUD #1	COLORADO						
K	THE HILLS	COLORADO						
K	AQUA WSC	COLORADO						
K	BARTON CREEK WEST WSC	COLORADO						

# Projected Water Demands

## TWDB 2012 State Water Plan Data

Please note that the demand numbers presented here include the plumbing code savings found in the Regional and State Water Plans.

RWPG	WUG	WUG Basin	2010	2020	2030	2040	2050	2060
K	CREEDMOOR-MAHA WSC	COLORADO	612	717	820	884	951	1,030
K	CEDAR PARK	COLORADO						
K	BRIARCLIFF VILLAGE	COLORADO						
K	ROUND ROCK	COLORADO						
K	ELGIN	COLORADO						
K	BEE CAVE VILLAGE	COLORADO						
K	MUSTANG RIDGE	COLORADO	93	111	128	139	150	162
K	HILL COUNTRY WSC	COLORADO						
K	MANVILLE WSC	COLORADO						
K	NORTH TRAVIS COUNTY MUD #5	COLORADO						
K	LOOP 360 WSC	COLORADO						
K	WELLS BRANCH MUD	COLORADO						
K	WINDERMERE UTILITY COMPANY	COLORADO						
K	IRRIGATION	GUADALUPE	14	13	12	11	10	9
K	CREEDMOOR-MAHA WSC	GUADALUPE	16	19	21	23	25	27
K	COUNTY-OTHER	GUADALUPE	0	0	0	0	0	0
K	LIVESTOCK	GUADALUPE	3	3	3	3	3	3
K	MUSTANG RIDGE	GUADALUPE	25	30	34	37	40	43
<b>Sum of Projected Water Demands (acre-feet/year)</b>			<b>158,162</b>	<b>188,746</b>	<b>222,698</b>	<b>253,180</b>	<b>284,819</b>	<b>307,727</b>

# Projected Water Supply Needs

## TWDB 2012 State Water Plan Data

Negative values (in red) reflect a projected water supply need, positive values a surplus.

### CALDWELL COUNTY

All values are in acre-feet/year

RWPG	WUG	WUG Basin	2010	2020	2030	2040	2050	2060
L	AQUA WSC	GUADALUPE	-49	-121	-178	-240	-300	-362
L	COUNTY LINE WSC	GUADALUPE	137	33	-64	-160	-259	-354
L	COUNTY-OTHER	COLORADO	6	7	7	7	8	8
L	COUNTY-OTHER	GUADALUPE	494	507	531	554	572	586
L	CREEDMOOR-MAHA WSC	COLORADO	-61	-102	-138	-175	-212	-250
L	CREEDMOOR-MAHA WSC	GUADALUPE	-44	-73	-100	-127	-153	-181
L	GOFORTH WSC	GUADALUPE	59	-26	-99	-174	-252	-328
L	GONZALES COUNTY WSC	GUADALUPE	87	71	56	42	28	14
L	IRRIGATION	COLORADO	0	1	3	4	5	6
L	IRRIGATION	GUADALUPE	1	115	217	307	388	460
L	LIVESTOCK	COLORADO	0	0	0	0	0	0
L	LIVESTOCK	GUADALUPE	0	0	0	0	0	0
L	LOCKHART	GUADALUPE	322	-321	-856	-1,407	-1,952	-2,512
L	LULING	GUADALUPE	21	-122	-211	-296	-398	-506
L	MANUFACTURING	GUADALUPE	14	11	8	5	2	0
L	MARTINDALE	GUADALUPE	33	24	19	15	8	0
L	MARTINDALE WSC	GUADALUPE	-29	-40	-45	-49	-57	-66
L	MAXWELL WSC	GUADALUPE	264	89	-77	-229	-399	-564
L	MINING	COLORADO	3	2	2	1	1	1
L	MINING	GUADALUPE	2	2	1	1	0	0
L	MUSTANG RIDGE	COLORADO	-17	-55	-89	-123	-157	-191
L	MUSTANG RIDGE	GUADALUPE	-2	-7	-10	-14	-18	-22
L	NIEDERWALD	GUADALUPE	-8	-25	-43	-60	-77	-93
L	POLONIA WSC	COLORADO	219	153	96	37	-20	-80
L	POLONIA WSC	GUADALUPE	504	352	221	86	-46	-185
<b>Sum of Projected Water Supply Needs (acre-feet/year)</b>			<b>-210</b>	<b>-892</b>	<b>-1,910</b>	<b>-3,054</b>	<b>-4,300</b>	<b>-5,694</b>

### HAYS COUNTY

All values are in acre-feet/year

RWPG	WUG	WUG Basin	2010	2020	2030	2040	2050	2060
K	BUDA	COLORADO	257	143	-332	-817	-1,395	-1,869

# Projected Water Supply Needs

## TWDB 2012 State Water Plan Data

Negative values (in red) reflect a projected water supply need, positive values a surplus.

RWPG	WUG	WUG Basin	2010	2020	2030	2040	2050	2060
K	CIMARRON PARK WATER COMPANY	COLORADO	-150	-236	-329	-423	-536	-629
K	COUNTY-OTHER	COLORADO	760	-838	-2,072	-3,440	-5,144	-6,482
K	DRIPPING SPRINGS	COLORADO	-574	-1,350	-1,791	-2,239	-2,794	-3,230
K	DRIPPING SPRINGS WSC	COLORADO	452	299	140	-17	-213	-366
K	HILL COUNTRY WSC	COLORADO	0	0	0	0	0	0
K	IRRIGATION	COLORADO	42	42	42	42	41	41
K	LIVESTOCK	COLORADO	2	2	2	2	0	0
K	MANUFACTURING	COLORADO	-93	-211	-330	-450	-558	-657
K	MINING	COLORADO	0	6	10	12	10	10
K	MOUNTAIN CITY	COLORADO	-25	-23	-23	-22	-22	-22
L	COUNTY LINE WSC	GUADALUPE	3	-1,049	-1,369	-1,443	-1,662	-2,032
L	COUNTY-OTHER	GUADALUPE	1,829	1,629	1,418	1,196	912	689
L	CREEDMOOR-MAHA WSC	GUADALUPE	-3	-5	-8	-10	-13	-16
L	CRYSTAL CLEAR WSC	GUADALUPE	181	27	-140	-293	-499	-661
L	GOFORTH WSC	GUADALUPE	398	30	-334	-705	-1,175	-1,544
L	IRRIGATION	GUADALUPE	316	319	322	325	328	331
L	KYLE	GUADALUPE	764	-436	-713	-873	-1,370	-1,699
L	LIVESTOCK	GUADALUPE	0	0	0	0	0	0
L	MANUFACTURING	GUADALUPE	1,353	1,316	1,280	1,243	1,210	1,179
L	MAXWELL WSC	GUADALUPE	120	77	28	-17	-77	-125
L	MINING	GUADALUPE	-82	-91	-97	-101	-102	-103
L	MOUNTAIN CITY	GUADALUPE	4	-22	-49	-75	-108	-134
L	NIEDERWALD	GUADALUPE	-50	-93	-140	-184	-240	-284
L	PLUM CREEK WATER COMPANY	GUADALUPE	407	211	10	-195	-454	-657
L	SAN MARCOS	GUADALUPE	5,014	1,854	-1,319	-4,772	-8,507	-11,387
L	STEAM ELECTRIC POWER	GUADALUPE	5,151	5,442	5,211	4,211	3,497	2,533
L	WIMBERLEY WSC	GUADALUPE	-219	-440	-667	-885	-1,179	-1,409
L	WOODCREEK	GUADALUPE	-23	-92	-162	-229	-317	-387
L	WOODCREEK UTILITIES INC	GUADALUPE	-455	-852	-1,271	-1,681	-2,184	-2,580
<b>Sum of Projected Water Supply Needs (acre-feet/year)</b>			<b>-1,674</b>	<b>-5,738</b>	<b>-11,146</b>	<b>-18,871</b>	<b>-28,549</b>	<b>-36,273</b>

# Projected Water Supply Needs

## TWDB 2012 State Water Plan Data

Negative values (in red) reflect a projected water supply need, positive values a surplus.

### TRAVIS COUNTY

All values are in acre-feet/year

RWPG	WUG	WUG Basin	2010	2020	2030	2040	2050	2060
K	AQUA WSC	COLORADO	0	0	0	0	0	0
K	AUSTIN	COLORADO	127,060	96,245	53,787	10,208	-30,488	-62,963
K	BARTON CREEK WEST WSC	COLORADO	-53	-50	-47	-45	-43	-43
K	BEE CAVE VILLAGE	COLORADO	-936	-1,172	-1,406	-1,615	-1,768	-1,923
K	BRIARCLIFF VILLAGE	COLORADO	46	1	-45	-87	-117	-149
K	CEDAR PARK	COLORADO	0	0	0	0	0	0
K	COUNTY-OTHER	COLORADO	16,862	16,697	17,028	17,131	16,871	16,523
K	COUNTY-OTHER	GUADALUPE	0	0	0	0	0	0
K	CREEDMOOR-MAHA WSC	COLORADO	305	-431	-548	-632	-715	-807
K	CREEDMOOR-MAHA WSC	GUADALUPE	0	0	0	0	0	0
K	ELGIN	COLORADO	0	3	3	1	-1	-3
K	GOFORTH WSC	COLORADO	-11	-21	-30	-37	-43	-48
K	HILL COUNTRY WSC	COLORADO	0	0	0	0	0	0
K	IRRIGATION	COLORADO	39	131	214	290	345	409
K	IRRIGATION	GUADALUPE	0	0	0	0	0	0
K	JONESTOWN	COLORADO	-129	-233	-329	-416	-481	-554
K	JONESTOWN WSC	COLORADO	0	0	0	0	0	0
K	LAGO VISTA	COLORADO	4,240	3,798	3,358	2,964	2,670	2,376
K	LAKEWAY	COLORADO	-1,681	-2,613	-3,513	-4,338	-4,954	-5,572
K	LIVESTOCK	COLORADO	197	197	197	197	196	196
K	LIVESTOCK	GUADALUPE	8	8	8	8	8	8
K	LOOP 360 WSC	COLORADO	22	25	29	32	32	32
K	LOST CREEK MUD	COLORADO	0	0	0	0	0	0
K	MANOR	COLORADO	1,265	-940	-1,173	-1,390	-1,552	-1,717
K	MANUFACTURING	COLORADO	0	0	0	0	0	0
K	MANVILLE WSC	COLORADO	2,581	1,961	-831	-2,184	-2,584	-3,034
K	MINING	COLORADO	3,527	3,909	4,376	4,915	5,517	5,462
K	MUSTANG RIDGE	COLORADO	0	0	0	0	0	0
K	MUSTANG RIDGE	GUADALUPE	0	0	0	0	0	0
K	NORTH AUSTIN MUD #1	COLORADO	0	0	0	0	0	0
K	NORTH TRAVIS COUNTY MUD #5	COLORADO	0	0	0	0	0	0

# Projected Water Supply Needs

## TWDB 2012 State Water Plan Data

Negative values (in red) reflect a projected water supply need, positive values a surplus.

RWPG	WUG	WUG Basin	2010	2020	2030	2040	2050	2060
K	PFLUGERVILLE	COLORADO	3,299	1,996	442	140	-918	-1,981
K	RIVER PLACE ON LAKE AUSTIN	COLORADO	-570	-823	-823	-817	-817	-817
K	ROLLINGWOOD	COLORADO	0	-376	-374	-372	-371	-373
K	ROUND ROCK	COLORADO	-158	-339	-528	-669	-813	-957
K	SAN LEANNA	COLORADO	100	0	0	0	0	0
K	SHADY HOLLOW MUD	COLORADO	0	0	0	0	0	0
K	STEAM ELECTRIC POWER	COLORADO	4,830	3,830	-170	-1,170	-5,170	-6,170
K	THE HILLS	COLORADO	1,033	867	867	871	871	871
K	TRAVIS COUNTY WCID #17	COLORADO	4,642	3,602	3,023	2,364	2,015	1,577
K	TRAVIS COUNTY WCID #18	COLORADO	547	325	122	-4	-135	-283
K	TRAVIS COUNTY WCID #19	COLORADO	0	0	0	0	0	0
K	TRAVIS COUNTY WCID #20	COLORADO	673	675	678	679	680	680
K	WELLS BRANCH MUD	COLORADO	31	30	30	30	29	29
K	WEST LAKE HILLS	COLORADO	0	-1,833	-2,049	-2,178	-2,320	-2,471
K	WEST TRAVIS COUNTY REGIONAL WS	COLORADO	7,641	6,921	6,217	5,692	5,075	4,520
K	WILLIAMSON-TRAVIS COUNTY MUD #1	COLORADO	0	0	0	0	0	0
K	WINDERMERE UTILITY COMPANY	COLORADO	0	-2,222	-2,201	-2,180	-2,180	-2,180
<b>Sum of Projected Water Supply Needs (acre-feet/year)</b>			<b>-3,538</b>	<b>-11,053</b>	<b>-14,067</b>	<b>-18,134</b>	<b>-55,470</b>	<b>-92,045</b>



# Projected Water Management Strategies

## TWDB 2012 State Water Plan Data

### CALDWELL COUNTY

WUG, Basin (RWPG)

All values are in acre-feet/year

Water Management Strategy	Source Name [Origin]	2010	2020	2030	2040	2050	2060
<b>AQUA WSC, GUADALUPE (L)</b>							
DROUGHT MANAGEMENT	DROUGHT MANAGEMENT [CALDWELL]	13	0	0	0	0	0
LOCAL GROUNDWATER CARRIZO-WILCOX AQUIFER (INCLUDES OVERDRAFTS)	CARRIZO-WILCOX AQUIFER [CALDWELL]	403	403	403	403	403	403
MUNICIPAL WATER CONSERVATION	CONSERVATION [CALDWELL]	0	0	0	0	6	19
<b>COUNTY LINE WSC, GUADALUPE (L)</b>							
HAYS/CALDWELL PUA PROJECT (INCL. GONZALES CO.)	CARRIZO-WILCOX AQUIFER [CALDWELL]	0	285	285	285	285	285
LOCAL GROUNDWATER (TRINITY AQUIFER)	TRINITY AQUIFER [CALDWELL]	0	10	10	10	10	10
MUNICIPAL WATER CONSERVATION	CONSERVATION [HAYS]	0	0	64	160	259	354
<b>COUNTY-OTHER, GUADALUPE (L)</b>							
FACILITIES EXPANSION	GUADALUPE RIVER RUN-OF-RIVER [CALDWELL]	0	0	0	0	0	0
MUNICIPAL WATER CONSERVATION	CONSERVATION [CALDWELL]	21	37	36	31	28	29
<b>CREEDMOOR-MAHA WSC, COLORADO (L)</b>							
GBRA MID BASIN (SURFACE WATER)	GUADALUPE RIVER RUN-OF-RIVER [GONZALES]	0	102	138	175	212	250
PURCHASE FROM WWP (GUADALUPE-BLANCO RIVER AUTHORITY)	GUADALUPE RIVER RUN-OF-RIVER [CALHOUN]	61	0	0	0	0	0
<b>CREEDMOOR-MAHA WSC, GUADALUPE (L)</b>							
GBRA MID BASIN (SURFACE WATER)	GUADALUPE RIVER RUN-OF-RIVER [GONZALES]	0	73	100	127	153	181
MUNICIPAL WATER CONSERVATION	CONSERVATION [CALDWELL]	0	0	0	0	0	11
PURCHASE FROM WWP (GUADALUPE-BLANCO RIVER AUTHORITY)	GUADALUPE RIVER RUN-OF-RIVER [CALHOUN]	44	0	0	0	0	0
<b>GOFORTH WSC, GUADALUPE (L)</b>							
HAYS/CALDWELL PUA PROJECT (INCL. GONZALES CO.)	CARRIZO-WILCOX AQUIFER [GONZALES]	0	26	99	174	252	328



# Projected Water Management Strategies

## TWDB 2012 State Water Plan Data

WUG, Basin (RWPG)

All values are in acre-feet/year

Water Management Strategy	Source Name [Origin]	2010	2020	2030	2040	2050	2060
<b>LOCKHART, GUADALUPE (L)</b>							
DROUGHT MANAGEMENT	DROUGHT MANAGEMENT [CALDWELL]	123	0	0	0	0	0
GBRA MID BASIN (SURFACE WATER)	GUADALUPE RIVER RUN-OF-RIVER [GONZALES]	0	1,120	1,120	1,120	1,120	1,120
LOCAL GROUNDWATER CARRIZO-WILCOX AQUIFER (INCLUDES OVERDRAFTS)	CARRIZO-WILCOX AQUIFER [CALDWELL]	0	403	1,210	1,613	2,016	2,823
MUNICIPAL WATER CONSERVATION	CONSERVATION [CALDWELL]	0	0	28	103	195	333
<b>LULING, GUADALUPE (L)</b>							
DROUGHT MANAGEMENT	DROUGHT MANAGEMENT [CALDWELL]	53	0	0	0	0	0
GBRA MID BASIN (SURFACE WATER)	GUADALUPE RIVER RUN-OF-RIVER [GONZALES]	0	1,680	1,680	1,680	1,680	1,680
LOCAL GROUNDWATER CARRIZO-WILCOX AQUIFER (INCLUDES OVERDRAFTS)	CARRIZO-WILCOX AQUIFER [CALDWELL]	0	403	403	403	403	807
MUNICIPAL WATER CONSERVATION	CONSERVATION [CALDWELL]	70	90	108	117	148	192
<b>MARTINDALE, GUADALUPE (L)</b>							
DROUGHT MANAGEMENT	DROUGHT MANAGEMENT [CALDWELL]	6	0	0	0	0	0
<b>MARTINDALE WSC, GUADALUPE (L)</b>							
CRWA WELLS RANCH PROJECT PHASE II (INCL. GONZALES CO.)	CARRIZO-WILCOX AQUIFER [GUADALUPE]	257	257	444	568	568	568
DROUGHT MANAGEMENT	DROUGHT MANAGEMENT [CALDWELL]	9	0	0	0	0	0
<b>MAXWELL WSC, GUADALUPE (L)</b>							
HAYS/CALDWELL PUA PROJECT (INCL. GONZALES CO.)	CARRIZO-WILCOX AQUIFER [CALDWELL]	0	300	600	900	1,200	1,500
MUNICIPAL WATER CONSERVATION	CONSERVATION [CALDWELL]	0	0	0	0	11	55
<b>MUSTANG RIDGE, COLORADO (L)</b>							
DROUGHT MANAGEMENT	DROUGHT MANAGEMENT [CALDWELL]	6	0	0	0	0	0
GBRA MID BASIN (SURFACE WATER)	GUADALUPE RIVER RUN-OF-RIVER [GONZALES]	0	55	89	123	157	191
MUNICIPAL WATER CONSERVATION	CONSERVATION [CALDWELL]	10	26	48	74	98	116

# Projected Water Management Strategies

## TWDB 2012 State Water Plan Data

### WUG, Basin (RWPG)

All values are in acre-feet/year

Water Management Strategy	Source Name [Origin]	2010	2020	2030	2040	2050	2060
PURCHASE FROM WWP (GUADALUPE-BLANCO RIVER AUTHORITY)	CANYON LAKE/RESERVOIR [RESERVOIR]	17	0	0	0	0	0
<b>MUSTANG RIDGE, GUADALUPE (L)</b>							
GBRA MID BASIN (SURFACE WATER)	GUADALUPE RIVER RUN-OF-RIVER [GONZALES]	0	7	10	14	18	22
PURCHASE FROM WWP (GUADALUPE-BLANCO RIVER AUTHORITY)	CANYON LAKE/RESERVOIR [RESERVOIR]	2	0	0	0	0	0
<b>NIEDERWALD, GUADALUPE (L)</b>							
GBRA MID BASIN (SURFACE WATER)	GUADALUPE RIVER RUN-OF-RIVER [GONZALES]	0	25	43	60	77	93
PURCHASE FROM WWP (GUADALUPE-BLANCO RIVER AUTHORITY)	CANYON LAKE/RESERVOIR [RESERVOIR]	8	0	0	0	0	0
<b>POLONIA WSC, COLORADO (L)</b>							
LOCAL GROUNDWATER CARRIZO-WILCOX AQUIFER (INCLUDES OVERDRAFTS)	CARRIZO-WILCOX AQUIFER [CALDWELL]	0	0	0	0	48	97
<b>POLONIA WSC, GUADALUPE (L)</b>							
LOCAL GROUNDWATER CARRIZO-WILCOX AQUIFER (INCLUDES OVERDRAFTS)	CARRIZO-WILCOX AQUIFER [CALDWELL]	0	0	0	0	113	226
<b>Sum of Projected Water Management Strategies (acre-feet/year)</b>		<b>1,103</b>	<b>5,302</b>	<b>6,918</b>	<b>8,140</b>	<b>9,460</b>	<b>11,693</b>

## HAYS COUNTY

### WUG, Basin (RWPG)

All values are in acre-feet/year

Water Management Strategy	Source Name [Origin]	2010	2020	2030	2040	2050	2060
<b>BUDA, COLORADO (K)</b>							
DEVELOPMENT OF CARRIZO-WILCOX AQUIFER	CARRIZO-WILCOX AQUIFER [CALDWELL]	0	1,687	1,687	1,687	1,687	1,687
DEVELOPMENT OF SALINE ZONE OF EDWARDS-BFZ AQUIFER	EDWARDS-BFZ AQUIFER [TRAVIS]	0	0	0	0	0	500
<b>CIMARRON PARK WATER COMPANY, COLORADO (K)</b>							
DEVELOPMENT OF SALINE ZONE OF EDWARDS-BFZ AQUIFER	EDWARDS-BFZ AQUIFER [TRAVIS]	0	0	250	350	500	600
DROUGHT MANAGEMENT	DROUGHT MANAGEMENT [HAYS]	109	109	109	109	109	109

# Projected Water Management Strategies

## TWDB 2012 State Water Plan Data

### WUG, Basin (RWPG)

All values are in acre-feet/year

Water Management Strategy	Source Name [Origin]	2010	2020	2030	2040	2050	2060
MUNICIPAL CONSERVATION	CONSERVATION [HAYS]	24	17	13	9	5	7
WATER ALLOCATION	EDWARDS-BFZ AQUIFER [HAYS]	17	110	0	0	0	0

### COUNTY-OTHER, COLORADO (K)

DEVELOPMENT OF SALINE ZONE OF EDWARDS-BFZ AQUIFER	EDWARDS-BFZ AQUIFER [TRAVIS]	0	250	2,500	2,500	5,000	6,000
PURCHASE WATER FROM COA	COLORADO RIVER RUN-OF-RIVER [TRAVIS]	1,100	1,100	1,100	1,100	1,100	1,100

### DRIPPING SPRINGS, COLORADO (K)

AMEND LCRA CONTRACT	COLORADO RIVER COMBINED RUN-OF-RIVER - LCRA SUPPLY REALLOCATION [TRAVIS]	493	1,073	1,321	1,690	2,133	2,482
MUNICIPAL CONSERVATION	CONSERVATION [HAYS]	81	277	470	549	661	748

### DRIPPING SPRINGS WSC, COLORADO (K)

AMEND LCRA CONTRACT	COLORADO RIVER COMBINED RUN-OF-RIVER - LCRA SUPPLY REALLOCATION [TRAVIS]	0	0	0	17	213	366
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### MANUFACTURING, COLORADO (K)

DEVELOPMENT OF TRINITY AQUIFER	TRINITY AQUIFER [HAYS]	0	0	75	200	301	400
DROUGHT MANAGEMENT	DROUGHT MANAGEMENT [HAYS]	257	257	257	257	257	257

### MOUNTAIN CITY, COLORADO (K)

DROUGHT MANAGEMENT	DROUGHT MANAGEMENT [HAYS]	39	39	39	39	39	39
MUNICIPAL CONSERVATION	CONSERVATION [HAYS]	2	0	0	0	0	0

### COUNTY LINE WSC, GUADALUPE (L)

DROUGHT MANAGEMENT	DROUGHT MANAGEMENT [HAYS]	58	0	0	0	0	0
HAYS/CALDWELL PUA PROJECT (INCL. GONZALES CO.)	CARRIZO-WILCOX AQUIFER [CALDWELL]	0	285	285	285	285	285
LOCAL GROUNDWATER (TRINITY AQUIFER)	TRINITY AQUIFER [CALDWELL]	0	1,119	1,442	1,603	1,926	2,410
MUNICIPAL WATER CONSERVATION	CONSERVATION [HAYS]	43	110	112	67	85	119

### COUNTY-OTHER, GUADALUPE (L)

MUNICIPAL WATER CONSERVATION	CONSERVATION [HAYS]	0	0	12	49	112	184
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# Projected Water Management Strategies

## TWDB 2012 State Water Plan Data

WUG, Basin (RWPG)

All values are in acre-feet/year

Water Management Strategy	Source Name [Origin]	2010	2020	2030	2040	2050	2060
<b>CREEDMOOR-MAHA WSC, GUADALUPE (L)</b>							
GBRA MID BASIN (SURFACE WATER)	GUADALUPE RIVER RUN-OF-RIVER [GONZALES]	0	5	8	10	13	16
PURCHASE FROM WWP (GUADALUPE-BLANCO RIVER AUTHORITY)	GUADALUPE RIVER RUN-OF-RIVER [CALHOUN]	3	0	0	0	0	0
<b>CRYSTAL CLEAR WSC, GUADALUPE (L)</b>							
BRACKISH GROUNDWATER DESALINATION (WILCOX AQUIFER)	CARRIZO-WILCOX AQUIFER- BRACKISH [GUADALUPE]	0	0	130	130	259	259
BRACKISH GROUNDWATER DESALINATION (WILCOX AQUIFER)	CARRIZO-WILCOX AQUIFER- BRACKISH [WILSON]	0	0	206	206	1,469	1,469
CRWA WELLS RANCH PROJECT PHASE I	CARRIZO-WILCOX AQUIFER [GONZALES]	434	0	0	0	0	0
GBRA MID BASIN (SURFACE WATER)	GUADALUPE RIVER RUN-OF-RIVER [GONZALES]	0	865	0	0	0	0
HAYS/CALDWELL PUA PROJECT (INCL. GONZALES CO.)	CARRIZO-WILCOX AQUIFER [CALDWELL]	0	0	530	530	0	0
LOCAL GROUNDWATER CARRIZO-WILCOX AQUIFER (INCLUDES OVERDRAFTS)	CARRIZO-WILCOX AQUIFER [GUADALUPE]	0	0	140	293	499	661
<b>GOFORTH WSC, GUADALUPE (L)</b>							
GBRA MID BASIN (SURFACE WATER)	GUADALUPE RIVER RUN-OF-RIVER [GONZALES]	0	0	300	300	300	300
HAYS/CALDWELL PUA PROJECT (INCL. GONZALES CO.)	CARRIZO-WILCOX AQUIFER [GONZALES]	0	1,613	1,540	1,465	1,387	1,311
MUNICIPAL WATER CONSERVATION	CONSERVATION [HAYS]	0	0	0	0	22	111
<b>KYLE, GUADALUPE (L)</b>							
DROUGHT MANAGEMENT	DROUGHT MANAGEMENT [HAYS]	137	0	0	0	0	0
HAYS/CALDWELL PUA PROJECT (INCL. GONZALES CO.)	CARRIZO-WILCOX AQUIFER [GONZALES]	0	500	1,000	2,416	5,144	9,355
MUNICIPAL WATER CONSERVATION	CONSERVATION [HAYS]	0	27	96	167	302	443
<b>MAXWELL WSC, GUADALUPE (L)</b>							
HAYS/CALDWELL PUA PROJECT (INCL. GONZALES CO.)	CARRIZO-WILCOX AQUIFER [CALDWELL]	0	100	200	300	400	500
<b>MINING, GUADALUPE (L)</b>							
INDUSTRIAL, STEAM-ELECTRIC POWER GENERATION, AND MINING WATER CONSERVATION	CONSERVATION [HAYS]	82	91	97	101	102	103

# Projected Water Management Strategies

## TWDB 2012 State Water Plan Data

WUG, Basin (RWPG)

All values are in acre-feet/year

Water Management Strategy	Source Name [Origin]	2010	2020	2030	2040	2050	2060
<b>MOUNTAIN CITY, GUADALUPE (L)</b>							
HAYS/CALDWELL PUA PROJECT (INCL. GONZALES CO.)	CARRIZO-WILCOX AQUIFER [CALDWELL]	0	150	150	150	150	150
MUNICIPAL WATER CONSERVATION	CONSERVATION [HAYS]	1	3	6	10	16	22
<b>NIEDERWALD, GUADALUPE (L)</b>							
DROUGHT MANAGEMENT	DROUGHT MANAGEMENT [HAYS]	7	0	0	0	0	0
GBRA MID BASIN (SURFACE WATER)	GUADALUPE RIVER RUN-OF-RIVER [GONZALES]	0	93	140	184	240	284
MUNICIPAL WATER CONSERVATION	CONSERVATION [HAYS]	0	1	8	15	27	42
PURCHASE FROM WWP (GUADALUPE-BLANCO RIVER AUTHORITY)	CANYON LAKE/RESERVOIR [RESERVOIR]	50	0	0	0	0	0
<b>PLUM CREEK WATER COMPANY, GUADALUPE (L)</b>							
GBRA MID BASIN (SURFACE WATER)	GUADALUPE RIVER RUN-OF-RIVER [GONZALES]	0	0	0	195	454	657
MUNICIPAL WATER CONSERVATION	CONSERVATION [HAYS]	0	0	0	0	12	54
<b>SAN MARCOS, GUADALUPE (L)</b>							
HAYS/CALDWELL PUA PROJECT (INCL. GONZALES CO.)	CARRIZO-WILCOX AQUIFER [GONZALES]	0	0	1,548	4,953	8,675	11,910
MUNICIPAL WATER CONSERVATION	CONSERVATION [HAYS]	417	554	815	1,282	1,875	2,656
<b>WIMBERLEY WSC, GUADALUPE (L)</b>							
DROUGHT MANAGEMENT	DROUGHT MANAGEMENT [HAYS]	39	0	0	0	0	0
MUNICIPAL WATER CONSERVATION	CONSERVATION [HAYS]	0	0	0	0	19	70
WIMBERLEY AND WOODCREEK WATER SUPPLY PROJECT	CANYON LAKE/RESERVOIR [RESERVOIR]	336	1,425	1,425	1,425	1,425	1,425
<b>WOODCREEK, GUADALUPE (L)</b>							
DROUGHT MANAGEMENT	DROUGHT MANAGEMENT [HAYS]	12	0	0	0	0	0
MUNICIPAL WATER CONSERVATION	CONSERVATION [HAYS]	0	0	2	6	20	37
WIMBERLEY AND WOODCREEK WATER SUPPLY PROJECT	CANYON LAKE/RESERVOIR [RESERVOIR]	112	400	400	400	400	400
<b>WOODCREEK UTILITIES INC, GUADALUPE (L)</b>							
MUNICIPAL WATER CONSERVATION	CONSERVATION [HAYS]	56	177	337	455	619	771



# Projected Water Management Strategies

## TWDB 2012 State Water Plan Data

### WUG, Basin (RWPG)

All values are in acre-feet/year

Water Management Strategy	Source Name [Origin]	2010	2020	2030	2040	2050	2060
WIMBERLEY AND WOODCREEK WATER SUPPLY PROJECT	CANYON LAKE/RESERVOIR [RESERVOIR]	672	2,655	2,655	2,655	2,655	2,655
<b>Sum of Projected Water Management Strategies (acre-feet/year)</b>		<b>4,581</b>	<b>15,092</b>	<b>21,405</b>	<b>28,159</b>	<b>40,897</b>	<b>52,954</b>

### TRAVIS COUNTY

#### WUG, Basin (RWPG)

All values are in acre-feet/year

Water Management Strategy	Source Name [Origin]	2010	2020	2030	2040	2050	2060
<b>AUSTIN, COLORADO (K)</b>							
COA CONSERVATION	CONSERVATION [TRAVIS]	11,030	18,795	24,036	25,385	30,401	36,370
COA DIRECT REUSE (MUNICIPAL & MANUFACTURING)	DIRECT REUSE [TRAVIS]	5,143	13,620	22,077	30,268	36,218	40,468
COA RETURN FLOWS	INDIRECT REUSE [TRAVIS]	27,188	24,954	25,692	33,549	33,263	39,528
DOWNSTREAM RETURN FLOWS	INDIRECT REUSE [TRAVIS]	0	0	238	950	1,781	2,375
LCRA CONTRACT REDUCTIONS	HIGHLAND LAKES LAKE/RESERVOIR SYSTEM [RESERVOIR]	-27,188	-24,954	-28,020	-34,499	-35,044	-41,903
PURCHASE WATER FROM COA	COLORADO RIVER RUN-OF-RIVER [TRAVIS]	-1,100	-1,100	-1,100	-1,100	-1,100	-1,100
<b>BARTON CREEK WEST WSC, COLORADO (K)</b>							
MUNICIPAL CONSERVATION	CONSERVATION [TRAVIS]	37	68	97	123	147	163
PURCHASE WATER FROM WEST TRAVIS COUNTY REGIONAL WS	HIGHLAND LAKES LAKE/RESERVOIR SYSTEM [RESERVOIR]	16	0	0	0	0	0
<b>BEE CAVE VILLAGE, COLORADO (K)</b>							
MUNICIPAL CONSERVATION	CONSERVATION [TRAVIS]	106	247	417	600	778	965
PURCHASE WATER FROM WEST TRAVIS COUNTY REGIONAL WS	HIGHLAND LAKES LAKE/RESERVOIR SYSTEM [RESERVOIR]	830	925	989	1,015	990	958
<b>BRIARCLIFF VILLAGE, COLORADO (K)</b>							
AMEND LCRA CONTRACT	COLORADO RIVER COMBINED RUN-OF-RIVER - LCRA SUPPLY REALLOCATION [TRAVIS]	0	0	0	21	47	74
MUNICIPAL CONSERVATION	CONSERVATION [TRAVIS]	16	39	61	66	70	75

# Projected Water Management Strategies

## TWDB 2012 State Water Plan Data

WUG, Basin (RWPG)

All values are in acre-feet/year

Water Management Strategy	Source Name [Origin]	2010	2020	2030	2040	2050	2060
<b>CREEDMOOR-MAHA WSC, COLORADO (K)</b>							
NEW LCRA CONTRACTS	COLORADO RIVER COMBINED RUN-OF- RIVER - LCRA SUPPLY REALLOCATION [TRAVIS]	0	431	548	632	715	807
<b>ELGIN, COLORADO (K)</b>							
EXPANSION OF CARRIZO-WILCOX AQUIFER	CARRIZO-WILCOX AQUIFER [BASTROP]	0	0	0	0	1	3
<b>GOFORTH WSC, COLORADO (K)</b>							
WATER TRANSFER	CANYON LAKE/RESERVOIR [RESERVOIR]	11	21	30	37	43	48
<b>JONESTOWN, COLORADO (K)</b>							
AMEND LCRA CONTRACT	COLORADO RIVER COMBINED RUN-OF- RIVER - LCRA SUPPLY REALLOCATION [TRAVIS]	129	233	329	416	481	554
<b>LAKEWAY, COLORADO (K)</b>							
AMEND LCRA CONTRACT	COLORADO RIVER COMBINED RUN-OF- RIVER - LCRA SUPPLY REALLOCATION [TRAVIS]	1,285	1,675	1,934	2,041	2,041	2,041
MUNICIPAL CONSERVATION	CONSERVATION [TRAVIS]	396	938	1,579	2,297	3,017	3,765
<b>MANOR, COLORADO (K)</b>							
MUNICIPAL CONSERVATION	CONSERVATION [TRAVIS]	102	235	393	490	522	557
NEW LCRA CONTRACTS	COLORADO RIVER COMBINED RUN-OF- RIVER - LCRA SUPPLY REALLOCATION [TRAVIS]	0	705	780	900	1,030	1,160
<b>MANVILLE WSC, COLORADO (K)</b>							
NEW LCRA CONTRACTS	COLORADO RIVER COMBINED RUN-OF- RIVER - LCRA SUPPLY REALLOCATION [TRAVIS]	0	0	831	2,184	2,584	3,034
<b>PFLUGERVILLE, COLORADO (K)</b>							
AMEND LCRA CONTRACT	COLORADO RIVER COMBINED RUN-OF- RIVER - LCRA SUPPLY REALLOCATION [TRAVIS]	0	0	0	0	3	995
MUNICIPAL CONSERVATION	CONSERVATION [TRAVIS]	541	748	810	844	915	986

# Projected Water Management Strategies

## TWDB 2012 State Water Plan Data

WUG, Basin (RWPG)

All values are in acre-feet/year

Water Management Strategy	Source Name [Origin]	2010	2020	2030	2040	2050	2060
<b>RIVER PLACE ON LAKE AUSTIN, COLORADO (K)</b>							
AMEND LCRA CONTRACT	COLORADO RIVER COMBINED RUN-OF- RIVER - LCRA SUPPLY REALLOCATION [TRAVIS]	438	528	392	268	156	55
MUNICIPAL CONSERVATION	CONSERVATION [TRAVIS]	132	295	431	549	661	762
<b>ROLLINGWOOD, COLORADO (K)</b>							
MUNICIPAL CONSERVATION	CONSERVATION [TRAVIS]	31	60	85	109	132	143
NEW LCRA CONTRACTS	COLORADO RIVER COMBINED RUN-OF- RIVER - LCRA SUPPLY REALLOCATION [TRAVIS]	0	373	373	373	373	373
<b>ROUND ROCK, COLORADO (K)</b>							
HB 1437 FOR WILLIAMSON COUNTY	COLORADO RIVER COMBINED RUN-OF- RIVER - LCRA SUPPLY REALLOCATION [TRAVIS]	126	246	349	426	536	645
MUNICIPAL CONSERVATION	CONSERVATION [TRAVIS]	32	93	179	243	277	312
<b>STEAM ELECTRIC POWER, COLORADO (K)</b>							
COA DIRECT REUSE (STEAM ELECTRIC)	DIRECT REUSE [TRAVIS]	2,315	3,315	7,315	8,315	12,315	13,315
LCRA CONTRACT REDUCTIONS	HIGHLAND LAKES LAKE/RESERVOIR SYSTEM [RESERVOIR]	0	-3,000	-5,000	0	0	0
<b>TRAVIS COUNTY WCID #18, COLORADO (K)</b>							
AMEND LCRA CONTRACT	COLORADO RIVER COMBINED RUN-OF- RIVER - LCRA SUPPLY REALLOCATION [TRAVIS]	0	0	0	4	135	283
<b>WEST LAKE HILLS, COLORADO (K)</b>							
MUNICIPAL CONSERVATION	CONSERVATION [TRAVIS]	139	303	495	677	870	1,074
NEW LCRA CONTRACTS	COLORADO RIVER COMBINED RUN-OF- RIVER - LCRA SUPPLY REALLOCATION [TRAVIS]	0	1,833	2,049	2,178	2,320	2,471
<b>WEST TRAVIS COUNTY REGIONAL WS, COLORADO (K)</b>							
MUNICIPAL CONSERVATION	CONSERVATION [TRAVIS]	17	9	0	0	0	0
PURCHASE WATER FROM WEST TRAVIS COUNTY REGIONAL WS	HIGHLAND LAKES LAKE/RESERVOIR SYSTEM [RESERVOIR]	-846	-925	-989	-1,015	-990	-958



# Projected Water Management Strategies

## TWDB 2012 State Water Plan Data

WUG, Basin (RWPG)

All values are in acre-feet/year

Water Management Strategy	Source Name [Origin]	2010	2020	2030	2040	2050	2060
<b>WINDERMERE UTILITY COMPANY, COLORADO (K)</b>							
NEW LCRA CONTRACTS	COLORADO RIVER COMBINED RUN-OF- RIVER - LCRA SUPPLY REALLOCATION [TRAVIS]	0	2,222	2,201	2,180	2,180	2,180
<b>Sum of Projected Water Management Strategies (acre-feet/year)</b>		<b>20,926</b>	<b>42,932</b>	<b>59,601</b>	<b>80,526</b>	<b>97,868</b>	<b>112,578</b>

the 1990s, the number of people with a mental health problem has increased in the UK (Mental Health Act 1983).

There is a growing awareness of the need to improve the lives of people with mental health problems. The Department of Health (1999) has set out a strategy for mental health care in the UK. The strategy is based on the following principles:

• The promotion of mental health and the prevention of mental health problems.

• The provision of a range of services to meet the needs of people with mental health problems.

• The promotion of recovery and the development of self-help strategies.

• The promotion of social inclusion and the reduction of social exclusion.

• The promotion of good practice and the development of best practice.

• The promotion of research and the development of evidence-based practice.

• The promotion of partnership and the development of multi-agency working.

• The promotion of quality and the development of quality assurance systems.

• The promotion of transparency and the development of open and honest communication.

• The promotion of accountability and the development of clear lines of responsibility.

## APPENDIX IV

### MODELED AVAILABLE GROUNDWATER ESTIMATES BY TWDB

**APPENDIX IV**

**PART A**

**TO ACHIEVE APPLICABLE DFCS IN GMA 9**

Trinity-Hill Country Aquifer

# Texas Water Development Board

P.O. Box 13231, 1700 N. Congress Ave.  
Austin, TX 78711-3231, [www.twdb.texas.gov](http://www.twdb.texas.gov)  
Phone (512) 463-7847, Fax (512) 475-2053

April 18, 2012

Mr. Kirk Holland  
General Manager  
Barton Springs/Edwards Aquifer Conservation District  
1124-A Regal Row  
Austin, TX 78748

Re: Modeled available groundwater estimates for the Trinity Aquifer and the Edwards Group  
of the Edwards-Trinity (Plateau) Aquifer in Groundwater Management Area 9

Dear Mr. Holland:

The Texas Water Code, Section 36.1084, Subsection (b), states that the Texas Water Development Board's (TWDB) Executive Administrator shall provide each groundwater conservation district and regional water planning group located wholly or partly in the groundwater management area with the modeled available groundwater in the management area based upon the desired future conditions adopted by the districts. This letter and the attached reports (GAM Run 10-049 MAG Version 2 and GAM Run 10-050 MAG Version 2) are in response to this directive.

As noted in the letter received by the TWDB on August 30, 2010, from Ronald Fieseler of the Blanco-Pedernales Groundwater Conservation District on behalf of Groundwater Management Area 9, desired future conditions were adopted for the Trinity Aquifer and the Edwards Group of the Edwards-Trinity (Plateau) Aquifer on July 26, 2010.

Modeled available groundwater is defined in the Texas Water Code, Section 36.001, Subsection (25), as "the amount of water that the executive administrator determines may be produced on an average annual basis to achieve a desired future condition established under Section 36.108." This is different from "managed available groundwater," shown in the draft version of GAM Run 10-050 Version 2, which was a permitting value and accounted for the estimated use exempt from permitting. This change was made to reflect changes in statute by the 82<sup>nd</sup> Legislature, effective September 1, 2011.

The first version released of GAM Run 10-049 MAG included modeled available groundwater values for Kerr County, which was declared "not-relevant" for joint planning purposes by Groundwater Management Area 9. Since modeled available groundwater only applies to areas with a specified desired future condition, the second version of this report has been updated to depict modeled available groundwater in relevant counties only. For use in the regional water planning process, modeled available groundwater estimates have been reported by aquifer, county, river basin, regional water planning area, groundwater conservation district, and any other subdivision of the aquifer designated by the management area (if applicable).

## Our Mission

To provide leadership, planning, financial assistance, information, and education for the conservation and responsible development of water for Texas

## Board Members

Edward G. Vaughan, Chairman  
Joe M. Crutcher, Vice Chairman

Thomas Weir Labatt III, Member  
Lewis H. McMahan, Member

Billy R. Bradford Jr., Member  
Monte Cluck, Member

Melanie Callahan, Executive Administrator

Mr. Kirk Holland  
April 18, 2012  
Page 2

We encourage open communication and coordination between groundwater conservation districts, regional water planning groups, and the TWDB to ensure that the modeled available groundwater reported in regional water plans and groundwater management plans are not in conflict. We estimated modeled available groundwater that would have to occur to achieve the desired future condition using the best available scientific tools. However, these estimates are based on assumptions of the magnitude and distribution of projected pumping in the aquifer. It is, therefore, important for groundwater conservation districts to monitor whether their management of pumping is achieving their desired future conditions. Districts are encouraged to continue to work with the TWDB to better define available groundwater as additional information may help better assess responses of the aquifer to pumping and its distribution now and in the future.

If you have any questions, please contact Ms. Rima Petrossian of my staff at 512-936-2420 or [rma.petrossian@twdb.texas.gov](mailto:rma.petrossian@twdb.texas.gov) for further information.

Sincerely,



Melanie Callahan  
Executive Administrator

Attachments: GAM Run 10-049 MAG Version 2  
GAM Run 10-050 MAG Version 2

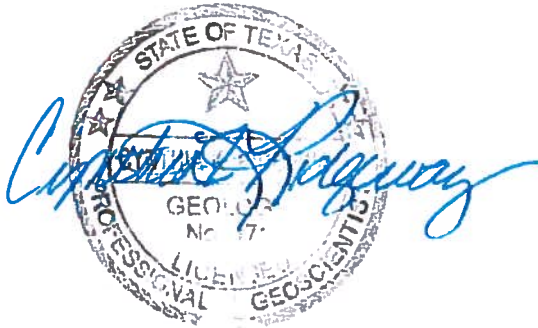
c w/att.: L'Oreal Stepney, Deputy Director, of Water, Texas Commission of Environmental Quality  
Kellye Rila, Texas Commission of Environmental Quality  
Kelly Mills, Texas Commission of Environmental Quality  
John Ashworth, LBG-Guyton Associates  
Jaime Burke, AECOM, Inc  
Sam Vaughn, HDR Engineering  
Raymond Buck, Upper Guadalupe River Authority  
James Kowis, Lower Colorado River Authority  
Suzanne Scott, San Antonio River Authority  
Bill West, Guadalupe-Blanco River Authority  
Robert E. Mace, Ph.D, P.G., Deputy Executive Administrator, Water Science and Conservation  
Joe Reynolds, Legal Services  
Larry French, P.G., Groundwater Resources  
Cindy Ridgeway, P.G., Groundwater Resources  
Rima Petrossian, P.G., Groundwater Resources  
Radu Boghici, P.G. Groundwater Resources  
David Meesey, Water Resources Planning and Information  
Dan Hardin, Water Resources Planning  
Matt Nelson, Water Resources Planning  
Temple McKinnon, Water Resources Planning  
Connie Townsend, Water Resources Planning  
Wendy Barron, Water Resources Planning

# GAM Run 10-050 MAG version 2

By Mohammad Masud Hassan, P.E.

Edited and finalized by Radu Boghici to reflect statutory changes effective September 1, 2011

Texas Water Development Board  
Groundwater Availability Modeling Section  
(512) 463-5808  
March 30, 2012



Cynthia K. Ridgeway, the Manager of the Groundwater Availability Modeling Section is responsible for oversight of work performed by employees under her direct supervision. The seal appearing on this document was authorized by Cynthia K. Ridgeway, P.G. 471 on March 30, 2012

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## **EXECUTIVE SUMMARY:**

The modeled available groundwater for the Trinity Aquifer as a result of the desired future condition adopted by the members of Groundwater Management Area 9 declines from approximately 93,000 acre-feet per year to approximately 90,500 acre-feet per year between 2010 and 2060. This is shown divided by county, regional water planning area, and river basin in Table 1 for use in the regional water planning process. Modeled available groundwater is summarized by county, regional water planning area, river basin, and groundwater conservation district in tables 2 through 5. The estimates were extracted from Scenario 6 of Groundwater Availability Modeling Task 10-005 (Hutchison, 2010), which meets the desired future condition adopted by the members of Groundwater Management Area 9.

## **REQUESTOR:**

Mr. Ronald G. Fieseler of the Blanco Pedernales Groundwater Conservation District on behalf of Groundwater Management Area 9

## **DESCRIPTION OF REQUEST:**

In a letter dated August 26, 2010 and received August 30, 2010, Mr. Ronald G. Fieseler provided the Texas Water Development Board (TWDB) with the desired future condition of the Trinity Aquifer adopted by the members of Groundwater Management Area 9. The desired future condition for the Trinity Aquifer in Groundwater Management Area 9, as described in Resolution No. 07-26-10-1, is:

*"Hill Country Trinity Aquifer - allow for an increase in average drawdown of approximately 30 feet through 2060 consistent with "Scenario 6" in TWDB Draft GAM Task 10-005"*

The TWDB has used this adopted desired future condition to estimate the modeled available groundwater for the Trinity Aquifer for each groundwater conservation district within Groundwater Management Area 9.

## **METHODS:**

The TWDB previously completed several predictive groundwater availability model simulations of the Trinity Aquifer to assist the members of Groundwater Management Area 9 in developing a desired future condition. The location of Groundwater Management Area 9, the Trinity Aquifer, and the groundwater availability model cells that represent the aquifer are shown in Figure 1. As stated in Resolution No. 07-26-10-1, the management area considered Groundwater Availability Modeling (GAM) Task 10-005 (Hutchison, 2010) when developing a desired future condition for the Trinity Aquifer. Since the desired future condition above is met in Scenario 6 of GAM Task 10-005, the modeled available groundwater for Groundwater Management Area 9 presented here was taken directly from that simulation. Please note that in GAM Task 10-005 the pumping was presented as an average of all years (2010 to 2060). We have reported this pumping by decade in the results shown in tables 1-5. The modeled available groundwater was then divided by county, regional water planning area, river basin, and groundwater conservation district (Figure 2).

## **PARAMETERS AND ASSUMPTIONS:**

The parameters and assumptions for the model run using the groundwater availability model for the Trinity Aquifer are described below:

- The results presented in this report are based on Scenario 6 of GAM Task 10-005 (Hutchison, 2010). See Hutchison (2010) for a full description of the methods, assumptions, and results of the model simulations.
- The recently updated groundwater availability model (version 2.01) for the Hill Country portion of the Trinity Aquifer developed by Jones and others (2009) was used for the simulations in GAM Task 10-005. See Mace and others (2000) and Jones and others (2009) for details on model construction, recharge, discharge, assumptions, and limitations.
- The model has four layers: Layer 1 represents the Edwards Group of the Edwards-Trinity (Plateau) Aquifer, Layer 2 represents the Upper Trinity Aquifer, Layer 3 represents the Middle Trinity Aquifer, and Layer 4 represents the Lower Trinity Aquifer. Each scenario in GAM Task 10-005 consisted of a series of 387 separate 50-year model simulations, each with a different recharge configuration. Though the pumping input to the model was the same for each of the 387 simulations, the pumping output differed depending on the occurrence of inactive (or dry) cells. The results below represent the average pumping for the year shown among the simulations comprising Scenario 6 in Hutchison (2010).

### **Modeled Available Groundwater and Permitting**

As defined in Chapter 36 of the Texas Water Code, “modeled available groundwater” is the estimated average amount of water that may be produced annually to achieve a desired future condition. This is distinct from “managed available groundwater”, shown in the draft version of this report dated December 1, 2010, which was a permitting value, and accounted for the estimated use of the aquifer exempt from permitting.

Groundwater conservation districts are required to consider modeled available groundwater, along with several other factors, when issuing permits in order to manage groundwater production to achieve the desired future condition(s). The other factors the districts must consider include annual precipitation and production patterns, the estimated amount of pumping exempt from permitting, existing permits, and a reasonable estimate of actual groundwater production under existing permits. The estimated amount of pumping exempt from permitting, which the Texas Water Development Board is now required to develop after soliciting input from applicable groundwater conservation districts, will be provided in a separate report.

## **RESULTS:**

The modeled available groundwater for the Trinity Aquifer in Groundwater Management Area 9 consistent with the desired future condition decreases from 93,052 acre-feet per year in 2010 to 90,503 acre-feet per year in 2060. The modeled available groundwater has been divided by county, regional water planning area, and river basin for each decade between 2010 and 2060 for use in the regional water planning process (Table 1).

The modeled available groundwater is also summarized by county, regional water planning area, river basin, and groundwater conservation district as shown in tables 2, 3, 4, and 5, respectively. In Table 5, note that modeled available groundwater is totaled for both groundwater conservation district areas and areas without groundwater conservation districts.

**REFERENCES:**

Hutchison, William R., 2010, GAM Task 10-005, Texas Water Development Board GAM Task 10-005 Report, 13 p.

Jones, I.C., Anaya, R. and Wade, S., 2009, Groundwater Availability Model for the Hill Country portion of the Trinity Aquifer System, Texas, Texas Water Development Board unpublished report, 193 p.

Mace, R.E., Chowdhury, A.H., Anaya, R., and Way, S-C., 2000, Groundwater availability of the Trinity Aquifer, Hill Country Area, Texas—Numerical simulations through 2050: Texas Water Development Board Report 353, 119 p.

**TABLE 1. MODELED AVAILABLE GROUNDWATER FOR THE TRINITY AQUIFER IN GROUNDWATER MANAGEMENT AREA 9 DIVIDED BY COUNTY, REGIONAL WATER PLANNING AREA, AND RIVER BASIN. RESULTS ARE IN ACRE-FEET PER YEAR.**

County	Regional Water Planning Area	River Basin	Year					
			2010	2020	2030	2040	2050	2060
Bandera	J	Guadalupe	76	76	76	76	76	76
		Nueces	903	903	903	903	903	903
		San Antonio	6,305	6,305	6,305	6,305	6,305	6,305
Bexar	L	San Antonio	24,856	24,856	24,856	24,856	24,856	24,856
Blanco	K	Colorado	1,322	1,322	1,322	1,322	1,322	1,322
		Guadalupe	1,251	1,251	1,251	1,251	1,251	1,251
Comal	L	Guadalupe	6,906	6,906	6,906	6,906	6,906	6,906
		San Antonio	3,308	3,308	3,308	3,308	3,308	3,308
Hays	K	Colorado	4,721	4,710	4,707	4,706	4,706	4,706
	L	Guadalupe	4,410	4,410	4,410	4,410	4,410	4,410
Kendall	L	Colorado	135	135	135	135	135	135
		Guadalupe	6,028	6,028	6,028	6,028	6,028	6,028
		San Antonio	4,976	4,976	4,976	4,976	4,976	4,976
Kerr	J	Colorado	318	318	318	318	318	318
		Guadalupe	15,646	14,129	14,056	13,767	13,450	13,434
		Nueces	0	0	0	0	0	0
		San Antonio	471	471	471	471	471	471
Medina	L	Nueces	1,575	1,575	1,575	1,575	1,575	1,575
		San Antonio	925	925	925	925	925	925
Travis	K	Colorado	8,920	8,672	8,655	8,643	8,627	8,598
<b>Total</b>			<b>93,052</b>	<b>91,276</b>	<b>91,183</b>	<b>90,881</b>	<b>90,548</b>	<b>90,503</b>

**TABLE 2: MODELED AVAILABLE GROUNDWATER FOR THE TRINITY AQUIFER SUMMARIZED BY COUNTY IN GROUNDWATER MANAGEMENT AREA 9 FOR EACH DECADE BETWEEN 2010 AND 2060. RESULTS ARE IN ACRE-FEET PER YEAR.**

County	Year					
	2010	2020	2030	2040	2050	2060
Bandera	7,284	7,284	7,284	7,284	7,284	7,284
Bexar	24,856	24,856	24,856	24,856	24,856	24,856
Blanco	2,573	2,573	2,573	2,573	2,573	2,573
Comal	10,214	10,214	10,214	10,214	10,214	10,214
Hays	9,131	9,120	9,117	9,116	9,116	9,116
Kendall	11,139	11,139	11,139	11,139	11,139	11,139
Kerr	16,435	14,918	14,845	14,556	14,239	14,223
Medina	2,500	2,500	2,500	2,500	2,500	2,500
Travis	8,920	8,672	8,655	8,643	8,627	8,598
<b>Total</b>	<b>93,052</b>	<b>91,276</b>	<b>91,183</b>	<b>90,881</b>	<b>90,548</b>	<b>90,503</b>

**TABLE 3: MODELED AVAILABLE GROUNDWATER FOR THE TRINITY AQUIFER SUMMARIZED BY REGIONAL WATER PLANNING AREA IN GROUNDWATER MANAGEMENT AREA 9 FOR EACH DECADE BETWEEN 2010 AND 2060. RESULTS ARE IN ACRE-FEET PER YEAR.**

Regional Water Planning Area	Year					
	2010	2020	2030	2040	2050	2060
J	23,719	22,202	22,129	21,840	21,523	21,507
K	16,214	15,955	15,935	15,922	15,906	15,877
L	53,119	53,119	53,119	53,119	53,119	53,119
<b>Total</b>	<b>93,052</b>	<b>91,276</b>	<b>91,183</b>	<b>90,881</b>	<b>90,548</b>	<b>90,503</b>

**TABLE 4: MODELED AVAILABLE GROUNDWATER FOR THE TRINITY AQUIFER SUMMARIZED BY RIVER BASIN IN GROUNDWATER MANAGEMENT AREA 9 FOR EACH DECADE BETWEEN 2010 AND 2060. RESULTS ARE IN ACRE-FEET PER YEAR.**

River Basin	Year					
	2010	2020	2030	2040	2050	2060
Colorado	15,416	15,157	15,137	15,124	15,108	15,079
Guadalupe	34,317	32,800	32,727	32,438	32,121	32,105
Nueces	2,478	2,478	2,478	2,478	2,478	2,478
San Antonio	40,841	40,841	40,841	40,841	40,841	40,841
<b>Total</b>	<b>93,052</b>	<b>91,276</b>	<b>91,183</b>	<b>90,881</b>	<b>90,548</b>	<b>90,503</b>

**TABLE 5: MODELED AVAILABLE GROUNDWATER FOR THE TRINITY AQUIFER SUMMARIZED BY GROUNDWATER CONSERVATION DISTRICT (GCD) IN GROUNDWATER MANAGEMENT AREA 9 FOR EACH DECADE BETWEEN 2010 AND 2060. RESULTS ARE IN ACRE-FEET PER YEAR. RA REFERS TO RIVER AUTHORITY. GWD REFERS TO GROUNDWATER DISTRICT.**

Groundwater Conservation District	Year					
	2010	2020	2030	2040	2050	2060
Bandera County RA & GWD	7,284	7,284	7,284	7,284	7,284	7,284
Blanco-Pedernales GCD	2,573	2,573	2,573	2,573	2,573	2,573
Cow Creek GCD	10,622	10,622	10,622	10,622	10,622	10,622
Hays Trinity GCD	9,109	9,098	9,095	9,094	9,094	9,094
Headwaters GCD	16,435	14,918	14,845	14,556	14,239	14,223
Medina County GCD	2,500	2,500	2,500	2,500	2,500	2,500
Trinity Glen Rose GCD	25,511	25,511	25,511	25,511	25,511	25,511
<b>Total (district areas)</b>	<b>74,034</b>	<b>72,506</b>	<b>72,430</b>	<b>72,140</b>	<b>71,823</b>	<b>71,807</b>
No District	19,018	18,770	18,753	18,741	18,725	18,696
<b>Total (including non-district areas)</b>	<b>93,052</b>	<b>91,276</b>	<b>91,183</b>	<b>90,881</b>	<b>90,548</b>	<b>90,503</b>



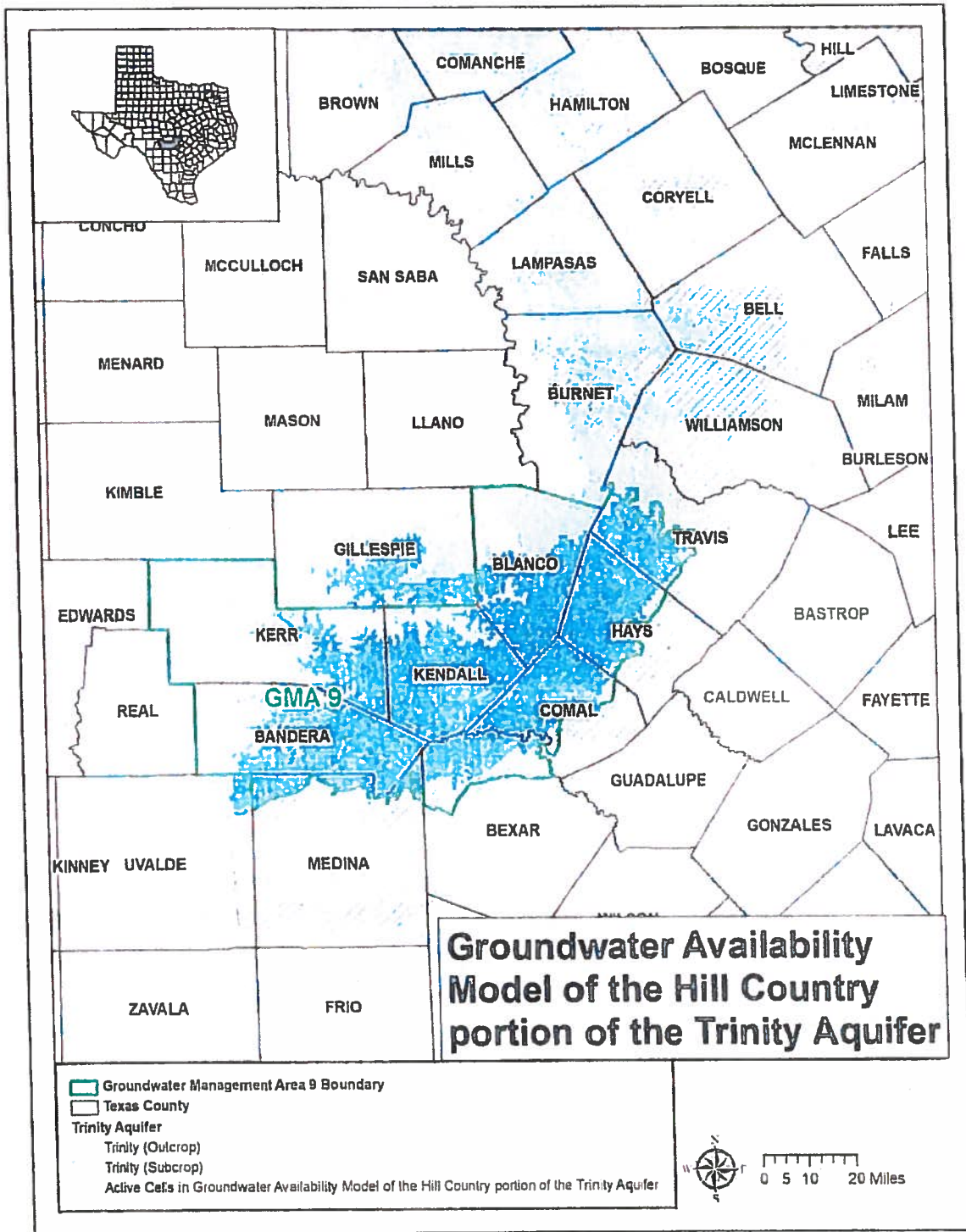


Figure 1: Map showing the areas covered by the groundwater availability model for the Trinity Aquifer.

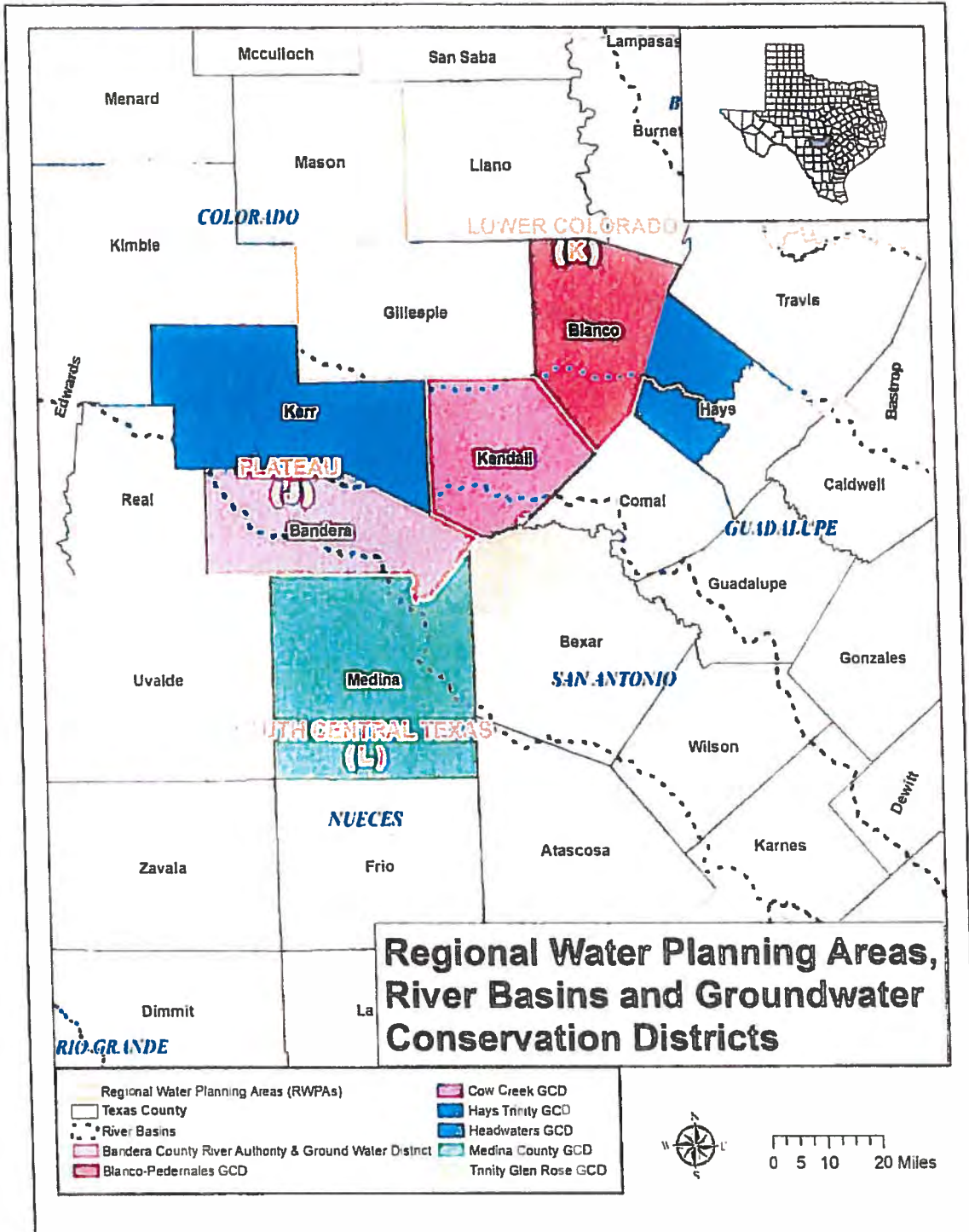


Figure 2: Map showing regional water planning areas (RWPAs), groundwater conservation districts (GCDs), counties, and river basins in Groundwater Management Area 9.



the 1990s, the number of people with a mental health problem has increased in the UK (Mental Health Act 1983, 1990).

There is a growing awareness of the need to improve the lives of people with mental health problems. The Department of Health (1999) has set out a vision of a new mental health system, which will be based on the following principles:

- People with mental health problems should be treated as individuals, with their own needs and wishes.
- People with mental health problems should be given the opportunity to participate in decisions about their care and treatment.
- People with mental health problems should be given the opportunity to live in their own homes and communities.

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## **APPENDIX IV**

### **PART B**

#### **TO ACHIEVE APPLICABLE DFCS IN GMA 10**

Northern Subdivision, Edwards BFZ Aquifer

Northern Subdivision, Saline Edwards Aquifer

Trinity Aquifer

# Texas Water Development Board

P. O. Box 13231, 1700 N. Congress Ave  
Austin, TX 78711-3231, www.twdb.state.tx.us  
Phone (512) 463-7847, Fax (512) 475-2053

December 9, 2011

Mr. Kirk Holland  
General Manager  
Barton Springs/Edwards Aquifer Conservation District  
1124-A Regal Row  
Austin, TX 78748

Re: Modeled available groundwater estimates for the freshwater and saline Edwards in the northern subdivision and Trinity aquifers in Groundwater Management Area 10

Dear Mr. Holland:

The Texas Water Code, Section 36.1084, Subsection (b), states that the Texas Water Development Board's (TWDB) Executive Administrator shall provide each groundwater conservation district and regional water planning group located wholly or partly in the groundwater management area with the modeled available groundwater in the management area based upon the desired future conditions adopted by the districts. This letter and the attached reports (GAM Run 10-059 MAG Version 2, GTA Aquifer Assessment 10-29 MAG, and GTA Aquifer Assessment 10-35 MAG) are in response to this directive.

As noted in the letter received by the TWDB on September 2, 2010, from Rick Illgner of the Edwards Aquifer Authority on behalf of Groundwater Management Area 10, desired future conditions were adopted for the freshwater and saline Edwards Aquifer in the northern subdivision of Groundwater Management Area 10 on August 4, 2010. The desired future condition for the Trinity Aquifer was adopted on August 23, 2010, as noted in the letter from Mr. Illgner received by TWDB on August 30, 2010.

Modeled available groundwater is defined in the Texas Water Code, Section 36.001, Subsection (25), as "the amount of water that the executive administrator determines may be produced on an average annual basis to achieve a desired future condition established under Section 36.108." This is different from "managed available groundwater," shown in the draft version of these reports, which was a permitting value and accounted for the estimated use exempt from permitting. This change was made to reflect changes in statute by the 82<sup>nd</sup> Legislature, effective September 1, 2011. For use in the regional water planning process, modeled available groundwater estimates have been reported by aquifer, county, river basin, regional water planning area, groundwater conservation district, and any other subdivision of the aquifer designated by the management area (if applicable).

We encourage open communication and coordination between groundwater conservation districts, regional water planning groups, and the TWDB to ensure that the modeled available groundwater reported in regional water plans and groundwater management plans are not in conflict. We estimated modeled available groundwater that would have to occur to achieve the desired future condition using the

## Our Mission : Board Members

To provide leadership, planning, financial assistance, information, and education for the conservation and responsible development of water for Texas

Edward G. Vaughan, Chairman  
Joe M. Crutcher, Vice Chairman  
Melanie Callahan, Interim Executive Administrator

Thomas Weir Labatt III, Member  
Lewis H. McMahan, Member


Billy R. Bradford Jr., Member  
Monte Cluck, Member

Mr. Holland  
December 9, 2011  
Page 2

best available scientific tools. However, these estimates are based on assumptions of the magnitude and distribution of projected pumping in the aquifer. It is, therefore, important for groundwater conservation districts to monitor whether their management of pumping is achieving their desired future conditions. Districts are encouraged to continue to work with the TWDB to better define available groundwater as additional information may help better assess responses of the aquifer to pumping and its distribution now and in the future.

If you have any questions, please contact Ms. Rima Petrossian of my staff at 512-936-2420 or [rima.petrossian@twdb.state.tx.us](mailto:rima.petrossian@twdb.state.tx.us) for further information.

Sincerely,



Melanie Callahan  
Interim Executive Administrator

Attachments: GAM Run 10-059 MAG Version 2  
GTA Aquifer Assessment 10-29 MAG  
GTA Aquifer Assessment 10-35 MAG

c w/atts.: L'Oreal Stepney, Deputy Director, Office of Water, Texas Commission of Environmental Quality  
Kellye Rila, Texas Commission of Environmental Quality  
Kelly Mills, Texas Commission of Environmental Quality  
Raymond Buck, Upper Guadalupe River Authority  
Rocky Freund, Nueces River Authority  
James Kowis, Lower Colorado River Authority  
Suzanne Scott, San Antonio River Authority  
Bill West, Guadalupe-Blanco River Authority  
John Ashworth, LBG-Guyton Associates  
Jaime Burke, AECOM, Inc  
Sam Vaughn, HDR Engineering  
Robert E. Mace, Ph.D, P.G., Deputy Executive Administrator, Water Science and Conservation  
Cindy Ridgeway, P.G., Groundwater Resources  
Rima Petrossian, P.G., Groundwater Resources  
Robert Bradley, P.G., Groundwater Resources  
David Thorkildsen, P.G., Groundwater Resources  
Sarah Backhouse, Groundwater Resources  
Wade Oliver, Groundwater Resources  
Dan Hardin, Water Resources Planning  
Matt Nelson, Water Resources Planning  
Temple McKinnon, Water Resources Planning  
David Meesey, Water Resources Planning  
Connie Townsend, Water Resources Planning  
Wendy Barron, Water Resources Planning



# GAM Run 08-37

By Mr. Wade Oliver

Texas Water Development Board  
Groundwater Availability Modeling Section  
(512) 463-3132  
June 20, 2008

## EXECUTIVE SUMMARY:

Texas State Water Code, Section 36.1071, Subsection (h), states that, in developing its groundwater management plan, groundwater conservation districts shall use groundwater availability modeling information provided by the Executive Administrator of the Texas Water Development Board in conjunction with any available site-specific information provided by the district for review and comment to the Executive Administrator. Information derived from groundwater availability models that shall be included in groundwater management plans include:

- (1) the annual amount of recharge from precipitation to the groundwater resources within the district, if any;
- (2) for each aquifer within the district, the annual volume of water that discharges from the aquifer to springs and any surface water bodies, including lakes, streams, and rivers; and
- (3) the annual volume of flow into and out of the district within each aquifer and between aquifers in the district.

The purpose of this groundwater availability model run is to provide information to the Barton Springs/Edwards Aquifer Conservation District needed for its groundwater management plan. The groundwater management plan for the Barton Springs/Edwards Aquifer Conservation District is due for approval by the Executive Administrator of the Texas Water Development Board before December 29, 2008.

This report discusses the methods, assumptions, and results from model runs using the groundwater availability model for the Barton Springs segment of the Edwards (Balcones Fault Zone) Aquifer. Table 1 summarizes the groundwater availability model data required by statute for the Barton Springs/Edwards Aquifer Conservation Districts groundwater management plan.

Although the Trinity Aquifer also occurs in Hays and Travis counties, the groundwater availability model for the Hill Country portion of the Trinity Aquifer does not include the segment of the aquifer that underlies the Barton Springs/Edwards Aquifer Conservation District. If the district would like information for the Trinity Aquifer, they may request it from the Groundwater Technical Assistance Section of the Texas Water Development Board.



## **METHODS:**

We ran the groundwater availability model for the Barton Springs segment of the Edwards (Balcones Fault Zone) Aquifer and extracted water budget values for recharge, surface water outflow, inflow to the district, and outflow from the district for the steady-state simulation period for the portions of the Edwards (Balcones Fault Zone) Aquifer located within the district.

## **PARAMETERS AND ASSUMPTIONS:**

- We used version 1.01 of the groundwater availability model for the Barton Springs segment of the Edwards (Balcones Fault Zone) Aquifer.
- We used the steady-state model, which was based on recharge for a twenty year period (1979 through 1998), instead of the transient simulation, which encompassed 1989 to 1998, since the transient simulation represented a timeframe that was wetter than normal. The recharge used for the steady-state model appeared to cover a cycle that represents more average climatic conditions.
- The root mean squared error (a measure of the difference between simulated and measured discharge during model calibration) for Barton Springs is 12 cubic feet per second, which represents 11 percent of the discharge fluctuations measured at Barton Springs during that time (Scanlon and others, 2001).
- The Barton Springs segment of the Edwards (Balcones Fault Zone) Aquifer groundwater availability model is a one-layer model and assumes no interaction with the underlying Trinity Aquifer. The cells are 1,000 feet long parallel to the strike of the faults and 500 feet wide.
- We used Processing Modflow for Windows (PMWIN) version 5.3 (Chiang and Kinzelbach, 2001) as the interface to process model output.

## **RESULTS:**

A groundwater budget summarizes the water entering and leaving the aquifer according to the groundwater availability model. Selected components were extracted from the groundwater budget for the calibrated steady-state portion of the model run. The components of the modified budgets shown in Table 1 include:

- Precipitation recharge—This is the areally distributed recharge sourced from precipitation falling on the outcrop areas of the aquifers (where the aquifer is exposed at land surface) within the district.
- Surface water outflow—This is the total water exiting the aquifer (outflow) to surface water features such as streams, reservoirs, and drains (springs).

- Lateral flow into and out of district—This component describes lateral flow within the aquifer between the district and adjacent counties.
- Net inter-aquifer flow—This describes the vertical flow, or leakage, between aquifers or confining units. This flow is controlled by the relative water levels in each aquifer or confining unit and aquifer properties of each aquifer or confining unit that define the amount of leakage that occurs. “Inflow” to an aquifer from an overlying or underlying aquifer will always equal the “Outflow” from the other aquifer. This model is a single-layer and does not include inter-aquifer flow.

The information needed for the district’s management plan is summarized in Table 1. It is important to note that sub-regional water budgets are not exact. This is due to the size of the model cells and the approach used to extract data from the model. To avoid double accounting, a model cell that straddles a political boundary, such as district or county boundaries, is assigned to one side of the boundary based on the location of the centroid of the model cell. For example, if a cell contains two counties, the cell is assigned to the county where the centroid of the cell is located. The orientation of the model cells and the political boundaries of the district do not overlie perfectly, therefore even though the district is larger than the model boundaries, some flow into and out of the district is reported due to the method of data extraction from the model (Scanlon and others, 2001: see figure 2 for an overlay of the model boundaries and the district boundaries [http://www.twdb.state.tx.us/gam/ebfz\\_b/ED-b\\_final.pdf](http://www.twdb.state.tx.us/gam/ebfz_b/ED-b_final.pdf) ).

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Scanlon, B., Mace, R., Smith, B., Hovorka, S., Dutton, A., and Reedy, R., 2001, Groundwater Availability of the Barton Springs Segment of the Edwards Aquifer, Texas—Numerical Simulations through 2050: The University of Texas at Austin, Bureau of Economic Geology, final report prepared for the Lower Colorado River Authority, under contract no. UTA99-0.



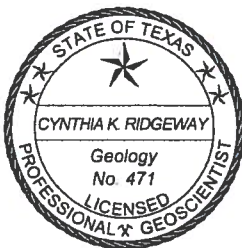
Table 1: Summarized information needed for the Barton Springs/Edwards Aquifer Conservation District's groundwater management plan. All values are reported in acre-feet per year. All numbers are rounded to the nearest 1 acre-foot. Negative values indicate water is leaving the aquifer system using the parameters or boundaries listed in the table.

Management Plan requirement	Aquifer or confining unit	Results
Estimated annual amount of recharge from precipitation to the district	Edwards and associated limestones	42,858 <sup>a</sup>
Estimated annual volume of water that discharges from the aquifer to springs and any surface water body including lakes, streams, and rivers	Edwards and associated limestones	-39,723
Estimated annual volume of flow into the district within each aquifer in the district	Edwards and associated limestones	3,191 <sup>b</sup>
Estimated annual volume of flow out of the district within each aquifer in the district	Edwards and associated limestones	-2,651 <sup>b</sup>
Estimated net annual volume of flow between each aquifer in the district	Edwards into Trinity	0 <sup>c</sup>

<sup>a</sup> Recharge value includes concentrated infiltration of water from stream channels. Scanlon and others (2001) postulated that approximately 15 percent of recharge in the model was due to diffuse inter-stream recharge, or direct precipitation, which equates to approximately 6,429 acre-feet per year.

<sup>b</sup> The orientation of the model cells and the political boundaries of the district do not overlie perfectly, therefore even though the district is larger than the model boundaries, some flow into and out of the district is reported due to the method of data extraction from the model.

<sup>c</sup> The model does not consider flow into or out of the Edwards (Balcones Fault Zone) Aquifer from other formations.



Cynthia K. Ridgeway is Manager of the Groundwater Availability Modeling Section and is responsible for oversight of work performed by employees under her direct supervision. The seal appearing on this document was authorized by Cynthia K. Ridgeway, P.G., on June 20, 2008.



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# **GAM RUN 10-059 MAG VERSION 2: GROUNDWATER MANAGEMENT AREA 10 MODEL RUNS TO ESTIMATE SPRINGFLOW UNDER ASSUMED FUTURE PUMPING AND RECHARGE CONDITIONS FOR THE NORTHERN SUBDIVISION OF THE EDWARDS (BALCONES FAULT ZONE) AQUIFER**

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Edited and finalized by Marius Jigmond to reflect statutory changes  
effective September 1, 2011

December 7, 2011



*Cynthia K. Ridgeway, the Manager of the Groundwater Availability Modeling Section and Interim Director of the Groundwater Resources Division, is responsible for oversight of work performed by employees under her direct supervision. The seal appearing on this document was authorized by Cynthia K. Ridgeway, P.G. 471 on December 7, 2011.*

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## ***EXECUTIVE SUMMARY:***

Two desired future conditions were adopted by the members of Groundwater Management Area 10 for the northern subdivision of the Edwards (Balcones Fault Zone) Aquifer - one for average recharge conditions and one for extreme drought conditions. The modeled available groundwater as a result of the desired future condition under average recharge conditions is approximately 11,557 acre-feet per year. This is shown by county, regional water planning area, and river basin as shown in Table 1. Of this pumping, 11,528 acre-feet per year is within Barton Springs/Edwards Aquifer Conservation District. These estimates were developed with a model run based on the methods used in GAM Run 09-019.

For extreme drought conditions, the modeled available groundwater of 3,765 acre-feet per year was estimated using a water balance approach based on information provided by the district supporting an approximate one-to-one relationship between springflow and pumping under low-flow conditions. This pumping is also summarized in Table 1 by county, regional water planning area, and river basin.

**REQUESTOR:**

Mr. Rick Illgner of the Edwards Aquifer Authority on behalf of Groundwater Management Area 10

**DESCRIPTION OF REQUEST:**

In a letter dated August 24, 2010 and received September 2, 2010, Mr. Rick Illgner provided the Texas Water Development Board (TWDB) with the desired future conditions of the northern subdivision of the Edwards (Balcones Fault Zone) Aquifer adopted by the members of Groundwater Management Area (GMA) 10. The desired future conditions, as shown in Resolution No. 2010-02, are as follows:

Springflow of Barton Springs during average recharge conditions shall be no less than 49.7 cubic feet per second (cfs) averaged over an 84-month (seven-year) period; and

During extreme drought conditions, including those as severe as a recurrence of the 1950's drought of record, springflow of Barton Springs shall be no less than 6.5 cubic feet per second (cfs), averaged on a monthly basis.

In response to receiving the adopted desired future conditions, the Texas Water Development Board has estimated the modeled available groundwater for Groundwater Management Area 10 for the northern subdivision of the Edwards (Balcones Fault Zone) Aquifer for both average recharge and extreme drought conditions.

**METHODS:**

The locations of Groundwater Management Area 10 and the northern subdivision of the Edwards (Balcones Fault Zone) Aquifer are shown in Figure 1. The Texas Water Development Board previously completed several predictive groundwater model simulations of the northern subdivision of the Edwards (Balcones Fault Zone) Aquifer to assist the members of Groundwater Management Area 10 in developing a desired future condition. These simulations are documented in Groundwater Availability Modeling (GAM) Run 09-019 (Hutchison and Hill, 2011). The specific annual pumping amounts simulated in the previous model runs included 3,847; 4,469; 5,437; 6,796; and 16,311 acre-feet per year. Relative frequencies of various springflows based on these pumping assumptions were then estimated over a wide range of recharge and initial condition assumptions. These model runs are referenced in the desired future condition resolution of Groundwater Management Area 10. However, the specified average pumping amount (16 cubic feet per second), average springflow (49.7 cubic feet per second), and the minimum drought

condition springflow (6.5 cubic feet per second) were not explicitly simulated in GAM Run 09-019 (Hutchison and Hill, 2011). As outlined in the resolution, the average springflow and pumping for average recharge conditions were estimated based on interpolation of the previous simulations. Therefore, part of the effort in this report was to confirm the average springflow and associated average pumping adopted in the desired future condition resolution with an additional set of model simulations similar to those presented in GAM Run 09-019.

As described below, the additional simulations confirmed that pumping of 11,557 acre-feet per year within Groundwater Management Area 10 (approximately 16 cubic feet per second) will result in an average springflow of 49.7 cubic feet per second. Though the series of 342 7-year simulations contained a wide range of recharge conditions, average springflows among the simulations correspond to average recharge conditions.

This pumping of 11,557 acre-feet per year for average recharge conditions was divided by county, regional water planning area, river basin, and groundwater conservation district (Figure 2). Note in Figure 2 that only the Barton Springs/Edwards Aquifer Conservation District and Edwards Aquifer Authority are shown. This is because these are the only two districts within Groundwater Management Area 10 that manage the northern subdivision of the Edwards (Balcones Fault Zone) Aquifer.

The desired future condition statement also provides for a drought-condition desired future condition that was adopted after considering GAM Run 09-019 and the Barton Springs/Edwards Aquifer Conservation District's 2004 report titled "Sustainable Yield Study" (Smith and Hunt, 2004). As stated in the desired future condition resolution, pumping reductions during drought conditions are a management tool of the Barton Springs/Edwards Aquifer Conservation District. Neither the simulations in GAM Run 09-019 nor the additional model simulations completed as part of this report assumed reductions in pumping due to drought conditions. These simulations could not, therefore, be used to directly assess springflows under drought conditions given the management strategy of the district.

However, as summarized in Technical Note 2011-0707 provided by Barton Springs/Edwards Aquifer Conservation District on July 7, 2011 to the Texas Water Development Board, multiple numerical modeling studies support an approximate one-to-one relationship between springflow and pumping under low-flow conditions (Hunt and others, 2011). Given a total water budget estimated by the district of 11.7 cubic feet per second (8,470 acre-feet per year) available for discharge during extreme drought conditions (Hunt and others, 2011) and the minimum drought condition springflow of 6.5 cubic feet per second (4,705 acre-feet per year), the available pumping under extreme

drought conditions was estimated to be approximately 5.2 cubic feet per second (3,765 acre-feet per year). The modeled available groundwater for extreme drought conditions using this water balance approach, which is distinct from the approach used for average recharge conditions, is presented separately in the results section below.

## **PARAMETERS AND ASSUMPTIONS:**

### ***Modeled Approach for Average Recharge Conditions***

- The model recalibrated to include the 1950s drought for the Barton Springs segment of the Edwards (Balcones Fault Zone) Aquifer was used for estimating modeled available groundwater during average recharge conditions (Hutchison and Hill, in preparation).
- Similar to GAM Run 09-019 (Hutchison and Hill, 2011), the simulations consisted of 342 7-year simulations extending from 1648 through 1995 based on a tree-ring dataset from Cleaveland (2006). Each 7-year simulation consisted of 84 monthly stress periods.
- Pumping of 11,557 acre-feet per year in Groundwater Management Area 10 was assumed and implemented by multiplying estimated 2002 pumping from the model by a factor of 2.13 in order to achieve the assumed pumping.

### ***Water Balance Approach for Extreme Drought Conditions***

- A water balance approach was used to estimate modeled available groundwater during extreme drought conditions based on information provided by Barton Springs/Edwards Aquifer Conservation District. See Hunt and others (2011) for additional details on the methods and assumptions for this approach.
- The total amount of water available for discharge by both springs and pumping during extreme drought conditions (11.7 cubic feet per second or 8,470 acre-feet per year) was estimated using information from the 1950's drought of record as described in Hunt and others (2011).
- The water balance approach described here does not contain information about the spatial distribution of pumping. For the purposes of regional water planning, the estimated total pumping available during extreme drought conditions was divided by county, regional water planning area, river basin, and groundwater conservation district based on the distribution of pumping in the modeled approach above.



## **Modeled Available Groundwater and Permitting**

As defined in Chapter 36 of the Texas Water Code, “modeled available groundwater” is the estimated average amount of water that may be produced annually to achieve a desired future condition. This is distinct from “managed available groundwater,” shown in the draft version of this report dated July 21, 2011, which was a permitting value and accounted for the estimated use of the aquifer exempt from permitting. This change was made to reflect changes in statute by the 82<sup>nd</sup> Texas Legislature, effective September 1, 2011.

Groundwater conservation districts are required to consider modeled available groundwater, along with several other factors, when issuing permits in order to manage groundwater production to achieve the desired future condition(s). The other factors districts must consider include annual precipitation and production patterns, the estimated amount of pumping exempt from permitting, existing permits, and a reasonable estimate of actual groundwater production under existing permits. The estimated amount of pumping exempt from permitting, which the Texas Water Development Board is now required to develop after soliciting input from applicable groundwater conservation districts, will be provided in a separate report.

### **RESULTS:**

Results of the additional model simulations are summarized in Figures 3 and 4. Figure 3 presents the cumulative distribution of springflow for the entire set of simulations (342 7-year simulations), which totals 28,728 months. Note that springflows below 6.5 cubic feet per second occur less than 0.5 percent of the time even though simulated pumping was not reduced during drought conditions. Though the estimated pumping for extreme drought conditions presented below was derived using a separate water balance approach, the modeling results are consistent with the conclusion that the drought condition desired future condition can be met given the management practice of Barton Springs/Edwards Aquifer Conservation District to reduce pumping during drought.

Figure 4 presents the average monthly springflow for each of the 342 7-year simulations plotted against the average precipitation for the corresponding 7-year period. Note that the average springflow for all 342 7-year periods is 49.7 cubic feet per second. Further, note that at any particular precipitation condition, there is considerable variation in the average springflow. This expected variation will be an important consideration when the Barton Springs/Edwards Aquifer Conservation District compiles springflow data and compares them to the desired future condition.

Based on the analysis described here, the modeled available groundwater for average recharge conditions for the northern subdivision of the Edwards (Balcones Fault Zone) Aquifer in Groundwater Management Area 10 as a result of the desired future condition is 11,557 acre-feet per year. This has been divided by county, regional water planning area, and river basin for each decade between 2010 and 2060 for use in the regional water planning process (Table 1).

As described above, for extreme drought conditions the modeled available groundwater is 3,765 acre-feet per year. This represents approximately 32.6 percent of the modeled available groundwater under average conditions. Since the water budget approach used to develop this estimate does not contain information about the spatial distribution of pumping, the results were divided by county, regional water planning area, and river basin based on the distribution of pumping during average conditions. Specifically, the modeled available groundwater under average conditions was multiplied by 32.6 percent to yield the modeled available groundwater during extreme drought conditions in each area (Table 1).

The modeled available groundwater for both average recharge and extreme drought conditions is also summarized by county, regional water planning area, river basin, and groundwater conservation district as shown in tables 2, 3, 4, and 5, respectively. In Table 5, note that Barton Springs/Edwards Aquifer Conservation District is the only district relevant to the desired future conditions. This excludes the Edwards Aquifer Authority because the desired future condition and modeled available groundwater in this area was set by the Texas Legislature during the 80<sup>th</sup> Legislative Session.

### **LIMITATIONS:**

The groundwater model used in completing this analysis is the best available scientific tool that can be used to meet the stated objective(s). To the extent that this analysis will be used for planning purposes and/or regulatory purposes related to pumping in the past and into the future, it is important to recognize the assumptions and limitations associated with the use of the results. In reviewing the use of models in environmental regulatory decision making, the National Research Council (2007) noted:

“Models will always be constrained by computational limitations, assumptions, and knowledge gaps. They can best be viewed as tools to help inform decisions rather than as machines to generate truth or make decisions. Scientific advances will never make it possible to build a perfect model that accounts for every aspect of reality or to prove that a given model is correct in all respects for a particular regulatory application. These characteristics make evaluation of a regulatory model

more complex than solely a comparison of measurement data with model results.”

A key aspect of using the groundwater model to evaluate the impacts of future pumping is the need to make assumptions about the location in the aquifer where future pumping will occur. As actual pumping changes in the future, it will be necessary to evaluate the amount of that pumping as well as its location in the context of the assumptions associated with this analysis. Evaluating the amount and location of future pumping is as important as evaluating the changes in groundwater levels, spring flows, and other metrics that describe the impacts of that pumping. This analysis does not assess the possible impacts of pumping such as reduced water quality or land surface subsidence.

In addition, certain assumptions have been made regarding future precipitation, recharge, and streamflow in evaluating the impacts of future pumping. Those assumptions also need to be considered and compared to actual future data.

Given these limitations, users of this information are cautioned that the results should not be considered a definitive, permanent prediction of the changes in groundwater storage, streamflow and spring flow. Because the application of the groundwater availability model was designed to address regional scale questions, the results are most effective on a regional scale. The TWDB makes no warranties or representations relating to the actual conditions of any aquifer at a particular location or at a particular time.

It is important for groundwater conservation districts to monitor future groundwater pumping and overall conditions of the aquifer. Because of the limitations of the groundwater availability model and the assumptions in this analysis, it is important that the groundwater conservation districts work with the TWDB to refine this analysis in the future given the reality of how the aquifer responds to the actual amount and location of pumping now and in the future.

**REFERENCES:**

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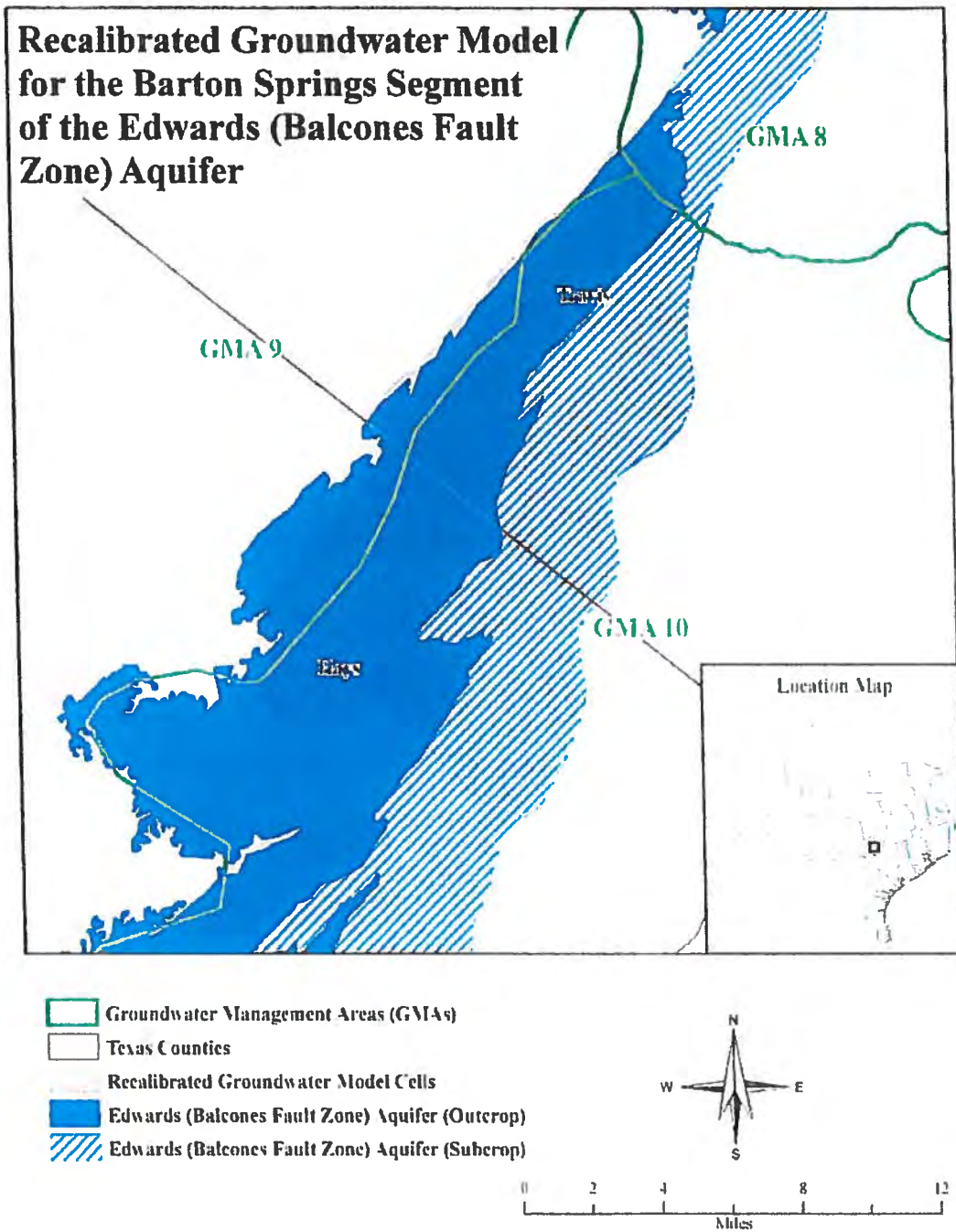
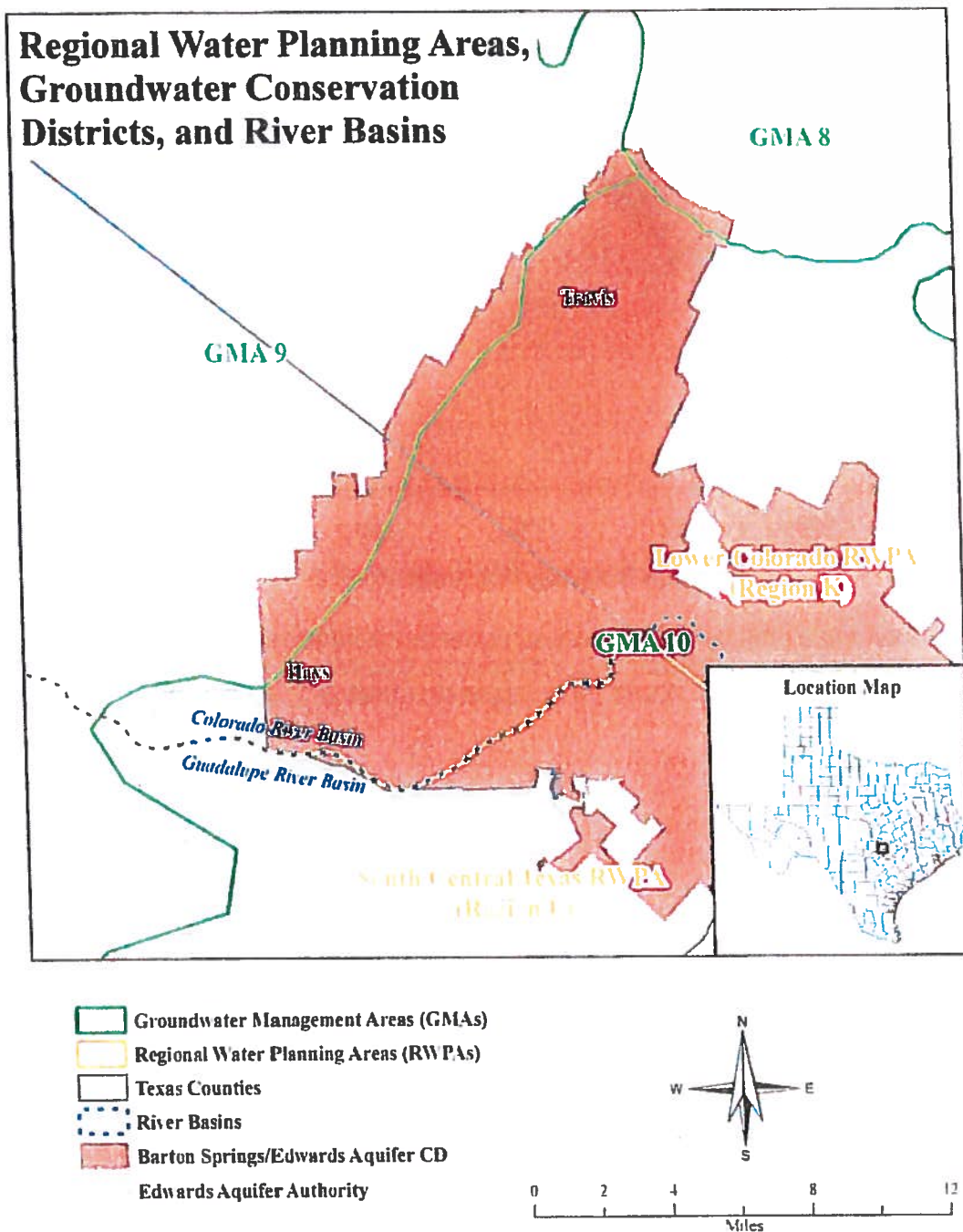


FIGURE 1. MAP SHOWING THE AREAS COVERED BY THE GROUNDWATER MODEL REPRESENTING THE NORTHERN SUBDIVISION OF THE EDWARDS (BALCONES FAULT ZONE) AQUIFER.





**FIGURE 2. MAP SHOWING REGIONAL WATER PLANNING AREAS, GROUNDWATER CONSERVATION DISTRICTS, COUNTIES, AND RIVER BASINS IN GROUNDWATER MANAGEMENT AREA 10 RELEVANT TO THE NORTHERN SUBDIVISION OF THE EDWARDS (BALCONES FAULT ZONE) AQUIFER.**

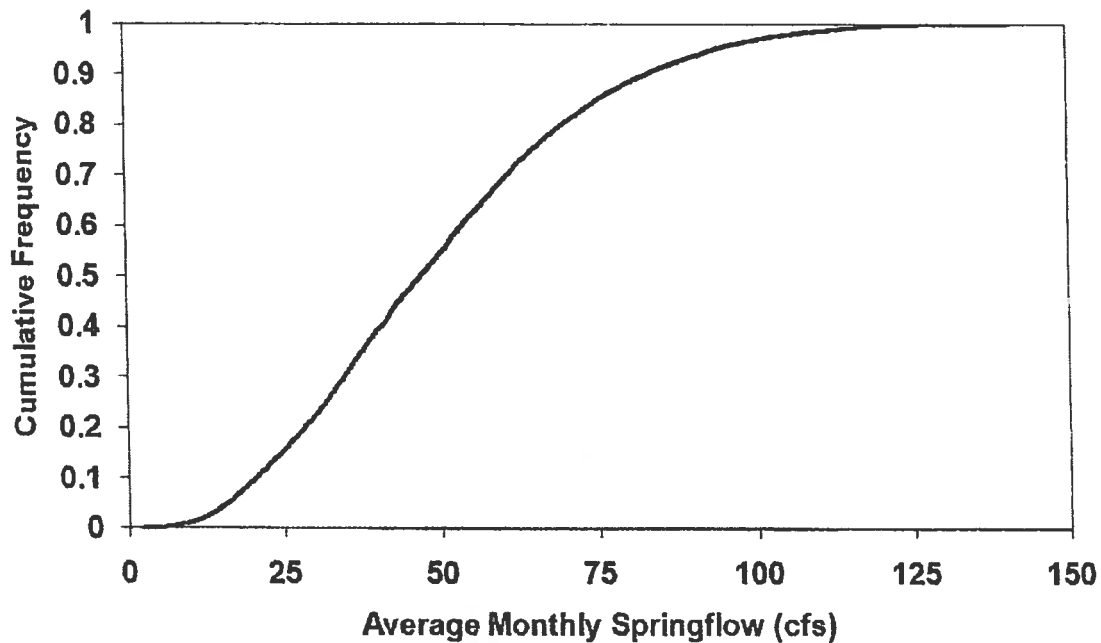


FIGURE 3. CUMULATIVE DISTRIBUTION OF AVERAGE MONTHLY SPRINGFLOW FOR BARTON SPRINGS BASED ON 342 7-YEAR SIMULATIONS WITH PUMPING AT 11,557 ACRE-Feet PER YEAR (16 CUBIC FEET PER SECOND) ASSUMING NO REDUCTIONS DURING DROUGHT.

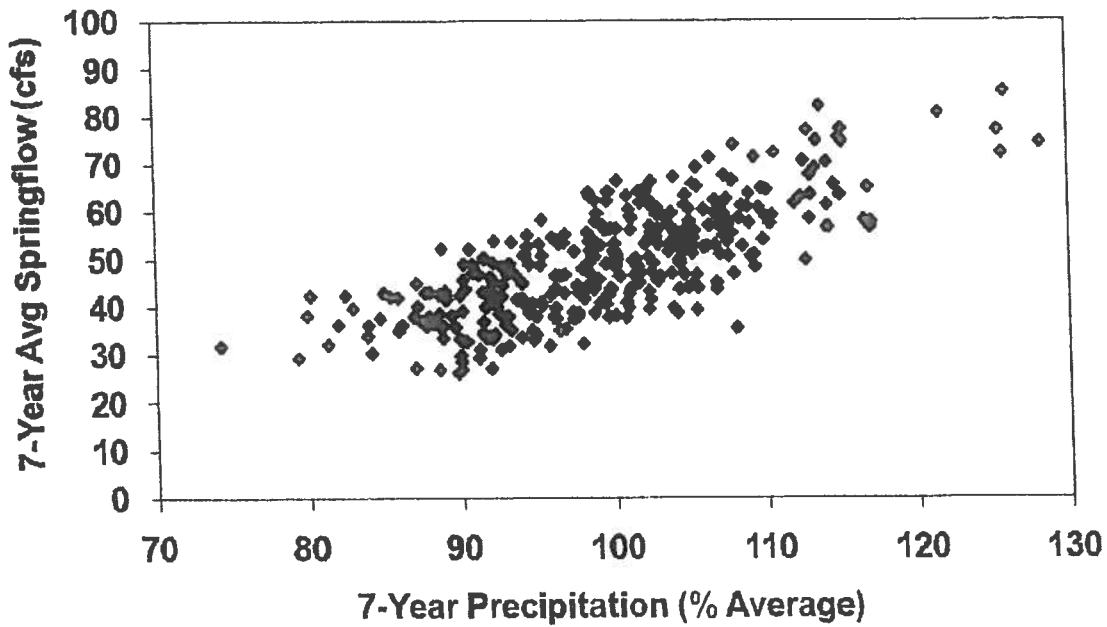


FIGURE 4. 7-YEAR PRECIPITATION VERSUS 7-YEAR AVERAGE SPRINGFLOW BASED ON 342 SIMULATIONS ASSUMING 11,557 ACRE-FEET OF ANNUAL PUMPING (16 CUBIC FEET PER SECOND).

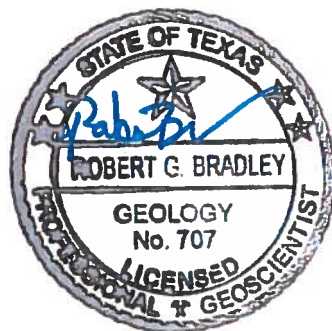


GTA Aquifer Assessment 10-35 MAG  
Groundwater Management Area 10  
Northern saline Edwards Aquifer  
Modeled Available Groundwater estimates  
November 20, 2011

## GTA Aquifer Assessment 10-35 MAG

by Robert G. Bradley, P.G.

Texas Water Development Board  
Groundwater Technical Assistance Section  
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Robert G. Bradley, P.G. 707, authorized the seal appearing on this document on November 20, 2011.

GTA Aquifer Assessment 10-35 MAG  
Groundwater Management Area 10  
Northern saline Edwards Aquifer  
Modeled Available Groundwater estimates  
November 20, 2011

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## **EXECUTIVE SUMMARY:**

The estimated modeled available groundwater from the saline Edwards Aquifer in the "northern subdivision" of Groundwater Management Area (GMA) 10 that achieves the desired future condition adopted by members of Groundwater Management Area 10 is approximately 1,180 acre-feet per year and is summarized by county, regional water planning area, and river basin as shown in Table 3. Within this area, the estimated modeled available groundwater for the Barton Springs Edwards Aquifer Conservation District is approximately 523 acre-feet per year from 2010 to 2060 and the modeled available groundwater for the Plum Creek Conservation District is approximately 112 acre feet between 2010 and 2060.

## **REQUESTOR:**

Mr. Rick Illgner of the Edwards Aquifer Authority acting on behalf of the member groundwater conservation districts of Groundwater Management Area 10.

## **DESCRIPTION OF REQUEST:**

In a letter received September 2, 2010, Mr. Illgner provided the Texas Water Development Board (TWDB) with the desired future condition of the saline zone of Edwards Aquifer in the "northern subdivision" as adopted by the members of Groundwater Management Area 10. The term "northern subdivision" was designated by Groundwater Management Area 10 and is used in this report to describe this assessment area. The desired future condition for the saline Edwards Aquifer, as described in Resolution No. 2010-06 and adopted August 4, 2010 by the groundwater conservation districts in Groundwater Management Area 10 is described below:

- Well drawdown at the saline-freshwater interface (the so called Edwards "bad water line") in the northern subdivision of GMA 10 that averages no more than 5 feet and does not exceed a maximum of 25 feet at any one point on the interface.

In response to receiving the adopted desired future condition, TWDB has estimated the modeled available groundwater that achieves the above desired future condition for the northern area saline zone of the Edwards Aquifer in Groundwater Management Area 10.

## **METHODS:**

Groundwater Management Area 10, located in South Central Texas, includes an areas designated by the GMA as the "northern subdivision" (Figure 1). This area includes all of the Edwards Aquifer in Groundwater Management Area 10 north of the Edwards Aquifer Authority. The saline zone of the Edwards Aquifer in this area has been determined to be relevant for joint planning purposes. There is no distinction between fresh and saline water from the aquifer within the jurisdiction of the Edwards Aquifer Authority.

The Theis equation (Theis, 1935) was used to simulate the desired future conditions on the saline-freshwater interface. Median values for transmissivity and storativity from Hunt and others (2010) were used to calculate the drawdown values.

The Barton Springs-Edwards Aquifer Conservation District established a 3-mile buffer from the saline-freshwater interface in the saline Edwards Aquifer (BSEAD, 2009), and this was honored in the estimation of the modeled available groundwater. It was assumed that no saline Edwards Aquifer wells would be pumping within the buffer zone and that this buffer zone would be applied to the Plum Creek Conservation District in order to achieve the desired future condition. It was assumed that if wells were located within the buffer zone it would result in greater drawdown at the saline-freshwater interface.

To show effects of pumping that averages no more than 5 feet the interface, a series of ten wells were assumed to be spaced one mile apart starting at the 3-mile buffer out to out to a distance of 12 miles. This maximum distance is approximately the distance where the Edwards Aquifer becomes too deep or too saline for use. Discharge volumes for each well that would result in a 5 feet drawdown at the saline-freshwater interface over a 50-year period were calculated iteratively in a Microsoft Excel worksheet (Table 1).

To determine the cumulative effect of pumping all of these wells upon a hypothetical monitoring well at the saline-freshwater interface, a drawdown superposition formula derived from the Theis equation (Briscoe, 1984, pp.574-575) was used to calculate a distance of a single hypothetical monitoring well that would represent the previous ten wells used in calculation of the discharge.



The formula is:

$$r = (r_1 * r_2 * \dots * r_n)^{1/n}$$

Where

r = distance of individual well from  
 fresh water/ saline-freshwater interface

The product of the distances raised to the inverse number results in an equivalent distance of approximately 7 miles. Using the sum of the discharges of 1,506 gallons per minute (2,431 acre-feet per year) as the pumping rate, the estimated drawdown at the interface is 51.4 feet over 50 years (Table 2). Therefore, the maximum desired future condition, a maximum of 25 feet at any one point on the interface, is not honored.

Table 1. Results of pumping wells and resulting drawdowns upon a hypothetical monitoring well at the saline-freshwater interface to achieve the desired future conditions for the saline Edwards Aquifer.

Description	Distance (miles)	Discharge (gpm)	Discharge (AF/YR)	Drawdown at interface (feet)
Wells used to determine effects of pumping to create 5 feet drawdown at the saline-freshwater interface.	3	106	171	5.0
	4	116	187	5.0
	5	127	204	5.0
	6	136	220	5.0
	7	147	238	5.0
	8	156	252	5.0
	9	164	264	5.0
	10	175	283	5.0
	11	185	298	5.0
	12	194	313	5.0

gpm = gallons per minute

AF/YR = acre-feet per year

Table 2. Results of the cumulative effect of pumping all ten wells (Table 1) upon a hypothetical monitoring well at the saline-freshwater interface.

Description	Distance (miles)	Discharge (gpm)	Discharge (AF/YR)	Drawdown at interface (feet)
Cumulative drawdown from wells in Table 1	7	1,506	2,431	51.4

gpm = gallons per minute

AF/YR = acre-feet per year

The maximum desired future condition of 25 feet of drawdown was determined to be the constraining factor and was used to calculate the modeled available groundwater. The distance of 7 miles was used to iteratively calculate the discharge that would result in 25 feet of drawdown at the saline-freshwater interface over a 50-year period. The maximum desired future condition is achievable by using an estimated modeled available groundwater volume of 731 gallons per minute or 1,180 acre-feet per year (Table 3).

Table 3. Resulting drawdown upon a hypothetical monitoring well at the saline-freshwater interface to achieve the maximum desired future conditions for the saline Edwards Aquifer.

Description	Distance (miles)	Discharge (gpm)	Discharge (AF/YR)	Drawdown at interface (feet)
Well used to determine effects of pumping to create a maximum 25 feet drawdown at the saline-freshwater interface.	7	731	1,180	25.0

gpm = gallons per minute

AF/YR = acre-feet per year

### PARAMETERS AND ASSUMPTIONS:

- The Theis equation is used to determine drawdown at the saline-freshwater interface, which assumes that the aquifer is homogenous and has infinite areal extent; and all wells penetrate the aquifer fully and have an infinitesimal diameter.
- The entire saline Edwards Aquifer is under confined conditions.
- Pumping will only occur outside of the "buffer zone" as defined in Barton Springs/Edwards Aquifer Conservation District rules (BSEACD, 2009).
- The storage coefficient of the aquifer is estimated to be  $7 \times 10^{-4}$  (Hunt and others, 2010).
- The transmissivity of the aquifer is estimated to be 2,000 ft<sup>2</sup>/day (converted from 15,000 gallons/day/ft from Hunt and others, 2010) and it is constant at all times and in all places within the aquifer.

- The aquifer area was calculated from the TWDB shapefile for the Trinity Aquifer, projected into the GAM projection (Anaya, 2001).
- Areas, in acres, were calculated within ArcGIS 9.2.
- The map area percentages were calculated by including all of the area covered by the saline Edwards Aquifer.
- Map areas were designated as Plum Creek Conservation District only where their jurisdiction does not overlap with the BSEACD.

## **MODELED AVAILABLE GROUNDWATER AND PERMITTING:**

As defined in Chapter 36 of the Texas Water Code, "modeled available groundwater" is the estimated average amount of water that may be produced annually to achieve a desired future condition. This is distinct from "managed available groundwater," shown in the draft version of this report dated April 18, 2011, which was a permitting value and accounted for the estimated use of the aquifer exempt from permitting. This change was made to reflect changes in statute by the 82<sup>nd</sup> Texas Legislature, effective September 1, 2011.

Groundwater conservation districts are required to consider modeled available groundwater, along with several other factors, when issuing permits in order to manage groundwater production to achieve the desired future condition(s). The other factors districts must consider include annual precipitation and production patterns, the estimated amount of pumping exempt from permitting, existing permits, and a reasonable estimate of actual groundwater production under existing permits.

The estimated amount of pumping exempt from permitting, which the Texas Water Development Board is now required to develop after soliciting input from applicable groundwater conservation districts, will be provided in a separate report.

## **RESULTS:**

The estimated modeled available groundwater from the saline Edwards Aquifer within the "northern subdivision" of Groundwater Management Area 10 that achieves the adopted desired future condition is approximately 1,180 acre-feet per year.

The modeled available groundwater for the entire area was split by county, regional water planning area, river basin, and groundwater conservation district in order to apportion the total amount to each area. Table 2 shows the individual areas and the calculated modeled available groundwater for each split.

GTA Aquifer Assessment 10-35 MAG  
 Groundwater Management Area 10  
 Northern saline Edwards Aquifer  
 Modeled Available Groundwater estimates  
 November 20, 2011

Table 4. Modeled available groundwater by county, regional water planning area, river basin, and groundwater conservation district (See Figure 1).

GMA	Aquifer	County	RWPA	Basin	GCD	Map Areas	Areal extent (acres)	Percent area	Estimated total pumping for study area (AC-FUYR)	Estimated total pumping for each map area (AC-FUYR)
10	Saline Edwards	Caldwell	L	Colorado	Barton Springs/Edwards Aquifer CD	1	3,905	2.39%	1,180	28
					N/A	2	5,022	3.08%	1,180	36
				Guadalupe	Barton Springs/Edwards Aquifer CD	3	12,433	7.62%	1,180	90
					N/A	4	2,005	1.23%	1,180	15
					Plum Creek CD	5	4,008	2.46%	1,180	29
		Hays	K	Colorado	Barton Springs/Edwards Aquifer CD	6	1,259	0.77%	1,180	9
				Guadalupe	Barton Springs/Edwards Aquifer CD	7	21,052	12.91%	1,180	152
			L	Guadalupe	Plum Creek CD	8	11,470	7.03%	1,180	83
		Travis	K	Colorado	Barton Springs/Edwards Aquifer CD	9	28,378	17.40%	1,180	205
					N/A	10	68,243	41.84%	1,180	494
				Guadalupe	Barton Springs/Edwards Aquifer CD	11	5,336	3.27%	1,180	39
Total							163,111	100.0%	n/a	1,180

GMA = groundwater management area      GCD = groundwater conservation district      RWPA = regional water planning area  
 ac-ft/yr = acre-feet per year      CD = conservation district  
 Values calculated in this table are the estimated total pumping determined by the assessment and then multiplied by the percent area

Modeled available groundwater estimates are also summarized by county, regional water planning area, and river basin for each decade between 2010 and 2060 for use in the regional water planning process (Table 3). The modeled available groundwater estimates are also summarized by individual counties, regional water planning areas, river basins, and groundwater conservation districts (Tables 4-7).

Table 5. Estimated modeled available groundwater by decade for the saline Edwards Aquifer within the "northern subdivision" of Groundwater Management Area 10. Results are in acre-feet per year and are divided by county, regional water planning area, and river basin.

County	Regional Water Planning Area	River Basin	Year					
			2010	2020	2030	2040	2050	2060
Caldwell	L	Colorado	64	64	64	64	64	64
		Guadalupe	134	134	134	134	134	134
Hays	K	Colorado	9	9	9	9	9	9
	L	Guadalupe	235	235	235	235	235	235
Travis	K	Colorado	699	699	699	699	699	699
		Guadalupe	39	39	39	39	39	39
Total			1,180	1,180	1,180	1,180	1,180	1,180

Table 6. Estimated modeled available groundwater, by county, for the saline Edwards Aquifer within the "northern subdivision" of Groundwater Management Area 10 for each decade between 2010 and 2060. Results are in acre-feet per year.

County	Year					
	2010	2020	2030	2040	2050	2060
Caldwell	198	198	198	198	198	198
Hays	244	244	244	244	244	244
Travis	738	738	738	738	738	738
<b>Total</b>	<b>1,180</b>	<b>1,180</b>	<b>1,180</b>	<b>1,180</b>	<b>1,180</b>	<b>1,180</b>

Table 7. Estimated modeled available groundwater, by regional water planning group, for the saline Edwards Aquifer within the "northern subdivision" of Groundwater Management Area 10 for each decade between 2010 and 2060. Results are in acre-feet per year.

Regional Water Planning Area	Year					
	2010	2020	2030	2040	2050	2060
K	747	747	747	747	747	747
L	433	433	433	433	433	433
<b>Total</b>	<b>1,180</b>	<b>1,180</b>	<b>1,180</b>	<b>1,180</b>	<b>1,180</b>	<b>1,180</b>

Table 8. Estimated modeled available groundwater, by river basin, for the saline Edwards Aquifer within the "northern subdivision" of Groundwater Management Area 10 for each decade between 2010 and 2060. Results are in acre-feet per year.

River Basin	Year					
	2010	2020	2030	2040	2050	2060
Colorado	772	772	772	772	772	772
Guadalupe	408	408	408	408	408	408
<b>Total</b>	<b>1,180</b>	<b>1,180</b>	<b>1,180</b>	<b>1,180</b>	<b>1,180</b>	<b>1,180</b>

Table 9. Estimates of modeled available groundwater for saline Edwards Aquifer within the "northern subdivision" of Groundwater Management Area for each decade between 2010 and 2060. Results are in acre-feet per year.

Groundwater Conservation District	Year					
	2010	2020	2030	2040	2050	2060
Barton Springs/Edwards Aquifer CD	523	523	523	523	523	523
Plum Creek CD	112	112	112	112	112	112
<b>Total (excluding non-district areas)</b>	<b>635</b>	<b>635</b>	<b>635</b>	<b>635</b>	<b>635</b>	<b>635</b>
No District	545	545	545	545	545	545
<b>Total (including non-district areas)</b>	<b>1,180</b>	<b>1,180</b>	<b>1,180</b>	<b>1,180</b>	<b>1,180</b>	<b>1,180</b>

CD = Conservation District

### LIMITATIONS:

The analytical method used was determined to be the best method to calculate estimates of modeled available groundwater; however, this method has limitations and should be replaced with better tools, including groundwater models and additional data that are not currently available, whenever possible.

This analysis assumes homogeneous and isotropic aquifers; however, aquifer conditions may not be uniform. However, it is understood that conditions for the saline Edwards Aquifer do not behave in a uniform manner. This assessment does not take in to account conduit flow and assumes only a matrix flow aquifer. Further, it assumes lateral inflow to the aquifer is equal to lateral outflow from the aquifer, and that future pumping will not alter this balance. In addition, certain assumptions have been made regarding future conditions, and these assumptions need to be considered and compared to actual future data when evaluating achievement of the desired future condition.

Given these limitations, users of this information are cautioned that the modeled available groundwater numbers should not be considered a definitive, permanent description of the amount of groundwater that can be pumped to meet the adopted desired future condition. The TWDB makes no warranties or representations relating to the actual conditions of any aquifer at a particular location or at a particular time.

It is important for groundwater conservation districts to monitor future groundwater pumping and water levels to know if they are achieving their desired future conditions.

Because of the limitations and assumptions in this analysis, it is important that the groundwater conservation districts work with the TWDB to refine these modeled available groundwater numbers given the reality of how the aquifer responds to the actual amount and location of pumping now and in the future.

## **REFERENCES:**

- Anaya, R., 2001, GAM technical memo 01-01(rev a): Texas Water Development Board technical memorandum, 2 p.
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GTA Aquifer Assessment 10-35 MAG  
 Groundwater Management Area 10  
 Northern saline Edwards Aquifer  
 Modeled Available Groundwater estimates  
 November 20, 2011

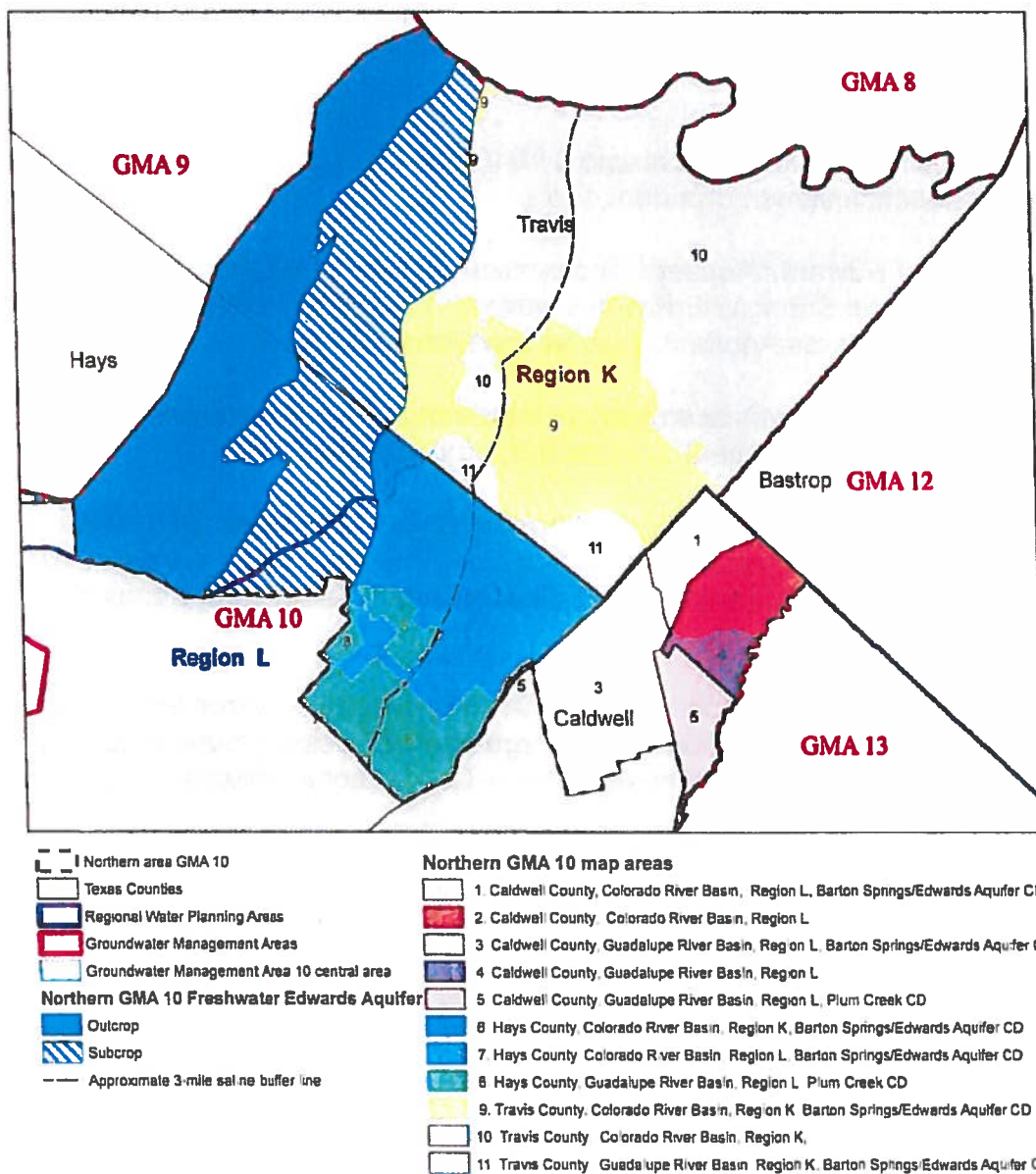


Figure 1. Map showing the areas used for estimating modeled available groundwater in the saline Edwards Aquifer in the "northern subdivision" of Groundwater Management Area 10.



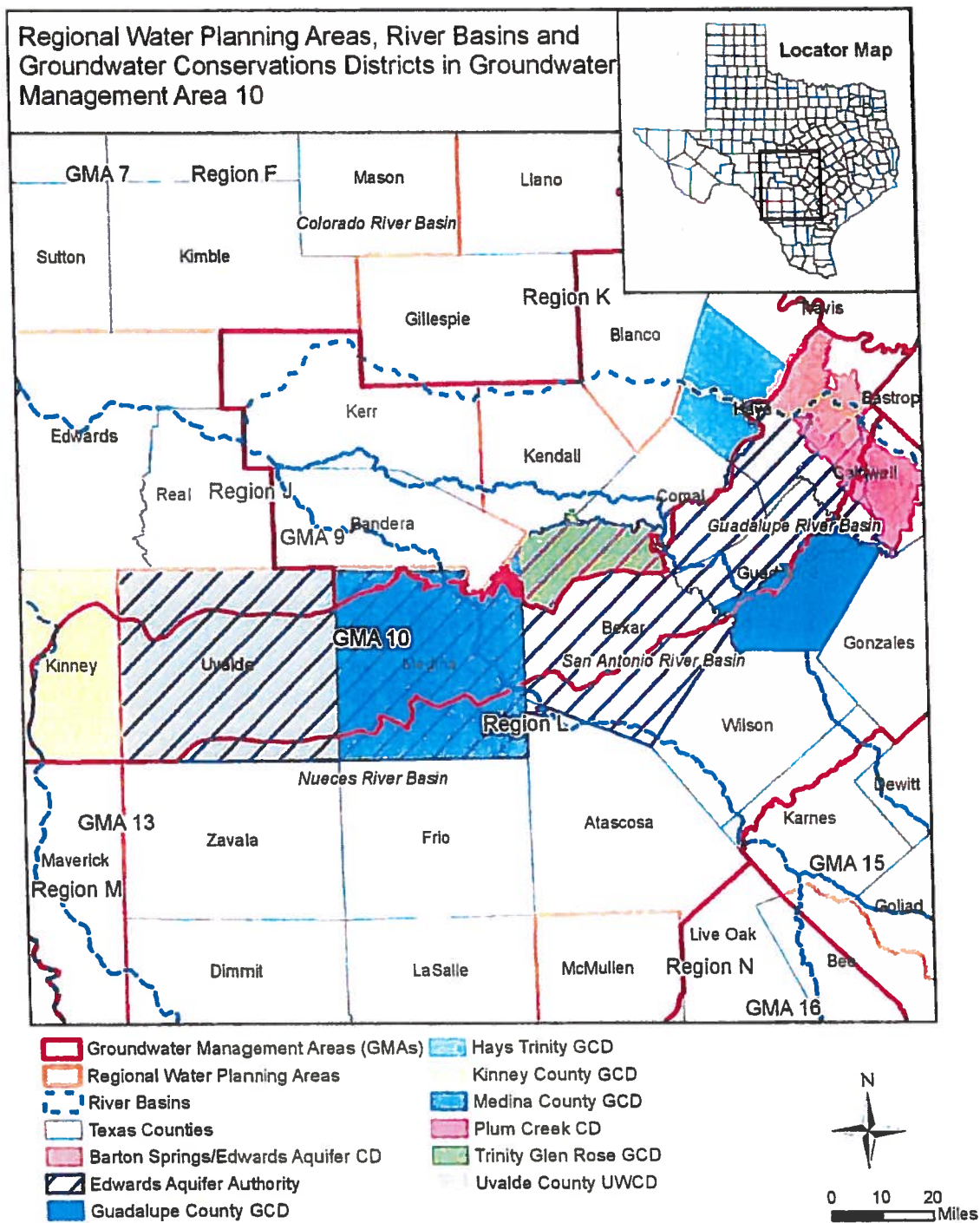


Figure 2. Map showing regional water planning areas, river basins, groundwater conservation districts and counties in Groundwater Management Area 10 (From Thorkildsen and Backhouse, 2010). CD = Conservation District, GCD = Groundwater Conservation District, UWCD = Underground Water Conservation District

the 1990s, the number of people in the world who are illiterate has increased from 1.2 billion to 1.5 billion.

There are many reasons for this. One is that the population of the world is growing so fast that the number of people who are illiterate is increasing.

Another reason is that the quality of education is so poor that many people who are in school are not learning enough to be able to read and write.

There are also many people who are illiterate because they do not have access to schools or because they cannot afford to go to school.

It is a tragedy that so many people in the world are illiterate. We need to find ways to help them learn to read and write.

One way to do this is to provide more schools and to improve the quality of the education that is provided.

Another way is to provide more opportunities for people to learn to read and write on their own.

There are many other ways to help people learn to read and write. We need to find the best way to help each person.

It is our responsibility to help people learn to read and write. We need to work together to make a difference.

Let us all do our part to help people learn to read and write. We can make a difference.

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GTA Aquifer Assessment 10-29 MAG  
Groundwater Management Area 10  
Trinity Aquifer  
Modeled Available Groundwater estimates  
November 29, 2011

## GTA Aquifer Assessment 10-29 MAG

by David Thorkildsen, P.G. and Sarah Backhouse

Texas Water Development Board  
Groundwater Technical Assistance Section  
(512) 936-0871



David Thorkildsen, P.G. 705 authorized the seal appearing on this document on  
November 29, 2011.

GTA Aquifer Assessment 10-29 MAG  
Groundwater Management Area 10  
Trinity Aquifer  
Modeled Available Groundwater estimates  
November 29, 2011

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## **EXECUTIVE SUMMARY:**

The modeled available groundwater for the Trinity Aquifer as a result of the desired future condition adopted by members of Groundwater Management Area 10 is approximately 59,746 acre-feet per year. This is divided by county, regional water planning area, and river basin in Table 2 for use in the regional water planning process. Modeled available groundwater is summarized by county, regional water planning area, river basin, and groundwater conservation district in tables 3 through 6. Pumping estimates, as well as parameters and assumptions to determine additional modeled available groundwater estimates were extracted from GTA Aquifer Assessment 10-06, which Groundwater Management Area 10 used as the basis for developing a desired future condition stating that *"except as otherwise provided herein: regional average well drawdown during average recharge conditions that does not exceed 25 feet; within the jurisdiction of Hays-Trinity GCD: regional average well drawdown during average recharge conditions of zero (0) feet; and in the Uvalde County part of GMA-10: regional average well drawdown during average recharge conditions of no more than twenty (20) feet"* and declaring *"the Trinity Aquifer in the part of GMA 10 that is in the Trinity-Glen Rose GCD as a non-relevant aquifer"*.

## **REQUESTOR:**

Mr. Rick Illgner of the Edwards Aquifer Authority acting on behalf of the member groundwater conservation districts of Groundwater Management Area 10.

## **DESCRIPTION OF REQUEST:**

In a letter received August 30, 2010, Mr. Illgner provided the Texas Water Development Board (TWDB) with the desired future condition of the Trinity Aquifer adopted by the members of Groundwater Management Area 10. The desired future condition for the Trinity Aquifer, as described in Resolution No. 2010-10 and adopted August 23, 2010 by the groundwater conservation districts in Groundwater Management Area 10 is described below:

- 1) *except as otherwise provided herein: regional average well drawdown during average recharge conditions that does not exceed 25 feet (including exempt and non-exempt well use);*
- 2) *within the jurisdiction of Hays-Trinity GCD: regional average well drawdown during average recharge conditions of zero (0) feet (including exempt and non-exempt use);*
- 3) *in the Uvalde County part of GMA-10: regional average well drawdown during average recharge conditions of no more than twenty (20) feet (including exempt and non-exempt well use);*

4) *declare the Trinity Aquifer in the part of GMA 10 that is in the Trinity-Glen Rose GCD as a non-relevant aquifer*

In response to receiving the adopted desired future condition, TWDB has estimated the modeled available groundwater that achieves the above desired future condition for Groundwater Management Area 10.

**METHODS:**

Groundwater Management Area 10, located in South Central Texas, includes part of the Trinity Aquifer (Figure 1). At the request of Groundwater Management Area 10 the TWDB previously analyzed several water level decline scenarios for the Trinity Aquifer, documented in GTA Aquifer Assessment 10-06. One of the scenarios included the desired future condition of 25 feet of water level decline, and one included the desired future condition of 20 feet of water level decline. For these two scenarios the pumping results presented here for Groundwater Management Area 10 are taken directly from GTA Aquifer Assessment 10-06 with the exception of the area in the Hays Trinity Groundwater Conservation District (GCD). The assessment did not include a 0 foot water level decline scenario, therefore new calculations to determine modeled available groundwater estimates were completed for this area (Table 1)

To calculate modeled available groundwater estimates for the desired future condition of 0 feet of water level decline for the Hays Trinity GCD parameters and assumptions for the volumetric storage, recharge, inflow calculations, map areas, and areal extent were obtained from GTA Aquifer Assessment 10-06 (Thorkildsen and Backhouse, 2010). It is important to note that only 3 percent (6,363 acres) of the total Hays Trinity GCD area occurs in Groundwater Management Area 10.

To calculate change in aquifer storage for the Hays Trinity GCD based on the desired future condition, map areas were multiplied by the estimated aquifer storativity or specific yield and then by a uniform water level decline of 0 feet. These volumes were then divided by 50 years to obtain a yearly volume. In cases where unconfined and confined conditions existed, those were calculated separately.

Modeled available groundwater estimates are divided by county, regional water planning area, river basin, and groundwater conservation district. These areas are shown in Figure 2.



## **PARAMETERS AND ASSUMPTIONS:**

- Parameters, assumptions, volumetric calculations, and areas were obtained from GTA Aquifer Assessment 10-06 (Thorkildsen and Backhouse, 2010).
- Water-level declines were estimated to be uniform across the aquifer.
- The Edwards Aquifer Authority is not included in this assessment because they are restricted by their enabling legislation to manage only the Edwards Aquifer.

## **MODELED AVAILABLE GROUNDWATER AND PERMITTING:**

As defined in Chapter 36 of the Texas Water Code, "modeled available groundwater" is the estimated average amount of water that may be produced annually to achieve a desired future condition. This is distinct from "managed available groundwater," shown in the draft version of this report dated January 10, 2011, which was a permitting value and accounted for the estimated use of the aquifer exempt from permitting. This change was made to reflect changes in statute by the 82<sup>nd</sup> Texas Legislature, effective September 1, 2011.

Groundwater conservation districts are required to consider modeled available groundwater, along with several other factors, when issuing permits in order to manage groundwater production to achieve the desired future condition(s). The other factors districts must consider include annual precipitation and production patterns, the estimated amount of pumping exempt from permitting, existing permits, and a reasonable estimate of actual groundwater production under existing permits. The estimated amount of pumping exempt from permitting, which the Texas Water Development Board is now required to develop after soliciting input from applicable groundwater conservation districts, will be provided in a separate report.

## **RESULTS:**

The estimated modeled available groundwater for the Trinity Aquifer in Groundwater Management Area 10 consistent with the adopted desired future condition is approximately 59,746 acre-feet per year. The volumetric calculations to determine the estimates for Hays Trinity GCD are shown in Table 1. The relatively small totals reflect the small percentage (3%) of the total district area that occurs in Groundwater Management Area 10.

Table 2 shows the modeled available groundwater by decade divided by county, regional water planning area, and river basin for use in the regional water planning process. Modeled available groundwater estimates are also summarized by county, regional water planning area, river basin, and

GTA Aquifer Assessment 10-29 MAG  
 Groundwater Management Area 10  
 Trinity Aquifer  
 Modeled Available Groundwater estimates  
 November 29, 2011

groundwater conservation district and are shown in tables 3, 4, 5, and 6 respectively.

Table 1. Volumetric calculations estimating annual modeled available groundwater for the Trinity Aquifer in Hays Trinity GCD. Map areas and parameters were obtained from GTA Aquifer Assessment 10-06 (Thorkildsen and Backhouse, 2010).

GMA	Aquifer	County	GCD	Map Areas	Estimated storage coefficient	Areal extent (acres)	Desired total aquifer water level decline (feet)	Estimated total volume from water level decline (acre-feet)	Estimated annual volume from water level decline (acre-feet)	Estimated annual effective recharge (ac-ft/yr)	Estimated annual lateral inflow (ac-ft/yr)	Estimated annual total volume (ac-ft/yr)
10	Trinity	Hays	Hays Trinity Groundwater Conservation District	7	0.00001	994	0	0	0	0	39	39
				8	0.00001	4,342	0	0	0	80	80	
				22	0.05	554	0	0	64	9	73	
				23	0.05	473	0	0	57	9	66	

GMA = groundwater management area ac-ft/yr = acre-feet per year

The formulas for this table are: storage coefficient \* areal extent \* desired total aquifer water level decline = estimated total volume from water level decline. Estimated total volume from water level decline/50 = estimated annual volume from water level decline. Then estimated annual volume from water level decline + estimated annual effective recharge + estimated annual lateral inflow = estimated annual total volume.

Table 2. Modeled available groundwater by decade for the Trinity Aquifer in Groundwater Management Area 10. Results are in acre-feet per year and are divided by county, regional water planning area, and river basin.

County	Regional Water Planning Area	River Basin	Year					
			2010	2020	2030	2040	2050	2060
Bexar	L	San Antonio	19,998	19,998	19,998	19,998	19,998	19,998
Caldwell	L	Guadalupe	0	0	0	0	0	0
Comal	L	Guadalupe	27,176	27,176	27,176	27,176	27,176	27,176
		San Antonio	2,108	2,108	2,108	2,108	2,108	2,108
Guadalupe	L	Guadalupe	0	0	0	0	0	0
		San Antonio	0	0	0	0	0	0
Hays	K	Colorado	955	955	955	955	955	955
	L	Guadalupe	2,860	2,860	2,860	2,860	2,860	2,860
Medina	L	Nueces	4,373	4,373	4,373	4,373	4,373	4,373
		San Antonio	996	996	996	996	996	996
Travis	K	Colorado	634	634	634	634	634	634
		Guadalupe	7	7	7	7	7	7
Uvalde	L	Nueces	639	639	639	639	639	639
Total			59,746	59,746	59,746	59,746	59,746	59,746



Table 3. Modeled available groundwater for the Trinity Aquifer summarized by county in Groundwater Management Area 10 for each decade between 2010 and 2060. Results are in acre-feet per year.

County	Year					
	2010	2020	2030	2040	2050	2060
Bexar	19,998	19,998	19,998	19,998	19,998	19,998
Caldwell	0	0	0	0	0	0
Cornal	29,284	29,284	29,284	29,284	29,284	29,284
Guadalupe	0	0	0	0	0	0
Hays	3,815	3,815	3,815	3,815	3,815	3,815
Medina	5,369	5,369	5,369	5,369	5,369	5,369
Travis	641	641	641	641	641	641
Uvalde	639	639	639	639	639	639
<b>Total</b>	<b>59,746</b>	<b>59,746</b>	<b>59,746</b>	<b>59,746</b>	<b>59,746</b>	<b>59,746</b>

Table 4. Modeled available groundwater for the Trinity Aquifer summarized by regional water planning area in Groundwater Management Area 10 for each decade between 2010 and 2060. Results are in acre-feet per year.

Regional Water Planning Area	Year					
	2010	2020	2030	2040	2050	2060
K	1,596	1,596	1,596	1,596	1,596	1,596
L	58,150	58,150	58,150	58,150	58,150	58,150
<b>Total</b>	<b>59,746</b>	<b>59,746</b>	<b>59,746</b>	<b>59,746</b>	<b>59,746</b>	<b>59,746</b>

Table 5. Modeled available groundwater for the Trinity Aquifer summarized by river basin in Groundwater Management Area 10 for each decade between 2010 and 2060. Results are in acre-feet per year.

River Basin	Year					
	2010	2020	2030	2040	2050	2060
Colorado	1,589	1,589	1,589	1,589	1,589	1,589
Guadalupe	30,043	30,043	30,043	30,043	30,043	30,043
Nueces	5,012	5,012	5,012	5,012	5,012	5,012
San Antonio	23,102	23,102	23,102	23,102	23,102	23,102
<b>Total</b>	<b>59,746</b>	<b>59,746</b>	<b>59,746</b>	<b>59,746</b>	<b>59,746</b>	<b>59,746</b>

Table 6. Modeled available groundwater for the Trinity Aquifer summarized by groundwater conservation district in Groundwater Management Area 10 for each decade between 2010 and 2060. Results are in acre-feet per year.

Groundwater Conservation District	Year					
	2010	2020	2030	2040	2050	2060
Barton Springs/Edwards Aquifer CD	1,288	1,288	1,288	1,288	1,288	1,288
Hays Trinity GCD	258	258	258	258	258	258
Medina County GCD	5,369	5,369	5,369	5,369	5,369	5,369
Plum Creek CD	238	238	238	238	238	238
Uvalde County UWCD	639	639	639	639	639	639
<b>Total (excluding non-district areas)</b>	<b>7,792</b>	<b>7,792</b>	<b>7,792</b>	<b>7,792</b>	<b>7,792</b>	<b>7,792</b>
No District	51,954	51,954	51,954	51,954	51,954	51,954
<b>Total (including non-district areas)</b>	<b>59,746</b>	<b>59,746</b>	<b>59,746</b>	<b>59,746</b>	<b>59,746</b>	<b>59,746</b>

GCD = Groundwater Conservation District      CD = Conservation District      UWCD = Underground Water Conservation District

### LIMITATIONS:

The water budget in this analysis was determined to be the best method to calculate estimates of modeled available groundwater, however this method has limitations and should be replaced with better tools, including groundwater models and additional data that are not currently available, whenever possible.

This analysis assumes homogeneous and isotropic aquifers; however, aquifer conditions may not be uniform. In addition, certain assumptions have been made regarding future precipitation, recharge, and streamflow in developing these pumping estimates. These assumptions need to be considered and compared to actual future data when evaluating achievement of the desired future condition.

Given these limitations, users of this information are cautioned that the modeled available groundwater numbers should not be considered a definitive, permanent description of the amount of groundwater that can be pumped to meet the adopted desired future condition. The TWDB makes no warranties or representations relating to the actual conditions of any aquifer at a particular location or at a particular time.

It is important for groundwater conservation districts to monitor future groundwater pumping and water levels to know if they are achieving their desired future conditions. Because of the limitations and assumptions in this analysis, it is important that the groundwater conservation districts work with the TWDB to refine these modeled available groundwater numbers given the reality of how the

GTA Aquifer Assessment 10-29 MAG  
Groundwater Management Area 10  
Trinity Aquifer  
Modeled Available Groundwater estimates  
November 29, 2011

aquifer responds to the actual amount and location of pumping now and in the future.

## **REFERENCES:**

Thorkildsen and Backhouse, 2010, GTA Aquifer Assessment 10-06: Texas Water Development Board, GTA Aquifer Assessment 10-06 Report, 20 p.



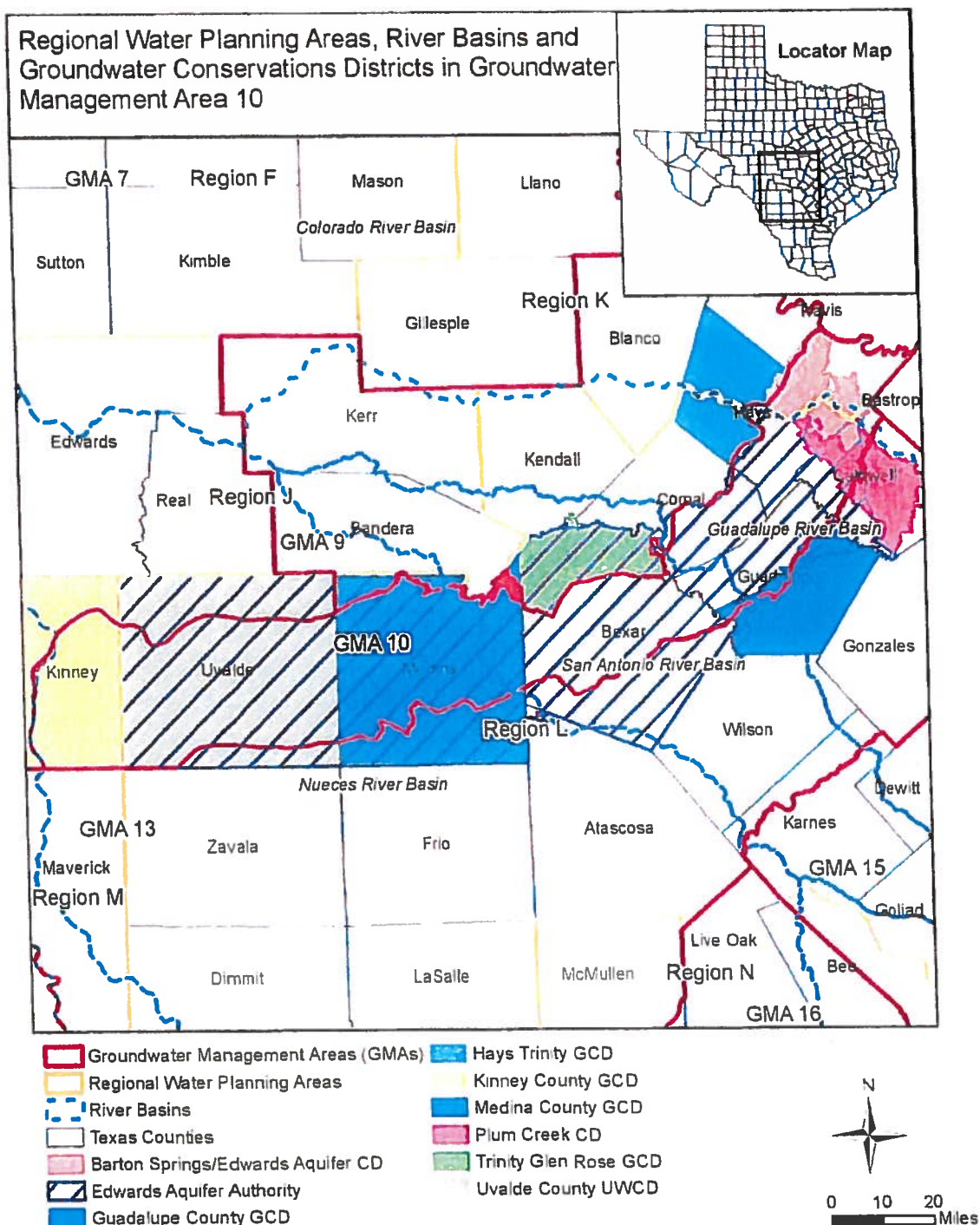


Figure 2. Map showing regional water planning areas, river basins, groundwater conservation districts and counties in and neighboring Groundwater Management Area 10. CD = Conservation District, GCD = Groundwater Conservation District, UWCD = Underground Water Conservation District

## **APPENDIX V**

### **NOTICE OF ADOPTED PLAN AVAILABILITY**

Bandera County River Authority and Groundwater District  
Blanco-Pedernales Groundwater Conservation District  
Cow Creek Groundwater Conservation District  
Hays Trinity Groundwater Conservation District  
Headwaters Groundwater Conservation District  
Medina County Groundwater Conservation District  
Trinity Glen Rose Groundwater Conservation District

Edwards Aquifer Authority  
Guadalupe County Groundwater Conservation District  
Kinney County Groundwater Conservation District  
Plum Creek Conservation District  
Uvalde County Underground Water Conservation District

Lower Colorado Regional Water Planning Group  
South Central Texas Regional Water Planning Group

Guadalupe-Blanco River Authority  
Lower Colorado River Authority





**Barton Springs  
Edwards Aquifer**  
CONSERVATION DISTRICT

**By E-mail and USPS Mail**

October 23, 2012

Mr. David Mauk, General Manager  
Bandera County River Authority and Groundwater District  
P.O. Box 177  
440 FM 3240  
Bandera, TX 78003

Subject: New Management Plan Adopted by the Board of Directors of the Barton Springs/Edwards Aquifer Conservation District

Dear David:

Pursuant to Texas Water Code §36.108(b), Joint Planning in Management Area, the Barton Springs/Edwards Aquifer Conservation District (District) is providing notice of the availability of the revised District Management Plan (Plan) to the Board of Directors of Bandera County River Authority and Groundwater District, a fellow member of GMA 9. I am enclosing a hard copy of this Plan; for your convenience, the Plan is also available electronically on our website, at the following location:

The Body of the Plan and Appendices are located at  
[www.bseacd.org/about-us/governing-documents#Revisions](http://www.bseacd.org/about-us/governing-documents#Revisions)

This Plan substantially revises the existing plan, dated August 2008, and it has now been adopted in a properly noticed meeting by Board resolution for review and comment by our two regional planning groups, our two river authorities, and the individual GCDs in our two GMAs, at their discretion, and ultimately by the TWDB for its overall approval. Until such approval is received, we consider this a proposed Plan. The Plan once approved both authorizes and guides the groundwater management programs and activities by the District for the ten-year period of 2012-2022; it will be considered for revision no later than October 2017.

The Plan conforms in all material respects to the requisites of Texas Administrative Code §356.6. The groundwater supply projections contained in the Plan are consistent with the latest TWDB-supplied Modeled Available Groundwater estimates for our District, which utilize the best available data and analytical methodologies. The Plan's objectives and strategies, and the District's Rules that implement those strategies, are designed to achieve and maintain the applicable Desired Future Conditions for the District's regulated aquifers in GMA 9. On the basis of the TWDB's pre-review comments that have been incorporated, we anticipate no differences between the Plan provided here and the version that is officially approved by TWDB, except for the inclusion in the appendices of the required notices, such as this one, and their acknowledgments and other related communications. Once the Plan is approved by TWDB, I will notify you and provide an electronic link to the approved Plan, complete with all appendices.

As you know, when a GCD amends an existing or issues a new Management Plan, under TWC 36.108, each GCD in each GMA of which the GCD is a member must be notified and provided a copy of the revised Management Plan. Specifically, the board of each of the GCDs in those GMAs is statutorily charged with considering that plan individually and comparing it to other management plans of other GCDs in the GMA. Discretion is available in how each board accomplishes that assessment.

Accordingly, we are requesting that you disseminate notice of this Plan's availability to members of your board of directors so that your board and staff may offer any comments on this Plan, either individually or collectively as part of the agenda of some upcoming BCRA GD board meeting. I would also appreciate a reply to this notice that the Plan has been received by BCRA GD and that we thereby have provided an *opportunity* for BCRA GD, at its discretion, to review, provide comments, and use this Plan.

Please let me know if you have any questions, comments, or concerns about the Plan or this notice process.

Sincerely,



W F (Kirk) Holland, P.G.  
General Manager

cc: Mr. Ron Fieseler, GMA 9 Committee Coordinator (without enclosure)

Enclosure





**Barton Springs  
Edwards Aquifer**  
CONSERVATION DISTRICT

**By E-mail and USPS Mail**

October 23, 2012

Ron Fieseler, General Manager  
Blanco-Pedernales Groundwater Conservation District  
601 West Main  
P.O. Box 1516  
Johnson City, Texas 78636-1516

Subject: New Management Plan Adopted by the Board of Directors of the  
Barton Springs/Edwards Aquifer Conservation District

Dear Ron:

Pursuant to Texas Water Code §36.108(b), Joint Planning in Management Area, the Barton Springs/Edwards Aquifer Conservation District (District) is providing notice of the availability of the revised District Management Plan (Plan) to the Board of Directors of Blanco-Pedernales Groundwater Conservation District, a fellow member of GMA 9. I am enclosing a hard copy of this Plan; for your convenience, the Plan is also available electronically on our website, at the following location:

The Body of the Plan and Appendices are located at  
[www.bseacd.org/about-us/governing-documents#Revisions](http://www.bseacd.org/about-us/governing-documents#Revisions)

This Plan substantially revises the existing plan, dated August 2008, and it has now been adopted in a properly noticed meeting by Board resolution for review and comment by our two regional planning groups, our two river authorities, and the individual GCDs in our two GMAs, at their discretion, and ultimately by the TWDB for its overall approval. Until such approval is received, we consider this a proposed Plan. The Plan once approved both authorizes and guides the groundwater management programs and activities by the District for the ten-year period of 2012-2022; it will be considered for revision no later than October 2017.

The Plan conforms in all material respects to the requisites of Texas Administrative Code §356.6. The groundwater supply projections contained in the Plan are consistent with the latest TWDB-supplied Modeled Available Groundwater estimates for our District, which utilize the best available data and analytical methodologies. The Plan's objectives and strategies, and the District's Rules that implement those strategies, are designed to achieve and maintain the applicable Desired Future Conditions for the District's regulated aquifers in GMA 9. On the basis of the TWDB's pre-review comments that have been incorporated, we anticipate no differences between the Plan provided here and the version that is officially approved by TWDB, except for the inclusion in the appendices of the required notices, such as this one, and their acknowledgments and other related communications. Once the Plan is approved by TWDB, I will notify you and provide an electronic link to the approved Plan, complete with all appendices.

As you know, when a GCD amends an existing or issues a new Management Plan, under TWC 36.108, each GCD in each GMA of which the GCD is a member must be notified and provided a copy of the revised Management Plan. Specifically, the board of each of the GCDs in those GMAs is statutorily charged with considering that plan individually and comparing it to other management plans of other GCDs in the GMA. Discretion is available in how each board accomplishes that assessment.

Accordingly, we are requesting that you disseminate notice of this Plan's availability to members of your board of directors so that your board and staff may offer any comments on this Plan, either individually or collectively as part of the agenda of some upcoming BPGCD board meeting. I would also appreciate a reply to this notice that the Plan has been received by BPGCD and that we thereby have provided an *opportunity* for BPGCD, at its discretion, to review, provide comments, and use this Plan.

Please let me know if you have any questions, comments, or concerns about the Plan or this notice process.

Sincerely,



W F (Kirk) Holland, P.G.  
General Manager

Enclosure



**Barton Springs  
Edwards Aquifer**  
CONSERVATION DISTRICT

**By E-mail and USPS Mail**

October 23, 2012

Mr. Micah Voulgaris, General Manager  
Cow Creek Groundwater Conservation District  
201 E. San Antonio Ave., Ste 100  
Boerne, Texas 78006

Subject: New Management Plan Adopted by the Board of Directors of the  
Barton Springs/Edwards Aquifer Conservation District

Dear Micah:

Pursuant to Texas Water Code §36.108(b), Joint Planning in Management Area, the Barton Springs/Edwards Aquifer Conservation District (District) is providing notice of the availability of the revised District Management Plan (Plan) to the Board of Directors of Cow Creek Groundwater Conservation District, a fellow member of GMA 9. I am enclosing a hard copy of this Plan; for your convenience, the Plan is also available electronically on our website, at the following location:

The Body of the Plan and Appendices are located at  
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This Plan substantially revises the existing plan, dated August 2008, and it has now been adopted in a properly noticed meeting by Board resolution for review and comment by our two regional planning groups, our two river authorities, and the individual GCDs in our two GMAs, at their discretion, and ultimately by the TWDB for its overall approval. Until such approval is received, we consider this a proposed Plan. The Plan once approved both authorizes and guides the groundwater management programs and activities by the District for the ten-year period of 2012-2022; it will be considered for revision no later than October 2017.

The Plan conforms in all material respects to the requisites of Texas Administrative Code §356.6. The groundwater supply projections contained in the Plan are consistent with the latest TWDB-supplied Modeled Available Groundwater estimates for our District, which utilize the best available data and analytical methodologies. The Plan's objectives and strategies, and the District's Rules that implement those strategies, are designed to achieve and maintain the applicable Desired Future Conditions for the District's regulated aquifers in GMA 9. On the basis of the TWDB's pre-review comments that have been incorporated, we anticipate no differences between the Plan provided here and the version that is officially approved by TWDB, except for the inclusion in the appendices of the required notices, such as this one, and their acknowledgments and other related communications. Once the Plan is approved by TWDB, I will notify you and provide an electronic link to the approved Plan, complete with all appendices.

As you know, when a GCD amends an existing or issues a new Management Plan, under TWC 36.108, each GCD in each GMA of which the GCD is a member must be notified and provided a copy of the revised Management Plan. Specifically, the board of each of the GCDs in those GMAs is statutorily charged with considering that plan individually and comparing it to other management plans of other GCDs in the GMA. Discretion is available in how each board accomplishes that assessment.

Accordingly, we are requesting that you disseminate notice of this Plan's availability to members of your board of directors so that your board and staff may offer any comments on this Plan, either individually or collectively as part of the agenda of some upcoming CCGCD board meeting. I would also appreciate a reply to this notice that the Plan has been received by CCGCD and that we thereby have provided an *opportunity* for CCGCD, at its discretion, to review, provide comments, and use this Plan.

Please let me know if you have any questions, comments, or concerns about the Plan or this notice process.

Sincerely,



W F (Kirk) Holland, P.G.  
General Manager

cc: Mr. Ron Fieseler, GMA 9 Committee Coordinator (without enclosure)

Enclosure



**Barton Springs  
Edwards Aquifer**  
CONSERVATION DISTRICT

**By E-mail and USPS Mail**

October 23, 2012

Mr. Rick Broun, General Manager  
Hays Trinity Groundwater Conservation District  
14101 Hwy 290 W. Bldg 100 Ste 212  
Austin, TX 78737

Subject: New Management Plan Adopted by the Board of Directors of the  
Barton Springs/Edwards Aquifer Conservation District

Dear Rick:

Pursuant to Texas Water Code §36.108(b), Joint Planning in Management Area, the Barton Springs/Edwards Aquifer Conservation District (District) is providing notice of the availability of the revised District Management Plan (Plan) to the Board of Directors of Hays Trinity Groundwater Conservation District, a fellow member of GMA 9. I am enclosing a hard copy of this Plan; for your convenience, the Plan is also available electronically on our website, at the following location:

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This Plan substantially revises the existing plan, dated August 2008, and it has now been adopted in a properly noticed meeting by Board resolution for review and comment by our two regional planning groups, our two river authorities, and the individual GCDs in our two GMAs, at their discretion, and ultimately by the TWDB for its overall approval. Until such approval is received, we consider this a proposed Plan. The Plan once approved both authorizes and guides the groundwater management programs and activities by the District for the ten-year period of 2012-2022; it will be considered for revision no later than October 2017.

The Plan conforms in all material respects to the requisites of Texas Administrative Code §356.6. The groundwater supply projections contained in the Plan are consistent with the latest TWDB-supplied Modeled Available Groundwater estimates for our District, which utilize the best available data and analytical methodologies. The Plan's objectives and strategies, and the District's Rules that implement those strategies, are designed to achieve and maintain the applicable Desired Future Conditions for the District's regulated aquifers in GMA 9. On the basis of the TWDB's pre-review comments that have been incorporated, we anticipate no differences between the Plan provided here and the version that is officially approved by TWDB, except for the inclusion in the appendices of the required notices, such as this one, and their acknowledgments and other related communications. Once the Plan is approved by TWDB, I will notify you and provide an electronic link to the approved Plan, complete with all appendices.

As you know, when a GCD amends an existing or issues a new Management Plan, under TWC 36.108, each GCD in each GMA of which the GCD is a member must be notified and provided a copy of the revised Management Plan. Specifically, the board of each of the GCDs in those GMAs is statutorily charged with considering that plan individually and comparing it to other management plans of other GCDs in the GMA. Discretion is available in how each board accomplishes that assessment.

Accordingly, we are requesting that you disseminate notice of this Plan's availability to members of your board of directors so that your board and staff may offer any comments on this Plan, either individually or collectively as part of the agenda of some upcoming HTGCD board meeting. I would also appreciate a reply to this notice that the Plan has been received by HTGCD and that we thereby have provided an *opportunity* for HTGCD, at its discretion, to review, provide comments, and use this Plan.

Please let me know if you have any questions, comments, or concerns about the Plan or this notice process.

Sincerely,



W F (Kirk) Holland, P.G.  
General Manager

cc: Mr. Ron Fieseler, GMA 9 Committee Coordinator (without enclosure)

Enclosure



**Barton Springs  
Edwards Aquifer**  
CONSERVATION DISTRICT

**By E-mail and USPS Mail**

October 23, 2012

Mr. Gene Williams, General Manager  
Headwaters Groundwater Conservation District  
125 North Lehmann Drive  
Kerrville, TX 78028

Subject: New Management Plan Adopted by the Board of Directors of the  
Barton Springs/Edwards Aquifer Conservation District

Dear Gene:

Pursuant to Texas Water Code §36.108(b), Joint Planning in Management Area, the Barton Springs/Edwards Aquifer Conservation District (District) is providing notice of the availability of the revised District Management Plan (Plan) to the Board of Directors of Headwaters Groundwater Conservation District, a fellow member of GMA 9. I am enclosing a hard copy of this Plan; for your convenience, the Plan is also available electronically on our website, at the following location:

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This Plan substantially revises the existing plan, dated August 2008, and it has now been adopted in a properly noticed meeting by Board resolution for review and comment by our two regional planning groups, our two river authorities, and the individual GCDs in our two GMAs, at their discretion, and ultimately by the TWDB for its overall approval. Until such approval is received, we consider this a proposed Plan. The Plan once approved both authorizes and guides the groundwater management programs and activities by the District for the ten-year period of 2012-2022; it will be considered for revision no later than October 2017.

The Plan conforms in all material respects to the requisites of Texas Administrative Code §356.6. The groundwater supply projections contained in the Plan are consistent with the latest TWDB-supplied Modeled Available Groundwater estimates for our District, which utilize the best available data and analytical methodologies. The Plan's objectives and strategies, and the District's Rules that implement those strategies, are designed to achieve and maintain the applicable Desired Future Conditions for the District's regulated aquifers in GMA 9. On the basis of the TWDB's pre-review comments that have been incorporated, we anticipate no differences between the Plan provided here and the version that is officially approved by TWDB, except for the inclusion in the appendices of the required notices, such as this one, and their acknowledgments and other related communications. Once the Plan is approved by TWDB, I will notify you and provide an electronic link to the approved Plan, complete with all appendices.

As you know, when a GCD amends an existing or issues a new Management Plan, under TWC 36.108, each GCD in each GMA of which the GCD is a member must be notified and provided a copy of the revised Management Plan. Specifically, the board of each of the GCDs in those GMAs is statutorily charged with considering that plan individually and comparing it to other management plans of other GCDs in the GMA. Discretion is available in how each board accomplishes that assessment.

Accordingly, we are requesting that you disseminate notice of this Plan's availability to members of your board of directors so that your board and staff may offer any comments on this Plan, either individually or collectively as part of the agenda of some upcoming HGCD board meeting. I would also appreciate a reply to this notice that the Plan has been received by HGCD and that we thereby have provided an *opportunity* for HGCD, at its discretion, to review, provide comments, and use this Plan.

Please let me know if you have any questions, comments, or concerns about the Plan or this notice process.

Sincerely,



W F (Kirk) Holland, P.G.  
General Manager

cc: Mr. Ron Fieseler, GMA 9 Committee Coordinator (without enclosure)

Enclosure





**Barton Springs  
Edwards Aquifer**  
CONSERVATION DISTRICT

**By E-mail and USPS Mail**

October 23, 2012

Luana Buckner, General Manager  
Medina County Groundwater Conservation District  
1613 Ave K  
Hondo, TX 78861

Subject: New Management Plan Adopted by the Board of Directors of the  
Barton Springs/Edwards Aquifer Conservation District

Dear Luana:

Pursuant to Texas Water Code §36.108(b), Joint Planning in Management Area, the Barton Springs/Edwards Aquifer Conservation District (District) is providing notice of the availability of the revised District Management Plan (Plan) to the Board of Directors of Medina County Groundwater Conservation District, a fellow member of both GMA 9 and GMA 10. I am enclosing a hard copy of this Plan; for your convenience, the Plan is also available electronically on our website, at the following location:

The Body of the Plan and Appendices are located at  
[www.bseacd.org/about-us/governing-documents#Revisions](http://www.bseacd.org/about-us/governing-documents#Revisions)

This Plan substantially revises the existing plan, dated August 2008, and it has now been adopted in a properly noticed meeting by Board resolution for review and comment by our two regional planning groups, our two river authorities, and the individual GCDs in our two GMAs, at their discretion, and ultimately by the TWDB for its overall approval. Until such approval is received, we consider this a proposed Plan. The Plan once approved both authorizes and guides the groundwater management programs and activities by the District for the ten-year period of 2012-2022; it will be considered for revision no later than October 2017.

The Plan conforms in all material respects to the requisites of Texas Administrative Code §356.6. The groundwater supply projections contained in the Plan are consistent with the latest TWDB-supplied Modeled Available Groundwater estimates for our District, which utilize the best available data and analytical methodologies. The Plan's objectives and strategies, and the District's Rules that implement those strategies, are designed to achieve and maintain the applicable Desired Future Conditions for the District's regulated aquifers in GMAs 9 and 10. On the basis of the TWDB's pre-review comments that have been incorporated, we anticipate no differences between the Plan provided here and the version that is officially approved by TWDB, except for the inclusion in the appendices of the required notices, such as this one, and their acknowledgments and other related communications. Once the Plan is approved by TWDB, I will notify you and provide an electronic link to the approved Plan, complete with all appendices.

As you know, when a GCD amends an existing or issues a new Management Plan, under TWC 36.108, each GCD in each GMA of which the GCD is a member must be notified and provided a copy of the revised Management Plan. Specifically, the board of each of the GCDs in those GMAs is statutorily charged with considering that plan individually and comparing it to other management plans of other GCDs in the GMA. Discretion is available in how each board accomplishes that assessment.

Accordingly, we are requesting that you disseminate notice of this Plan's availability to members of your board of directors so that your board and staff may offer any comments on this Plan, either individually or collectively as part of the agenda of some upcoming MCGCD board meeting. I would also appreciate a reply to this notice that the Plan has been received by MCGCD and that we thereby have provided an *opportunity* for MCGCD, at its discretion, to review, provide comments, and use this Plan.

Please let me know if you have any questions, comments, or concerns about the Plan or this notice process.

Sincerely,



W F (Kirk) Holland, P.G.  
General Manager

cc: Mr. Ron Fieseler, GMA 9 Committee Coordinator (without enclosure)  
Mr. Rick Illgner, GMA 10 Committee Coordinator (without enclosure)

Enclosure



**Barton Springs  
Edwards Aquifer**  
CONSERVATION DISTRICT

**By E-mail and USPS Mail**

October 23, 2012

Mr. George Wissmann, General Manager  
Trinity Glen Rose Groundwater Conservation District  
6335 Camp Bullis Rd, Suite 25  
San Antonio, TX 78257

Subject: New Management Plan Adopted by the Board of Directors of the Barton  
Springs/Edwards Aquifer Conservation District

Dear George:

Pursuant to Texas Water Code §36.108(b), Joint Planning in Management Area, the Barton Springs/Edwards Aquifer Conservation District (District) is providing notice of the availability of the revised District Management Plan (Plan) to the Board of Directors of Trinity Glen Rose Groundwater Conservation District, a fellow member of GMA 9. I am enclosing a hard copy of this Plan; for your convenience, the Plan is also available electronically on our website, at the following location:

The Body of the Plan and Appendices are located at  
[www.bseacd.org/about-us/governing-documents#Revisions](http://www.bseacd.org/about-us/governing-documents#Revisions)

This Plan substantially revises the existing plan, dated August 2008, and it has now been adopted in a properly noticed meeting by Board resolution for review and comment by our two regional planning groups, our two river authorities, and the individual GCDs in our two GMAs, at their discretion, and ultimately by the TWDB for its overall approval. Until such approval is received, we consider this a proposed Plan. The Plan once approved both authorizes and guides the groundwater management programs and activities by the District for the ten-year period of 2012-2022; it will be considered for revision no later than October 2017.

The Plan conforms in all material respects to the requisites of Texas Administrative Code §356.6. The groundwater supply projections contained in the Plan are consistent with the latest TWDB-supplied Modeled Available Groundwater estimates for our District, which utilize the best available data and analytical methodologies. The Plan's objectives and strategies, and the District's Rules that implement those strategies, are designed to achieve and maintain the applicable Desired Future Conditions for the District's regulated aquifers in GMA 9. On the basis of the TWDB's pre-review comments that have been incorporated, we anticipate no differences between the Plan provided here and the version that is officially approved by TWDB, except for the inclusion in the appendices of the required notices, such as this one, and their acknowledgments and other related communications. Once the Plan is approved by TWDB, I will notify you and provide an electronic link to the approved Plan, complete with all appendices.

As you know, when a GCD amends an existing or issues a new Management Plan, under TWC 36.108, each GCD in each GMA of which the GCD is a member must be notified and provided a copy of the revised Management Plan. Specifically, the board of each of the GCDs in those GMAs is statutorily charged with considering that plan individually and comparing it to other management plans of other GCDs in the GMA. Discretion is available in how each board accomplishes that assessment.

Accordingly, we are requesting that you disseminate notice of this Plan's availability to members of your board of directors so that your board and staff may offer any comments on this Plan, either individually or collectively as part of the agenda of some upcoming TGRGCD board meeting. I would also appreciate a reply to this notice that the Plan has been received by TGRGCD and that we thereby have provided an *opportunity* for TGRGCD, at its discretion, to review, provide comments, and use this Plan.

Please let me know if you have any questions, comments, or concerns about the Plan or this notice process.

Sincerely,



W F (Kirk) Holland, P.G.  
General Manager

cc: Mr. Ron Fieseler, GMA 9 Committee Coordinator (without enclosure)

Enclosure



**Barton Springs  
Edwards Aquifer**  
CONSERVATION DISTRICT

**By E-mail and USPS Mail**

October 23, 2012

Mr. Roland Ruiz, General Manager  
Edwards Aquifer Authority  
1615 N. St. Mary's Street  
San Antonio, TX 78215

Subject: New Management Plan Adopted by the Board of Directors of the  
Barton Springs/Edwards Aquifer Conservation District

Dear Roland:

Pursuant to Texas Water Code §36.108(b), Joint Planning in Management Area, the Barton Springs/Edwards Aquifer Conservation District (District) is providing notice of the availability of the revised District Management Plan (Plan) to the Board of Directors of the Edwards Aquifer Authority, a fellow member of both GMA 9 and GMA 10. I am enclosing a hard copy of this Plan; for your convenience, the Plan is also available electronically on our website, at the following location:

The Body of the Plan and Appendices are located at  
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This Plan substantially revises the existing plan, dated August 2008, and it has now been adopted in a properly noticed meeting by Board resolution for review and comment by our two regional planning groups, our two river authorities, and the individual GCDs in our two GMAs, at their discretion, and ultimately by the TWDB for its overall approval. Until such approval is received, we consider this a proposed Plan. The Plan once approved both authorizes and guides the groundwater management programs and activities by the District for the ten-year period of 2012-2022; it will be considered for revision no later than October 2017.

The Plan conforms in all material respects to the requisites of Texas Administrative Code §356.6. The groundwater supply projections contained in the Plan are consistent with the latest TWDB-supplied Modeled Available Groundwater estimates for our District, which utilize the best available data and analytical methodologies. The Plan's objectives and strategies, and the District's Rules that implement those strategies, are designed to achieve and maintain the applicable Desired Future Conditions for the District's regulated aquifers in GMAs 9 and 10. On the basis of the TWDB's pre-review comments that have been incorporated, we anticipate no differences between the Plan provided here and the version that is officially approved by TWDB, except for the inclusion in the appendices of the required notices, such as this one, and their acknowledgments and other related communications. Once the Plan is approved by TWDB, I will notify you and provide an electronic link to the approved Plan, complete with all appendices.

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Accordingly, we are requesting that you disseminate notice of this Plan's availability to members of your board of directors so that your board and staff may offer any comments on this Plan, either individually or collectively as part of the agenda of some upcoming EAA board meeting. I would also appreciate a reply to this notice that the Plan has been received by EAA and that we thereby have provided an *opportunity* for EAA, at its discretion, to review, provide comments, and use this Plan.

Please let me know if you have any questions, comments, or concerns about the Plan or this notice process.

Sincerely,



W F (Kirk) Holland, P.G.  
General Manager

cc: Mr. Ron Fieseler, GMA 9 Committee Coordinator (without enclosure)  
Mr. Rick Illgner, GMA 10 Committee Coordinator (without enclosure)

Enclosure



**Barton Springs  
Edwards Aquifer**  
CONSERVATION DISTRICT

**By E-mail and USPS Mail**

October 23, 2012

Mr. Ron Naumann, General Manager  
Guadalupe County Groundwater Conservation District  
PO Box 1221  
Seguin, Texas 78156

Subject: New Management Plan Adopted by the Board of Directors of the  
Barton Springs/Edwards Aquifer Conservation District

Dear Ron:

Pursuant to Texas Water Code §36.108(b), Joint Planning in Management Area, the Barton Springs/Edwards Aquifer Conservation District (District) is providing notice of the availability of the revised District Management Plan (Plan) to the Board of Directors of Guadalupe County Groundwater Conservation District, a fellow member of GMA 10. I am enclosing a hard copy of this Plan; for your convenience, the Plan is also available electronically on our website, at the following location:

The Body of the Plan and Appendices are located at  
[www.bseacd.org/about-us/governing-documents#Revisions](http://www.bseacd.org/about-us/governing-documents#Revisions)

This Plan substantially revises the existing plan, dated August 2008, and it has now been adopted in a properly noticed meeting by Board resolution for review and comment by our two regional planning groups, our two river authorities, and the individual GCDs in our two GMAs, at their discretion, and ultimately by the TWDB for its overall approval. Until such approval is received, we consider this a proposed Plan. The Plan once approved both authorizes and guides the groundwater management programs and activities by the District for the ten-year period of 2012-2022; it will be considered for revision no later than October 2017.

The Plan conforms in all material respects to the requisites of Texas Administrative Code §356.6. The groundwater supply projections contained in the Plan are consistent with the latest TWDB-supplied Modeled Available Groundwater estimates for our District, which utilize the best available data and analytical methodologies. The Plan's objectives and strategies, and the District's Rules that implement those strategies, are designed to achieve and maintain the applicable Desired Future Conditions for the District's regulated aquifers in GMA 10. On the basis of the TWDB's pre-review comments that have been incorporated, we anticipate no differences between the Plan provided here and the version that is officially approved by TWDB, except for the inclusion in the appendices of the required notices, such as this one, and their acknowledgments and other related communications. Once the Plan is approved by TWDB, I will notify you and provide an electronic link to the approved Plan, complete with all appendices.

As you know, when a GCD amends an existing or issues a new Management Plan, under TWC 36.108, each GCD in each GMA of which the GCD is a member must be notified and provided a copy of the revised Management Plan. Specifically, the board of each of the GCDs in those GMAs is statutorily charged with considering that plan individually and comparing it to other management plans of other GCDs in the GMA. Discretion is available in how each board accomplishes that assessment.

Accordingly, we are requesting that you disseminate notice of this Plan's availability to members of your board of directors so that your board and staff may offer any comments on this Plan, either individually or collectively as part of the agenda of some upcoming GCGCD board meeting. I would also appreciate a reply to this notice that the Plan has been received by GCGCD and that we thereby have provided an *opportunity* for GCGCD, at its discretion, to review, provide comments, and use this Plan.

Please let me know if you have any questions, comments, or concerns about the Plan or this notice process.

Sincerely,



W F (Kirk) Holland, P.G.  
General Manager

cc: Mr. Rick Illgner, GMA 10 Committee Coordinator (without enclosure)

Enclosure





**Barton Springs  
Edwards Aquifer**  
CONSERVATION DISTRICT

**By E-mail and USPS Mail**

October 23, 2012

Mr. Ken Carver, General Manager  
Kinney County Groundwater Conservation District  
112 West Spring Street  
Brackettville TX 78832

Subject: New Management Plan Adopted by the Board of Directors of the  
Barton Springs/Edwards Aquifer Conservation District

Dear Ken:

Pursuant to Texas Water Code §36.108(b), Joint Planning in Management Area, the Barton Springs/Edwards Aquifer Conservation District (District) is providing notice of the availability of the revised District Management Plan (Plan) to the Board of Directors of Kinney County Groundwater Conservation District, a fellow member of GMA 10. I am enclosing a hard copy of this Plan; for your convenience, the Plan is also available electronically on our website, at the following location:

The Body of the Plan and Appendices are located at  
[www.bseacd.org/about-us/governing-documents#Revisions](http://www.bseacd.org/about-us/governing-documents#Revisions)

This Plan substantially revises the existing plan, dated August 2008, and it has now been adopted in a properly noticed meeting by Board resolution for review and comment by our two regional planning groups, our two river authorities, and the individual GCDs in our two GMAs, at their discretion, and ultimately by the TWDB for its overall approval. Until such approval is received, we consider this a proposed Plan. The Plan once approved both authorizes and guides the groundwater management programs and activities by the District for the ten-year period of 2012-2022; it will be considered for revision no later than October 2017.

The Plan conforms in all material respects to the requisites of Texas Administrative Code §356.6. The groundwater supply projections contained in the Plan are consistent with the latest TWDB-supplied Modeled Available Groundwater estimates for our District, which utilize the best available data and analytical methodologies. The Plan's objectives and strategies, and the District's Rules that implement those strategies, are designed to achieve and maintain the applicable Desired Future Conditions for the District's regulated aquifers in GMA 10. On the basis of the TWDB's pre-review comments that have been incorporated, we anticipate no differences between the Plan provided here and the version that is officially approved by TWDB, except for the inclusion in the appendices of the required notices, such as this one, and their acknowledgments and other related communications. Once the Plan is approved by TWDB, I will notify you and provide an electronic link to the approved Plan, complete with all appendices.

As you know, when a GCD amends an existing or issues a new Management Plan, under TWC 36.108, each GCD in each GMA of which the GCD is a member must be notified and provided a copy of the revised Management Plan. Specifically, the board of each of the GCDs in those GMAs is statutorily charged with considering that plan individually and comparing it to other management plans of other GCDs in the GMA. Discretion is available in how each board accomplishes that assessment.

Accordingly, we are requesting that you disseminate notice of this Plan's availability to members of your board of directors so that your board and staff may offer any comments on this Plan, either individually or collectively as part of the agenda of some upcoming KCGCD board meeting. I would also appreciate a reply to this notice that the Plan has been received by KCGCD and that we thereby have provided an *opportunity* for KCGCD, at its discretion, to review, provide comments, and use this Plan.

Please let me know if you have any questions, comments, or concerns about the Plan or this notice process.

Sincerely,



W F (Kirk) Holland, P.G.  
General Manager

cc: Mr. Rick Illgner, GMA 10 Committee Coordinator (without enclosure)

Enclosure



**Barton Springs  
Edwards Aquifer**  
CONSERVATION DISTRICT

**By E-mail and USPS Mail**

October 23, 2012

Mr. Johnie Halliburton, General Manager  
Plum Creek Conservation District  
1101 West San Antonio Street  
PO Box 328  
Lockhart, Texas 78644

Subject: New Management Plan Adopted by the Board of Directors of the  
Barton Springs/Edwards Aquifer Conservation District

Dear Johnie:

Pursuant to Texas Water Code §36.108(b), Joint Planning in Management Area, the Barton Springs/Edwards Aquifer Conservation District (District) is providing notice of the availability of the revised District Management Plan (Plan) to the Board of Directors of Plum Creek Conservation District, a fellow member of GMA 10. I am enclosing a hard copy of this Plan; for your convenience, the Plan is also available electronically on our website, at the following location:

The Body of the Plan and Appendices are located at  
[www.bseacd.org/about-us/governing-documents#Revisions](http://www.bseacd.org/about-us/governing-documents#Revisions)

This Plan substantially revises the existing plan, dated August 2008, and it has now been adopted in a properly noticed meeting by Board resolution for review and comment by our two regional planning groups, our two river authorities, and the individual GCDs in our two GMAs, at their discretion, and ultimately by the TWDB for its overall approval. Until such approval is received, we consider this a proposed Plan. The Plan once approved both authorizes and guides the groundwater management programs and activities by the District for the ten-year period of 2012-2022; it will be considered for revision no later than October 2017.

The Plan conforms in all material respects to the requisites of Texas Administrative Code §356.6. The groundwater supply projections contained in the Plan are consistent with the latest TWDB-supplied Modeled Available Groundwater estimates for our District, which utilize the best available data and analytical methodologies. The Plan's objectives and strategies, and the District's Rules that implement those strategies, are designed to achieve and maintain the applicable Desired Future Conditions for the District's regulated aquifers in GMA 10. On the basis of the TWDB's pre-review comments that have been incorporated, we anticipate no differences between the Plan provided here and the version that is officially approved by TWDB, except for the inclusion in the appendices of the required notices, such as this one, and their acknowledgments and other related communications. Once the Plan is approved by TWDB, I will notify you and provide an electronic link to the approved Plan, complete with all appendices.

As you know, when a GCD amends an existing or issues a new Management Plan, under TWC 36.108, each GCD in each GMA of which the GCD is a member must be notified and provided a copy of the revised Management Plan. Specifically, the board of each of the GCDs in those GMAs is statutorily charged with considering that plan individually and comparing it to other management plans of other GCDs in the GMA. Discretion is available in how each board accomplishes that assessment.

Accordingly, we are requesting that you disseminate notice of this Plan's availability to members of your board of directors so that your board and staff may offer any comments on this Plan, either individually or collectively as part of the agenda of some upcoming PCCD board meeting. I would also appreciate a reply to this notice that the Plan has been received by PCCD and that we thereby have provided an *opportunity* for PCCD, at its discretion, to review, provide comments, and use this Plan.

Please let me know if you have any questions, comments, or concerns about the Plan or this notice process.

Sincerely,



W F (Kirk) Holland, P.G.  
General Manager

cc: Mr. Rick Illgner, GMA 10 Committee Coordinator (without enclosure)

Enclosure



**Barton Springs  
Edwards Aquifer**  
CONSERVATION DISTRICT

**By E-mail and USPS Mail**

October 23, 2012

Mr. Vic Hilderbran, General Manager  
Uvalde County Underground Water Conservation District  
200 East Nopal Street  
Uvalde, TX 78801

Subject: New Management Plan Adopted by the Board of Directors of the  
Barton Springs/Edwards Aquifer Conservation District

Dear Vic:

Pursuant to Texas Water Code §36.108(b), Joint Planning in Management Area, the Barton Springs/Edwards Aquifer Conservation District (District) is providing notice of the availability of the revised District Management Plan (Plan) to the Board of Directors of Uvalde County Underground Water Conservation District, a fellow member of GMA 10. I am enclosing a hard copy of this Plan; for your convenience, the Plan is also available electronically on our website, at the following location:

The Body of the Plan and Appendices are located at  
[www.bseacd.org/about-us/governing-documents#Revisions](http://www.bseacd.org/about-us/governing-documents#Revisions)

This Plan substantially revises the existing plan, dated August 2008, and it has now been adopted in a properly noticed meeting by Board resolution for review and comment by our two regional planning groups, our two river authorities, and the individual GCDs in our two GMAs, at their discretion, and ultimately by the TWDB for its overall approval. Until such approval is received, we consider this a proposed Plan. The Plan once approved both authorizes and guides the groundwater management programs and activities by the District for the ten-year period of 2012-2022; it will be considered for revision no later than October 2017.

The Plan conforms in all material respects to the requisites of Texas Administrative Code §356.6. The groundwater supply projections contained in the Plan are consistent with the latest TWDB-supplied Modeled Available Groundwater estimates for our District, which utilize the best available data and analytical methodologies. The Plan's objectives and strategies, and the District's Rules that implement those strategies, are designed to achieve and maintain the applicable Desired Future Conditions for the District's regulated aquifers in GMA 10. On the basis of the TWDB's pre-review comments that have been incorporated, we anticipate no differences between the Plan provided here and the version that is officially approved by TWDB, except for the inclusion in the appendices of the required notices, such as this one, and their acknowledgments and other related communications. Once the Plan is approved by TWDB, I will notify you and provide an electronic link to the approved Plan, complete with all appendices.

As you know, when a GCD amends an existing or issues a new Management Plan, under TWC 36.108, each GCD in each GMA of which the GCD is a member must be notified and provided a copy of the revised Management Plan. Specifically, the board of each of the GCDs in those GMAs is statutorily charged with considering that plan individually and comparing it to other management plans of other GCDs in the GMA. Discretion is available in how each board accomplishes that assessment.

Accordingly, we are requesting that you disseminate notice of this Plan's availability to members of your board of directors so that your board and staff may offer any comments on this Plan, either individually or collectively as part of the agenda of some upcoming UCUWCD board meeting. I would also appreciate a reply to this notice that the Plan has been received by UCUWCD and that we thereby have provided an *opportunity* for UCUWCD, at its discretion, to review, provide comments, and use this Plan.

Please let me know if you have any questions, comments, or concerns about the Plan or this notice process.

Sincerely,



W F (Kirk) Holland, P.G.  
General Manager

cc: Mr. Rick Illgner, GMA 10 Committee Coordinator (without enclosure)

Enclosure



**Barton Springs  
Edwards Aquifer**  
CONSERVATION DISTRICT

**By E-mail and USPS Mail**

October 23, 2012

Mr. John Burke, Chair  
Lower Colorado Regional Water Planning Group  
% John E Burke & Associates LLC  
496 Shiloh Road  
Bastrop, TX 78602

Subject: New Management Plan Adopted by the Board of Directors of the  
Barton Springs/Edwards Aquifer Conservation District

Dear John:

Pursuant to Texas Water Code §36.1071 and Texas Administrative Code §356.6(a)(4), the Barton Springs/Edwards Aquifer Conservation District (District) is hereby providing notice of the availability of the revised District Management Plan (Plan) to the Lower Colorado Regional Water Planning Group (Region K). I am enclosing a hard copy of this Plan for your convenience; the Plan is also available electronically on our website, at the following location:

The Body of the Plan and Appendices are located at  
[www.bseacd.org/about-us/governing-documents#Revisions](http://www.bseacd.org/about-us/governing-documents#Revisions)

This Plan substantially revises the existing plan, dated August 2008, and it has now been adopted in a properly noticed meeting by Board resolution for review and comment by our two regional planning groups, by the individual GCDs in our two GMAs, and ultimately by the TWDB for its overall approval. Until such approval is received, we consider this a proposed Plan. The Plan authorizes and guides the groundwater management programs and activities of the District for the ten-year period of 2012-2022; it will be considered for revision no later than October 2017.

We have used the TWDB-supplied information from the current State Water Plan in preparing this Plan, in particular the demand projections, surface-water supplies, water needs, and water management strategies applicable to WUGs in our jurisdictional area. The groundwater supply projections contained in the Plan similarly conform to the latest TWDB-supplied Modeled Available Groundwater estimates for our District, which utilize the best available data and analytical methodologies and which achieve the applicable Desired Future Conditions for aquifers that provide groundwater in Region K. Region K may reliably utilize the supplies that the District's objectives and strategies provide, as enumerated in this Plan, for its groundwater supply planning.

As you know, the District staff has actively participated in Region K planning activities for some time, previously as an alternate representative to Region K for groundwater conservation districts and now as the designated GMA 10 representative, who regularly apprises the GMA and the District of the status and activities of Region K. The District has been proactive in supporting the development of alternative water supplies in Region K, especially desalination and aquifer storage and recovery evaluations, and has reported on the status and issues associated with such development. We look forward to continuing and expanding that collaboration.

We would request that you disseminate notice of this Plan's availability to members of Region K for both their individual comments and their prospective use, as provided by statute. I would also appreciate a reply to this notice that the Plan has been received by Region K and distributed for use in its water planning activities. On the basis of the TWDB's pre-review comments that have been incorporated, we anticipate no differences between the Plan provided here and the version that is officially approved by TWDB, except for the inclusion in the appendices of the required notices, such as this one, and their acknowledgments and other related communications. Once the Plan is approved by TWDB, I will notify you and provide you an electronic link to the approved Plan, complete with all appendices.

Please let me know if you have any questions, comments, or concerns about the Plan or this notice process.

Sincerely,



W F (Kirk) Holland, P.G.  
General Manager

Enclosure





**Barton Springs  
Edwards Aquifer**  
CONSERVATION DISTRICT

**By E-mail and USPS Mail**

October 23, 2012

Mr. Con Mims, Chair  
South Central Texas Regional Water Planning Group  
% Nueces River Authority  
P O Box 349  
Uvalde, TX 78801

Subject: New Management Plan Adopted by the Board of Directors of the Barton Springs/Edwards Aquifer Conservation District

Dear Con:

Pursuant to Texas Water Code §36.1071 and Texas Administrative Code §356.6(a)(4), the Barton Springs/Edwards Aquifer Conservation District (District) is hereby providing notice of the availability of the revised District Management Plan (Plan) to the South Central Texas Regional Water Planning Group (Region L). I am enclosing a hard copy of this Plan for your convenience; the Plan is also available electronically on our website, at the following location:

The Body of the Plan and Appendices are located at  
[www.bseacd.org/about-us/governing-documents#Revisions](http://www.bseacd.org/about-us/governing-documents#Revisions)

This Plan substantially revises the existing plan, dated August 2008, and it has now been adopted in a properly noticed meeting by Board resolution for review and comment by our two regional planning groups, by the individual GCDs in our two GMAs, and ultimately by the TWDB for its overall approval. Until such approval is received, we consider this a proposed Plan. The Plan authorizes and guides the groundwater management programs and activities of the District for the ten-year period of 2012-2022; it will be considered for revision no later than October 2017.

We have used the TWDB-supplied information from the current State Water Plan in preparing this Plan, in particular the demand projections, surface-water supplies, water needs, and water management strategies applicable to WUGs in our jurisdictional area. The groundwater supply projections contained in the Plan similarly conform to the latest TWDB-supplied Modeled Available Groundwater estimates for our District, which utilize the best available data and analytical methodologies and which achieve the applicable Desired Future Conditions for aquifers that provide groundwater in Region L. Region L may reliably utilize the supplies that the District's objectives and strategies provide, as enumerated in this Plan, for its groundwater supply planning.

As you know, the District staff has actively participated in Region L planning activities for some time. The District has been proactive in discussing the development of alternative water supplies in Region L, especially desalination and aquifer storage and recovery evaluations. We look forward to continuing and expanding that collaboration.

We would request that you disseminate notice of this Plan's availability to members of Region L for both their individual comments and their prospective use, as provided by statute. I would also appreciate a reply to this notice that the Plan has been received by Region L and distributed for use in its water planning activities. On the basis of the TWDB's pre-review comments that have been incorporated, we anticipate no differences between the Plan provided here and the version that is officially approved by TWDB, except for the inclusion in the appendices of the required notices, such as this one, and their acknowledgments and other related communications. Once the Plan is approved by TWDB, I will notify you and provide you an electronic link to the approved Plan, complete with all appendices.

Please let me know if you have any questions, comments, or concerns about the Plan or this notice process.

Sincerely,



W F (Kirk) Holland, P.G.  
General Manager

Enclosure



**Barton Springs  
Edwards Aquifer**  
CONSERVATION DISTRICT

**By E-mail and USPS Mail**

October 23, 2012

Mr. Bill West, General Manager  
Guadalupe-Blanco River Authority  
933 East Court Street  
Seguin, TX 78155

Subject: New Management Plan Adopted by the Board of Directors of the  
Barton Springs/Edwards Aquifer Conservation District

Dear Bill:

Pursuant to Texas Water Code §36.1071 and Texas Administrative Code §356.6(a)(4), the Barton Springs/Edwards Aquifer Conservation District (District) is hereby providing notice of the availability of the revised District Management Plan (Plan) to the Guadalupe-Blanco River Authority, as a surface-water management entity within our jurisdictional boundaries. I am enclosing a hard copy of this Plan; for your convenience, the Plan is also available electronically on our website, at the following location:

The Body of the Plan and Appendices are located at  
[www.bseacd.org/about-us/governing-documents#Revisions](http://www.bseacd.org/about-us/governing-documents#Revisions)

This Plan substantially revises the existing plan, dated August 2008, and it has now been adopted in a properly noticed meeting by Board resolution for review and comment by our two regional planning groups, our two river authorities, and the individual GCDs in our two GMAs, at their discretion, and ultimately by the TWDB for its overall approval. Until such approval is received, we consider this a proposed Plan. The Plan authorizes and guides the groundwater management programs and activities of the District for the ten-year period of 2012-2022; it will be considered for revision no later than October 2017.

We have used the TWDB-supplied information from the current State Water Plan in preparing this Plan, in particular its demand projections, surface-water supplies, water needs, and water management strategies applicable to WUGs in our jurisdictional area. The groundwater supply projections contained in the Plan similarly conform to the latest TWDB-supplied Modeled Available Groundwater estimates for our District, which utilize the best available data and analytical methodologies and which achieve the applicable Desired Future Conditions for aquifers that provide groundwater in our shared jurisdictional areas. GBRA may reliably utilize the groundwater supplies that the District's objectives and strategies provide, as enumerated in this Plan, for water supply planning and management.

On the basis of the TWDB's pre-review comments that have been incorporated, we anticipate no differences between the Plan provided here and the version that is officially approved by TWDB, except for the inclusion in the appendices of the required notices, such as this one, and their acknowledgments and other related communications. Once the Plan is approved by TWDB, I will notify you and provide an electronic link to the approved Plan, complete with all appendices.

We are requesting that you disseminate this notice of the Plan's availability to appropriate staff and board members of GBRA for their individual comments and their prospective use. I would also appreciate a reply to this notice that the Plan has been received by GBRA and that we have thereby provided you an *opportunity*, at your discretion, for comment and use of this Plan in your water planning and management activities.

Please let me know if you have any questions, comments, or concerns about the Plan or this notice process.

Sincerely,



W F (Kirk) Holland, P.G.  
General Manager

Enclosure



**Barton Springs  
Edwards Aquifer**  
CONSERVATION DISTRICT

**By E-mail and USPS Mail**

October 23, 2012

Ms. Becky Motal, General Manager  
Lower Colorado River Authority  
P.O. Box 220  
Austin, TX 78767

Subject: New Management Plan Adopted by the Board of Directors of the  
Barton Springs/Edwards Aquifer Conservation District

Dear Becky:

Pursuant to Texas Water Code §36.1071 and Texas Administrative Code §356.6(a)(4), the Barton Springs/Edwards Aquifer Conservation District (District) is hereby providing notice of the availability of the revised District Management Plan (Plan) to the Lower Colorado River Authority, as a surface-water management entity within our jurisdictional boundaries. I am enclosing a hard copy of this Plan; for your convenience, the Plan is also available electronically on our website, at the following location:

The Body of the Plan and Appendices are located at  
[www.bseacd.org/about-us/governing-documents#Revisions](http://www.bseacd.org/about-us/governing-documents#Revisions)

This Plan substantially revises the existing plan, dated August 2008, and it has now been adopted in a properly noticed meeting by Board resolution for review and comment by our two regional planning groups, our two river authorities, and the individual GCDs in our two GMAs, at their discretion, and ultimately by the TWDB for its overall approval. Until such approval is received, we consider this a proposed Plan. The Plan authorizes and guides the groundwater management programs and activities of the District for the ten-year period of 2012-2022; it will be considered for revision no later than October 2017.

We have used the TWDB-supplied information from the current State Water Plan in preparing this Plan, in particular its demand projections, surface-water supplies, water needs, and water management strategies applicable to WUGs in our jurisdictional area. The groundwater supply projections contained in the Plan similarly conform to the latest TWDB-supplied Modeled Available Groundwater estimates for our District, which utilize the best available data and analytical methodologies and which achieve the applicable Desired Future Conditions for aquifers that provide groundwater in our shared jurisdictional areas. LCRA may reliably utilize the groundwater supplies that the District's objectives and strategies provide, as enumerated in this Plan, for water supply planning and management.

On the basis of the TWDB's pre-review comments that have been incorporated, we anticipate no differences between the Plan provided here and the version that is officially approved by TWDB, except for the inclusion in the appendices of the required notices, such as this one, and their acknowledgments and other related communications. Once the Plan is approved by TWDB, I will notify you and provide an electronic link to the approved Plan, complete with all appendices.

We are requesting that you disseminate this notice of the Plan's availability to appropriate staff and board members of LCRA for their individual comments and their prospective use. I would also appreciate a reply to this notice that the Plan has been received by LCRA and that we have thereby provided you an *opportunity*, at your discretion, for comment and use of this Plan in your water planning and management activities.

Please let me know if you have any questions, comments, or concerns about the Plan or this notice process.

Sincerely,



W F (Kirk) Holland, P.G.  
General Manager

Enclosure