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**JEFF DAVIS COUNTY UNDERGROUND  
WATER CONSERVATION DISTRICT**

**MANAGEMENT PLAN**

**2024-2029**

Adopted February 27, 2024

## **DISTRICT MISSION**

The Jeff Davis County Underground Water Conservation District will strive to develop, promote, and implement water conservation and management strategies to protect water resources for the benefit of the citizens, economy, and environment of the District.

## **TIME PERIOD FOR THIS PLAN**

This plan becomes effective upon adoption by the District Board of Directors and approved by the Texas Water Development Board (TWDB) affirming the plan is administratively complete. This plan replaces the existing plan adopted by the District Board of Directors on October 23, 2018. This District management plan will remain in effect until December 02, 2028 or until a revised plan is approved by the TWDB, whichever is earlier.

## **STATEMENT OF GUIDING PRINCIPLES**

The District recognizes that the groundwater resources of the county are of vital importance. The preservation of this most valuable resource can be managed in a prudent and cost-effective manner through education, regulations, and permitting. The greatest threat to prevent the District from achieving the stated mission is inappropriate management, based in part on the lack of understanding of local conditions. A basic understanding of the aquifers and their hydrogeologic properties, as well as a quantification of resources is the foundation from which to build prudent planning measures. The goals of this plan can best be achieved through guidance from the locally elected board members who have an understanding of local conditions as well as technical support from the Texas Water Development Board and qualified consulting agencies. This management plan is intended as a tool to focus the thoughts and actions of those given the responsibility for the execution of the District activities.

## **General Description of the District**

### **History**

The citizens of Jeff Davis County through an election created the District, November 2, 1993. The current Board of Directors are Johnny Wofford - Chairman, Jim Espy - Vice-Chairman, Jim Dyer- Secretary, Bud Coffey and Clay Miller. The District Manager is Janet Adams. Jeff Davis County Underground Water Conservation District (JDCUWCD) covers all of Jeff Davis County. The agricultural community dominates the county's economy. The agricultural income is derived mainly from cattle. Tourism and hunting also contribute to the income of the county.

## **Location and Extent**

Jeff Davis County, having areal extent of 2,2564 square miles, with 100 % being in the District is located in west Texas. The county is bounded on the east by Pecos County, on the north by Reeves County, on the west by Culberson County, and on the south by Brewster and Presidio Counties. Fort Davis, which is located on the east side of the county, is the county seat. Valentine, is the only other town in the county is located in the west portion of the county.

## **Topography**

Jeff Davis County is located in the mountains of West Texas. The county has the highest average elevation in the state of Texas with one mile or higher altitudes. The county consists of peaks, canyons, and plateaus.

## **Groundwater Resources of Jeff Davis County**

In the Jeff Davis County Underground Water Conservation District, the Texas Water Development Board lists several aquifers, which account for the known groundwater resources of the District. These include the Edwards-Trinity (Plateau), the West Texas Bolsons, of which there are several divisions, and the Igneous areas of the District. Due to the lack of scientific study, the aquifers are not well defined geographically. The TWDB also lists a small portion of the Cenozoic Pecos Alluvium Aquifer along the northeastern boundary of the District.

Not included in the table below are two very minor aquifers in Jeff Davis County.

1. Capitan Reef  
12,100 acres - Areal Extent  
341 estimated acre feet of recharge annually
2. Rustler Aquifer  
101,881 acres – Areal Extent  
780 estimated acre feet of recharge

## **Additional Amount of Natural/Artificial Recharge That Would Feasibly Be Achieved**

The additional amount of natural or artificial recharge that would be realized from implementation of feasible weather modification would be an 8% increase in rainfall. This would result in a 703.5 acre feet increase in recharge. This data was obtained from the direct gathering of evidence of the High Plains Water District of their weather modification program.

**Water exported out of Jeff Davis County Underground Conservation District is as follows from Jeff Davis County:**

Year	acre-feet /year
2022	852
2021	835
2020	1286
2019	1047
2018	909
2017	948
2016	985
2015	983
2014	907
2013	1,078
2012	1,336
2011	866
2010	796
2009	839
2008	1,070
2007	992
2006	939
2005	983
2004	1,182
2003	1,232
2002	1,282
2001	1,184
2000	1,225
1999	1,073
1998	1,154

This data was obtained from meters read by JDCUWCD.

**Modeled Available Groundwater Estimate**

Please refer to Appendix C – Gam Run 21-010 MAG

**Groundwater Availability Modeling Estimates**

Please refer to Appendix B-- GAMRUN 23-010



## **Estimated Historical Groundwater use in Jeff Davis County**

Please refer to Appendix A

## **Projected Surface Water Supplies**

Please refer to Appendix A.

## **Projected Water Demands**

Please refer to Appendix A.

## **Projected Water Supply Needs**

There are no projected water supply needs identified in the most recent state water plan

Please refer to Appendix A.

## **Projected Water Management Strategies**

There are three water management strategies in the district:

One for the Town of Valentine to drill a well in the West Texas Bolsons Aquifer

Two for the Fort Davis WSC to drill a well in the Igneous Aquifer.

Three for Fort Davis WSC and Fort Davis Estates to run a transmission line to connect Fort Davis WSC and Fort Davis Estates

Please refer to Appendix A.

## **Management of Groundwater Supplies**

The District will manage the supply of groundwater within the District in order to conserve the resource while seeking to maintain the economic viability of all the resource user groups, public and private. In consideration of the economic and cultural activities occurring within the District, the District will identify and engage in such activities and practices, that if implemented would result a reduction of groundwater use. An observation network shall be established and maintained in order to monitor changing storage conditions of groundwater supplies within the District. The District will make regular assessments of water supply and groundwater storage conditions and will report those conditions to the Board and to the public. The district will undertake, as necessary and co-operate with investigations of the groundwater resources within the District and will make the results of investigations available to the public upon adoption of the Board.

The District has rules to regulate groundwater withdrawals by means of production limits. The District may deny a well construction permit or limit groundwater withdrawals in accordance with the guidelines stated in the rules of the District. In making a determination to deny a permit or limit groundwater withdrawals, the District will consider the public benefit against individual hardship after considering all appropriate testimony.

The relevant factors to be considered in making a determination to deny a permit or limit groundwater withdrawals will include:

- 1) The purpose of the rules of the District
- 2) The equitable distribution of the resources
- 3) The economic hardship resulting from grant or denial of a permit or the terms prescribed by the permit

In pursuit of the District's mission of protecting the resource, the District may require reduction of groundwater withdrawals to amounts, which will not cause harm to the aquifer. To achieve this purpose, the District may, at the Board's discretion amend or revoke any permit after notice and hearing. The determination to seek the amendment or revocation of a permit by the District will be based on aquifer conditions observed by the District. The District will enforce the terms and conditions of permits and the rules of the District by enjoining the permit holder in a court of competent jurisdiction as provide for in TWC 36.102.

### **Actions, Procedures, Performance and Avoidance for Plan Implementation**

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

The District will adopt rules relating to the permitting of wells and the production of groundwater. The rules adopted by the District shall be pursuant to TWC 36 and the provisions of this plan. All rules will be adhered to and enforced. The promulgation and enforcement of the rules will be based on the best technical evidence available. These rules can be found in appendix D

The district shall treat all citizens with equality. Citizens may apply to the District for discretion in enforcement of the rules on grounds of adverse economic effects or unique local conditions. In granting of discretion to any rule,

the Board shall consider the potential for adverse effects on adjacent landowners. The exercise of said discretion by the Board shall not be construed as limiting the power of the Board.

The District will seek the cooperation in the implementation of the plan and management of groundwater supplies within the District. All activities of the District will be undertaken in cooperation and coordinated with the appropriate state, regional, or local water management entity.

### **The methodology that the District will use to trace its progress on an annual basis in achieving all of its management goals will be as follows:**

The District manager will prepare and present an annual report to the Board of Directors on District performance in regards to achieving management goals and objectives (during last monthly Board of Directors meeting each fiscal year, beginning December 31, 2000). The report will include the number of instances each activity was engaged in during the year, referenced to the expenditure of staff time and budget so that the effectiveness and efficiency of each activity may be evaluated. The annual report will be maintained on file at the District office.

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

### **Goal**

#### **1.0 Providing the Most Efficient Use of Groundwater.**

##### Management Objective

1.1 Each year, require meters to be installed on all new production wells.

##### Performance Standard

1.1a - Each year, provide a report to the Board of Directors indicating the number of meters installed on new wells in the District and the location and ownership.

##### Management Objective

1.2 All current existing rules and regulations will be reviewed and amended to address the needs of the District every three years.

##### Performance Standard

1.2a - Each year, report to the Board of Directors the number of changes required to keep District rules updated to District needs.

### **Goal**

#### **2.0 Controlling and Preventing Waste of Groundwater.**

##### Management Objective

2.1 Each year, investigate all reports of wasteful practices within the District.

##### Performance Standards

2.1a - Each year, locate all complaint sites on a District map.

2.1b - Each year, provide a report to the Board of Directors indicating the number of complaint sites.

##### Management Objective

2.2 Each year, register all new wells drilled in the District.

##### Performance Standards

2.2a - District will maintain files including information on the drilling and completion of all new wells in the District.

2.2b - Annually report to the Board of Directors on the number of new wells registered during the year.

## **Goal**

### **3.0 Implement management strategies that will address drought conditions.**

#### Management Objective

3.1 - The District will monitor the Palmer Drought Severity Index (PDSI) by Texas Climatic Divisions and <https://waterdatafortexas.org//drought>. If PDSI indicates that the District will experience severe drought conditions, the District will notify all public water suppliers within the District.

#### Performance Standard

3.1a - The District staff will monitor the PDSI and report the number of times the PDSI is less than 1 (mild drought) to the District Board on a quarterly basis.

## **Goal**

### **4.0 Implement management strategies that will promote water conservation.**

#### Management Objective

4.1 Disperse educational information yearly regarding the current conservation practices for efficient use of water resources.

#### Performance Standard

4.1a - Each year, report to the Board of Directors the number of water conservation literature packets handed out.

## **Goal**

### **5.0 Rainwater Harvesting, Recharge Enhancement, Precipitation Enhancement, and Brush Control where appropriate.**

#### Management Objective: Rainwater Harvesting

5.1 Provide demonstrations on the rainwater harvesting system installed at District office.

#### Performance Standards

5.1a - District staff will provide information about rainwater harvesting through demonstrations of the system installed at District office

5.1b – Each year, report to the Board of Directors the number of demonstrations given on rainwater harvesting.

#### Recharge Enhancement

5.2 Not Applicable – not cost effective

#### Precipitation Enhancement

5.3 Not Applicable – not cost effective

#### Brush Control

5.4 Not Applicable – not cost effective

**Goal**

**6.0 Addressing the Desired Future Conditions.**

**Management Objective**

6.1 Conduct water level measurements at least annually on observation wells within the District

**Performance Standards**

6.1a Annually evaluate water level trends to ensure that the aquifers conditions comply with the desired future conditions of the District

**Goal**

**7.0 Addressing natural resource issues that impact the use and availability of groundwater or that are impacted by the use of groundwater**

**Management Objective**

Prevent contamination/pollution of the aquifers from other natural resources being produced within the District.

**Performance Standard**

Monitor any oil and gas drilling or mining operations for potential sources of pollution of the aquifers in the District. Make annual reports to the District. The annual report will include the number of new oil and gas wells drilled, District Rules require any water wells drilled associated with oil and gas drilling or production be registered with the District and are required to comply with District construction standards and reporting.

## **SB - 1 MANAGEMENT GOALS DETERMINED NOT-APPLICABLE**

### **Goal**

#### **1.0 Control and prevention of subsidence.**

*TWDB Contract Number 1648302062, by LRE*

Water: <http://www.twdb.texas.gov/groundwater/models/research/subsidence/subsidence.asp>

Pages 4-151 thru 4-157 figure 4.101 state the Igneous is not at risk for subsidence

Pages 4-214 thru 4-221 figure 4.141 state the West Texas Bolsons are not a risk for subsidence

The District will continue to look for subsidence and will respond to any reports of potential subsidence.

Therefore, the subsidence goal is not applicable.

### **Goal**

#### **3.0 Addressing conjunctive surface water management issues.**

There is no surface water within the District.

## **SUMMARY DEFINITIONS**

“Board” - the Board of Directors of the Jeff Davis County Underground Water Conservation District.

“District” - the Jeff Davis County Underground Water Conservation District.

“TWDB” - Texas Water Development Board.

“Waste” - as defined by Chapter 36 of the Texas Water Code means any one or more of the following:

1. Withdrawal of groundwater from a groundwater reservoir at a rate and in a amount that causes or threatens to cause intrusion into the reservoir of water unsuitable for agricultural, gardening, domestic, or stock raising purposes;
2. The flowing or producing of wells from a groundwater reservoir if the water produced is not used for a beneficial purpose;
3. Escape of groundwater from a groundwater reservoir to any other reservoir or geologic strata that does not contain groundwater;
4. Pollution or harmful alteration of groundwater in a groundwater reservoir by salt water or by other deleterious matter admitted from another stratum or from the surface of the ground;
5. Willfully or negligently causing, suffering, or allowing groundwater to escape into a river, creek, natural watercourse, depression, lake, reservoir, drain, sewer, street, highway, road, or road ditch, or onto any land other than that of the owner of the well unless such discharge is authorized by permit, rule, or order issued by the commission under Chapter 26 of the Texas Water Code;
6. Groundwater pumped for irrigation that escapes as irrigation tail water onto land other than that of the owner of the well unless permission has been granted by the occupant of the land receiving the discharge.
7. For water produced from an artesian well “waste” has the meaning assigned by Section 11.205 of the Texas Water Code.

# **Appendix**

## **A**



# Estimated Historical Groundwater Use And 2022 State Water Plan Datasets:

Jeff Davis County Underground Water Conservation District

Texas Water Development Board  
Groundwater Division  
Groundwater Technical Assistance Section  
stephen.allen@twdb.texas.gov  
(512) 463-7317  
June 11, 2023

## ***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/GMPChecklist0113.pdf>

The five reports included in this part 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)  
*from the 2022 Texas State Water Plan (SWP)*

Part 2 of the 2-part package is the groundwater availability model (GAM) report for the District (checklist items 3 through 5). The District should have received, or will receive, this report from the Groundwater Availability Modeling Section. Questions about the GAM can be directed to Grayson Dowlearn, [grayson.dowlearn@twdb.texas.gov](mailto:grayson.dowlearn@twdb.texas.gov) (512) 475-1552.

## ***DISCLAIMER:***

The data presented in this report represents the most up to date WUS and 2022 SWP data available as of 6/11/2023. Although it does not happen frequently, either of these datasets are subject to change pending the availability of more accurate WUS data or an amendment to the 2022 SWP. District personnel must review these datasets and correct any discrepancies to ensure approval of their groundwater management plan.

The WUS dataset can be verified at this web address:

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

The 2022 SWP dataset can be verified by contacting Sabrina Anderson (sabrina.anderson@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 conditions within district boundaries. The multiplier used in the following formula is a land area ratio:  $(\text{data value} * (\text{land area of district in county} / \text{land area of county}))$ . For two of the four SWP 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 when they are located within the district, and eliminated when they are located outside (we ask each district to identify these entity locations).

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

In the WUS 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 ideal 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 can add those data to the plan with an explanation of how the data were derived. Apportioning percentages that the TWDB used are listed above each applicable table.

For additional questions regarding these data, please contact Stephen Allen (stephen.allen@twdb.texas.gov or 512-463-7317).

# Estimated Historical Water Use

## TWDB Historical Water Use Survey (WUS) Data

Groundwater and surface water historical use estimates are currently unavailable for calendar year 2020. TWDB staff anticipates the calculation and posting of these estimates at a later date.

### JEFF DAVIS COUNTY

100% (multiplier)

All values are in acre-feet

Year	Source	Municipal	Manufacturing	Mining	Steam Electric	Irrigation	Livestock	Total
2019	GW	1,201	0	0	0	541	470	2,212
	SW	0	0	0	0	64	25	89
2018	GW	1,271	0	40	0	608	470	2,389
	SW	0	0	0	0	0	25	25
2017	GW	1,213	0	20	0	549	457	2,239
	SW	0	0	0	0	312	24	336
2016	GW	1,123	0	0	0	620	298	2,041
	SW	0	0	0	0	85	16	101
2015	GW	1,200	0	0	0	667	293	2,160
	SW	0	0	0	0	73	15	88
2014	GW	1,254	0	0	0	732	287	2,273
	SW	0	0	0	0	45	15	60
2013	GW	1,252	0	0	0	662	316	2,230
	SW	0	0	0	0	76	17	93
2012	GW	1,205	0	0	0	1,180	394	2,779
	SW	0	0	0	0	45	21	66
2011	GW	1,149	0	0	0	250	446	1,845
	SW	0	0	0	0	50	24	74
2010	GW	600	0	0	0	233	444	1,277
	SW	0	0	0	0	50	23	73
2009	GW	620	0	0	0	1,655	422	2,697
	SW	0	0	0	0	45	22	67
2008	GW	545	0	0	0	2,102	470	3,117
	SW	5	0	0	0	0	25	30
2007	GW	493	0	0	0	2,113	375	2,981
	SW	5	0	0	0	95	20	120
2006	GW	552	0	0	0	3,383	359	4,294
	SW	0	0	0	0	55	19	74
2005	GW	526	0	0	0	3,370	375	4,271
	SW	1	0	0	0	68	20	89
2004	GW	448	0	0	0	3,438	377	4,263
	SW	1	0	0	0	0	20	21

# Projected Surface Water Supplies

## TWDB 2022 State Water Plan Data

# Projected Water Demands

## TWDB 2022 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.

### JEFF DAVIS COUNTY

100% (multiplier)

All values are in acre-feet

RWPG	WUG	WUG Basin	2020	2030	2040	2050	2060	2070
E	County-Other, Jeff Davis	Rio Grande	153	148	145	142	142	142
E	Fort Davis WSC	Rio Grande	319	314	309	307	307	307
E	Irrigation, Jeff Davis	Rio Grande	665	665	665	665	665	665
E	Livestock, Jeff Davis	Rio Grande	397	397	397	397	397	397
E	Mining, Jeff Davis	Rio Grande	153	153	153	153	153	153
Sum of Projected Water Demands (acre-feet)			1,687	1,677	1,669	1,664	1,664	1,664

# Projected Water Supply Needs

## TWDB 2022 State Water Plan Data

Negative values (in red) reflect a projected water supply need, positive values a surplus.

### JEFF DAVIS COUNTY

All values are in acre-feet

RWPG	WUG	WUG Basin	2020	2030	2040	2050	2060	2070
E	County-Other, Jeff Davis	Rio Grande	191	196	199	202	202	202
E	Fort Davis WSC	Rio Grande	149	154	159	161	161	161
E	Irrigation, Jeff Davis	Rio Grande	701	701	701	701	701	701
E	Livestock, Jeff Davis	Rio Grande	73	73	73	73	73	73
E	Mining, Jeff Davis	Rio Grande	0	0	0	0	0	0
Sum of Projected Water Supply Needs (acre-feet)			0	0	0	0	0	0

# Projected Water Management Strategies

## TWDB 2022 State Water Plan Data

### JEFF DAVIS COUNTY

WUG, Basin (RWPG)

All values are in acre-feet

Water Management Strategy	Source Name [Origin]	2020	2030	2040	2050	2060	2070
<b>County-Other, Jeff Davis, Rio Grande (E)</b>							
Jeff Davis County Other (Town of Valentine) - Additional Groundwater Well	West Texas Bolsons Aquifer [Jeff Davis]	129	129	129	129	129	129
		<b>129</b>	<b>129</b>	<b>129</b>	<b>129</b>	<b>129</b>	<b>129</b>
<b>Fort Davis WSC, Rio Grande (E)</b>							
Fort Davis WSC - Additional Groundwater Well	Igneous Aquifer [Jeff Davis]	274	274	274	274	274	274
Fort Davis WSC - Transmission Line to Connect Fort Davis WSC to Fort Davis Estates	Igneous Aquifer [Jeff Davis]	0	114	114	114	114	114
		<b>274</b>	<b>388</b>	<b>388</b>	<b>388</b>	<b>388</b>	<b>388</b>
<b>Sum of Projected Water Management Strategies (acre-feet)</b>		<b>403</b>	<b>517</b>	<b>517</b>	<b>517</b>	<b>517</b>	<b>517</b>

# **Appendix**

## **B**



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# **GAM RUN 23-010: JEFF DAVIS COUNTY UNDERGROUND WATER CONSERVATION DISTRICT MANAGEMENT PLAN**

Micaela Pedrazas, GIT and Grayson Dowlearn, P.G.

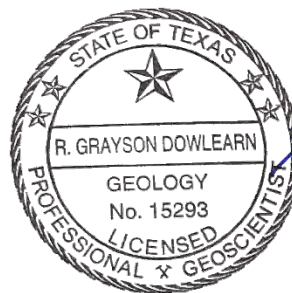
Texas Water Development Board

Groundwater Division

Groundwater Modeling Department

512-463-3075

June 7, 2023



*Grayson Dowlearn*  
6/7/2023

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# **GAM RUN 23-010: JEFF DAVIS COUNTY UNDERGROUND WATER CONSERVATION DISTRICT MANAGEMENT PLAN**

Micaela Pedrazas, GIT and Grayson Dowlearn, P.G.  
Texas Water Development Board  
Groundwater Division  
Groundwater Modeling Department  
512-463-3075  
June 7, 2023

## ***EXECUTIVE SUMMARY:***

Texas Water Code § 36.1071(h), states that, in developing its groundwater management plan, a groundwater conservation district shall use groundwater availability modeling information provided by the Executive Administrator of the Texas Water Development Board (TWDB) in conjunction with any available site-specific information provided by the district for review and comment to the Executive Administrator.

The TWDB provides data and information to the Jeff Davis County Underground Water Conservation District in two parts. Part 1 is the Estimated Historical Water Use/State Water Plan dataset report, which will be provided to you separately by the TWDB Groundwater Technical Assistance Department. Please direct questions about the water data report to Mr. Stephen Allen at 512-463-7317 or [stephen.allen@twdb.texas.gov](mailto:stephen.allen@twdb.texas.gov). Part 2 is the required groundwater availability modeling information, which includes:

1. the annual amount of recharge from precipitation, if any, to the groundwater resources within the district;
2. the annual volume of water that discharges from the aquifer to springs and any surface-water bodies, including lakes, streams, and rivers, for each aquifer within the district; and
3. the annual volume of flow into and out of the district within each aquifer and between aquifers in the district.

The groundwater management plan for the Jeff Davis County Underground Water Conservation District should be adopted by the district on or before September 13, 2023 and submitted to the TWDB Executive Administrator on or before October 13, 2023. The current management plan for the Jeff Davis County Underground Water Conservation District expires on December 12, 2023.

We used four groundwater availability models for the Jeff Davis County Underground Water Conservation District. Information for the Rustler Aquifer is from version 1.01 of the groundwater availability model for the Rustler Aquifer (Ewing and others, 2012). Information for the Edwards-Trinity (Plateau) and Pecos Valley aquifers is from version 1.01 of the groundwater availability model for the Edwards-Trinity (Plateau) and Pecos Valley aquifers (Anaya and Jones, 2009). Information for the Igneous Aquifer is from version 1.01 of the groundwater availability model for the Igneous Aquifer and parts of the West Texas Bolsons Aquifer (Wild Horse Flat, Michigan Flat, Ryan Flat, and Lobo Flat) (Beach and others, 2004). Information for the West Texas Bolsons Aquifer (Michigan Flat, Ryan Flat, Lobo Flat, and Green River Valley) is from two models: 1) version 1.01 of the groundwater availability model for the Igneous Aquifer and parts of the West Texas Bolsons Aquifer (Wild Horse Flat, Michigan Flat, Ryan Flat, and Lobo Flat) (Beach and others, 2004) and 2) version 1.01 of the groundwater availability model for the West Texas Bolsons Aquifer (Red Light Draw, Green River Valley, and Eagle Flat) (Beach and others, 2008).

While a small portion of the Capitan Reef Complex Aquifer underlies the district in northern Jeff Davis County, the current model for the Capitan Reef Complex Aquifer does not extend into Jeff Davis County. For more information concerning this aquifer, please contact Mr. Stephen Allen at 512-463-7317 or [stephen.allen@twdb.texas.gov](mailto:stephen.allen@twdb.texas.gov).

This report replaces the results of GAM Run 12-023 (Jigmond, 2012). Values may differ from the previous report as a result of routine updates to the spatial grid file used to define county, groundwater conservation district, and aquifer boundaries, which can impact the calculated water budget values. Additionally, the approach used for analyzing model results is reviewed during each update and may have been refined to better delineate groundwater flows. Tables 1 through 5 summarize the groundwater availability model data required by statute. Figures 1, 3, 5, 7 and 9 show the areas of the respective models from which the values in Tables 1 through 5 were extracted. Figures 2, 4, 6, 8 and 10 provide a generalized diagram of the groundwater flow components provided in Tables 1 through 5. If, after review of the figures, the Jeff Davis County Underground Water Conservation District determines that the district boundaries used in the assessment do not reflect current conditions, please notify the TWDB at your earliest convenience.

The flow components presented in this report do not represent the full groundwater budget. If additional inflow and outflow information would be helpful for planning purposes, the district may submit a request in writing to the TWDB Groundwater Modeling Department for the full groundwater budget.

## ***METHODS:***

In accordance with Texas Water Code § 36.1071(h), the groundwater availability model mentioned above was used to estimate information for the Jeff Davis County Underground Water Conservation District management plan. Water budgets were extracted for the historical model periods for the Rustler Aquifer (1980 through 2008), Edwards-Trinity (Plateau) and Pecos Valley aquifers (1981 through 2000), Igneous and parts of the West Texas Bolsons (Michigan Flat, Ryan Flat, and Lobo Flat) aquifers (1980 through 2000) using ZONEBUDGET Version 3.01 (Harbaugh, 2009). A water budget for the West Texas Bolsons (Green River Valley) Aquifer was extracted from the steady state model using ZONEBUDGET Version 3.01 (Harbaugh, 2009). The average annual water budget values for recharge, surface-water outflow, inflow to the district, outflow from the district, and the flow between aquifers within the district are summarized in this report.

## ***PARAMETERS AND ASSUMPTIONS:***

### ***Rustler Aquifer***

- We used version 1.01 of the groundwater availability model for the Rustler Aquifer (Ewing and others, 2012) to analyze the Rustler Aquifer. See Ewing and others (2012) for assumptions and limitations of the model.
- The groundwater availability model for Rustler Aquifer contains the following two layers:
  - Layer 1 represents the Dewey Lake Formation and Dockum Group.
  - Layer 2 represents the Rustler Aquifer.
- A water budget was not extracted for the Dockum Aquifer since it does not occur within Jeff Davis County Underground Water Conservation District.
- The MODFLOW WEL package was used to simulate cross-formational flow from overlying units along the Davis Mountains.
- Water budget terms were averaged for the period 1980 through 2008 (stress periods 63 through 91).
- The model was run with MODFLOW-NWT (Niswonger and others, 2011).

***Edwards-Trinity (Plateau) and Pecos Valley Aquifers***

- We used version 1.01 of the groundwater availability model for the Edwards-Trinity (Plateau) and Pecos Valley aquifers (Anaya and Jones, 2009) to analyze the Edwards-Trinity (Plateau) and Pecos Valley aquifers. See Anaya and Jones (2009) for assumptions and limitations of the model.
- The groundwater availability model for the Edwards-Trinity (Plateau) and Pecos Valley aquifers in Jeff Davis County Underground Water Conservation District is represented by one layer:
  - Layer 1 represents the Pecos Valley Aquifer, Edwards Group and equivalent limestone hydrostratigraphic units of the Edwards-Trinity (Plateau) Aquifer, and undifferentiated Trinity Group hydrostratigraphic units or equivalent units of the Edwards-Trinity (Plateau) Aquifer.
- Water budget terms were averaged for the period 1981 through 2000 (stress periods 2 through 21).
- The model was run with MODFLOW-96 (Harbaugh and McDonald, 1996).

***Igneous Aquifer and parts of the West Texas Bolsons Aquifer (Michigan Flat, Ryan Flat, Lobo Flat, and Green River Valley)***

- We used version 1.01 of the groundwater availability model for the Igneous Aquifer and parts of the West Texas Bolsons Aquifer (Wild Horse Flat, Michigan Flat, Ryan Flat, and Lobo Flat) (Beach and others, 2004) to analyze the Igneous and West Texas Bolsons (Michigan Flat, Ryan Flat, and Lobo Flat) aquifers. See Beach and others (2004) for assumptions and limitations of the model.
- The groundwater availability model for the Igneous Aquifer and parts of the West Texas Bolsons Aquifer (Wild Horse Flat, Michigan Flat, Ryan Flat, and Lobo Flat) contains the following three layers:
  - Layer 1 represents the West Texas Bolsons Aquifer.
  - Layer 2 represents the Igneous Aquifer.
  - Layer 3 represents the Cretaceous and Permian units.
- Water budgets for the district have been determined individually for the West Texas Bolsons Aquifer and the Igneous Aquifer.
- Water budget terms were averaged for the period 1980 through 2000 (stress periods 32 through 52).
- The model was run with MODFLOW-96 (Harbaugh and McDonald, 1996).

- We used version 1.01 of the groundwater availability model of the West Texas Bolsons (Red Light Draw, Green River Valley, and Eagle Flat) aquifer (Beach and others, 2008) to analyze the West Texas Bolsons (Green River Valley) Aquifer. See Beach and others (2008) for assumptions and limitations of the groundwater availability model.
- The groundwater availability model for West Texas Bolsons Aquifer contains the following three layers:
  - Layer 1 represents the West Texas Bolsons Aquifer.
  - Layer 2 represents the Cretaceous and Permian units.
  - Layer 3 represents the Cretaceous and Paleozoic units.
- The groundwater availability model does not contain a transient simulation due to lack of data when the model was built.
- Water budget terms were extracted for the steady state period (stress period 1).
- The model was run with MODFLOW-2000 (Harbaugh and Others, 2000).

## ***RESULTS:***

A groundwater budget summarizes the amount of water entering and leaving an aquifer according to the groundwater availability model. Selected groundwater budget components listed below were extracted from the groundwater availability model results for the Rustler, Edwards-Trinity (Plateau), Pecos Valley, Igneous and West Texas Bolsons aquifers located within the Jeff Davis County Underground Water Conservation District and averaged over the historical calibration period, as shown in Tables 1 through 5.

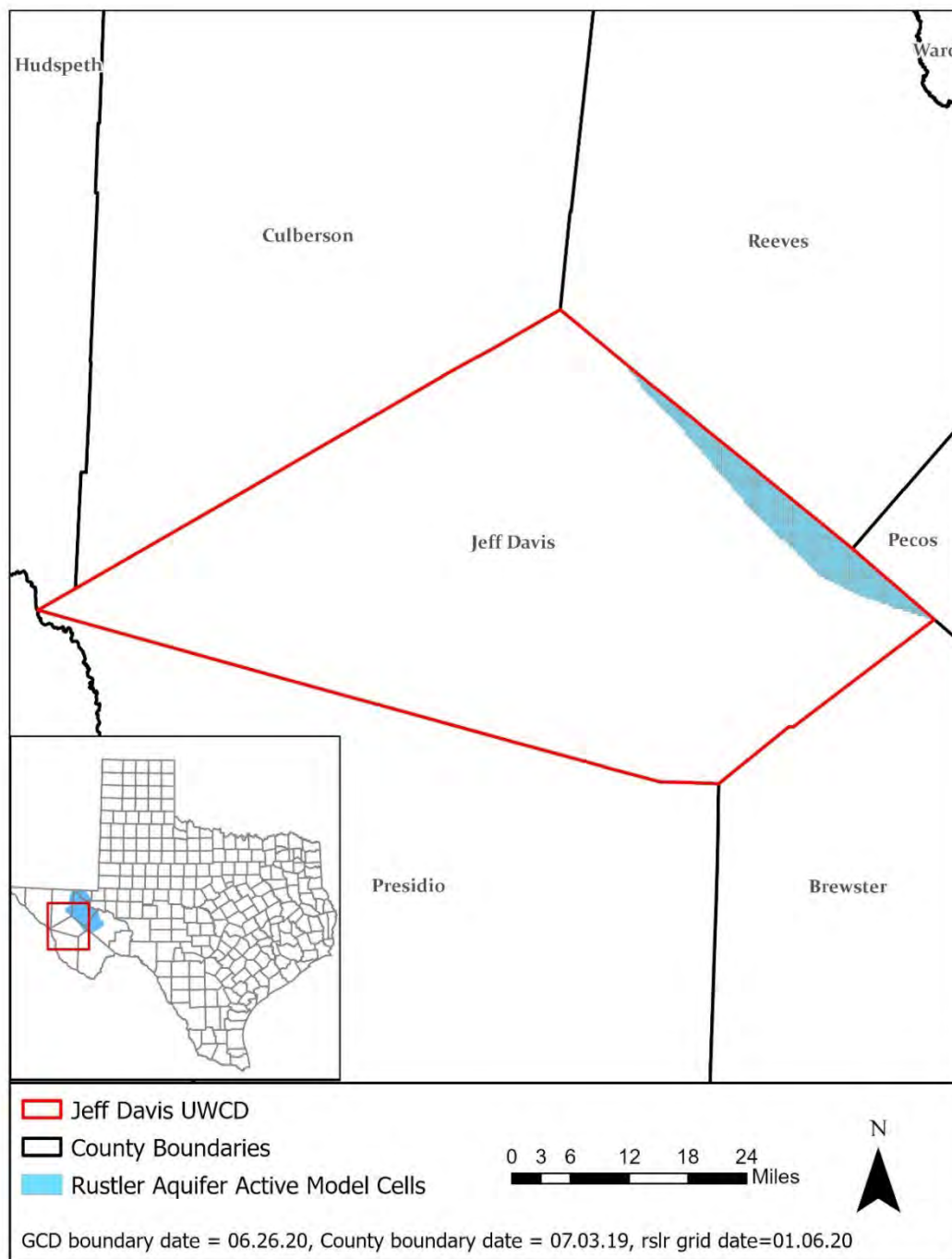
1. Precipitation recharge—the areally distributed recharge sourced from precipitation falling on the outcrop areas of the aquifers (where the aquifer is exposed at land surface) within the district.
2. Surface-water outflow—the total water discharging from the aquifer (outflow) to surface-water features such as streams, reservoirs, and springs.
3. Flow into and out of district—the lateral flow within the aquifer between the district and adjacent counties.
4. Flow between aquifers—the net vertical flow between the aquifer and adjacent aquifers or confining units. This flow is controlled by the relative water levels in each aquifer and aquifer properties of each aquifer or confining unit that define the amount of leakage that occurs.

The information needed for the district's management plan is summarized in Tables 1 through 5. Figures 1, 3, 5, 7 and 9 show the areas of the respective models from which the values in Tables 1 through 5 were extracted. Figures 2, 4, 6, 8 and 10 provide a generalized diagram of the groundwater flow components provided in Tables 1 through 5. 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 a district or county boundary, 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.

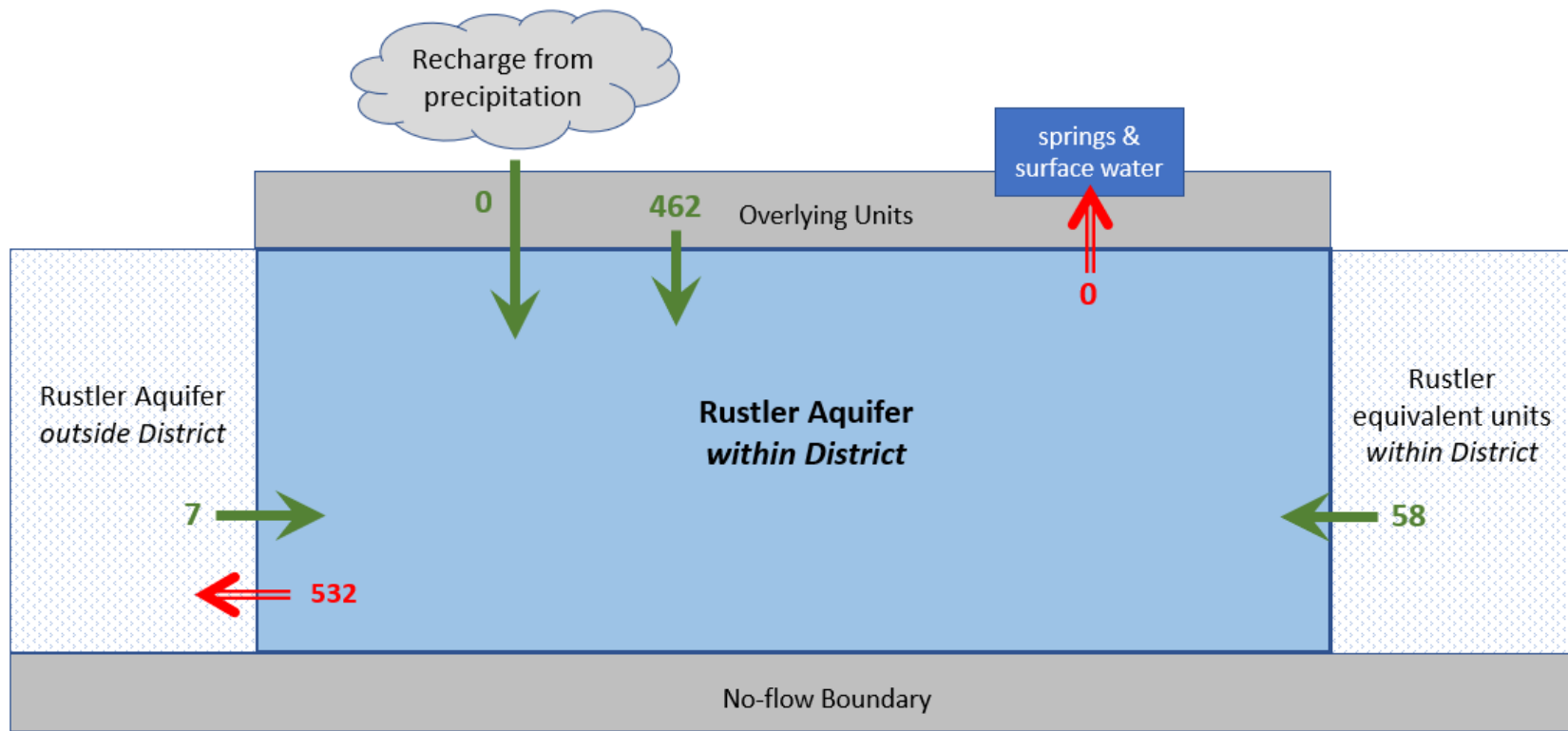


**Table 1: Summarized information for the Rustler Aquifer that is needed for the Jeff Davis County Underground Water Conservation District groundwater management plan. All values are reported in acre-feet per year and rounded to the nearest 1 acre-foot.**

Management plan requirement	Aquifer or confining unit	Results
Estimated annual amount of recharge from precipitation to the district	Rustler Aquifer	0
Estimated annual volume of water that discharges from the aquifer to springs and any surface water body including lakes, streams, and rivers	Rustler Aquifer	0
Estimated annual volume of flow into the district within each aquifer in the district	Rustler Aquifer	7
Estimated annual volume of flow out of the district within each aquifer in the district	Rustler Aquifer	532
Estimated net annual volume of flow between each aquifer in the district	To Rustler Aquifer from overlying stratigraphic units	462
	To Rustler Aquifer from Rustler equivalent units	58



**Figure 1: Area of the Rustler Aquifer groundwater availability model from which the information in Table 1 was extracted (the Rustler Aquifer extent within the district boundary).**

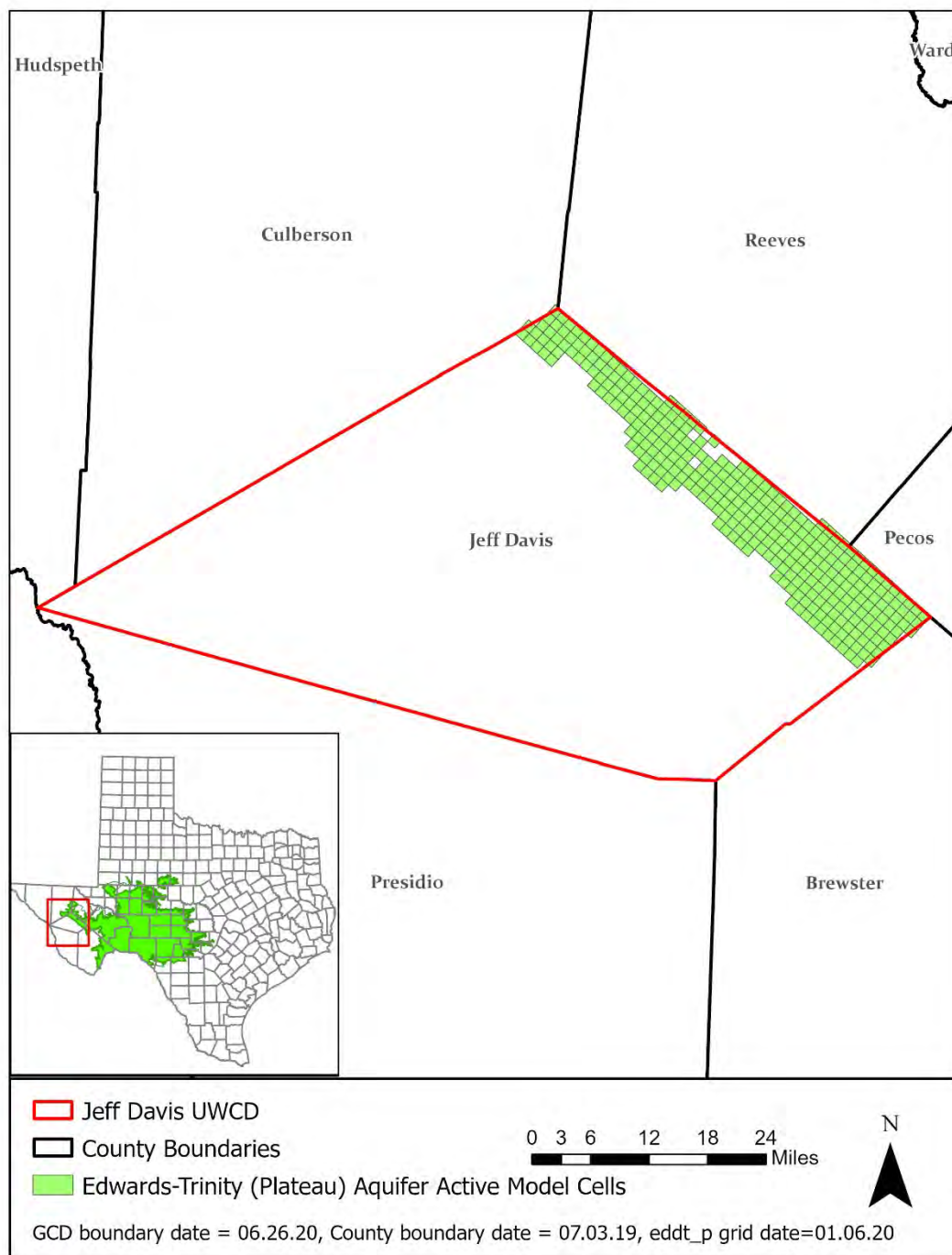


*Caveat: This diagram only includes the water budget items provided in Table 1. A complete water budget would include additional inflows and outflows. For a full groundwater budget, please submit a request in writing to the Groundwater Modeling Department.*

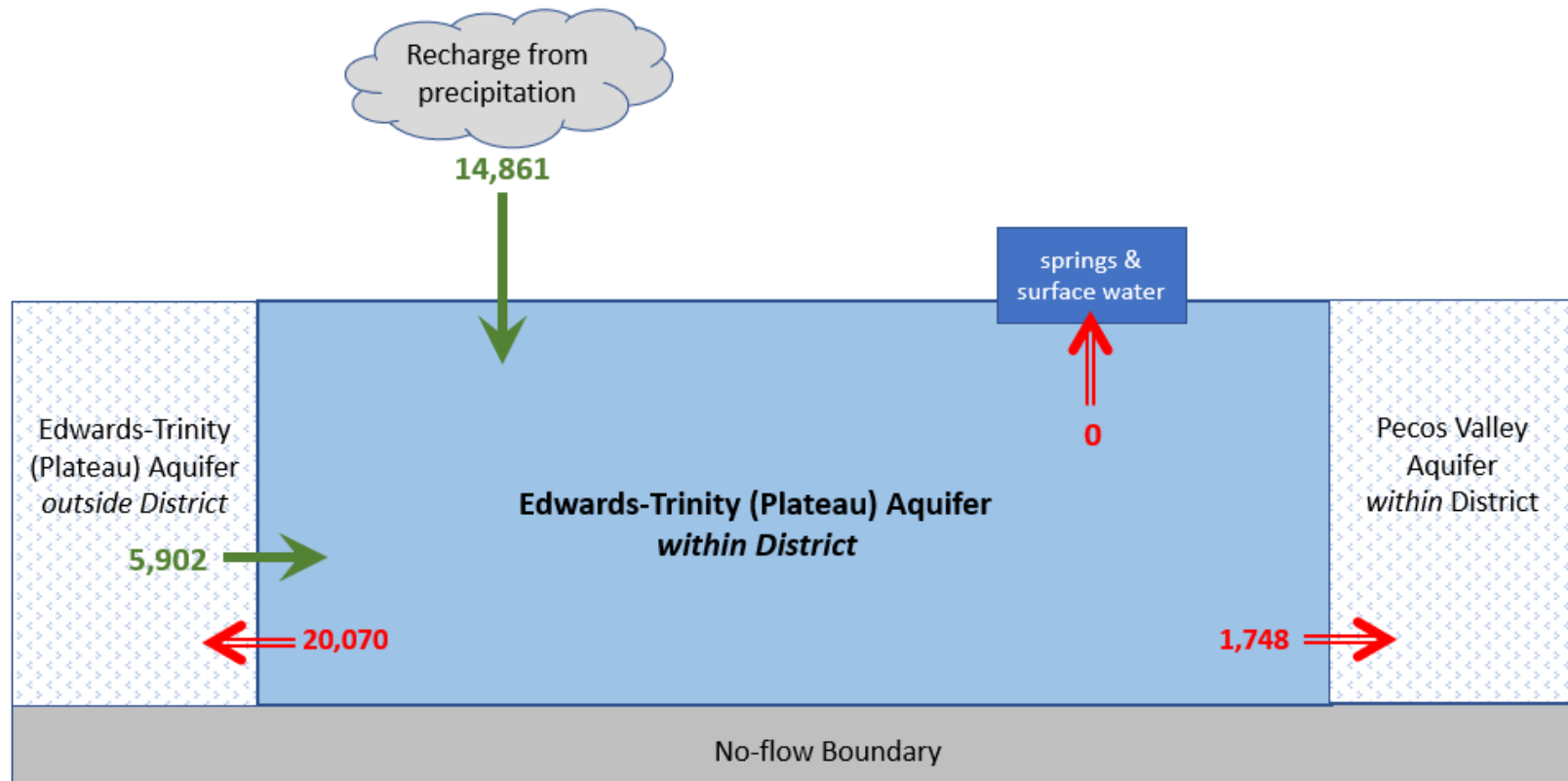
**Figure 2: Generalized diagram of the summarized budget information from Table 1, representing directions of flow for Rustler Aquifer within Jeff Davis County Underground Water Conservation District. Flow values are expressed in acre-feet per year.**

**Table 2: Summarized information for the Edwards-Trinity (Plateau) Aquifer for the Jeff Davis County Underground Water Conservation District groundwater management plan. All values are reported in acre-feet per year and rounded to the nearest 1 acre-foot.**

Management plan requirement	Aquifer or confining unit	Results
Estimated annual amount of recharge from precipitation to the district	Edwards-Trinity (Plateau) Aquifer	14,861
Estimated annual volume of water that discharges from the aquifer to springs and any surface water body including lakes, streams, and rivers	Edwards-Trinity (Plateau) Aquifer	0
Estimated annual volume of flow into the district within each aquifer in the district	Edwards-Trinity (Plateau) Aquifer	5,902
Estimated annual volume of flow out of the district within each aquifer in the district	Edwards-Trinity (Plateau) Aquifer	20,070
Estimated net annual volume of flow between each aquifer in the district	From Edwards-Trinity (Plateau) Aquifer to Pecos Valley Aquifer	1,748



**Figure 3: Area of the Edwards-Trinity (Plateau) and Pecos Valley aquifers groundwater availability model from which the information in Table 2 was extracted (the Edwards-Trinity [Plateau] Aquifer extent within the district boundary).**

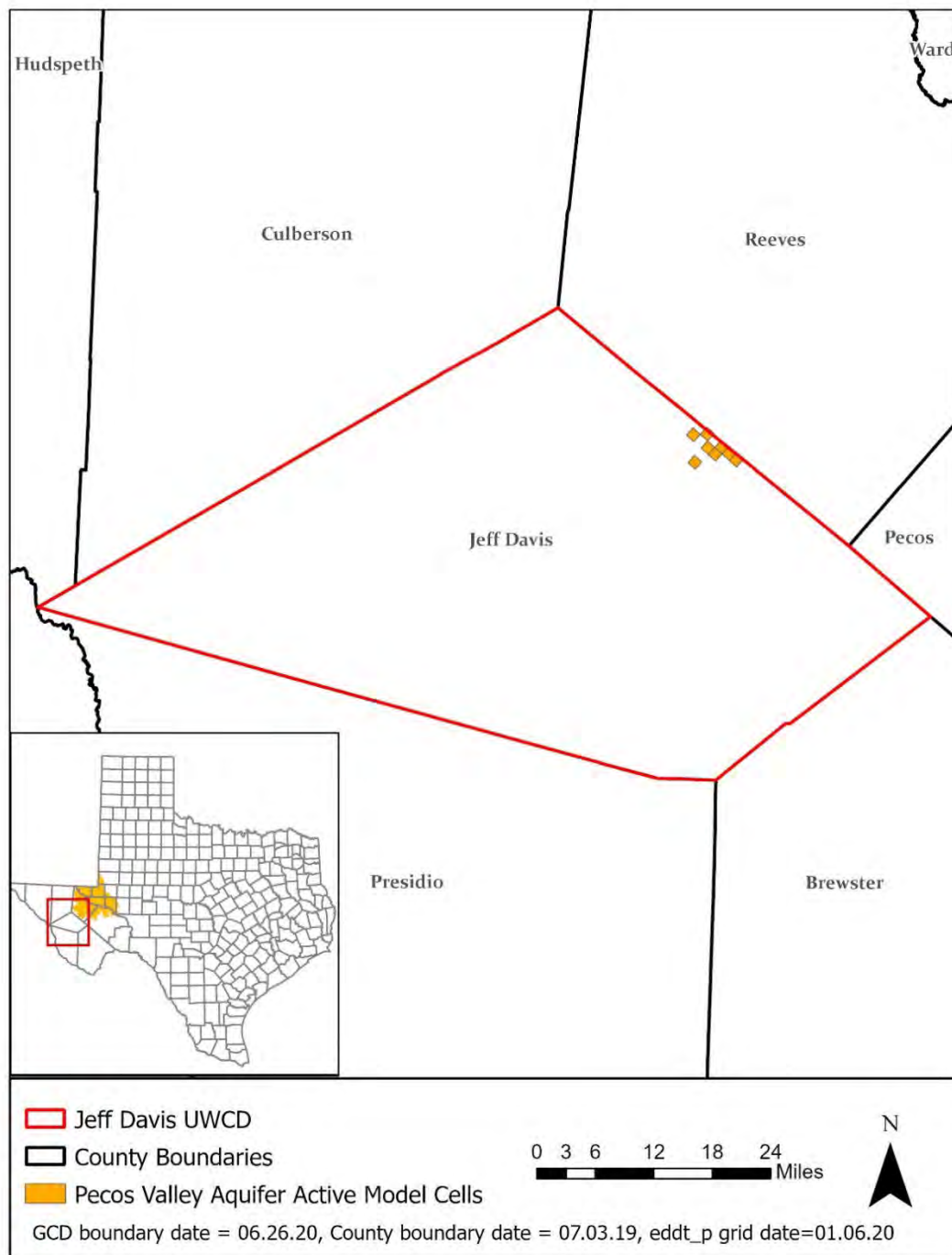


*Caveat: This diagram only includes the water budget items provided in Table 2. A complete water budget would include additional inflows and outflows. For a full groundwater budget, please submit a request in writing to the Groundwater Modeling Department.*

**Figure 4: Generalized diagram of the summarized budget information from Table 2, representing directions of flow for the Edwards-Trinity (Plateau) Aquifer within Jeff Davis County Underground Water Conservation District. Flow values are expressed in acre-feet per year.**

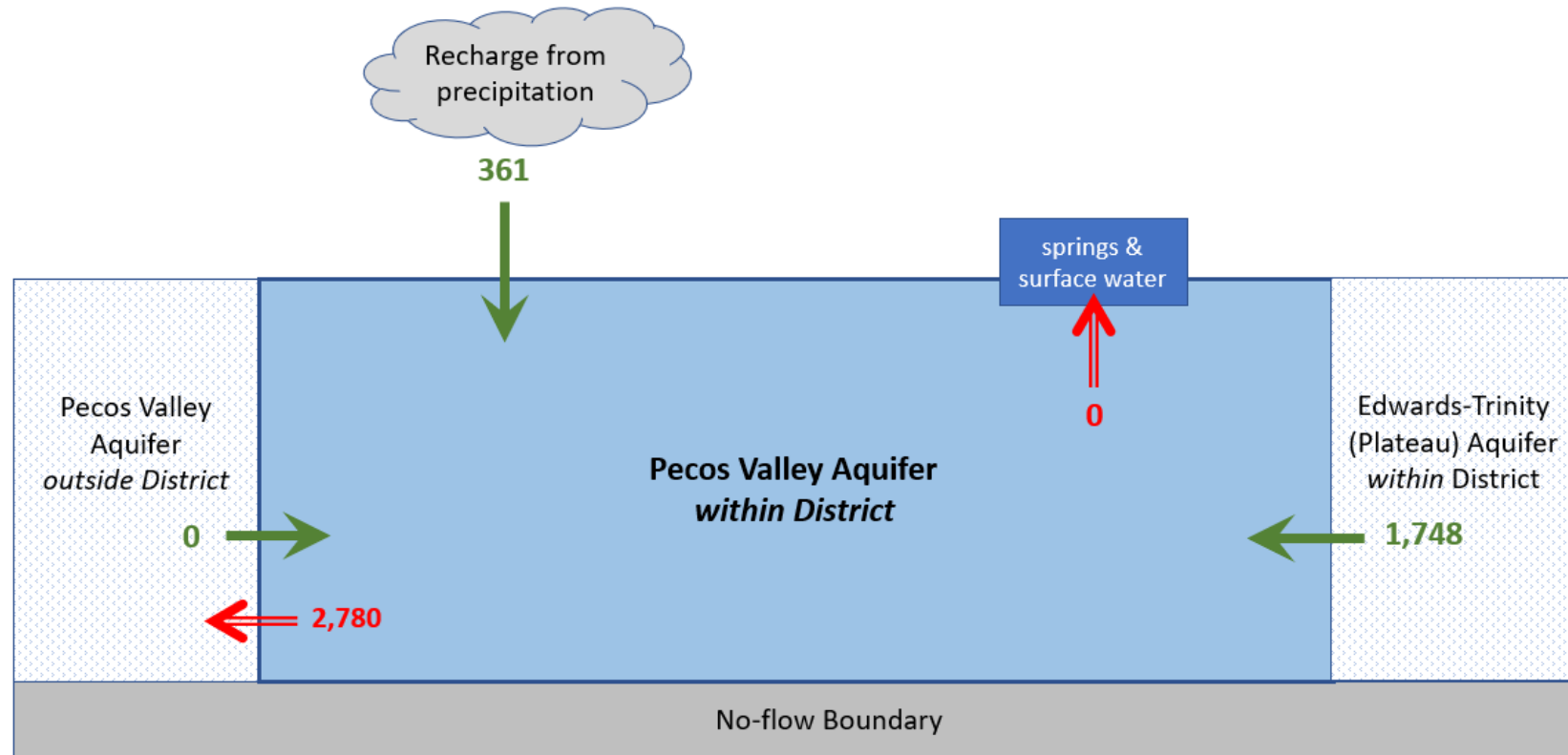
**Table 3: Summarized information for the Pecos Valley Aquifer that is needed for the Jeff Davis County Underground Water Conservation District groundwater management plan. All values are reported in acre-feet per year and rounded to the nearest 1 acre-foot.**

Management plan requirement	Aquifer or confining unit	Results
Estimated annual amount of recharge from precipitation to the district	Pecos Valley Aquifer	361
Estimated annual volume of water that discharges from the aquifer to springs and any surface water body including lakes, streams, and rivers	Pecos Valley Aquifer	0
Estimated annual volume of flow into the district within each aquifer in the district	Pecos Valley Aquifer	0
Estimated annual volume of flow out of the district within each aquifer in the district	Pecos Valley Aquifer	2,780
Estimated net annual volume of flow between each aquifer in the district	To Pecos Valley Aquifer from Edwards-Trinity (Plateau) Aquifer	1,748



**Figure 5: Area of the Edwards-Trinity (Plateau) and Pecos Valley aquifers groundwater availability model from which the information in Table 3 was extracted (the Pecos Valley Aquifer extent within the district boundary).**





*Caveat: This diagram only includes the water budget items provided in Table 3. A complete water budget would include additional inflows and outflows. For a full groundwater budget, please submit a request in writing to the Groundwater Modeling Department.*

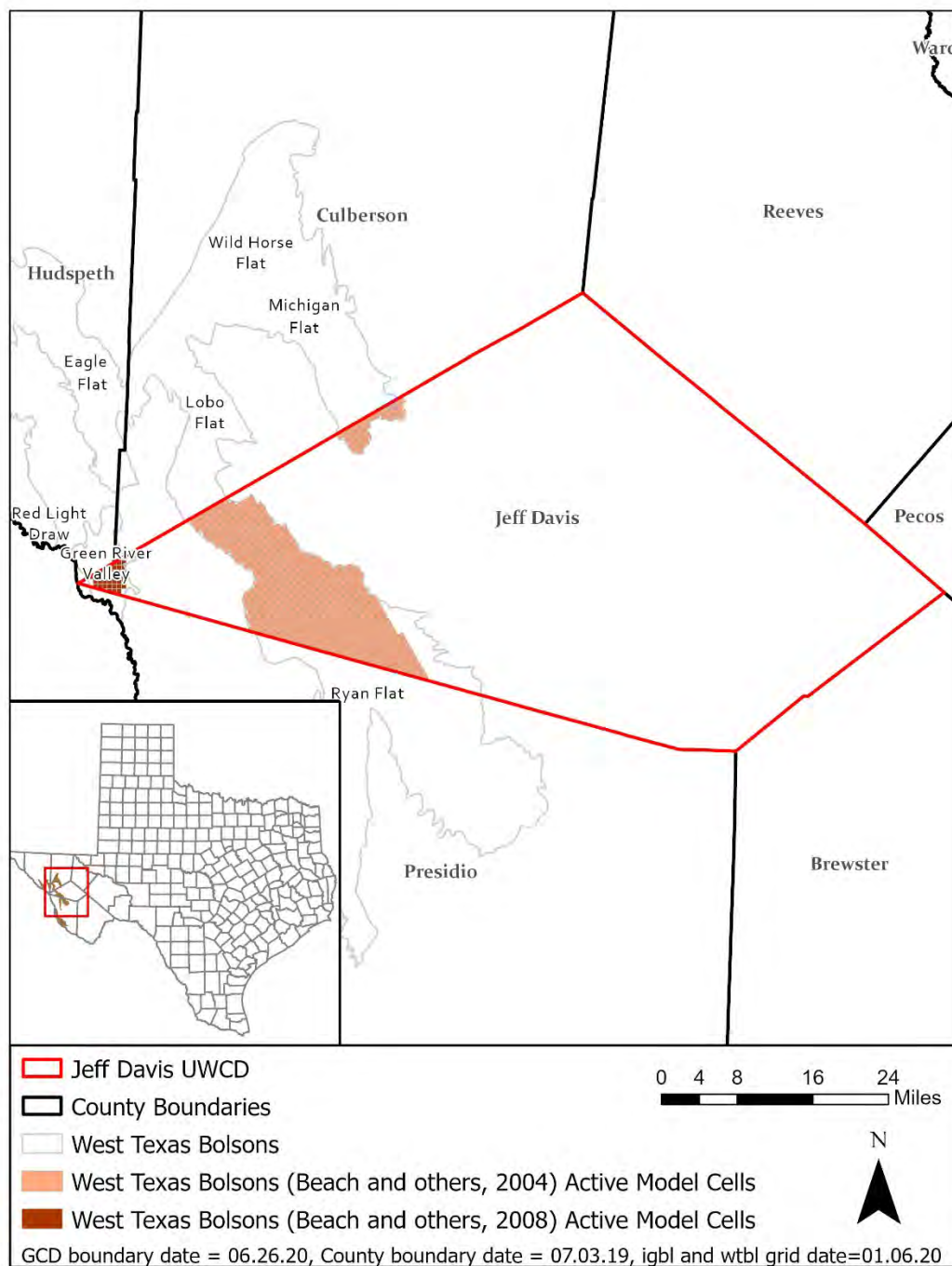
**Figure 6: Generalized diagram of the summarized budget information from Table 3, representing directions of flow for Pecos Valley Aquifer within Jeff Davis County Underground Water Conservation District. Flow values are expressed in acre-feet per year.**

**Table 4: Summarized information for the West Texas Bolsons Aquifer that is needed for the Jeff Davis County Underground Water Conservation District groundwater management plan. All values are reported in acre-feet per year and rounded to the nearest 1 acre-foot.**

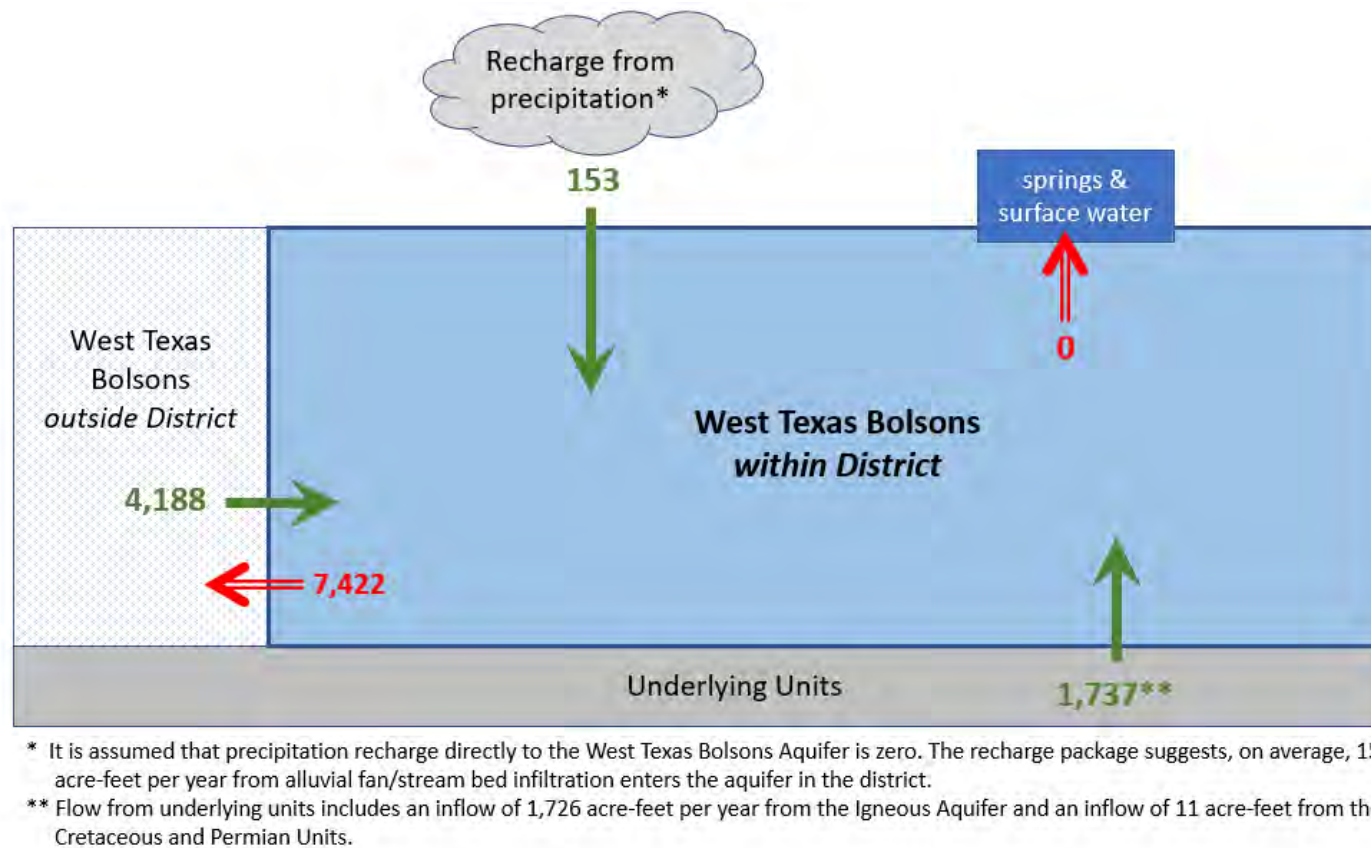
Management plan requirement	Aquifer or confining unit	Results
Estimated annual amount of recharge from precipitation to the district <sup>1</sup>	West Texas Bolsons Aquifer	153
Estimated annual volume of water that discharges from the aquifer to springs and any surface water body including lakes, streams, and rivers	West Texas Bolsons Aquifer	0
Estimated annual volume of flow into the district within each aquifer in the district	West Texas Bolsons Aquifer	4,188
Estimated annual volume of flow out of the district within each aquifer in the district	West Texas Bolsons Aquifer	7,422
Estimated net annual volume of flow between each aquifer in the district	To West Texas Bolsons Aquifer from Igneous Aquifer	1,726
	To West Texas Bolsons Aquifer from Cretaceous and Permian units	11

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<sup>1</sup> It is assumed that the West Texas Bolsons Aquifer does not receive any direct recharge from precipitation. However, the model estimate presented above includes indirect recharge estimates from alluvial fan and stream bed infiltration during precipitation events.



**Figure 7: Area of the Igneous and parts of the West Texas Bolsons (Wild Horse Flat, Michigan Flat, Ryan Flat, and Lobo Flat) Aquifer groundwater availability model and the West Texas Bolsons (Red Light Draw, Green River Valley, and Eagle Flat) Aquifer groundwater availability model from which the information in Table 4 was extracted (the West Texas Bolsons Aquifer extent within the district boundary).**

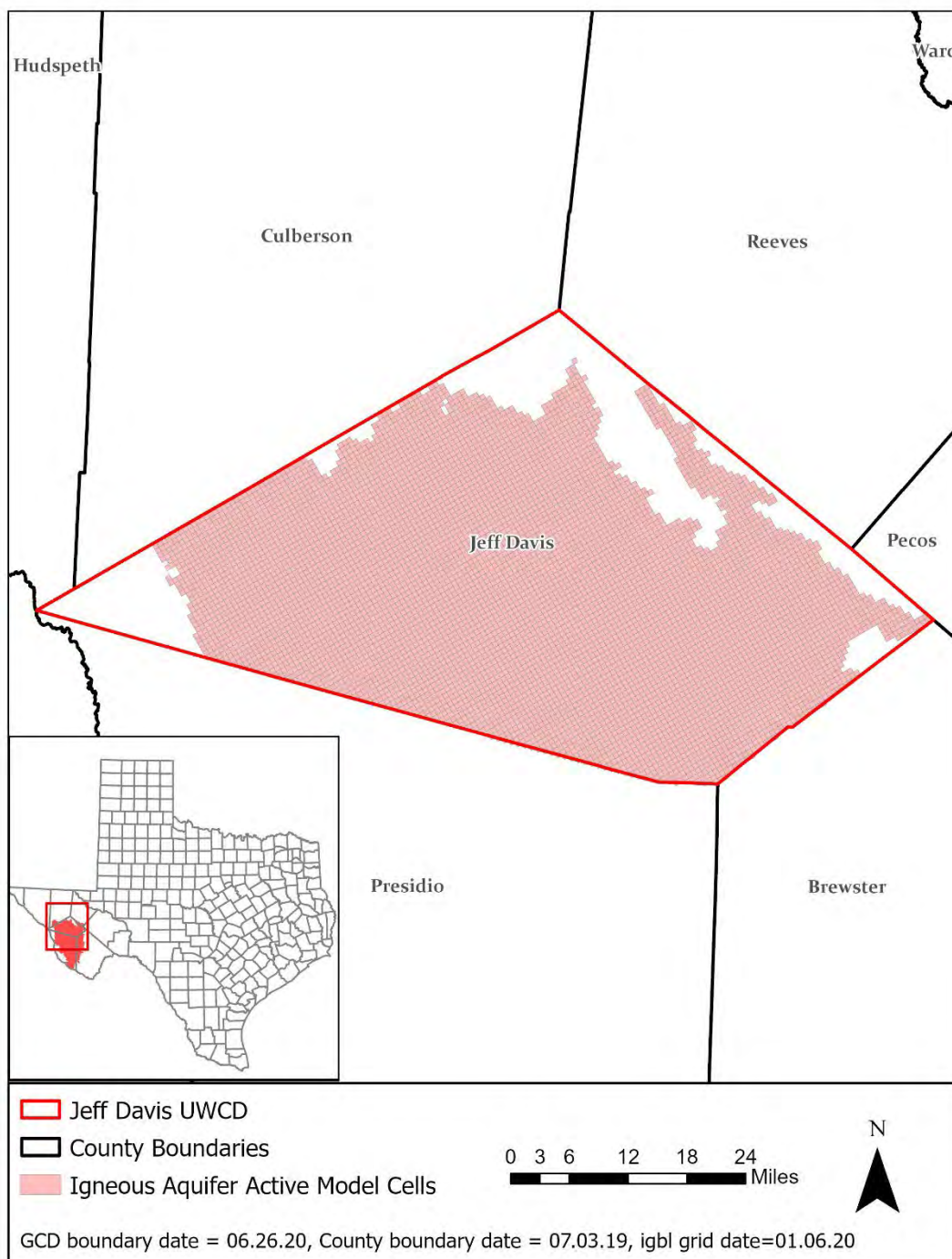


*Caveat: This diagram only includes the water budget items provided in Table 4. A complete water budget would include additional inflows and outflows. For a full groundwater budget, please submit a request in writing to the Groundwater Modeling Department.*

**Figure 8: Generalized diagram of the summarized budget information from Table 4, representing directions of flow for the West Texas Bolsons Aquifer within Jeff Davis County Underground Water Conservation District. Flow values are expressed in acre-feet per year.**

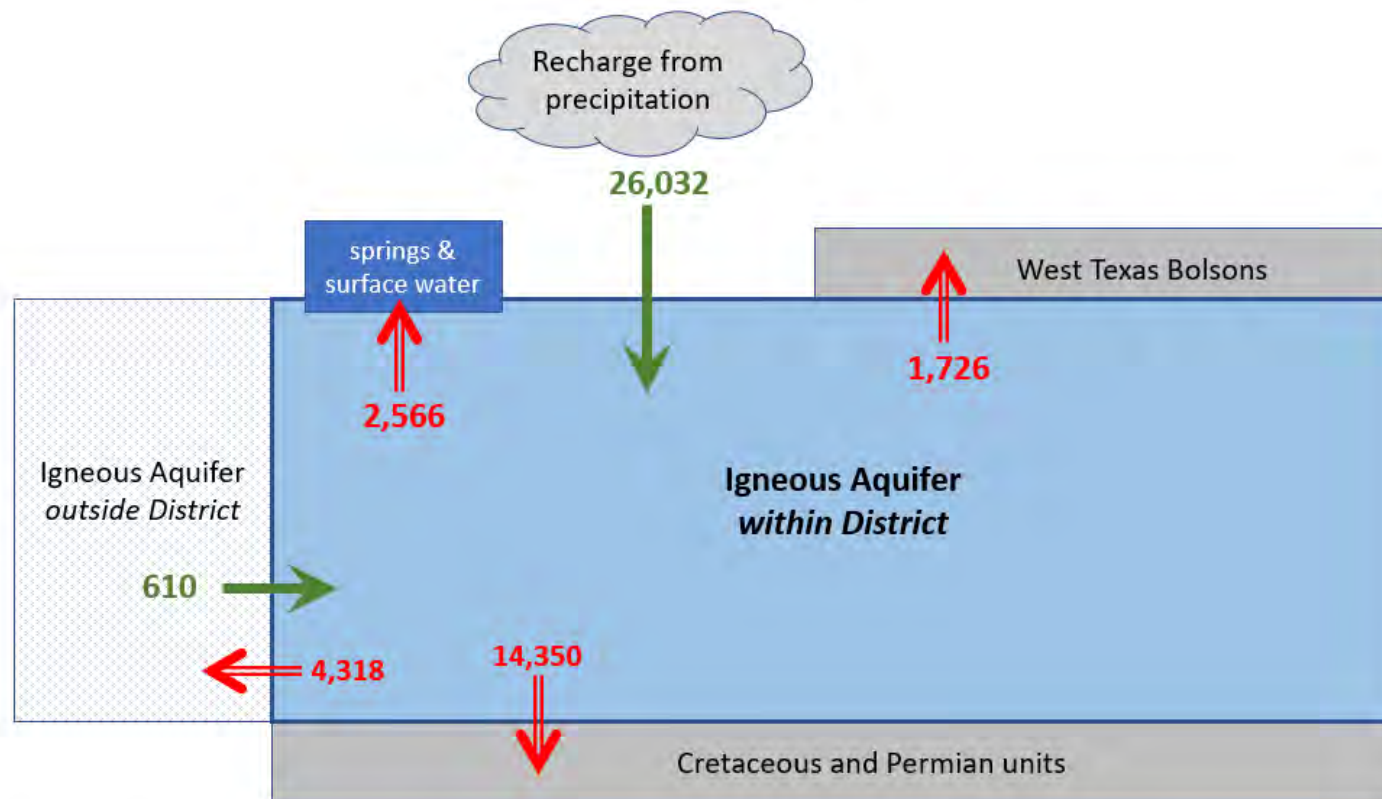
**Table 5: Summarized information for the Igneous Aquifer that is needed for the Jeff Davis County Underground Water Conservation District groundwater management plan. All values are reported in acre-feet per year and rounded to the nearest 1 acre-foot.**

Management plan requirement	Aquifer or confining unit	Results
Estimated annual amount of recharge from precipitation to the district	Igneous Aquifer	26,032
Estimated annual volume of water that discharges from the aquifer to springs and any surface water body including lakes, streams, and rivers	Igneous Aquifer	2,566
Estimated annual volume of flow into the district within each aquifer in the district	Igneous Aquifer	610
Estimated annual volume of flow out of the district within each aquifer in the district	Igneous Aquifer	4,318
Estimated net annual volume of flow between each aquifer in the district	From Igneous Aquifer to West Texas Bolsons Aquifer	1,726
	From Igneous Aquifer to Cretaceous and Permian units	14,350



**Figure 9: Area of the Igneous and West Texas Bolsons aquifers groundwater availability model from which the information in Table 5 was extracted (the Igneous Aquifer extent within the district boundary).**





*Caveat: This diagram only includes the water budget items provided in Table 5. A complete water budget would include additional inflows and outflows. For a full groundwater budget, please submit a request in writing to the Groundwater Modeling Department.*

**Figure 10:** Generalized diagram of the summarized budget information from Table 5, representing directions of flow for Igneous Aquifer within Jeff Davis County Underground Water Conservation District. Flow values are expressed in acre-feet per year.

## ***LIMITATIONS:***

The groundwater models used in completing this analysis are the best available scientific tools that can be used to meet the stated objectives. 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 historic groundwater flow conditions includes the assumptions about the location in the aquifer where historic pumping was placed. Understanding the amount and location of historical pumping is as important as evaluating the volume of groundwater flow into and out of the district, between aquifers within the district (as applicable), interactions with surface water (as applicable), recharge to the aquifer system (as applicable), and other metrics that describe the impacts of that pumping. In addition, assumptions regarding precipitation, recharge, and interaction with streams are specific to particular historic time periods.

Because the application of the groundwater models was designed to address regional scale questions, the results are most effective on a regional scale. The TWDB makes no warranties or representations related 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 groundwater pumping and overall conditions of the aquifer. Because of the limitations of the groundwater 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. Historic precipitation patterns also need to be placed in context as future climatic conditions, such as dry and wet year precipitation patterns, may differ and affect groundwater flow conditions.



## **REFERENCES:**

- Anaya, R. and Jones, I., 2009, Groundwater Availability Model for the Edwards-Trinity (Plateau) and Pecos Valley Aquifers of Texas, 115 p.,  
[http://www.twdb.texas.gov/groundwater/models/gam/eddt\\_p/ET-Plateau\\_Full.pdf](http://www.twdb.texas.gov/groundwater/models/gam/eddt_p/ET-Plateau_Full.pdf)
- Beach, J.A., Ashworth, J.B., Finch, S.T., Chastain-Howley, A., Calhoun, K., Urbanczyk, K., Sharp, J.M., and Olson, J., 2004, Groundwater Availability Model for the Igneous and parts of the West Texas Bolsons (Wild Horse Flat, Michigan Flat, Ryan Flat, and Lobo Flat) Aquifers, 407 p.,  
[http://www.twdb.texas.gov/groundwater/models/gam/igbl/IGBL\\_Model\\_Report.pdf](http://www.twdb.texas.gov/groundwater/models/gam/igbl/IGBL_Model_Report.pdf)
- Beach, J.A., Symank, L., Huang, Y., Ashworth, J.B., Davidson, T., Collins, E.W., Hibbs, B.J., Darling, B.K., Urbanczyk, K., Calhoun, K., and Finch, S., 2008, Groundwater Availability Model for the West Texas Bolsons (Red Light Draw, Green River Valley, and Eagle Flat) Aquifer in Texas, 320 p.,  
[http://www.twdb.texas.gov/groundwater/models/gam/wtbl/WTBL\\_Model\\_Report.pdf](http://www.twdb.texas.gov/groundwater/models/gam/wtbl/WTBL_Model_Report.pdf)
- Ewing, J. E., Kelley, V. A., Jones, T. L., Yan, T., Singh, A., Powers, D. W., Holt, R. M., and Sharp, J. M., 2012, Groundwater availability model report for the Rustler Aquifer: Prepared for the Texas Water Development Board by Intera Inc., 460 p.  
<https://www.twdb.texas.gov/groundwater/models/gam/rslr/rslr.asp>
- Harbaugh, A. W., 2009, Zonebudget Version 3.01, A computer program for computing subregional water budgets for MODFLOW ground-water flow models, U.S. Geological Survey Groundwater Software.
- Harbaugh, A.W., Banta, E.R., Hill, M.C., and McDonald, M.G., 2000, MODFLOW-2000, The U.S. Geological Survey modular ground-water model-User guide to modularization concepts and the ground-water flow process: U.S. Geological Survey, Open-File Report 00-92.
- Harbaugh, A. W., and McDonald, M. G., 1996, User's documentation for MODFLOW-96, an update to the U.S. Geological Survey modular finite-difference groundwater-water flow model: U.S. Geological Survey Open-File Report 96-485, 56 p.
- Jigmond, M., 2012, GAM Run 12-023: Texas Water Development Board, GAM Run 12-023  
<https://www.twdb.texas.gov/groundwater/docs/GAMruns/GR12-023.pdf>
- National Research Council, 2007, Models in Environmental Regulatory Decision Making Committee on Models in the Regulatory Decision Process, National Academies Press, Washington D.C., 287 p.

Niswonger, R.G., Panday, S., and Ibaraki, M., 2011, MODFLOW-NWT, a Newton formulation for MODFLOW-2005: USGS, Techniques and Methods 6-A37, 44 p.

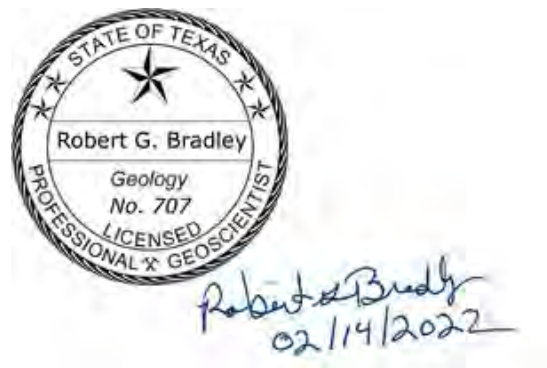
Texas Water Code § 36.1071

# **Appendix C**

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# **GAM RUN 21-010 MAG: MODELED AVAILABLE GROUNDWATER FOR THE AQUIFERS IN GROUNDWATER MANAGEMENT AREA 4**

Radu Boghici, P.G. and Robert G. Bradley, P.G.  
Texas Water Development Board  
Groundwater Division  
(512) 463-5808  
January 21, 2022



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# **GAM RUN 21-010 MAG: MODELED AVAILABLE GROUNDWATER FOR THE AQUIFERS IN GROUNDWATER MANAGEMENT AREA 4**

Radu Boghici, P.G. and Robert G. Bradley, P.G.  
Texas Water Development Board  
Groundwater Division  
(512) 463-5808  
January 21, 2022

## **EXECUTIVE SUMMARY:**

The modeled available groundwater for the relevant aquifers of Groundwater Management Area 4—the Bone Spring-Victorio Peak, Capitan Reef Complex, Edwards-Trinity (Plateau), Igneous, Marathon, and West Texas Bolsons aquifers—are summarized by decade for use for the groundwater conservation districts (Tables 1, 3, 5, 7, 9, and 11) and in the regional water planning process (Tables 2, 4, 6, 8, 10, and 12)). The modeled available groundwater estimates are:

- 101,400 acre-feet per year in the Bone Spring-Victorio Peak Aquifer,
- 8,163 acre-feet per year in the Capitan Reef Complex Aquifer,
- 1,394 acre-feet per year in the Edwards-Trinity (Plateau) Aquifer,
- 11,331 to 11,336 acre-feet per year in the Igneous Aquifer,
- 7,327 acre-feet per year in the Marathon Aquifer, and
- 57,754 to 58,580 acre-feet per year in the West Texas Bolsons Aquifer (Salt Basin and Presidio and Redford Bolsons combined).

Within the West Texas Bolsons Aquifer in Culberson County GCD, the modeled available groundwater for Lobo Flat, Wildhorse Flat, and Michigan Flat are:

- 11,087 to 11,112 acre-feet per year in Lobo Flat, and
- 24,422 to 24,638 acre-feet per year in Wildhorse Flat.

The modeled available groundwater estimates were extracted from results of model runs using the following groundwater availability models and alternative models: Bone Spring-Victorio Peak, Eastern Arm of the Capitan Reef Complex, Edwards-Trinity (Plateau), Igneous and West Texas Bolsons (Wild Horse Flat, Michigan Flat, Ryan Flat, and Lobo Flat), and West Texas Bolsons (Presidio and Redford) aquifers.

Analytical methods were used to calculate the modeled available groundwater for the Capitan Reef Complex Aquifer in Culberson County and for the Marathon Aquifer. The explanatory report and other materials submitted to the Texas Water Development Board (TWDB) were determined to be administratively complete on October 29, 2021.

## **REQUESTOR:**

Groundwater Conservation District members of Groundwater Management Area 4.

## **DESCRIPTION OF REQUEST:**

In the *Resolution for Adoption of Desired Future Conditions for the Aquifers in Groundwater Management Area 4* dated June 17, 2021, the District Members of Groundwater Management Area 4 provided the TWDB with the desired future conditions of the relevant aquifers in Groundwater Management Area 4. The 2021 desired future conditions are identical with the 2016 desired future conditions, and are reproduced below:

### **Brewster County Groundwater Conservation District (2010-2060)**

- 3 feet drawdown for the Edwards-Trinity (Plateau) Aquifer.
- 10 feet drawdown for the Igneous Aquifer.
- 0-foot drawdown for the Marathon Aquifer.
- 0-foot drawdown for the Capitan Reef Complex Aquifer.

### **Culberson County Groundwater Conservation District (2010-2060)**

- 50 feet drawdown for the Capitan Reef Complex Aquifer.
- 78 feet drawdown for the [Salt Basin portion of the] West Texas Bolsons Aquifer.
- 66 feet drawdown for the Igneous Aquifer.

### **Hudspeth County Underground Water Conservation District No.1 (2010-2060)**

- 0-foot drawdown for the Bone Spring-Victorio Peak Aquifer, averaged across the portion of the aquifer within the boundaries of the District.

### **Jeff Davis County Underground Water Conservation District (2010-2060)**

- 20 feet drawdown for the Igneous Aquifer.
- 72 feet drawdown for the [Salt Basin portion of the] West Texas Bolsons Aquifer.

### **Presidio County Underground Water Conservation District (2010-2060)**

- 14 feet drawdown for the Igneous Aquifer.

- 72 feet drawdown for the [Salt Basin portion of the] West Texas Bolsons Aquifer.
- 72 feet drawdown for the Presidio-Redford Bolson [portion of the West Texas Bolsons].

The following stipulations from the 2016 desired future conditions also apply to the 2021 desired future conditions.

“In response to requests for clarifications from the TWDB on December 5, 2017, December 8, 2017, and February 5, 2018 the Groundwater Management Area 4 Chair, Ms. Janet Adams, indicated the following preferences for calculating modeled available groundwater volumes in Groundwater Management Area 4:

- For the Bone Spring-Victorio Peak Aquifer (Hudspeth County), the TWDB will use the results reported in GAM Run 10-061 and the assumptions described in GAM Task 10-006;
- For the Capitan Reef Complex Aquifer (Brewster and Culberson counties), the TWDB will use the Capitan Reef Complex Aquifer (Eastern Arm) groundwater availability model for Brewster County and the analytical approach (AA 09-08) for Culberson County. For Brewster County we will use 2005 as the baseline year and for Culberson County we will use the assumptions described in AA 09-08. The TWDB will assume the desired future condition in Brewster County is met if the average simulated drawdown value is within 3 feet.
- For the Edwards-Trinity (Plateau) Aquifer (Brewster County), the TWDB will use the single layer groundwater flow model for the Edwards-Trinity (Plateau) and Pecos Valley aquifers, with 2005 as the baseline year and the assumptions described in GR 10-048.
- For the Igneous Aquifer and Salt Basin Portion of the West Texas Bolsons Aquifer (Brewster, Culberson, Jeff Davis, and Presidio counties), the TWDB will use the Igneous and West Texas Bolsons aquifers groundwater availability model, with 2000 as the baseline year and the assumptions described in report GR 10-037 MAG.
- For Presidio and Redford Bolsons portion of the West Texas Bolsons Aquifer, the TWDB will use the West Texas Bolsons Aquifer (Presidio and Redford Bolsons) groundwater availability model, with 2008 as the baseline year.



- The Red Light Draw, Green River Valley, and Eagle Flat portions of the West Texas Bolsons Aquifer are considered non-relevant for the purposes of joint planning because there are no groundwater conservation districts with jurisdiction over this portion of the minor aquifer.”

## **METHODS:**

The desired future conditions for the Bone Spring-Victorio Peak, Capitan Reef Complex (Culberson and Brewster counties), Marathon, Igneous, Edwards-Trinity (Plateau), and West Texas Bolsons (Wild Horse Flat, Michigan Flat, Ryan Flat, and Lobo Flat) aquifers are identical to the ones adopted in 2016, and the applicable groundwater availability models and analytical methodology to calculate modeled available groundwater are unchanged. With the exception of the West Texas Bolsons Aquifer (years 2060 and 2070, where modeled available groundwater increased slightly), the modeled available groundwater volumes presented for those aquifers are the same as those shown in the previous analytical assessments and model runs—GAM Task 10-061 (Oliver, 2011c), AA 09-08 (Wuerch and Davidson, 2010), AA 09-09 (Thorkildsen and Backhouse, 2010), GAM Run 10-048 (Oliver, 2012), and GAM Run 10-037 (Oliver, 2011a), and GAM Run 10-036 (Oliver, 2011b), GAM Run 16-030 (Boghici and Bradley, 2018), and GAM Run 16-030\_Addendum (Wade, 2020).

Where analytical aquifer assessments were used, modeled available groundwater volumes were determined by summing estimates of effective recharge and the change in aquifer storage. See Freeze and Cherry (1979, p.365) for details regarding this analytical method.

Where groundwater availability models were used, the TWDB identified groundwater pumping scenarios that could achieve the adopted desired future conditions in Groundwater Management Area 4. The TWDB extracted simulated water levels for baseline years (see Parameters and Assumptions section for more information) and subsequent decades. The simulated drawdowns in all active model cells were averaged by aquifer for each county and groundwater conservation district. If water levels dropped below the base of the model cells during the predictive simulations, these cells became “dry cells”. In some instances, dry cells were included in drawdown averages; in other instances, they were not. See the “Parameters and Assumptions” section for more details on the treatment of dry cells in each of the model runs.

The calculated drawdown averages compared well with the desired future conditions and verified that the desired future conditions adopted by the districts can be achieved—within the assumptions and limitations associated with each groundwater availability model. Modeled available groundwater volumes were determined by extracting pumping rates by decade from the model results using ZONEBUDGET Version 3.01 (Harbaugh, 2009). Annual

pumping rates were divided by county, river basin, regional water planning area, and groundwater conservation district within Groundwater Management Area 4 (Figures 1 through 13 and Tables 1 through 12).

### **Modeled Available Groundwater and Permitting**

Chapter 36 of the Texas Water Code defines “modeled available groundwater” as the estimated average amount of water that may be produced annually to achieve a desired future condition. 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.

### **PARAMETERS AND ASSUMPTIONS:**

#### **Bone Spring-Victorio Peak Aquifer**

- The previous modeled available groundwater (Boghici and Bradley, 2018, Oliver, 2011c) was calculated using three separate flow models run under a variety of climatic and pumping scenarios. See Hutchison (2008) for assumptions and limitations of the three groundwater flow models.
- The models have one layer representing the Bone Spring-Victorio Peak Aquifer, a portion of the Capitan Reef Complex Aquifer, and the Diablo Plateau.
- Hutchison (2008) ran all three models using pumping ranging from 0 to 125,000 acre-feet per year and climatic information from tree ring data ranging from 1000 to 1988.
- The results of the 144 simulations were plotted to establish a relationship between pumping and drawdown (Hutchison, 2010). Modeled available groundwater was the sum of net pumping and the estimated irrigation return flow (approximately 30 percent of the net pumping, according to the Hudspeth County Underground Water Conservation District No. 1) for each desired future condition. Additional information on the application of irrigation return flow is described in GAM Run 10-061 MAG (Oliver, 2011c).
- Because the analysis used was statistically based, the starting and ending period can apply for any 50-year planning horizon. Therefore, we applied the values to 2020 to 2060 (2020 to 2070 for the Regional Water Planning Area (RWPA) table.

### **Capitan Reef Complex Aquifer (Brewster County only)**

- Version 1.01 of the groundwater availability model of the Eastern Arm of the Capitan Reef Complex Aquifer was used, with a baseline year of 2005. See Jones (2016) for assumptions and limitations of the groundwater availability model. A new model run simulation was completed to determine modeled available groundwater that achieved the desired future condition.
- The model has five layers: Layer 1, the Edwards-Trinity (Plateau) and Pecos Valley aquifers; Layer 2, the Dockum Aquifer and the Dewey Lake Formation; Layer 3, the Rustler Aquifer; Layer 4, a confining unit made up of the Salado and Castile formations, and the overlying portion of the Artesia Group; and Layer 5, the Capitan Reef Complex Aquifer, part of the Artesia Group, and the Delaware Mountain Group. Layers 1 through 4 are intended to act solely as boundary conditions facilitating groundwater inflow and outflow relative to the Capitan Reef Complex Aquifer (Layer 5).
- The recharge used for the model simulation represents average recharge from 1931 through 2005 (last year of model calibration).
- Available water-level data from 2005 to 2010 for the Capitan Reef Complex Aquifer indicates that water level changes have been minimal. Therefore, applying the clarifications received from the Groundwater Management Area 4 on December 7, 2017, we concluded that a 2005-to-2055 predictive simulation is equivalent to a 2010-to-2060 predictive simulation.
- Desired future conditions were assumed met when the average drawdowns were within 1 foot of the adopted desired future condition.
- Drawdowns were averaged over the official aquifer extent.
- All active model cells were included in drawdown averaging.
- Used a predictive run that included modeled available groundwater volumes from cycle 2 of the desired future conditions process from neighboring groundwater management areas 3 and 7.
- Grid file vintage: 01/06/2020.

### **Capitan Reef Complex Aquifer (Culberson County only)**

- There is no groundwater availability model for the Capitan Reef Complex Aquifer in Culberson County.

- The annual total pumping estimates were calculated as the sum of the annual effective recharge amount and the annual volume of water depleted from the aquifer based on the desired future condition.
- Recharge was assumed to be evenly distributed across the outcrop of the aquifer.
- Effective recharge estimates were based on springflow and surface hydrology, groundwater pumpage and water-level changes, and precipitation estimates.
- Annual volumes of water taken from storage were calculated by dividing the total volume of depletion, based on the desired future condition, by 50 years. For this report, we assumed the 50 years was 2010 to 2060.
- Calculated water-level declines were assumed to be uniform across the aquifer within its footprint area, and these calculated water-level declines did not exceed aquifer thickness.
- A detailed description of all parameters and assumptions is available in AA 09-08 (Wuerch and others, 2011).

#### **Edwards-Trinity (Plateau) Aquifer (Brewster County)**

- The alternate groundwater flow model for the Edwards-Trinity (Plateau) and Pecos Valley aquifers was used for the desired future condition simulations. This model is an update to the previously developed groundwater availability model documented in Anaya and Jones (2009). See Hutchison and others (2011) and Anaya and Jones (2009) for assumptions and limitations of the model.
- The groundwater model has one layer representing the Pecos Valley Aquifer and the Edwards-Trinity (Plateau) Aquifer. In the relatively narrow area where both aquifers are present, the model is a lumped representation of both aquifers.
- The recharge used for the model simulation represents average recharge as described in Hutchison and others (2011).
- Per Clarification Letter 2017-1208, TWDB used 2005 as the baseline year for predictive model runs and drawdown averaging.
- Time interval for drawdown averaging was 2005-2060.
- Desired future conditions were assumed met when average drawdowns are within 1 foot of the adopted desired future conditions.
- Drawdowns were averaged over model extent.

- Dry model cells were excluded from drawdowns' averaging.
- Used a predictive run that included modeled available groundwater volumes from cycle 2 of the desired future conditions process from neighboring groundwater management areas 2, 3, and 7.
- Grid file vintage: 08/26/2015.

### **Igneous Aquifer**

- Version 1.01 of the groundwater availability flow model for the Igneous and parts of the West Texas Bolson aquifers was used for this analysis with year 2000 as baseline. See Beach and others (2004) for assumptions and limitations of the model.
- The model includes three layers representing the Wild Horse Flat, Michigan Flat, Ryan Flat, and Lobo Flat portions of the West Texas Bolsons Aquifer (Layer 1), the Igneous Aquifer (Layer 2), and the underlying Cretaceous and Permian units (Layer3). Some areas of Layer 2 outside the boundary of the Igneous Aquifer are active in order to allow flow between Layer 1 and Layer 3.
- See GAM Task 10-028 (Oliver, 2010) for a full description of the methods and assumptions used in the groundwater availability model simulations.
- The averaging of drawdowns and modeled available groundwater calculations were based on model extent as opposed to the official aquifer footprint. The Igneous Aquifer model extent is a smoothed and somewhat smaller version of the official footprint of the Igneous Aquifer. A comparison of these two areas is shown in Figure 8.
- Per Clarification Letter 2017-1208, we used 2000 as the baseline year for predictive model runs and drawdown averaging. Time interval for drawdown averaging was 2000-2050, equivalent to 2010-2060 due to minimal change in water levels in wells from 2000 to 2010.
- Desired future conditions were assumed met when the average drawdowns are within 1 foot of the adopted desired future conditions
- Drawdowns were averaged over model extent.
- The predictive model run for this analysis resulted in water levels in some model cells dropping below the base elevation of the cell during the simulation. These cells were excluded from the averaging of drawdowns, which in turn resulted in

progressively lower pumping values through time. This is illustrated by the decline in modeled available groundwater (see Tables 7 and 8).

- Modeled available groundwater values are slightly changed for 2060 and 2070 when compared with those reported in GAM Run 16-030 (Boghici and Bradley, 2018). This is because the previously reported values were determined by extrapolating the 2010-2050 trend shown in Oliver (2010), while the current values have been extracted from the model run output directly.
- This predictive run was unique to Groundwater Management Area 4.
- Grid file vintage: 01/20/2020.

### **Marathon Aquifer**

- The annual total pumping estimates was calculated as the sum of the annual effective recharge amount and the annual volume of water depleted from the aquifer based on the desired future condition.
- Recharge was assumed to occur evenly across the aerial extent of the aquifer.
- Average annual precipitation (1971 through 2000) from the Climatic Atlas of Texas (Narasimhan and others, 2008) was used to calculate annual effective recharge volumes.
- The draft annual total pumping estimates are the sum of the annual effective recharge amount and the annual volume of water depleted from the aquifer based on the draft desired future condition. Annual volumes were calculated by dividing the total volume by 50 years. For this report, we assumed the 50 years was 2010 to 2060.
- Calculated water level declines were estimated uniformly across the aquifer.
- A detailed description of all parameters and assumptions is available in AA 09-09 (Thorkildsen and Backhouse, 2010).

### **[Salt Basin portion of the] West Texas Bolsons (Wild Horse Flat, Michigan Flat, Ryan Flat, and Lobo Flat) Aquifer**

- Version 1.01 of the groundwater availability flow model for the Igneous and parts of the West Texas Bolson aquifers was used for this analysis with year 2000 as baseline. See Beach and others (2004) for assumptions and limitations of the model.

- The model includes three layers representing the Wild Horse Flat, Michigan Flat, Ryan Flat and Lobo Flat portions of the West Texas Bolsons Aquifer (Layer 1), the Igneous Aquifer (Layer 2), and the underlying Cretaceous and Permian units (Layer3).
- See GAM Task 10-028 (Oliver, 2010) for a full description of the methods and assumptions used in the groundwater availability model simulations.
- The simulation was set up using average recharge as described in Beach and others (2004) and was run from 2000 to 2060.
- Per Clarification Letter 2017-1208, we used 2000 as the baseline year for predictive model runs and drawdown averaging. Time interval for drawdown averaging: 2000-2050, equivalent to 2010-2060 due to minimal change in water levels in wells from 2000 to 2010.
- For the West Texas Bolsons in Culberson County, we used the methodology and calculations described in GAM Run 16-030\_Addendum (Wade, 2020) to split modeled available groundwater by individual Flats: Lobo, Wild Horse, and Michigan. Later on, at the request of Culberson County Groundwater Conservation District, we combined the totals for Wild Horse and Michigan flats, and reported them under Wild Horse Flat only in Tables 11 and 12.
- Drawdowns were averaged over model extent.
- Desired future conditions were assumed met when the average drawdowns were within 1 foot of the adopted desired future conditions.
- The predictive model run for this analysis resulted in water levels in some model cells dropping below the base elevation of the cell during the simulation. These cells have been excluded from the averaging of drawdowns, which in turn resulted in progressively lower pumping values through time. This is illustrated by the decline in modeled available groundwater (see Tables 11 and 12).
- Modeled available groundwater values are slightly changed for 2060 and 2070 when compared with those reported in GAM Run 16-030 (Boghici and Bradley, 2018). This is because the previously reported values were determined by extrapolating the 2010-2050 trend shown in Oliver (2010), while the current values have been extracted from the model run output directly.
- Predictive run was unique to Groundwater Management Area 4.
- Grid file vintage: 01/20/2020.

### **West Texas Bolsons (Presidio and Redford) Aquifer**

- Version 1.01 of the groundwater availability model of the Presidio and Redford bolsons of the West Texas Bolsons Aquifer was used with a baseline year of 2008. A new model run simulation was completed to determine the modeled available groundwater that achieved the desired future condition.
- The model includes three layers representing the Rio Grande Alluvium (layer 1), West Texas Bolsons (Presidio and Redford) Aquifer (layer 2), and Tertiary and Cretaceous units (layer 3).
- See Wade and Jigmond (2013) for assumptions and limitations of the groundwater availability model.
- The recharge used for the simulation represents average recharge from 1948 through 2008 (end year of model calibration). Pumping was adjusted in all model layers and on both the United States and the Mexico sides of the aquifer during the predictive run simulations.
- An analysis of the Presidio and Redford bolsons indicate that there have been minimal changes in water levels in the few wells with available data from 2008 through 2010. Therefore, consistent with the clarifications received from the Groundwater Management Area 4 on December 7, 2017, we assumed that a 2008-to-2058 predictive simulation is equivalent to a 2010-to-2060 predictive simulation.
- Drawdowns were calculated by subtracting 2008 simulated water levels from 2058 simulated water levels which were then averaged for all active model cells in Layer 1 and Layer 2 within the official aquifer boundary in Presidio County. Drawdowns in model cells located in Mexico were excluded from averaging. We assumed the desired future condition was met if the average drawdown value was within 1 foot.
- Predictive run was unique to Groundwater Management Area 4.
- Grid file vintage: 1/20/2020.



## RESULTS:<sup>1</sup>

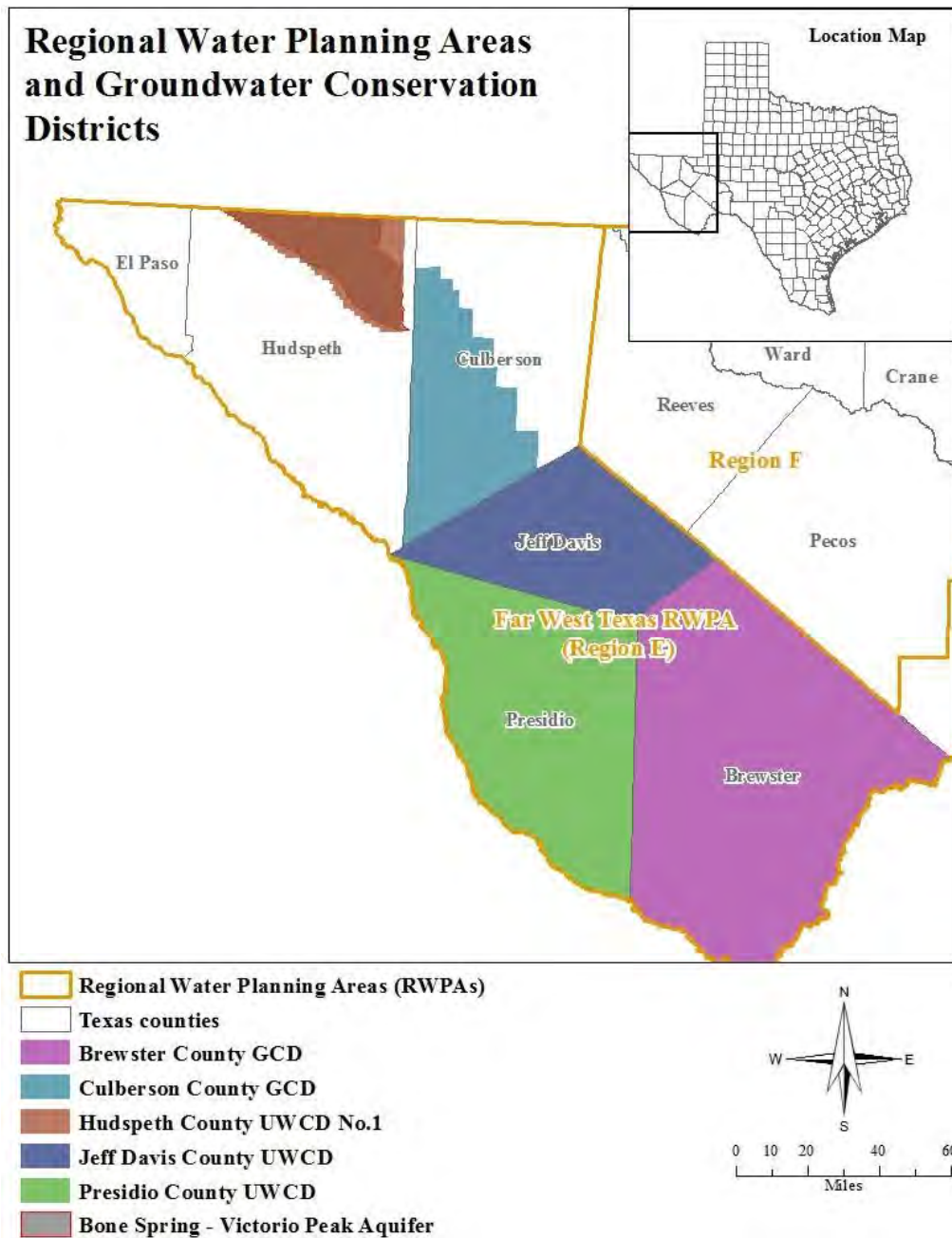
The results for the groundwater conservation districts (Tables 1, 3, 5, 7, 9, and 11), reflect the ending year discussed in the Parameters and Assumption Section of this report. For planning purposes (Tables 2, 4, 6, 8, 10, and 12), the modeled available groundwater values have been populated past the dates defined by the desired future conditions resolutions using predictive model run results. Tables 1 through 12 show the combination of modeled available groundwater summarized (1) by groundwater conservation district and county; and (2) by county, river basin, and regional water planning area for use in the regional water planning process.

The modeled available groundwater that achieves the desired future conditions adopted by Groundwater Management Area 4 is:

- 101,400 acre-feet per year from 2020 to 2060/2080 (Tables 1 and 2) for the Bone Spring-Victorio Peak Aquifer. These volumes represent total pumping, defined as the sum of net pumping and the irrigation return flow. Hudspeth County Underground Water Conservation District No. 1 estimates that irrigation return flow is about 30 percent of net pumping.
- 8,163 acre-feet per year from 2020 to 2060/2080 (Tables 3 and 4) for the Capitan Reef Complex Aquifer. This value includes 583 acre-feet per year in Brewster County; 7,580 acre-feet per year in Culberson County.
- 1,394 acre-feet per year from 2020 to 2060/2080 (Tables 5 and 6) for the Edwards-Trinity (Plateau) Aquifer.
- 11,336 to 11,331/11,331 acre-feet per year between 2020 and 2060/2080 (Tables 7 and 8) for the Igneous Aquifer.
- 7,327 acre-feet per year from 2020 to 2060/2080 (Tables 9 and 10) for the Marathon Aquifer.
- 58,580 to 57,754 acre-feet per year between 2020 and 2060/2080 (Tables 11 and 12) for the West Texas Bolsons (including the Salt Bolson and Presidio and Redford Bolsons).

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<sup>1</sup> Note: Since the desired future conditions were defined by Groundwater Management Area 4 only to year 2060, the groundwater pumping volumes reported past 2060 in Tables 1-12 may not honor said desired future conditions. The 2070 and 2080 pumping volumes are reported here as *Groundwater Availability* for use by the regional water planning areas.



**FIGURE 1. REGIONAL WATER PLANNING AREAS (RWPAS), GROUNDWATER CONSERVATION DISTRICTS (GCDs), UNDERGROUND WATER CONSERVATION DISTRICTS (UWCD), AND COUNTIES IN THE VICINITY OF THE BONE SPRING-VICTORIO PEAK AQUIFER IN GROUNDWATER MANAGEMENT AREA 4.**



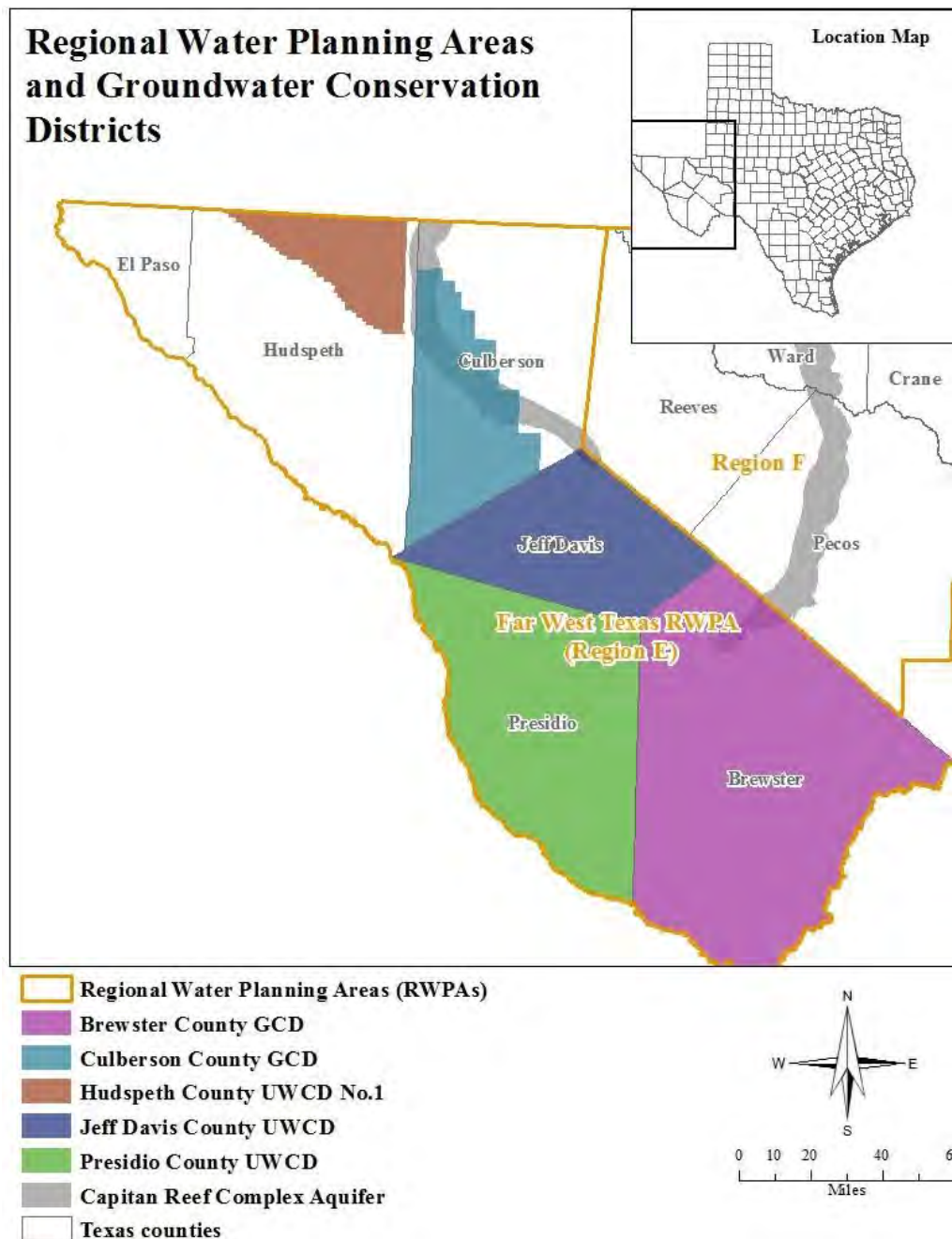
**FIGURE 2. AREA COVERED BY THE GROUNDWATER AVAILABILITY MODEL FOR THE BONE SPRING-VICTORIO PEAK AQUIFER IN GROUNDWATER MANAGEMENT AREA 4.**

**TABLE 1. MODELED AVAILABLE GROUNDWATER FOR THE BONE SPRING- VICTORIO PEAK AQUIFER IN GROUNDWATER MANAGEMENT AREA 4SUMMARIZED BY UNDERGROUND WATER CONSERVATION DISTRICT (UWCD) AND COUNTY FOR EACH DECADE BETWEEN 2020 AND 2060. VALUES ARE IN ACRE- FEET PER YEAR.**

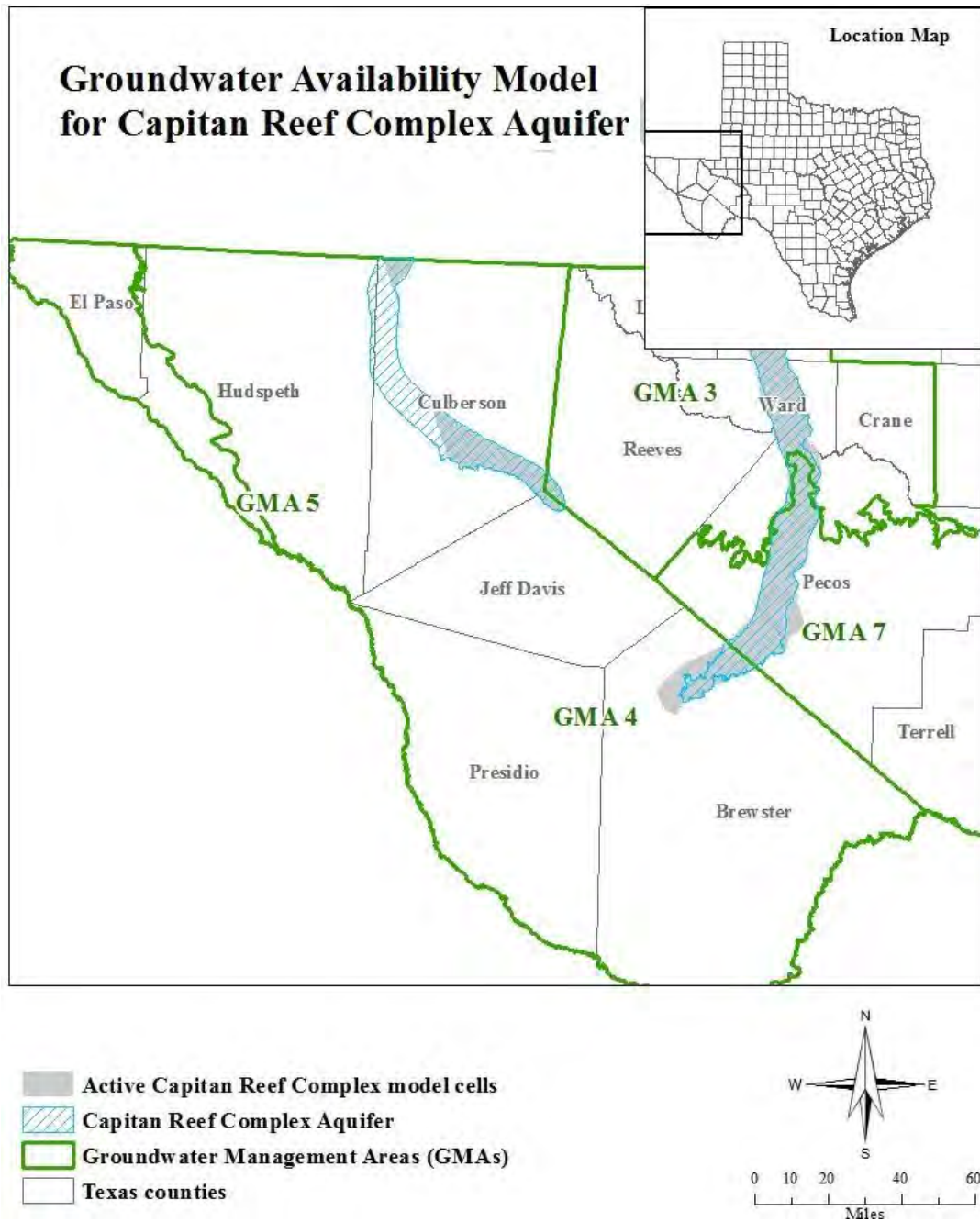
Groundwater Conservation District	County	2020	2030	2040	2050	2060
Hudspeth County UWCD	Hudspeth	101,400	101,400	101,400	101,400	101,400
No district-County	Hudspeth	0	0	0	0	0
<b>Total</b>		<b>101,400</b>	<b>101,400</b>	<b>101,400</b>	<b>101,400</b>	<b>101,400</b>

**TABLE 2.      MODELED AVAILABLE GROUNDWATER FOR THE BONE SPRING-VICTORIO PEAK AQUIFER IN GROUNDWATER MANAGEMENT AREA 4 SUMMARIZED BY COUNTY, REGIONAL WATER PLANNING AREA (RWPA), AND RIVER BASIN FOR EACH DECADE BETWEEN 2020 AND 2080. VALUES ARE IN ACRE-FEET PER YEAR.**

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**FIGURE 3. REGIONAL WATER PLANNING AREAS (RWPAS), GROUNDWATER CONSERVATION DISTRICTS (GCDs), UNDERGROUND WATER CONSERVATION DISTRICTS (UWCD), AND COUNTIES IN THE VICINITY OF THE CAPITAN REEF COMPLEX AQUIFER IN GROUNDWATER MANAGEMENT AREA 4.**



**FIGURE 4. AREAS COVERED BY THE GROUNDWATER AVAILABILITY MODEL FOR THE CAPITAN REEF COMPLEX AQUIFER IN GROUNDWATER MANAGEMENT AREA 4.**

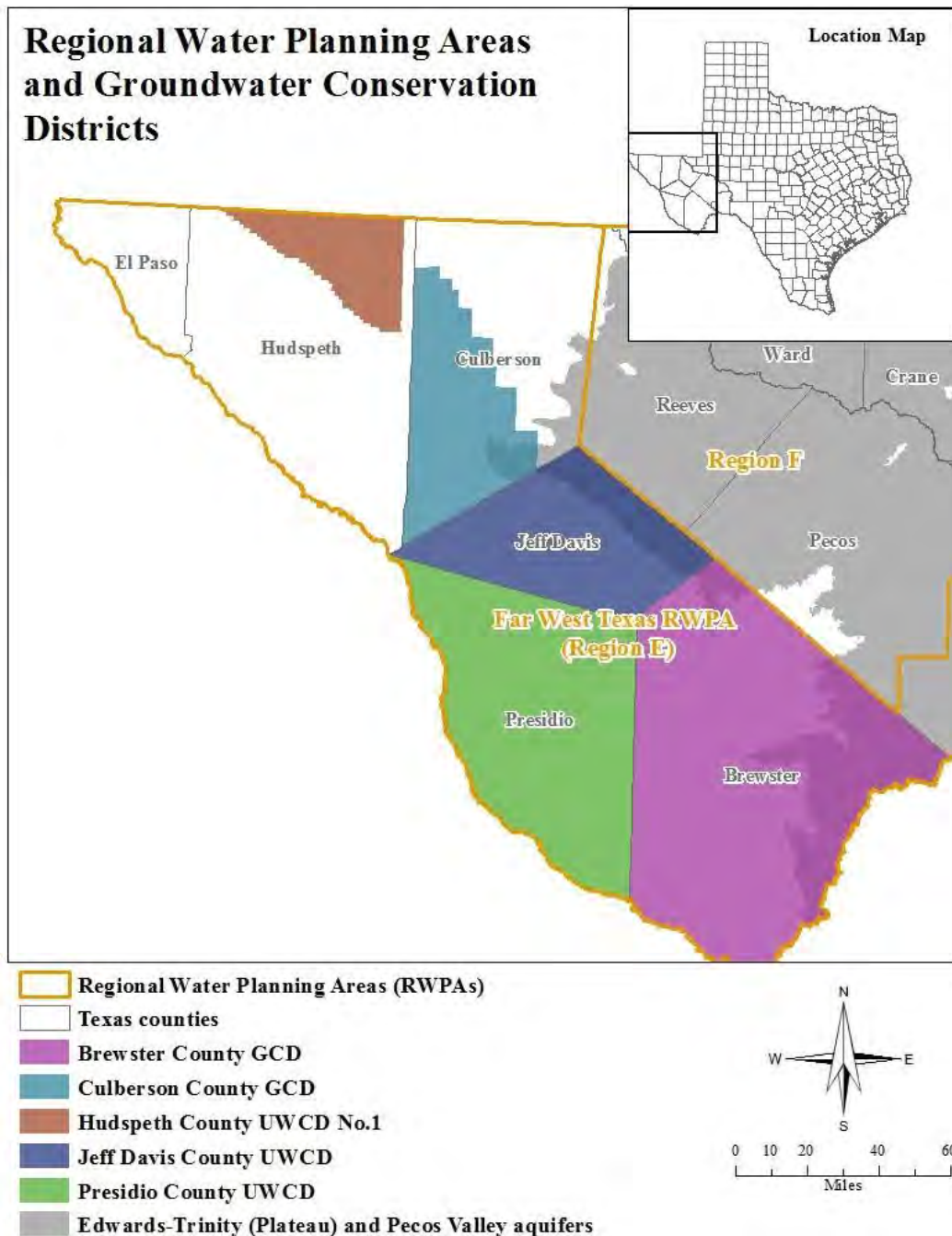


**TABLE 3.      MODELED AVAILABLE GROUNDWATER FOR THE CAPITAN AQUIFER IN GROUNDWATER MANAGEMENT AREA 4 SUMMARIZED BY GROUNDWATER CONSERVATION DISTRICT (GCD) AND COUNTY FOR EACH DECADE BETWEEN 2020 AND 2060. VALUES ARE IN ACRE-FEET PER YEAR.**

Groundwater Conservation District	County	2020	2030	2040	2050	2060
Brewster County GCD	Brewster	583	583	583	583	583
Culberson County GCD	Culberson	7,580	7,580	7,580	7,580	7,580
<b>Total</b>		<b>8,163</b>	<b>8,163</b>	<b>8,163</b>	<b>8,163</b>	<b>8,163</b>

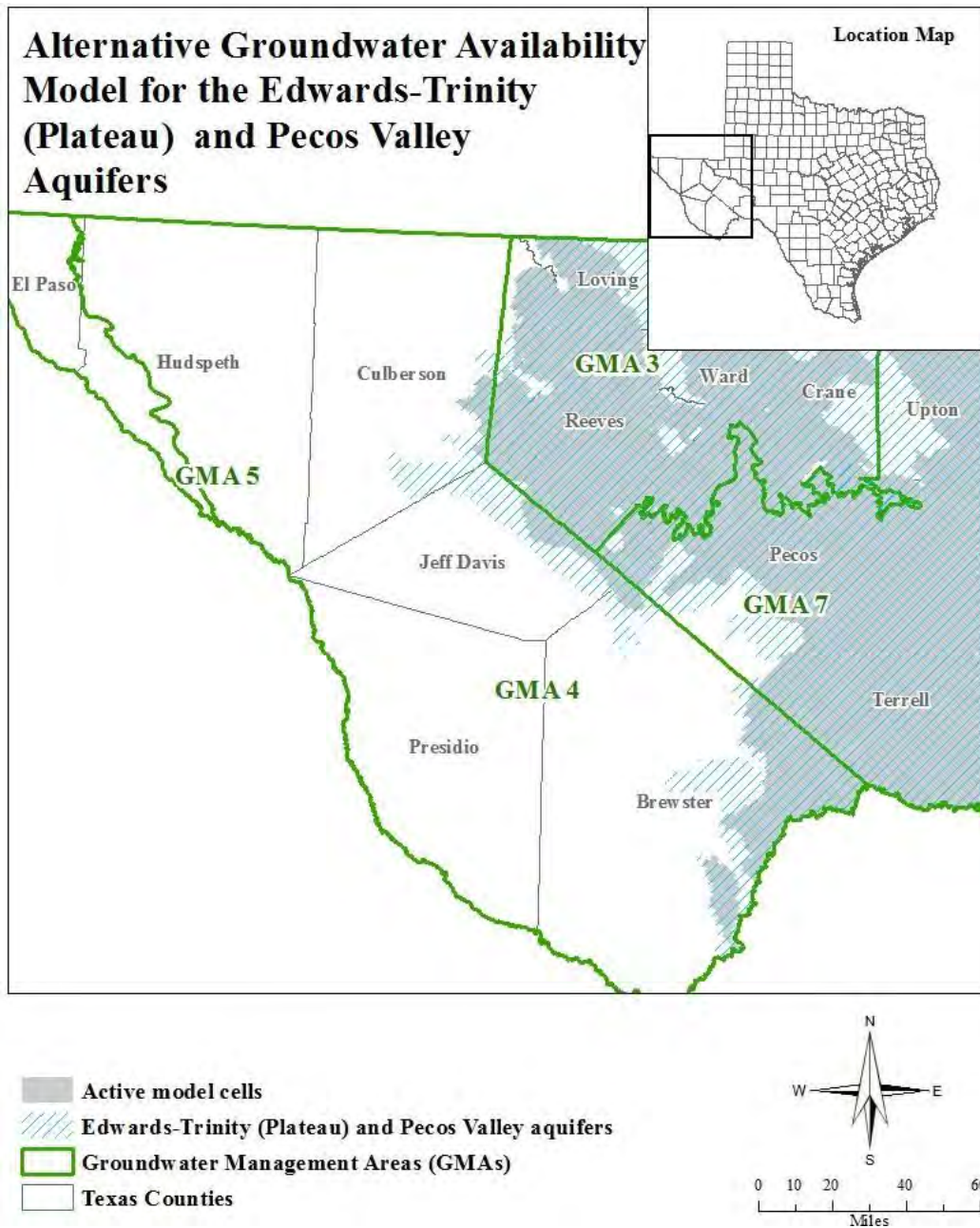
**TABLE 4. MODELED AVAILABLE GROUNDWATER FOR THE CAPITAN AQUIFER IN GROUNDWATER MANAGEMENT AREA 4 SUMMARIZED BY COUNTY, REGIONAL WATER PLANNING AREA (RWPA), AND RIVER BASIN FOR EACH DECADE BETWEEN 2020 AND 2080. VALUES ARE IN ACRE-FEET PER YEAR.**

[illegible]



**FIGURE 5. REGIONAL WATER PLANNING AREAS (RWPAS), GROUNDWATER CONSERVATION DISTRICTS (GCDs), UNDERGROUND WATER CONSERVATION DISTRICTS (UWCD), AND COUNTIES IN THE VICINITY OF THE EDWARDS-TRINITY (PLATEAU) AQUIFER IN GROUNDWATER MANAGEMENT AREA 4.**





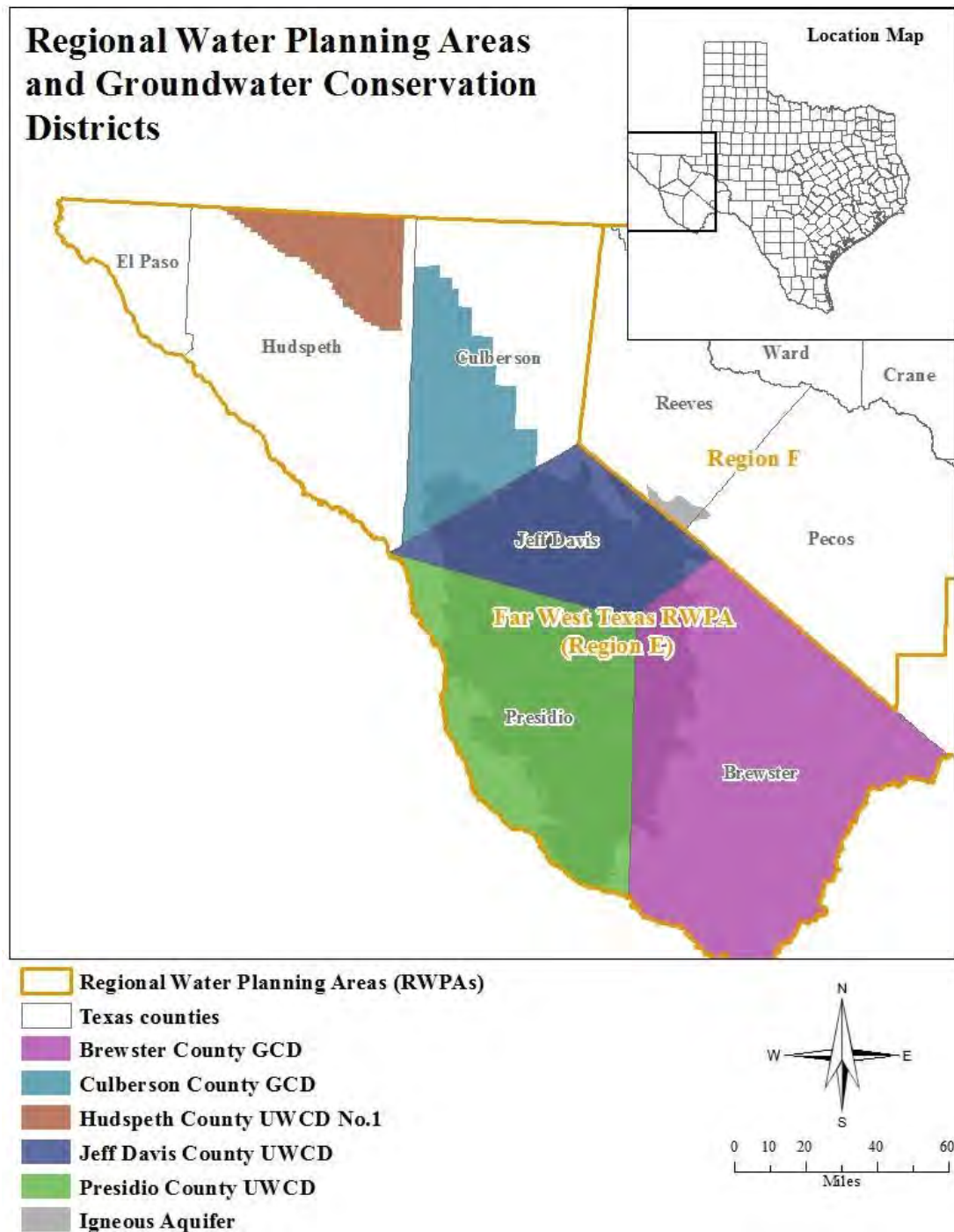
**FIGURE 6. AREAS COVERED BY THE ALTERNATIVE GROUNDWATER AVAILABILITY MODEL FOR THE EDWARDS-TRINITY (PLATEAU) AQUIFER IN GROUNDWATER MANAGEMENT AREA 4.**

**TABLE 5.      MODELED AVAILABLE GROUNDWATER FOR THE EDWARDS-TRINITY (PLATEAU) AQUIFER IN GROUNDWATER MANAGEMENT AREA 4 SUMMARIZED BY GROUNDWATER CONSERVATION DISTRICT (GCD) AND COUNTY FOR EACH DECADE BETWEEN 2020 AND 2060. VALUES ARE IN ACRE-FEET PER YEAR.**

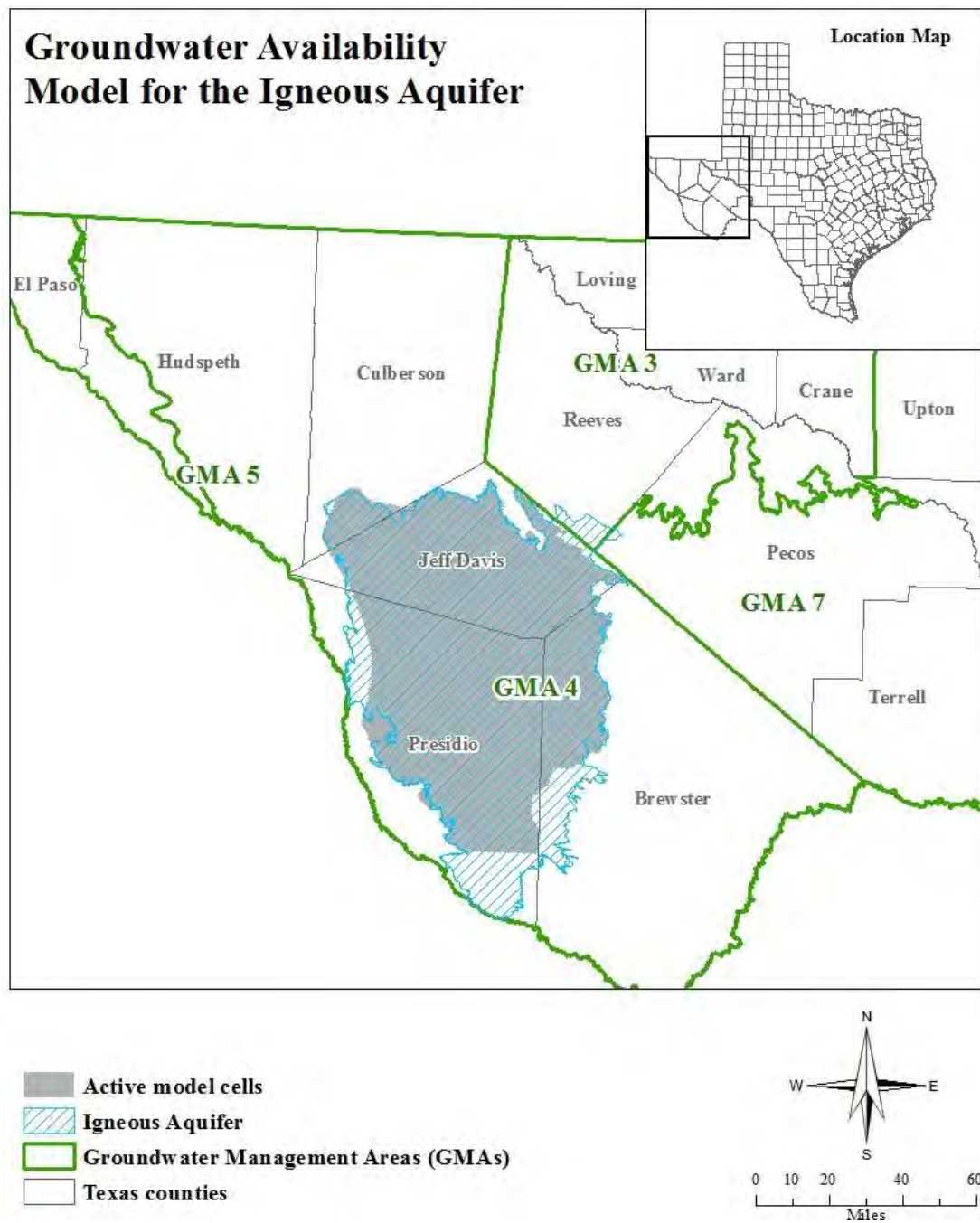
Groundwater Conservation District	County	2020	2030	2040	2050	2060
Brewster County GCD	Brewster	1,394	1,394	1,394	1,394	1,394
<b>Total</b>		<b>1,394</b>	<b>1,394</b>	<b>1,394</b>	<b>1,394</b>	<b>1,394</b>

**TABLE 6.      MODELED AVAILABLE GROUNDWATER FOR THE EDWARDS-TRINITY (PLATEAU) AQUIFER IN GROUNDWATER MANAGEMENT AREA 4 SUMMARIZED BY COUNTY, REGIONAL WATER PLANNING AREA (RWPA), AND RIVER BASIN FOR EACH DECADE BETWEEN 2020 AND 2080. VALUES ARE IN ACRE-FEET PER YEAR.**

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**FIGURE 7. REGIONAL WATER PLANNING AREAS (RWPAS), GROUNDWATER CONSERVATION DISTRICTS (GCDs), UNDERGROUND WATER CONSERVATION DISTRICTS (UWCD), AND COUNTIES IN THE VICINITY OF THE IGNEOUS AQUIFER IN GROUNDWATER MANAGEMENT AREA 4.**



**FIGURE 8. AREAS COVERED BY THE GROUNDWATER AVAILABILITY MODEL FOR THE IGNEOUS AQUIFER IN GROUNDWATER MANAGEMENT AREA 4.**

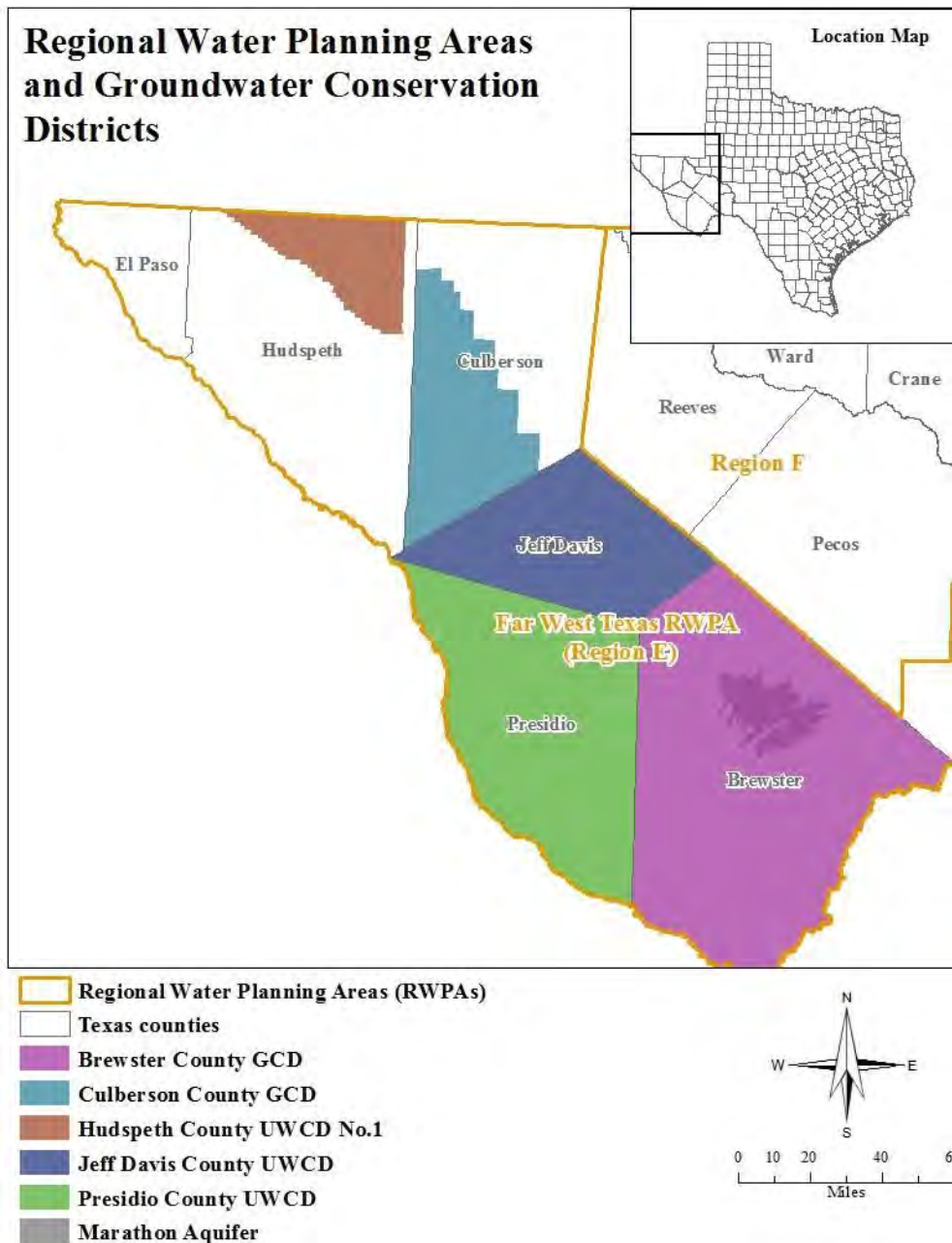
**TABLE 7. MODELED AVAILABLE GROUNDWATER FOR THE IGNEOUS AQUIFER IN GROUNDWATER MANAGEMENT AREA 4 SUMMARIZED BY GROUNDWATER CONSERVATION DISTRICT (GCD), UNDERGROUND WATER CONSERVATION DISTRICT (UWCD), AND COUNTY FOR EACH DECADE BETWEEN 2020 AND 2060. VALUES ARE IN ACRE-FEET PER YEAR.**

Groundwater Conservation District	County	2020	2030	2040	2050	2060
Brewster County GCD	Brewster	2,587	2,587	2,586	2,583	2,582
Culberson County GCD	Culberson	99	99	99	99	99
Jeff Davis County UWCD	Jeff Davis	4,585	4,585	4,585	4,585	4,585
Presidio County UWCD	Presidio	4,065	4,065	4,065	4,065	4,065
<b>Total</b>		<b>11,336</b>	<b>11,336</b>	<b>11,335</b>	<b>11,332</b>	<b>11,331</b>

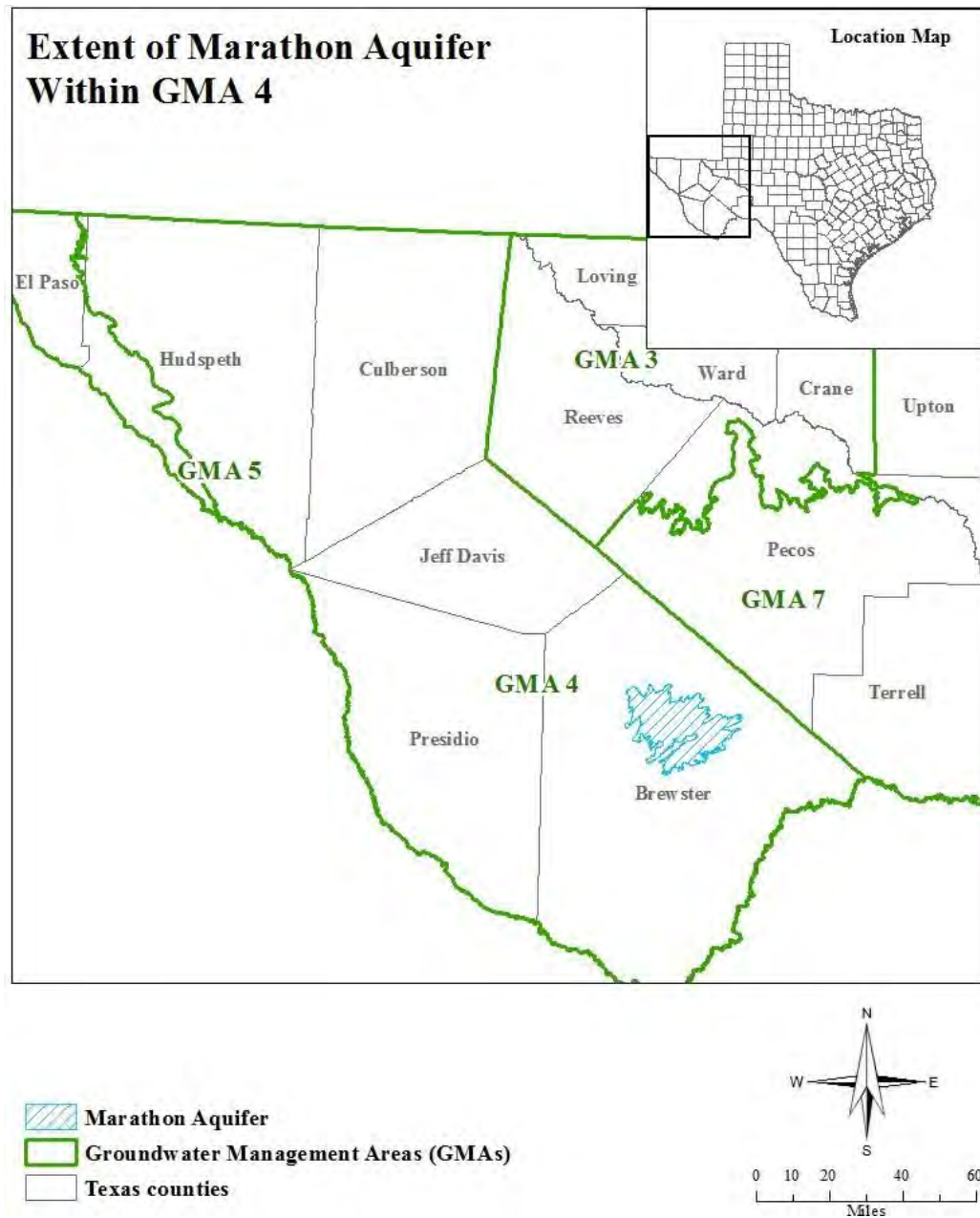
**TABLE 8. MODELED AVAILABLE GROUNDWATER FOR THE IGNEOUS AQUIFER IN GROUNDWATER MANAGEMENT AREA 4 SUMMARIZED BY COUNTY, REGIONAL WATER PLANNING AREA (RWPA), AND RIVER BASIN FOR EACH DECADE BETWEEN 2020 AND 2080. VALUES ARE IN ACRE-FEET PER YEAR**

County	RWPA	River Basin	2020	2030	2040	2050	2060	2070	2080
Brewster	E	Rio Grande	2,587	2,587	2,586	2,583	2,582	2,582	2,582
Culberson	E	Rio Grande	99	99	99	99	99	99	99
Jeff Davis	E	Rio Grande	4,585	4,585	4,585	4,585	4,585	4,585	4,585
Presidio	E	Rio Grande	4,065	4,065	4,065	4,065	4,065	4,065	4,065
<b>Total</b>			<b>11,336</b>	<b>11,336</b>	<b>11,335</b>	<b>11,332</b>	<b>11,331</b>	<b>11,331</b>	<b>11,331</b>





**FIGURE 9. REGIONAL WATER PLANNING AREAS (RWPAS), GROUNDWATER CONSERVATION DISTRICTS (GCDs), UNDERGROUND WATER CONSERVATION DISTRICTS (UWCD), AND COUNTIES IN THE VICINITY OF THE MARATHON AQUIFER IN GROUNDWATER MANAGEMENT AREA 4.**



**FIGURE 10. GROUNDWATER MANAGEMENT AREAS (GMAS) AND COUNTIES IN THE VICINITY OF THE MARATHON AQUIFER IN GROUNDWATER MANAGEMENT AREA 4.**

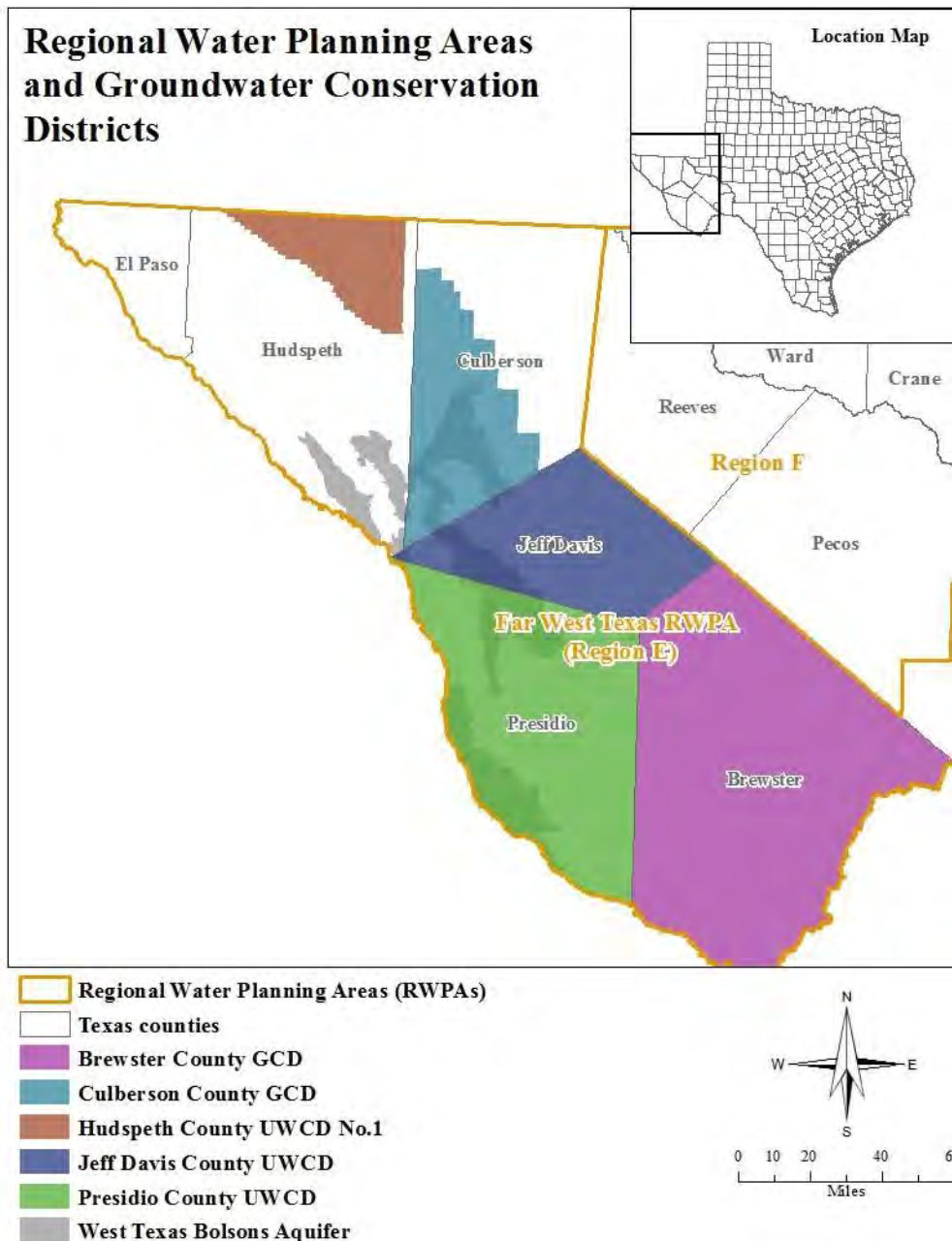
**TABLE 9.      MODELED AVAILABLE GROUNDWATER FOR THE MARATHON AQUIFER  
IN GROUNDWATER MANAGEMENT AREA 4 SUMMARIZED BY  
GROUNDWATER CONSERVATION DISTRICT (GCD) AND COUNTY FOR  
EACH DECADE BETWEEN 2020 AND 2060. VALUES ARE IN ACRE-Feet  
PER YEAR.**

Groundwater Conservation District	County	2020	2030	2040	2050	2060
Brewster County GCD	Brewster	7,327	7,327	7,327	7,327	7,327
Total		7,327	7,327	7,327	7,327	7,327

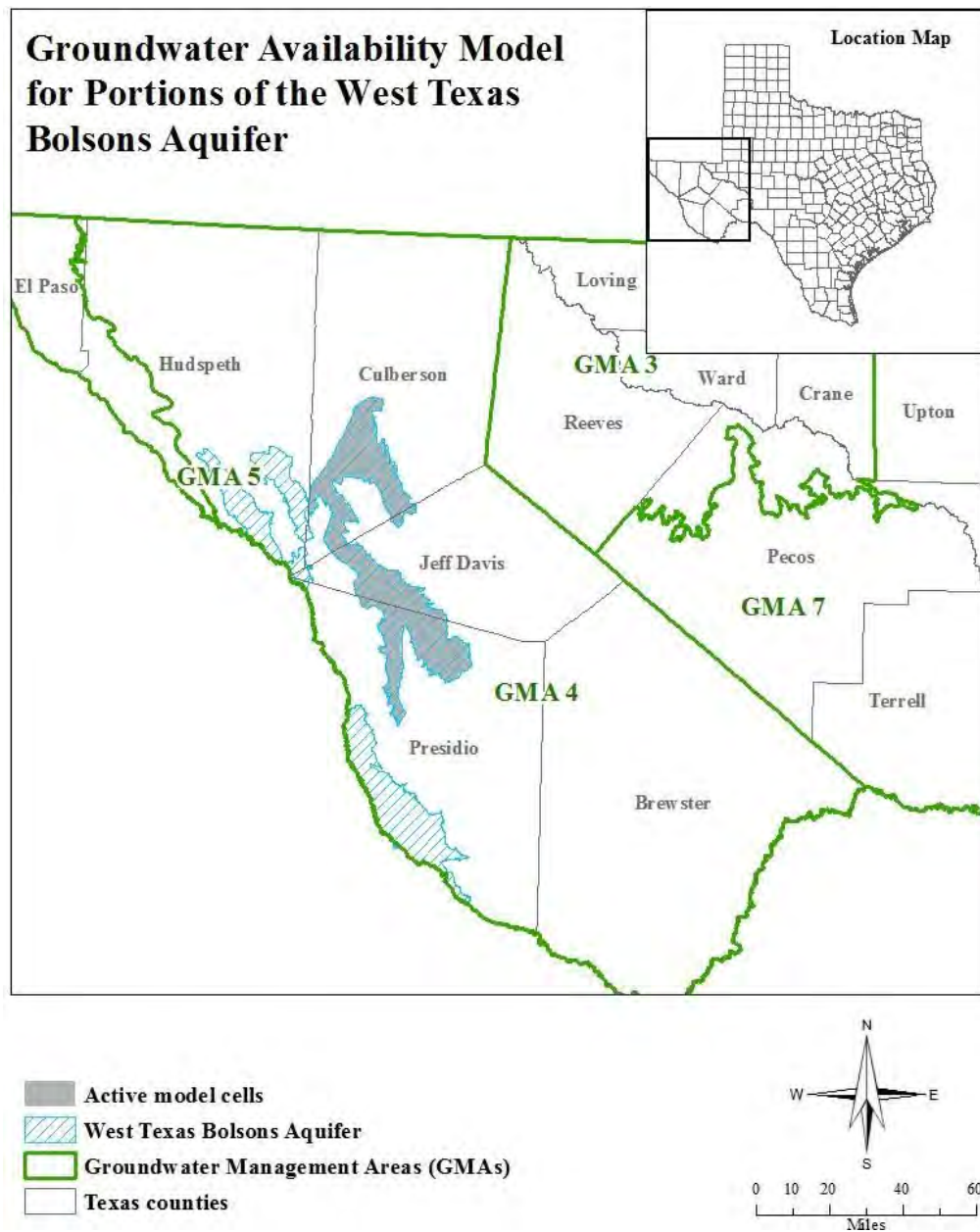
**TABLE 10. MODELED AVAILABLE GROUNDWATER FOR THE MARATHON AQUIFER IN GROUNDWATER MANAGEMENT AREA 4 SUMMARIZED BY COUNTY, REGIONAL WATER PLANNING AREA (RWPA), AND RIVER BASIN FOR EACH DECADE BETWEEN 2020 AND 2070. VALUES ARE IN ACRE-FEET PER YEAR.**

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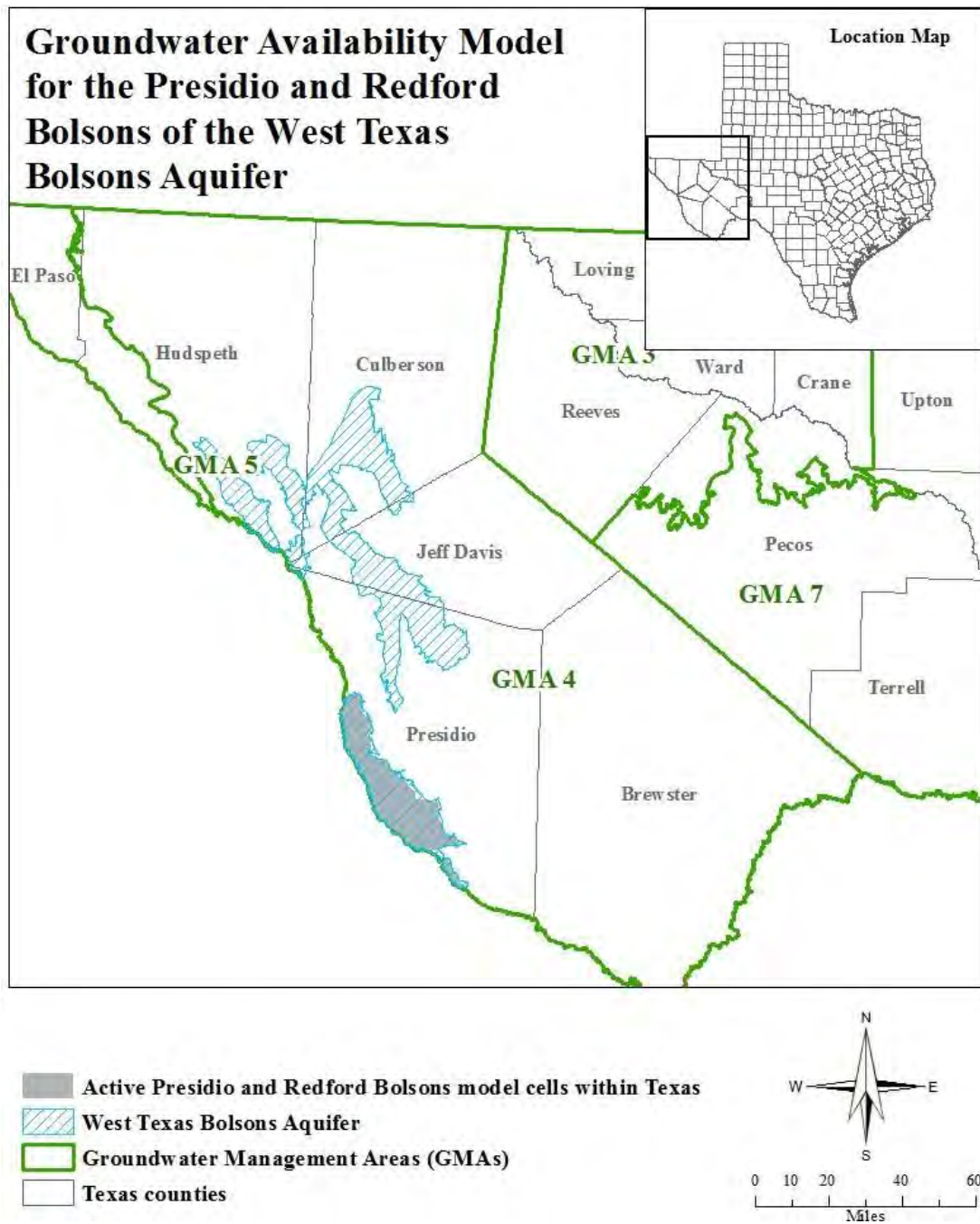




**FIGURE 11. REGIONAL WATER PLANNING AREAS (RWPAS), GROUNDWATER CONSERVATION DISTRICTS (GCDs), UNDERGROUND WATER CONSERVATION DISTRICTS (UWCD) AND COUNTIES IN THE VICINITY OF THE WEST TEXAS BOLSONS AQUIFER IN GROUNDWATER MANAGEMENT AREA 4.**



**FIGURE 12. AREAS COVERED BY THE GROUNDWATER AVAILABILITY MODEL FOR WILD HORSE FLAT, MICHIGAN FLAT, RYAN FLAT, AND LOBO FLAT PORTIONS OF THE WEST TEXAS BOLSONS AQUIFER IN GROUNDWATER MANAGEMENT AREA 4.**



**FIGURE 13. AREAS COVERED BY THE GROUNDWATER AVAILABILITY MODEL FOR THE PRESIDIO AND REDFORD PORTIONS OF THE WEST TEXAS BOLSON AQUIFER IN GROUNDWATER MANAGEMENT AREA 4.**

**TABLE 11. MODELED AVAILABLE GROUNDWATER FOR THE WEST TEXAS BOLSONS AQUIFER IN GROUNDWATER MANAGEMENT AREA 4 SUMMARIZED BY GROUNDWATER CONSERVATION DISTRICT (GCD), UNDERGROUND WATER CONSERVATION DISTRICT (UWCD), COUNTY, AND AQUIFER SEGMENT FOR EACH DECADE BETWEEN 2020 AND 2060. VALUES ARE IN ACRE-FEET PER YEAR. THE SALT BASIN PORTION OF THE WEST TEXAS BOLSONS AQUIFER INCLUDES WILD HORSE, MICHIGAN, LOBO FLATS, AND RYAN FLAT.**

Groundwater Conservation District	County	Aquifer Segment	2020	2030	2040	2050	2060
Culberson County GCD	Culberson	Lobo Flat	11,112	11,112	11,097	11,092	11,087
		Wild Horse Flat	24,638	24,566	24,504	24,459	24,422
Culberson County GCD total			35,750	35,678	35,601	35,551	35,509
Jeff Davis County UWCD	Jeff Davis	Ryan Flat	6,056	6,056	5,989	5,961	5,942
Jeff Davis County UWCD total			6,056	6,056	5,989	5,961	5,942
Presidio County UWCD	Presidio	Ryan Flat	9,113	8,983	8,835	8,711	8,642
		Presidio and Redford Bolsons	7,661	7,661	7,661	7,661	7,661
Presidio County UWCD total			16,774	16,644	16,496	16,372	16,303
GMA 4 TOTAL			58,580	58,378	58,086	57,884	57,754

**TABLE 12. MODELED AVAILABLE GROUNDWATER FOR THE WEST TEXAS BOLSONS AQUIFER IN GROUNDWATER MANAGEMENT AREA 4 SUMMARIZED BY COUNTY, REGIONAL WATER PLANNING AREA (RWPA), RIVER BASIN, AND AQUIFER SEGMENT FOR EACH DECADE BETWEEN 2020 AND 2080. VALUES ARE IN ACRE-FEET PER YEAR.**

County	RWPA	River Basin	Aquifer Segment	2020	2030	2040	2050	2060	2070	2080
Culberson	E	Rio Grande	Lobo Flat	11,112	11,112	11,097	11,092	11,087	11,061	11,040
		Rio Grande	Wild Horse Flat	24,638	24,566	24,504	24,459	24,422	24,358	24,307
Culberson County total				35,750	35,678	35,601	35,551	35,509	35,419	35,347
Jeff Davis	E	Rio Grande	Ryan Flat	6,056	6,056	5,989	5,961	5,942	5,904	5,876
Jeff Davis County total				6,056	6,056	5,989	5,961	5,942	5,904	5,876
Presidio	E	Rio Grande	Ryan Flat	9,113	8,983	8,835	8,711	8,642	8,586	8,503
			Presidio and Redford	7,661	7,661	7,661	7,661	7,661	7,661	7,661
Presidio County total				16,774	16,644	16,496	16,372	16,303	16,247	16,164
GMA 4 TOTAL				58,580	58,378	58,086	57,884	57,754	57,570	57,387

## LIMITATIONS:

The groundwater model used in completing this analysis is the best available scientific tool that can be used to meet the stated objectives. 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 historic groundwater flow conditions includes the assumptions about the location in the aquifer where historic pumping was placed. Understanding the amount and location of historic pumping is as important as evaluating the volume of groundwater flow into and out of the district, between aquifers within the district (as applicable), interactions with surface water (as applicable), recharge to the aquifer system (as applicable), and other metrics that describe the impacts of that pumping. In addition, assumptions regarding precipitation, recharge, and streamflow are specific to a particular historic time period.

Because the application of the groundwater 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 groundwater pumping and groundwater levels in the aquifer. Because of the limitations of the groundwater 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. Historic precipitation patterns also need to be placed in context as future climatic conditions, such as dry and wet year precipitation patterns, may differ and affect groundwater flow conditions.

## REFERENCES:

- Anaya, R., and Jones, I. C., 2009, Groundwater Availability Model for the Edwards-Trinity (Plateau) and Pecos Valley Aquifers of Texas: Texas Water Development Board Report 373, 103 p.
- Beach, J. and others, 2004, Groundwater Availability Model for the Igneous and parts of the West Texas Bolsons (Wild Horse Flat, Michigan Flat, Ryan Flat and Lobo Flat) Aquifers: Texas Water Development Board, 407 p.  
[http://www.twdb.texas.gov/groundwater/models/gam/igbl/IGBL\\_Model\\_Report.pdf](http://www.twdb.texas.gov/groundwater/models/gam/igbl/IGBL_Model_Report.pdf).
- Boghici, R. and Bradley, R, 2018, GAM Run 16-030 MAG: Modeled Available Groundwater for the Aquifers in Groundwater Management Area 4, Texas Water Development Board, 37 p. [https://www.twdb.texas.gov/groundwater/docs/GAMruns/GR16-030\\_MAG.pdf?d=17193.400000095367](https://www.twdb.texas.gov/groundwater/docs/GAMruns/GR16-030_MAG.pdf?d=17193.400000095367)
- Freeze, A.R. and Cherry, J.A., 1979, Groundwater, Prentice-Hall, 604 p.
- Groundwater Management Area 4 (GMA 4), William R. Hutchison, 2017, Explanatory Report for Desired Future Conditions Groundwater Management Area 4, 159 p.
- Harbaugh, A. W., 2009, Zonebudget Version 3.01, A computer program for computing subregional water budgets for MODFLOW ground-water flow models, U.S. Geological Survey Groundwater Software.
- Harbaugh, A.W., Banta, E.R., Hill, M.C., and McDonald, M.G., 2000, MODFLOW-2000, The U.S. Geological Survey modular ground-water model-User guide to modularization concepts and the ground-water flow process: U.S. Geological Survey, Open-File Report 00-92.
- Hutchison, W.R., 2008, Preliminary groundwater flow model Dell City area, Hudspeth and Culberson counties, Texas: EPWU hydrogeology report 08-01, 480p.  
[http://www.twdb.texas.gov/groundwater/models/gam/bsvp/bsvp\\_report.pdf](http://www.twdb.texas.gov/groundwater/models/gam/bsvp/bsvp_report.pdf).
- Hutchison, W.R., 2010, GAM Task 10-006, Predictive simulations for the Bone Spring-Victorio Peak Aquifer in Groundwater Management Area 4: Texas Water Development Board, 7 p.  
<http://www.twdb.texas.gov/groundwater/docs/GAMruns/Task10-006.pdf>.
- Hutchison, W.R. Jones, I.C, and Anaya, R., 2011, Update of the Groundwater Availability Model for the Edwards-Trinity (Plateau) and Pecos Valley Aquifers of Texas: Texas Water Development Board, 61 p.  
[http://www.twdb.texas.gov/groundwater/models/alt/eddt\\_p\\_2011/ETP\\_PV\\_One\\_Layer\\_Model.pdf](http://www.twdb.texas.gov/groundwater/models/alt/eddt_p_2011/ETP_PV_One_Layer_Model.pdf).



- Jones, I.C., 2016, Groundwater Availability Model: Eastern Arm of the Capitan Reef Complex Aquifer of Texas: Texas Water Development Board, 494 p.  
<http://www.twdb.texas.gov/groundwater/models/gam/crcx/CapitanModelReportFinal.pdf>.
- Narasimhan, B., Srinivasan, R., Quiring, S., and Nielsen-Gammon, J.W., 2008, Digital Climatic Atlas of Texas: Texas A&M University, Texas Water Development Board Contract, Report 2005-483-5591, 108 p.
- National Research Council, 2007, Models in Environmental Regulatory Decision Making Committee on Models in the Regulatory Decision Process, National Academies Press, Washington D.C., 287 p., [http://www.nap.edu/catalog.php?record\\_id=11972](http://www.nap.edu/catalog.php?record_id=11972).
- Oliver, W., 2010, GAM Task 10-028, Predictive simulation for the Igneous and West Texas Bolsons aquifers in Groundwater Management Area 4: Texas Water Development Board, 8 p. <http://www.twdb.texas.gov/groundwater/docs/GAMruns/Task10-028.pdf>
- Oliver, W., 2011a, GAM Run 10-037, Managed available groundwater estimates for the West Texas Bolsons Aquifer in Groundwater Management Area 4: Texas Water Development Board, 10 p.  
[http://www.twdb.texas.gov/groundwater/docs/GAMruns/GR10-037\\_MAG.pdf](http://www.twdb.texas.gov/groundwater/docs/GAMruns/GR10-037_MAG.pdf).
- Oliver, W., 2011b, and GAM Run 10-036, Managed available groundwater estimates for the Igneous Aquifer in Groundwater Management Area 4: Texas Water Development Board, 11 p. [http://www.twdb.texas.gov/groundwater/docs/GAMruns/GR10-036\\_MAG.pdf](http://www.twdb.texas.gov/groundwater/docs/GAMruns/GR10-036_MAG.pdf).
- Oliver, W., 2011c, GAM Run 10-061 MAG, Modeled available groundwater estimates for the Bone Spring-Victorio Peak Aquifer in Groundwater Management Area 4: Texas Water Development Board, 8 p.
- Oliver, W., 2012, GAM Run 10-048, Modeled available groundwater estimates for the Edwards-Trinity (Plateau) Aquifer in Groundwater Management Area 4: Texas Water Development Board, 10 p.  
[http://www.twdb.texas.gov/groundwater/docs/GAMruns/GR10-048\\_MAG.pdf](http://www.twdb.texas.gov/groundwater/docs/GAMruns/GR10-048_MAG.pdf).
- Texas Water Code, 2011, <http://www.statutes.legis.state.tx.us/docs/WA/pdf/WA.36.pdf>.
- Thorkildsen, D. and Backhouse, S., 2010, Aquifer Assessment 09-09, Desired future condition scenarios for the Marathon Aquifer in Groundwater Management Area 4: Texas Water Development Board, 7p.  
<http://www.twdb.texas.gov/groundwater/docs/AA/AA09-09.pdf>.

- Wade, S.C. and Jigmond, M., 2013, Groundwater Availability Model of West Texas Bolsons (Presidio and Redford) Aquifer: Texas Water Development Board, 100 p.  
[http://www.twdb.texas.gov/groundwater/models/gam/prbl/PRBL\\_ModelFinalReport.pdf](http://www.twdb.texas.gov/groundwater/models/gam/prbl/PRBL_ModelFinalReport.pdf).
- Wade, S.C., 2020, Culberson County Groundwater Conservation District Modeled Available Groundwater for the West Texas Bolsons Aquifer, 7 p.  
[https://www.twdb.texas.gov/groundwater/docs/GAMruns/GR16-030\\_MAG\\_addendum.pdf?d=17193.400000095367](https://www.twdb.texas.gov/groundwater/docs/GAMruns/GR16-030_MAG_addendum.pdf?d=17193.400000095367).
- Wuerch, D. and Davidson, S., 2010, Aquifer Assessment 09-08, Desired future condition scenarios for the Capitan Reef Complex Aquifer in Groundwater Management Area 4: Texas Water Development Board 9 p.  
<http://www.twdb.texas.gov/groundwater/docs/AA/AA09-08.pdf>.



# Appendix D

# **JEFF DAVIS COUNTY UNDERGROUND WATER CONSERVATION DISTRICT**

## **DISTRICT RULES**

May 2006

# **JEFF DAVIS COUNTY UNDERGROUND WATER CONSERVATION DISTRICT**

## **DISTRICT RULES**

### **SECTION 1. DEFINITIONS AND CONCEPTS**

**RULE 1.1 DEFINITIONS OF TERMS:** In the administration of its duties, the Jeff Davis County Underground Water Conservation District follows the definitions of terms set forth in Chapter 36, Water Code, and other definitions as follows:

1. “Agricultural well” means any well devoted solely to raising food for consumption by humans and animals or fiber for clothing. If any part of the well production is used for any other purpose, including processing food or fiber, the well does not qualify as an agricultural well.
2. “Board” means the Board of Directors of the District.
3. “Casing” means a tubular watertight, except for the perforated portions installed below the top of a geologic strata containing groundwater, structure installed in the excavated or drilled hole to maintain the well opening and, along with cementing, to confine the groundwater to their zones of origin and prevent the entrance of surface pollutants.
4. “Cement” means a neat Portland or construction cement mixture of not more than seven gallons of water per ninety-four pound sack of dry cement, or cement slurry that contains cement along with bentonite, gypsum, or other additives. All manufacturers’ recommendations regarding water content for the mix must be strictly adhered to.
5. “Desired future condition of the aquifer” means the quantity and quality of water desired for each aquifer as jointly defined by the Groundwater Conservation Districts within the groundwater management area.
6. “District” means the Jeff Davis County Underground Water Conservation District.
7. “District Act” means the Jeff Davis County Underground Water Conservation District Act.
8. “District office” means the office of the District as set by Board resolution.
9. “Drilling Permit” means a permit for a water well to be drilled, re-worked, re-drilled, or re-equipped.
10. “Exempt well” means any artificial excavation constructed to produce or which produces less than 25,000 gallons of water per day (17.36 gallons per minute).
11. “Groundwater” means water located beneath the earth’s surface within the District but does not include water produced with oil in the production of oil and gas.

12. “Hearing body” means the Board, any committee of the board, or a Hearing Examiner at any hearing held by the District.
13. “Hearing Examiner” means a person appointed to conduct a hearing or other proceeding.
14. “Managed Available Groundwater” means the annual amount of groundwater available for withdrawal within the District.
15. “Mud” means a relatively homogeneous, relatively viscous fluid produced by the suspension of clay-size particles in water. Specifically, it must be a nine and two-tenths pounds per gallon mud or heavier, with a marsh funnel viscosity of fifty seconds or equivalent.
16. “New well application” means an application for a permit for a well that has not been drilled.
17. “Open Meetings Act” means Chapter 551, Government Code.
18. “Operating Permit” means a permit for a water well issued or to be issued by the District allowing the withdrawal of groundwater for a designated period.
19. “Person” includes corporation, individual, organization, government, or governmental subdivision or agency, business trust, estate, trust, partnership, association, or any other legal entity.
20. “Pollution” means the alteration of the physical, thermal, chemical, or biological quality of, or the contamination of, any water in the District that renders the water harmful, detrimental, or injurious to humans, animal life, vegetation, or property or to public health, safety, or welfare, or impairs the usefulness or public enjoyment of the water for lawful or reasonable purpose.
21. “Presiding officer” means the Chair, Vice-Chair, Secretary, or other Board member presiding at any hearing or other proceeding, or a Hearing Examiner conducting any hearing or other proceeding.
22. “Production well” means a well required to obtain a permit for the production of groundwater from within the District that is capable of producing in excess of 25,000 gallons of groundwater per day; or any well utilized to produce water for compensation.
23. “Public Information Act” means Chapter 552, Government Code.
24. “Pumpage or Groundwater Production” means all water withdrawn from the ground, measured at the well head.
25. “Texas Rules of Civil Procedure” and “Texas Rules of Civil Evidence” mean the civil procedure and evidence rules as amended and in effect at the time of the action or

proceeding. Except as modified by the Rules of the District, the rights, duties, and responsibilities of the presiding officer acting under the Texas Rules of Civil Procedure or the Texas Rules of Evidence are the same as a court acting under those rules.

26. "Transportation Permit" means an authorization issued by the District allowing the transfer or transportation of a specific amount of groundwater out of the District for a designated period of time.
27. "Waste" means any one or more of the following:
  - (1) withdrawal of groundwater from a groundwater reservoir at a rate and in an amount that causes or threatens to cause intrusion into the reservoir of water unsuitable for agricultural, gardening, domestic, or stock raising purposes;
  - (2) the flowing or producing of wells from a groundwater reservoir if the water produced is not used for a beneficial purpose or in an amount in excess of the amount reasonably needed for that beneficial purpose;
  - (3) escape of groundwater from a groundwater reservoir to any other reservoir or geologic strata that does not contain groundwater;
  - (4) pollution or harmful alteration of groundwater in a groundwater reservoir by saltwater or by other deleterious matter admitted from another stratum or from the surface of the ground;
  - (5) willfully or negligently causing, suffering, or allowing groundwater to escape into any river, creek, natural watercourse, depression, (other than stock tank) lake, reservoir, drain, sewer, street, highway, road or road ditch, or onto any land other than that of the owner unless such discharge is authorized by permit, rule, or order issued by the Texas Commission on Environmental Quality under Chapter 26, Water Code;
  - (6) groundwater pumped for irrigation that escapes as irrigation tailwater onto land other than that of the owner of the well unless permission has been granted by the occupant of the land receiving the discharge; or
  - (7) for water produced from an artesian well, "waste" has the meaning assigned by Section 11.205, Water Code.
28. "Well" means any facility, device, or method used to withdraw groundwater from the groundwater supply within the District.
29. "Well owner" means the person who owns the land upon which a well is located or is to be located.
30. "Well operator" means the person who operates a well or a water distribution system supplied by a well.
31. "Withdraw" means the act of extracting groundwater by pumping or some other method.

**RULE 1.2 PURPOSE OF RULES:** These rules are adopted pursuant to the District Act and Chapter 36, Water Code, for the purpose of conserving, preserving, protecting and recharging the groundwater in the District, and these rules are adopted under the District's statutory authority to prevent waste and protect rights of owners of interest in groundwater.

**RULE 1.3 USE AND EFFECT OF RULES:** These Rules are used by the District as guides in the exercise of the powers conferred by law and in the accomplishment of the purpose of the District Act. They may not be construed as a limitation or restriction on the exercise of any discretion nor may they be construed to deprive the District or Board of the exercise of any powers, duties, or jurisdiction conferred by law, nor may they be construed to limit or restrict the amount and character of data or information that may be required to be collected for the proper administration of the District Act.

**RULE 1.4 AMENDING OF RULES:** The Board may, following notice and hearing, amend these Rules or adopt new Rules.

**RULE 1.5 HEADINGS AND CAPTIONS:** The section and other headings and captions contained in these Rules are for reference purposes only and do not affect in any way the meaning or interpretation of these Rules.

**RULE 1.6 CONSTRUCTION:** A reference to a title, chapter or section without further identification is a reference to a title, chapter, or section of the Water Code. Construction of words and phrases are governed by the Code Construction Act, Subchapter B, Chapter 311, Government Code.

**RULE 1.7 METHODS OF SERVICE UNDER THE RULES:** Except as otherwise expressly provided in these Rules, any notice or document required by these Rules to be served or delivered may be delivered to the recipient, or the recipient's authorized representative, in person, by agent, by courier receipted delivery, by certified mail sent to the recipient's last known address, or by telephonic document transfer to the recipient's current telecopier number. Service by mail is complete upon deposit in a post office or other depository of the United States Postal Service. Service by telephonic document transfer is complete upon transfer, except that any transfer occurring after 5:00 p.m. shall be deemed complete the following business day. If service or delivery is by mail, and the recipient has the right, or is required, to do some act within a prescribed period of time after service, three days will be added to the prescribed period. Where service by other methods has proved impossible, the service may be complete upon publication of the notice in a newspaper with general circulation in the District.

**RULE 1.8 SEVERABILITY:** If any one or more of the provisions contained in these Rules is for any reason held invalid, illegal, or unenforceable in any respect, the invalidity, illegality, or unenforceability may not affect any other Rules or provisions of these Rules and these Rules will be construed as if such invalid, illegal, or unenforceable rule or provision had never been contained in these Rules.

## **SECTION 2. BOARD**

**RULE 2.1 PURPOSE OF BOARD:** The Board was created to determine policy and regulate the withdrawal of groundwater within the boundaries of the District, and to exercise its rights, powers, and duties in a manner that will effectively and expeditiously accomplish the purposes of the District Act. The Board's responsibilities include, but are not limited to, the adoption and enforcement of reasonable rules, policy and orders.

**RULE 2.2 BOARD STRUCTURE, OFFICERS:** The Board consists of the members appointed and qualified as required by the District Act. Each year at its regular February meeting, and if there is no February meeting, at its next regular meeting, the Board will select one of its members to serve as Chair to preside over Board meetings and proceedings, one to serve as Vice-Chair to preside in the absence of the Chair, and one to serve as Secretary to keep a true and complete account of all meetings and proceedings of the Board. Members and officers serve until their successors are elected and sworn in accordance with the District Act and these Rules.

**RULE 2.3 MEETINGS:** The Board will hold a regular meeting each month on a day the Board may establish. At the request of the Chair, or by written request of at least two members, the Board may hold special meetings. All Board meetings will be held in accordance with the Texas Open Meetings Act.

**RULE 2.4 COMMITTEES:** The Chair may establish committees for formulation of policy recommendations to the Board, and appoint the chair and membership of the committees.

**RULE 2.5 EX PARTE COMMUNICATIONS:** Board members may not communicate, directly or indirectly, in connection with any issue of fact or law in any contested case before the Board, with any agency, person, party or their representatives, except on notice and opportunity for all parties to participate. A Board member may communicate ex parte with other members of the Board. This rule does not apply to a Board member who abstains from voting on any matter in which ex parte communications have occurred.

### **SECTION 3. GENERAL MANAGER**

**RULE 3.1 GENERAL MANAGER:** The person employed by the Board as General Manager is the chief administrative officer of the District, pursuant to the District Act, and shall have full authority to manage and operate the affairs of the District, subject only to Board orders. The General Manager is responsible for employing all persons necessary for the proper handling of the business and operation of the District and determining their compensation.

**RULE 3.2 DELEGATION OF AUTHORITY:** The General Manager may delegate duties as may be necessary to effectively and expeditiously accomplish those duties, provided, that no such delegation may ever relieve the General Manager from responsibilities under the District Act or Board orders.

### **SECTION 4. DISTRICT**

**RULE 4.1 MINUTES AND RECORDS OF THE DISTRICT:** All documents, reports, records and minutes of the District will be available for public inspection and copying in accordance with the Texas Public Information Act. Upon written application of any person, the District will furnish copies of its public records. Persons who are furnished copies may be assessed a copying charge, pursuant to policies established by the General Manager. A list of the charges for copies will be

furnished by the District.

**RULE 4.2 CERTIFIED COPIES:** Requests for certified copies must be in writing. Certified copies will be made under the direction of the General Manager and will be affixed with the seal of the District. Persons furnished certified copies may be assessed a certification charge, in addition to a copying charge, pursuant to policies established by the General Manger.

## **SECTION 5. PERMITS**

### **RULE 5.1 REGISTRATION OF NEW WELLS:**

- a. All new wells must be registered by the owner, well operator, or water well driller prior to being drilled. Registration may be by mail or telephonic document transfer, using a form provided by the District. The District staff will review the registration and make a preliminary determination on whether the well meets drilling and operating permit exclusions and exemptions provided in Rule 5.6, and must inform the registrant of their determination within fifteen business days. If the preliminary determination is that the well is excluded or exempt from requiring a drilling or operating permit, the registrant may begin drilling immediately upon receiving the approved registration.
- b. It is a violation of these rules for a well owner, well operator, or water well driller to drill any well without the approved registration form filed with the District.

### **RULE 5.2 GENERAL PERMITTING POLICIES AND PROCEDURES FOR NON-EXEMPT WELLS:**

- a. **Permit Requirement:** Except as provided in Rule 5.1, the well owner, well operator, or any other person acting on behalf of the well owner, must obtain the appropriate permit before a well may be drilled or operated. A well must be permitted prior to drilling and must remain permitted unless and until the well plumbing and power source are disconnected and the well casing or discharge pipe is capped.
- b. **Applications and Application Fees:** Each original application for a water well permit, a temporary emergency permit, a permit renewal or a permit amendment requires a separate application. Application forms will be provided by the District and furnished to the applicant upon request. The appropriate application fee, established by the District, must be paid by the applicant at the time the application is submitted to the District. After the application form and fee are submitted, the District may request additional information to complete its review of the application. Any additional information received will become part of the application. An application is not considered administratively complete until all requested information is submitted and the application fee paid.
- c. **Notice of Permit Hearing:** Once the District receives a completed original application for a water well permit, or application for a permit renewal or amendment, the General Manager will issue written notice indicating a date and time for a hearing on the application in accordance with these Rules, except that no notice or hearing is required for permit amendments granted by the General Manager in accordance with Rule 5.4 or temporary or emergency permits granted in accordance with Rule 5.5. The General Manager may



schedule as many applications at one hearing as the General Manager deems necessary. Any person that wishes to be heard as a potential party to a hearing must, at least 5 business days prior to the hearing date, provide the General Manager with written notice of that person's intent to appear at the hearing. If the General Manager decides to contest the application, the General Manager must, at least 5 business days prior to the hearing date, provide the applicant with written notice of the General Manager's intent to contest the application.

- d. **Decision and Issuance of Permit:** In deciding whether or not to issue a permit, and in setting the terms of the permit, the Board will consider the purpose of the District Act and all other relevant factors, including, but not limited to, (1) the District Groundwater Management Plan; (2) the quality, quantity, and availability of alternative water supplies; (3) the impact on other landowners' rights in groundwater from grant or denial of the permit, or the terms prescribed by the permit; and (4) the desired future condition of the aquifer and Managed Available Groundwater within the District.. If no person notifies the General Manager of their intent to contest the application, and the General Manager does not contest the application, the application will be presented directly to the Board for final decision. The Board may grant the application or refer the application to the Hearings Examiner for a complete hearing.
- e. The Board must grant a permit to an applicant whenever it is found upon presentation of adequate proof that there is no other adequate and available substitute or supplemental source of water, as long as issuing that permit would not result in groundwater withdrawals in excess of the Managed Available Groundwater for the District.
- f. **Permit Term and Renewal:** Unless specified otherwise by the Board or these Rules, permits are effective for a term ending one year from the last day of the calendar month of issuance. The permit term will be shown on the permit. The Board may issue a permit for a term of 5 years. Permits may be renewed by the Board following application and hearing. Permits do not become vested rights in the permit holder, and there is no automatic right of renewal. Operating Permits will not be renewed unless the well has been drilled at the time of application.
- g. **Permit Provisions:** The permit will contain the standard provisions listed in Rule 5.3 and any other special provisions or exemptions deemed appropriate. The permit may also contain provisions relating to water conservation, accountability, waste prevention, transportation limitations, or any other conditions deemed appropriate by the Board.
- h. **Revocation or Modification Permit:** A permit does not become a vested right in the holder, and the Board may, after notice and hearing, revoke or suspend a permit, or modify or amend the permit or permit terms at any time.

**RULE 5.3 STANDARD PERMIT PROVISIONS:** All permits are granted subject to the District Act, these Rules, orders of the Board, and the laws of the State of Texas. In addition to any special provisions or other requirements incorporated into the permit, each permit issued shall contain the following standard permit provisions:

- a. This permit is granted in accordance with the provisions of the District Act, Water Code, and

the rules and orders of the District, and the permittee shall comply with the Texas Water Code, the District Act, the District Rules, orders of the District Board, and all the terms, provisions, conditions, requirements, limitations and restrictions embodied in this permit. Failure to comply with any of these provisions may result in cancellation or revocation of the permit.

- b. This permit confers no vested rights in the holder, and it may be revoked or suspended, or its terms may be modified or amended pursuant to the provisions of the District Act.
- c. The operation of the well for the authorized withdrawal must be conducted in a non-wasteful manner.
- d. The permittee must keep accurate records of the amount of groundwater withdrawn and the purpose of the withdrawal and such records shall be available for inspection by District representatives. Immediate written notice must be given to the District in the event a withdrawal exceeds the quantity authorized by this permit, or the well is either polluted or causing pollution of the aquifer.
- e. The well site must be accessible to District representatives for inspection, and the permittee agrees to cooperate fully in any reasonable inspection of the well and well site by District representatives.
- f. The application pursuant to which this permit has been issued is incorporated in this permit, and this permit is granted on the basis of and contingent upon the accuracy of the information supplied in that application and in any amendments to the application. A finding that false information has been supplied is grounds for immediate revocation of the permit. In the event of conflict between the provisions of this permit and the contents of the application, the provisions of this permit shall control.
- g. Violation of this permit's terms, conditions, requirements, or special provisions, is punishable by civil penalties as provided by the District Rules.
- h. Wherever District special provisions are inconsistent with other provisions or District Rules, the special provisions prevails.

#### **RULE 5.4 PERMIT AMENDMENTS:**

- a. **Permit Amendment Increasing Authorized Withdrawal:** Permits may be amended to increase the authorized amount of withdrawal.
  - 1. **Submission of Application:** An application by a permit holder for a permit amendment increasing maximum authorized withdrawal must be submitted prior to the withdrawal of the groundwater in excess of the amount currently permitted.
  - 2. **Basis for Amendment:** An applicant for a permit amendment increasing authorized withdrawal must present sufficient evidence that: (1) due to circumstances beyond the control of the applicant, the amount of withdrawal originally authorized has proved inadequate, (2) no suitable alternative water is immediately available to the

applicant; and (3) granting the amendment will not impair the rights of any other owner of interest in groundwater.

3. **Action on Request:** The general Manager may grant any application for increased withdrawal in an amount up to but not exceeding 10 percent of the initially authorized withdrawal, without notice, hearing, or further action by the Board. The General Manager's action may be appealed to the Board by filing a written request for hearing within twenty business days of the date of the General Manager's decision. If a written request for hearing is filed, or if the application for increased withdrawal is for an amount greater than twenty five percent of the initially authorized withdrawal, notice must be issued and a hearing conducted in the manner prescribed for permit issuance.
- b. **Permit Amendment Decreasing Authorized Withdrawal:** An application by a permit holder for a permit amendment decreasing the authorized withdrawal must be made in writing. The General Manager may grant such an amendment without notice, hearing, or further action by the Board.
- c. **Permit Amendment to Transfer Ownership of the Permit:** An application to amend the permit to change the name of the permittee must be made within 90 calendar days of the change in ownership of the permitted well. The General Manager may grant such an amendment without notice, hearing, or further action by the Board.

#### **RULE 5.5 TEMPORARY EMERGENCY PERMITS:**

- a. **Basis for Temporary or Emergency Permit:** Upon application, the General Manager may grant a temporary or Emergency Permit that authorizes the withdrawal of water from a well not currently permitted.
  1. An application for a Temporary Permit must present sufficient evidence that:
    - i. no suitable alternative water supply is immediately available to the applicant;
    - ii. the well to be drilled will not be capable of producing more than 25,000 gallons of water per day; and
    - iii. the well usage will not impair the rights of any other owner of interest in groundwater.
  2. An application for an Emergency Permit must present sufficient evidence that:
    - i. no suitable alternative water supply is immediately available to the applicant; and
    - ii. an emergency need for the groundwater exists.
- b. **Action on Requests:** The General Manager may grant any application for a Temporary or Emergency Permit without notice, hearing, or further action by the Board. The General Manager may deny an application for a Temporary or Emergency Permit on any reasonable ground including, but not limited to, a determination that the applicant is currently in violation of the District Act or these Rules, or that the applicant has a previous unresolved violation on record with the District. Notice of the General Manager's action will be served upon the applicant. Any affected party may appeal the General Manager's action by filing, within twenty business days of that action, a written request for a hearing before the Board. The Board will hear the applicant's appeal at the next available regular Board meeting. The

General Manager must inform the Board of any Temporary or Emergency Permits granted. On the motion of any Board member, and a majority concurrence in the motion, the Board may overrule the action of the General Manager.

- c. **Term of Temporary or Emergency Permit:** No Temporary or Emergency Permit may be issued unless an application for a permit issued under Rule 5.2 has been filed with the District. The term of any Temporary or Emergency Permit granted by the General Manager under this Rule extends only until the Board makes a final decision on the application for the permit under Rule 5.2.

**RULE 5.6 WELL PERMIT EXEMPTION:**

- a. A well producing water exclusively for use by an individual or a household is exempt from the production permit requirements and the meter requirements. "Use by an individual or household" means use for:
  - 1. drinking, washing, or culinary purposes;
  - 2. irrigation of lawns, a family garden or orchard;
  - 3. watering domestic animals;
- b. A well drilled or equipped so that it is incapable of producing more than 25,000 gallons per day is exempt from the production permit requirements of Rule 5.2.
- c. Accepting monetary consideration, either given or received, for any of the water produced from an otherwise exempt well forfeits any exemption.

## **SECTION 6: OTHER DISTRICT ACTIONS AND DUTIES**

**RULE 6.1 DISTRICT GROUNDWATER MANAGEMENT PLAN:** The District Plan specifies the acts, procedures, performance and avoidance necessary to prevent waste and protect rights of owners or interest in groundwater, and forms the basis of permitting decisions and permit requirements imposed by the Board. The Board will review the plan every five years. If the Board considers a new plan necessary or desirable a new plan will be adopted. A plan, once adopted, remains in effect until the adoption of a new plan.

**RULE 6.2 AQUIFER STORAGE AND RECOVERY:**

- a) A permit is required to store water in any aquifer within the District, and a separate Recovery Permit is required to withdraw stored water from the Aquifer Storage and Recovery Project. Permits must be approved by the Board of Directors prior to beginning any construction or drilling.
- b) The Board may consider the impact on the quality and quantity of water in the receiving aquifer, as well as the potential impact on any wells in the same formation, as well as any mitigation measures to be implemented by the permittee.
- c) The applicant must show the following:
  - 1. the water to be injected or recharged into the aquifer is of the same quality as the water residing in the aquifer at the point of injection or recharge;
  - 2. neither the water injection nor the withdrawal of stored water will harm any other well owner;

3. water stored and withdrawn will be put to a beneficial use; and
  4. operating the project will not result in wasting groundwater.
- d) The Board of Directors may impose conditions on the permit to ensure all the above conditions are met, including mitigation measures for other well owners.

#### **RULE 6.3 SEALING, CAPPING, AND PLUGGING OF WELLS:**

- a) **Sealing Wells.** The District may seal wells that are prohibited from withdrawing groundwater within the District by the District Act, these Rules or Board orders, or when the General Manager determines that sealing a well is reasonably necessary to ensure that the well will not be operated in violation of the District Act, these Rules or Board orders. A well may be sealed when:
- 1) representations have been made by the well owner or primary operator that no groundwater is to be withdrawn from a well during a particular period;
  - 2) the well has not been properly permitted; or
  - 3) continued operation of the well will result in waste or pollution.

The well may be sealed by physical means, and tagged to indicate that the well has been sealed by the District, and other appropriate action may be taken as necessary to preclude operation of the well or to identify unauthorized operation of the well. Tampering with, altering, damaging, or removing the seal of a sealed well, or in any other way violating the integrity of the seal, or pumping of groundwater from a sealed well constitutes a violation of these Rules and will subject the person performing that action, as well as any well owner or primary operator who authorizes or allows that action, to such penalties as provided by the District Act and these Rules.

- b) **Capping Wells:** The District may require a well to be capped to prevent waste, prevent pollution, or prevent further deterioration of a well casing. The well must remain capped until such time as the conditions that led to the capping requirement are eliminated. If well pump equipment is removed from a well and the well will be re-equipped at a later date, the well must be capped, provided however that the casing is not in a deteriorated condition that would permit commingling of water strata, in which case the well must be plugged.
- c) **Plugging Wells:** It is the responsibility of the landowner to plug a well that is deteriorated or abandoned. The well must be capped immediately in accordance with Rule 6.3(b). The well casing may not be allowed to deteriorate to a point where commingling of water strata is possible or occurring. The well owner or operator must, within thirty calendar days, either equip or plug a deteriorated well such that commingling of strata is prevented.
- 1) For a well that does not penetrate any undesirable water zone but is deteriorated or abandoned, all removable casing must be removed from the well and the well plugged as follows:
    - i. filled with cement to the land surface; or
    - ii. filled with mud followed by a cement plug not less than ten feet long extending down from the land surface.
  - 2) For a well that penetrates any undesirable water zone and is deteriorated or abandoned, all removable casing must be removed from the well and the well plugged as follows:
    - i. filled with cement to the land surface; or

- ii. either the zone(s) contributing undesirable water or the fresh water zone(s) must be isolated with cement plugs and the remainder of the well bore filled with mud to form a base for a cement plug not less than ten feet long extending down from the land surface.
- 3) Any person that plugs a well in the District must, within sixty (60) days after plugging is complete, submit a copy of the plugging report on forms furnished by the Texas Water Well Drillers Board to the District.

**RULE 6.4 DRILLER'S LOG, CASING AND PUMP DATA:** A water well driller must notify the District at least 24 hours prior to commencing drilling, repairing, capping or plugging a well. Complete records must be kept and reports thereof made to the District concerning the drilling, maximum production potential, equipping and completion of all wells drilled in the District. Such records must include an accurate Driller's log, any mechanical log that may have been made and a registration of the well correctly furnishing all available information required on the forms furnished by the District or on forms furnished by the Texas Department of Licensing and Regulation. Such reports must be filed within 60 calendar days after completion of the well.

## **SECTION 7: HEARINGS**

**7.1 TYPES OF HEARINGS:** The District conducts two general types of hearings: hearings involving permit matters, in which the rights, duties, or privileges of a party are determined after an opportunity for an adjudicative hearing, and rulemaking hearings involving matters of general applicability that implement, interpret, or prescribe the law or District policy, or that describe the procedure or practice requirements of the District. Any matter designated for hearing before the Board may be referred by the Board for hearing before a Hearings Examiner.

a. **Permit Hearings:**

- 1. **Permit Applications, Amendments and Revocations:** The District may hold hearings on original permit applications, applications for permit renewals or amendments and permit revocations or suspensions. Hearings involving permit matters may be referred to a Hearings Examiner.
- 2. **Hearings on Motions for Rehearing:** Motions for Rehearing will be heard by the Board pursuant to Rule 7.8(b).

b. **Rulemaking Hearings:**

- 1. **District Plan:** At its discretion, the Board may hold a hearing to consider adoption of a new District plan.
- 2. **Other Matters:** A public hearing may be held on any matter within the jurisdiction of the Board if the Board, or the General Manager when authorized by the Board, deems a hearing to be in the public interest, or if the Board or the General Manager, when authorized by the Board, deems a hearing necessary to effectively carry out the duties and responsibilities of the District.

**RULE 7.2 NOTICE AND SCHEDULING OF HEARINGS:** The General Manager is responsible for giving notice of all hearings in the following manner:

- a. Written notice of a hearing will be given to each county and municipal government within the District. Notice must also be given to each person who has previously requested copies of hearing notices pursuant to the procedures set forth in subsection (b), and any other person the General Manager deems appropriate. The date of delivery or mailing of notice may not be less than 10 business days before the date set for the hearing.

Notice of hearing must be published at least once in a newspaper of general circulation within the District. The date of publication may not be less than 10 business days before the date set for the hearing.

A copy of the notice must be posted at the county courthouse of each county within the District in the place where notices are usually posted. The date of posting shall not be less than 10 business days before the date of the hearing.

In addition to the notices required above, where a hearing involves a permit matter, notice of the date, time, and location of the hearing will be given to the applicant by certified mail, return receipt requested, at least 10 business days before the day of the hearing.

- b. Any person having an interest in the subject matter of a hearing or hearings may receive written notice of such hearing or hearings by submitting a request, in writing, addressed to the General Manager. The request must identify with as much specificity as possible the hearing or hearings of which written notice is requested. The request will remain valid for a period of one year from the date of the request, at which time a new request must be submitted. Failure to provide written notice under this section does not invalidate any action taken by the Board.
- c. Hearings may be scheduled during the District's regular business hours, Monday through Friday of each week, except District holidays. All permit hearings will be held at the District Office. However, the Board may from change or schedule additional dates, times, and places for hearings by order adopted at a regular Board meeting. The General Manager is authorized to schedule hearings involving permit matters at such dates, times, and places set forth above for permit hearings as the General Manager deems administratively feasible and appropriate. Other hearings may be scheduled at the dates, times and locations set at a regular Board meeting. The Board shall set a hearing within 60 days of declaring an application as administratively complete, and the hearing must be set within 35 days of the day the Board meets to set the hearing date.

**RULE 7.3 GENERAL PROCEDURES:**

- a. **Authority of Presiding Officer:** The presiding officer may conduct the hearing or other proceeding in the manner the presiding officer deems most appropriate for that particular proceeding. The presiding officer has the authority to:
  1. set hearing dates, other than the initial hearing date for permit matters set by the

- General Manager in accordance with Rule 7.2(c);
  2. convene the hearing at the time and place specified in the notice for public hearing;
  3. establish the jurisdiction of the District concerning the subject matter under consideration;
  4. rule on motions and on the admissibility of evidence and amendments to pleadings;
  5. designate and align parties and establish the order for presentation of evidence;
  6. administer oaths to all persons presenting testimony;
  7. examine witnesses;
  8. issue subpoenas when required to compel the attendance of witnesses or the production of papers and documents;
  9. require the taking of depositions and compel other forms of discovery under these Rules;
  10. ensure that information and testimony are introduced as conveniently and expeditiously as possible, without prejudicing the rights of any party to the proceedings;
  11. conduct public hearings in an orderly manner in accordance with these Rules;
  12. recess any hearing from time to time and place to place;
  13. reopen the record of a hearing for additional evidence when necessary to make the record more complete and;
  14. exercise any other appropriate powers necessary or convenient to effectively carry out the responsibilities of presiding officer.
- b. **Registration Forms:** Each individual attending a hearing or other proceeding of the District must submit a form providing the person's name and address, whether the person plans to testify; and any other information relevant to the hearing or other proceeding.
- c. **Appearance; Representative Capacity:** Any interested person may appear in person or may be represented by counsel, engineer, or other representative, provided the representative is fully authorized to speak and act for the principal. Such person or representative may present evidence, exhibits, or testimony, or make an oral presentation in accordance with the procedures applicable to the particular proceeding. Any partner may appear on behalf of the partnership. A duly authorized officer or agent of a public or private corporation, political subdivision, governmental agency, municipality, association, firm, or other entity may appear for the entity. A fiduciary may appear for a ward, trust, or estate. A person appearing in a representative capacity may be required to prove proper authority.
- d. **Alignment of Parties; Number of Representatives Heard:** Participants in a proceeding may be aligned according to the nature of the proceeding and their relationship to it. The presiding officer may require the participants of an aligned class to select one or more persons to represent them in the proceeding or on any particular matter or ruling and may limit the number of representatives heard, but must allow at least one representative of an aligned class to be heard in the proceeding or on any particular matter or ruling.
- e. **Appearance by Applicant or Movant:** The applicant, movant or party requesting the hearing or other proceeding or a representative should be present at the hearing or other proceeding. Failure to so appear may be grounds for withholding consideration of a matter and dismissal without prejudice or may require the rescheduling or continuance of the hearing or other proceeding if the presiding officer deems it necessary in order to fully



develop the record.

- f. **Reporting:** Hearings and other proceedings will be recorded on audio cassette tape or, at the discretion of the presiding officer, may be recorded by a certified shorthand reporter. The District does not prepare transcriptions for the public of hearings or other proceedings recorded on audio cassette tape on District equipment, but will arrange for a party at interest to have access to the recording. Subject to availability of space, any party at interest may, at its own expense, arrange for a reporter to report the hearing or other proceeding or for recording of the hearing or other proceeding. The cost of reporting or transcribing a permit hearing may be assessed in accordance with Rule 7.5(b). If a proceeding other than a permit hearing is recorded by a reporter, and a copy of the transcript of testimony is ordered by any person, the testimony will be transcribed and the original transcript filed with the papers of the proceeding at the expense of the person requesting the transcript of testimony. Copies of the transcript of any hearing or other proceeding thus reported may be purchased from the reporter.
- g. **Continuance:** The presiding officer may continue hearings or other proceedings from time to time and from place to place without the necessity of publishing, serving, mailing, or otherwise issuing a new notice. If a hearing or other proceeding is continued and a time and place (other than the District Office) for the hearing or other proceeding to reconvene are not publicly announced at the hearing or other proceeding by the presiding officer before it is recessed, a notice of any further setting of the hearing or other proceeding must be delivered at a reasonable time to all parties, persons who have requested notice of the hearing pursuant to Rule 7.2(b), and any other person the presiding officer deems appropriate, but it is not necessary to post at the county courthouses or publish a newspaper notice of the new setting.
- h. **Filing of Documents; Time Limit:** Applications, motions, exceptions, communications, requests, briefs, or other papers and documents required to be filed under these Rules or by law must be received in the hand of the District's Office within the time limit, if any, set by these Rules or by the presiding officer for filing. Mailing within the time period is insufficient if the submissions are not actually received by the District within the time limit.
- i. **Computing Time:** In computing any period of time specified by these Rules, by a presiding officer, by Board orders, or by law, the day of the act, event, or default after which the designated period of time begins to run is not included, but the last day of the period computed is included, unless the last day is a Saturday, Sunday, or legal holiday, in which case the period runs until the end of the next business day.
- j. **Affidavit:** Whenever the making of an affidavit by a party to a hearing or other proceeding is necessary, it may be made by the party or the party's representative or counsel. This Rule does not dispense with the necessity of an affidavit being made by a party when expressly required by statute.
- k. **Broadening the Issues:** No person will be allowed to appear in any hearing or other proceeding that in the opinion of the presiding officer is for the sole purpose of unduly broadening the issues to be considered in the hearing or other proceeding.
- l. **Conduct and Decorum:** Every person, party, representative, witness, and other participant

in a proceeding must conform to ethical standards of conduct and will exhibit courtesy and respect for all other participants. No person may engage in any activity during a proceeding that interferes with the orderly conduct of District business. If in the judgment of the presiding officer, a person is acting in violation of this provision, the presiding officer will first warn the person to refrain from engaging in such conduct. Upon further violation by the same person, the presiding officer may exclude that person from the proceeding for such time and under such conditions as the presiding officer deems necessary.

#### **RULE 7.4 UNCONTESTED PERMIT HEARINGS PROCEDURES:**

- a. **Informal Hearings:** Permit hearings may be conducted informally when, in the judgment of the Hearing Examiner, the conduct of the proceeding under informal procedures will result in a savings of time or cost to the parties, lead to a negotiated or agreed settlement of facts or issues in controversy, and not prejudice the rights of any party.
- b. **Agreement of Parties:** If all parties reach a negotiated or agreed settlement that settles the facts or issues in controversy, the proceeding will be considered an uncontested case and the General Manager will summarize the evidence, including findings of fact and conclusions of law based on the existing record and any other evidence submitted by the parties at the hearing.
- c. **Decision to Proceed as Uncontested or Contested Case:** If the parties do not reach a negotiated or agreed settlement of the facts and issues in controversy or if any party contests a staff recommendation, and the Hearing Examiner determines these issues will require extensive discovery proceedings, the Hearing Examiner may declare the case to be contested and convene a prehearing conference as set forth in Rule 7.5. The Hearing Examiner may also recommend issuance of a temporary permit for a period not to exceed 4 months, with any special provisions the Hearing Examiner deems necessary, for the purpose of completing the contested case process. Any case not declared a contested case under this provision will be an uncontested case.

#### **RULE 7.5 CONTESTED PERMIT HEARINGS PROCEDURES:**

- a. **Prehearing Conference:** A prehearing conference may be held to consider any matter that may expedite the hearing or otherwise facilitate the hearing process.
- b. **Matters Considered:** Matters that may be considered at a prehearing conference include, but are not limited to, (1) designation of parties; (2) formulation and simplification of issues; (3) necessity or desirability of amending applications or other pleadings; (4) possibility of making admissions or stipulations; (5) scheduling discovery; (6) identification of and specification of the number of witnesses; (7) filing and exchange of prepared testimony and exhibits; and (8) procedure at the hearing.
- c. **Notice:** A prehearing conference may be held at a date, time, and place stated in a separate notice given in accordance with Rule 7.2, or at the date, time and place for hearing stated in the notice of public hearing, and may be continued from time to time place to place, at the discretion of the Hearings Examiner.

- d. **Conference Action:** Action taken at a prehearing conference may be reduced to writing and made a part of the record or may be stated on the record at the close of the conference.
- e. **Assessing Reporting and Transcription Costs:** Upon the timely request of any party, or at the discretion of the Hearing Examiner, the Hearing Examiner may assess reporting and transcription costs to one or more of the parties. The Hearing Examiner will consider the following factors in assessing reporting and transcription cost:
  - 1. the party who requested the transcript;
  - 2. the financial ability of the party to pay the cost;
  - 3. the extent to which the party participated in the hearing;
  - 4. the relative benefits to the various parties of having a transcript;
  - 5. the budgetary constraints of a governmental entity participating in the proceeding;
  - 6. any other factor that is relevant to a just and reasonable assessment of costs.

In any proceeding where the assessment of reporting or transcription costs is an issue, the Hearing Examiner will provide the parties an opportunity to present evidence and argument on the issue. A recommendation regarding the assessment of costs will be included in the Hearing Examiner's report to the Board.

- f. **Designation of Parties:** Parties to a hearing may be designated in the first day of hearing or at such other times as the Hearing Examiner determines. The General Manager and any person specifically named in a matter are automatically designated parties. Persons other than the General Manager or a person specifically named must, in order to be admitted as a party, appear at the proceeding in person or by a representative and seek to be designated. After parties are designated, no other person may be admitted as a party unless, in the judgment of the Hearing Examiner, there exists good cause and the hearing will not be unreasonably delayed.
- g. **Rights of Designated Parties:** Subject to the direction and orders of the Hearings Examiner, parties have the right to conduct discovery, present a direct case, cross examine witnesses, make oral and written arguments, obtain copies of all documents filed in the proceeding, receive copies of all notices issued by the District concerning the proceeding, and otherwise fully participate in the proceeding.
- h. **Persons Not Designated as Parties:** At the discretion of the Hearing Examiner, persons not designated as parties to a proceeding may submit comments or statements, orally or in writing. Comments or statements submitted by non-parties may be included in the record, but may not be considered by the Hearing Examiner as evidence.
- i. **Furnishing Copies of Pleadings:** After parties have been designated, a copy of every pleading, request, motion, or reply filed in the proceeding must be provided by the author to every other party or the party's representative. A certification of the fact must accompany the original instrument when filed with the District. Failure to provide copies may be grounds for withholding consideration of the pleading or the matters set forth therein.
- j. **Interpreters for Deaf Parties and Witnesses:** If a party or subpoenaed witness in a contested case is deaf, the District will provide an interpreter whose qualifications are

approved by the State Commission for the Deaf and Hearing Impaired to interpret the proceedings for that person. “Deaf person” means a person who has a hearing impairment, whether or not the person also has a speech impairment, that inhibits the person’s comprehension of the proceedings or communication with others.

- k. **Agreements to be in Writing:** No agreement between parties or their representatives affecting any pending matter will be considered by the Hearing Examiner unless it is in writing, signed, and filed as part of the record, or unless it is announced at the hearing and entered of record.
- l. **Discovery:** Discovery will be conducted upon such terms and conditions, and at such times and places, as directed by the Hearing Examiner. Unless specifically modified by these Rules or by order of the Hearing Examiner, discovery will be governed by, and subject to the limitations set forth in, the Texas Rules of Civil Procedure. In addition to the forms of discovery authorized under the Texas rules of Civil Procedures, the parties may exchange informal requests for information, either by agreement or by order of the Hearing Examiner.
- m. **Discovery Sanctions:** If the Hearing Examiner finds a party is abusing the discovery process in seeking, responding to, or resisting discovery, the Hearing Examiner may:
  - 1. suspend processing of the application for a permit if the applicant is the offending party;
  - 2. disallow any further discovery of any kind or a particular kind by the offending party;
  - 3. rule that particular facts be regarded as established against the offending party for the purpose of the proceeding, in accordance with the claim of the party obtaining the discovery ruling;
  - 4. limit the offending party’s participation in the proceeding;
  - 5. disallow the offending party’s presentation of evidence on issues that were the subject of the discovery request; and
  - 6. recommend to the board that the hearing be dismissed with or without prejudice.
- n. **Ex Parte Communication:** The Hearing Examiner may not communicate, directly or indirectly, in connection with any issue of fact or law with any agency, party, or their representatives, except on notice and opportunity for all parties to participate. This provision does not prevent communications with staff not directly involved in the hearing in order to utilize the special skills and knowledge of the District in evaluating the evidence.
- o. **Compelling Testimony; Swearing Witnesses and Subpoena Power:** The Hearings Examiner may compel any person to testify who is necessary, helpful, or appropriate to the hearing. The Hearing Examiner shall administer the oath in a manner calculated to impress the witness with the importance and solemnity of the promise to adhere to the truth. The Hearing Examiner may issue subpoenas to compel the testimony of any person and the production of books, papers, documents, or tangible things, in a manner provided in the Texas Rules of Civil Procedure.
- p. **Evidence:** Except as modified by these Rules, The Texas Rules of Civil Evidence govern the admissibility and introduction of evidence; however, evidence not admissible under the Texas Rules of Civil Evidence may be admitted if it is of the type commonly relied upon by

reasonable prudent persons in the conduct of their affairs. In addition, evidence may be stipulated by agreement of all parties.

- q. **Written Testimony:** When a proceeding will be expedited and the interests of the parties not substantially prejudiced, testimony may be received in written form. The written testimony of a witness, either in narrative or question and answer form, may be admitted into evidence upon the witness being sworn and identifying the testimony as a true and accurate record of what the testimony would be if given orally. The witness will be subject to clarifying questions and to cross-examination, and the prepared testimony will be subject to objection.
- r. **Requirements for Exhibits:** Exhibits of a documentary character must be of a size that will not unduly encumber the files and records of the District. All exhibits must be numbered and, except for maps and drawings, may not exceed 8-1/2 by 11 inches in size.
- s. **Abstracts of Documents:** When documents are numerous, the Hearing Examiner may receive in evidence only those that are representative and require the abstract of relevant data from the documents and the presentation of the abstracts in the form of an exhibit. Parties have the right to examine the documents from which the abstracts are made.
- t. **Introduction and Copies of Exhibits:** Each exhibit offered shall be tendered for identification and placed in the record. Copies must be furnished to the Hearing Examiner and to each of the parties, unless the Hearing Examiner rules otherwise.
- u. **Excluding Exhibits:** In the event an exhibit has been identified, objected to, and excluded, it may be withdrawn by the offering party. If withdrawn, the exhibit will be returned and the offering party waives all objections to the exclusion of the exhibit. If not withdrawn, the exhibit shall be included in the record for the purpose of preserving the objection to excluding the exhibit.
- v. **Official Notice:** The Hearing Examiner may take official notice of all facts judicially cognizable. In addition, official notice may be taken of generally recognized facts within the area of the District's specialized knowledge.
- w. **Documents in District Files:** Extrinsic evidence of authenticity is not required as a condition precedent to admissibility of documents maintained in the files and records of the District.
- x. **Oral Argument:** At the discretion of the Hearing Examiner, oral arguments may be heard at the conclusion of the presentation of evidence. Reasonable time limits may be prescribed. The hearing Examiner may require or accept written briefs in lieu of, or in addition to, oral arguments. When the matter is presented to the board for final decision, further oral arguments may be heard by the Board.

#### **RULE 7.6 CONCLUSION OF THE HEARING; REPORT:**

- a. **Closing the Record; Final Report:** At the conclusion of the presentation of evidence and any oral argument, the Hearing Examiner may either close the record or keep it open and

allow the submission of additional evidence, exhibits, briefs, or proposed findings and conclusions from one or more of the parties. No additional evidence, exhibits, briefs, or proposed findings and conclusions may be filed unless permitted or requested by the Hearing Examiner. After the record is closed, the Hearing Examiner shall prepare a report to the Board. The report will include a summary of the evidence, together with the Hearing Examiner's findings and conclusions and recommendations for action. Upon completion and issuance of the Hearings Examiner's report, a copy will be submitted to the Board and delivered to each party to the proceedings. In a contested case, delivery to the parties will be by certified mail.

- b. **Exceptions to the Hearings Examiner's Report; Reopening the Record:** Prior to Board action any party in a contested case may file written exception to the Hearing Examiner's report, and any party in an uncontested case may request an opportunity to make an oral presentation of exceptions to the Board. Upon review of the report and exceptions, the Hearing Examiner may reopen the record for the purpose of developing additional evidence, or may deny the exceptions and submit the report and exceptions to the Board. The Board may, at any time and in any case, remand the matter to the Hearing Examiner for further proceedings.
- c. **Time for Board Action on Certain Permit Matters:** In the case of hearings involving original permit applications, or applications for permit renewals or amendments, the Hearing Examiner's report should be submitted, and the Board should act, within 60 calendar days after the close of the hearing record. The Board may choose to conduct additional hearings as necessary to complete the record or answer exceptions filed by any party. The Board shall act on the application within 60 calendar days after concluding the final hearing.

#### **RULE 7.7 RULEMAKING HEARINGS PROCEDURES:**

- a. **General Procedures:** The presiding officer will conduct the rulemaking hearing in the manner the presiding officer deems most appropriate to obtain all relevant information pertaining to the subject of the hearing as conveniently, inexpensively, and expeditiously as possible.
- b. **Submission of Documents:** Any interested person may submit written statements, protests or comments, briefs, affidavits, technical reports, or other documents relating to the subject of the hearing. Such documents must be submitted no later than the time of the hearing, as stated in the notice of hearing given in accordance with Rule 7.2; provided, however, that the presiding officer may grant additional time for the submission of documents.
- c. **Conclusion of the Hearing; Closing the Record; Hearings Examiner's Report:** At the conclusion of the testimony, and after the receipt of all documents, the presiding officer may either close the record, or keep it open to allow the submission of additional information. If the presiding officer is a Hearing Examiner, the Hearings Examiner will, after the record is closed, prepare a report to the Board. The report will include a summary of the subject of the hearing and the public comments received, together with the hearings Examiner's recommendations for action. Upon completion and issuance of the Hearings Examiner's report, a copy will be submitted to the board. Any interested person who so requests in writing will be notified when the report is completed, and furnished a copy of the report.

- d. **Exceptions to the Hearings Examiner's Report; Reopening the Record:** Any interested person may make exceptions to the Hearings Examiner's report, and the Board may reopen the record, in the manner prescribed in Rule 7.6(b).

#### **RULE 7.8 FINAL DECISION; APPEAL:**

- a. **Board Action:** After the record is closed and the matter is submitted to the Board, the Board may then take the matter under advisement, continue it from day to day, reopen or rest the matter, refuse the action sought or grant the same in whole or part, or take any other appropriate action. The Board action takes effect at the conclusion of the meeting and is not affected by a motion for rehearing.
- b. **Requests for Rehearing:** Any decision of the Board on a matter may be appealed by requesting a rehearing before the Board within 20 calendar days of the Board's decision. Such a rehearing request must be filed at the District Office in writing and must state clear and concise grounds for the request. Such a rehearing request is mandatory with respect to any decision or action of the Board before any appeal to State District Court. The Board's decision is final if no request for rehearing is made within the specified time, or upon the Board's denial of the request for rehearing, or upon rendering a decision after rehearing. If the rehearing is granted by the Board, the date of the rehearing will be within 45 calendar days thereafter, unless agreed to by the parties to the proceeding. The failure of the Board to grant or deny the request for rehearing within 90 calendar days of submission will be deemed to be a denial of the request.

### **SECTION 8. OTHER REQUIREMENTS**

**RULE 8.1 WELL METERS:** All production wells are required to be metered in accordance with this section.

- a. **Approved Meters:** Meters must be mechanically driven, digital, totalizing water meters. The digital totalizer must not be resettable by the permittee and must be capable of a maximum reading greater than the maximum expected pumpage during the permit term. Battery operated registers must have a minimum five year life expectancy and must be permanently hermetically sealed. Battery operated registers must visibly display the expiration date of the battery. All meters must meet the requirements for registration accuracy set forth in the American Water Works Association Standards for cold-water meters.
- b. **Installation:** Water meters must be installed according to the manufacturer's published specifications in effect at the time of the meter installation, or its accuracy must be verified by the permittee. If no specifications are published, there must be a minimum length of five pipe diameters of straight pipe upstream of the water meter and one pipe diameter of straight pipe downstream of the water meter. These lengths of straight pipe must contain no check valves, tees, gate valves, backflow preventers, blowout valves, or any other fixtures other than those flanges or welds necessary to connect the straight pipe to the meter. In addition,

the pipe must be completely full of water throughout the area of the meter. All installed meters must measure only groundwater.

- c. **Bypasses:** All bypasses must be metered. A bypass is any pipe of any size connected to the discharge pipe between the well and the meter.
- d. **Metering Aggregate Withdrawal:** Where wells are permitted in aggregate, one or more water meters may be used for the aggregate well system if the water meter or meters are installed so as to measure the groundwater production from all wells covered by the aggregated permits.
- e. **Meter Accuracy to be Tested:** The District may require the permittee, at the permittee's expense, to test the accuracy of the water meter and submit a certificate of the test results. The certificate must be on a form provided by the District. The District may further require that the test be performed by a third party qualified to perform meter tests. Certification tests are required no more than once every three years for the same meter and installation. If the test results indicate accuracy outside the range of 95% to 105% of the actual flow, then appropriate steps must be taken to repair or replace the water meter. The District, at its own expense, may undertake random tests and other investigations at any time for the purpose of verifying water meter readings. If the District's tests or investigations reveal that a water meter is not registering within an accuracy of 95% to 105% of actual flow, or is not properly recording the total flow of groundwater withdrawn from the well or wells, the permittee must reimburse the District for the cost of those tests or investigations, and the permittee must take appropriate steps to remedy the problem. If a water meter or related piping or equipment is tampered with or damaged so that the measurement accuracy is impaired, the District may require the permittee, at the permittee's expense, to take appropriate steps to remedy any problem, and to retest the water meter within 90 calendar days from the date the problem is discovered and reported to the permittee. Only equipment capable of accuracy results of plus or minus two percent of actual flow may be used to calibrate or test meters.

## **SECTION 9. INVESTIGATIONS AND ENFORCEMENT**

**RULE 9.1 NOTICE AND ACCESS TO PROPERTY:** Board Members, the General Manager, and District agents and employees are entitled to access to all property within the District to carry out technical and other investigations necessary to the implementation of the District Act and these Rules. Prior to entering upon property for the purpose of conducting an investigation, the person seeking access shall give notice in writing, in person or by telephone to the owner, lessee, or operator, agent, or employee of the well owner or lessee, as determined by information contained in the application or other information on file with the District. Notice is not required if prior permission has been granted to enter without notice. Inhibiting or prohibiting access to any Board Member, the General Manager, District agents, or employees who are attempting to conduct an investigation under the District Act or these Rules shall constitute a violation and shall subject the person who is inhibiting or prohibiting access, as well as any other person who authorizes or allows such actions, to the maximum penalties established in Rule 9.4.

**RULE 9.2 LIMITATIONS OF DISTRICT EMPLOYEE ACTIVITIES:** Employees of the



District are not authorized to engage in information gathering activities that are not specifically related to groundwater conservation, groundwater quality, groundwater protection, or otherwise stated in the Employee Duties and Responsibilities Policy.

**RULE 9.3 CONDUCT OF INVESTIGATION:** Where investigations or inspections require entrance upon property, such investigations and inspections will be conducted at reasonable times, and will be consistent with the establishment's rules and regulations concerning safety, internal security, and fire protection. The persons conducting such investigations must identify themselves and present credentials upon request of the owner, lessee, operator, or person in charge of the well.

**RULE 9.4 REQUEST FOR INJUNCTIVE RELIEF AND ASSESSMENTS OF PENALTIES:** If it appears that a person has violated, is violating, or is threatening to violate any provision of the District Act or any Board order, rule or permit, the Board may authorize the General Manager to institute and conduct a suit in the name of the District for injunctive relief, or to recover a civil penalty of up to ten thousand dollars for each violation and for each day of violation, or both injunctive relief and civil penalties.

## **SECTION 10. TRANSPORTATION OF WATER**

### **RULE 10.1 TRANSPORTATION PERMIT REQUIRED:**

Any person who seeks to export groundwater produced from a well within the District's boundaries to a place of use outside the District's boundaries must first obtain a Transportation Permit from the District.

### **RULE 10.2 BASIS FOR ACTION ON TRANSPORTATION PERMIT APPLICATIONS:**

- a. The Board shall grant an application for a transportation permit if the Board finds that:
  1. the application is complete and filed on a form prescribed by the District;
  2. the application complies with the rules of the District;
  3. all applicable fees and deposits have been paid;
  4. the water to be exported is proposed to be placed to a beneficial use as evidenced by water supply contract secured by the applicant;
  5. the place of use is identified specifically and located outside the District's boundaries;
  6. the applicant is in compliance with any permits the applicant holds from the District and with District rules;
  7. the applicant has a production permit issued by the District;
  8. there is insufficient water available at, or proximate to, the proposed place of use to substantially meet the actual or projected demand at the receiving area during the proposed term of the groundwater export permit;
  9. the exportation will not have an unreasonable adverse effect on aquifer conditions, depletion, or water quality;
  10. the exportation will not have an unreasonable adverse effect on existing permittees, or other groundwater users within the District;
  11. the project is included in the current State Water Plan and consistent with the current Regional Water Plan; and
  12. the exportation is consistent with the District's certified Groundwater Management Plan.

- b. The Board may include the following as conditions on a transportation permit:
  - 1. the end users at the proposed place of use will comply with all applicable duties to conserve water in accordance with applicable law, including the adoption and implementation of a water conservation plan;
  - 2. the end users at the proposed place of use have adopted and implemented a drought management plan; and
  - 3. the activities for which the groundwater will be beneficially used will be constructed, operated, and maintained to preserve and protect; prevent the pollution, degradation, or harmful alteration of; control and prevent the waste of; prevent the escape of; and achieve the conservation of groundwater in the aquifer.

**RULE 10.3 TRANSPORTATION PERMIT TERM AND RENEWAL:**

- a. The permit term for a transportation permit is as follows:
  - 1. at least three years, if construction of a conveyance system in the District's boundaries has not been initiated prior to the issuance of the permit; or
  - 2. at least 30 years, if construction of a conveyance system has been initiated in the District's boundaries prior to the issuance of the permit or if construction of a conveyance system is begun prior to expiration of the initial three year term.
- b. A transportation permit may be renewed. Any person seeking the renewal of a transportation permit must file with the District an application to renew on a form prescribed by the District. The application must be filed with the District no later than one year prior to the expiration of the permit term.

**RULE 10.4 CONTENTS OF TRANSPORTATION PERMITS:**

- a. A transportation permit shall include the following terms and conditions:
  - 1. the name, physical address, mailing address, and telephone number of the permittee;
  - 2. the name, physical address, mailing address, and telephone number of the authorized representative, if any, of the permittee;
  - 3. if the permittee owns the well from which the production for exportation is made, then the production permit number of the well, as appropriate;
  - 4. if the permittee does not own the well from which the production for exportation is made, then the name, physical address, mailing address and telephone number of the well owner, and the production permit number of the well, as appropriate;
  - 5. if not the permittee, the name, physical address, mailing address and telephone number of the owner of the land on which the well is located;
  - 6. the permit term, including dates of issuance, effectiveness, and termination;
  - 7. the initial term during which construction of the conveyance system is required to be commenced;
  - 8. the purpose of use for which the water produced from the well is to be used;
  - 9. a requirement that the water produced under the permit be put to beneficial use without waste;
  - 10. the specific location of the place of use outside the District's boundaries;
  - 11. the maximum amount of production in acre-feet per annum by purpose of use, that may be exported from the District, and any conditions or restrictions relative thereto;
  - 12. appropriate meter information;
  - 13. reporting requirement; and
  - 14. other terms and conditions as may be required by the Board.

- b. All transportation permits shall be issued with and subject to the following conditions:
  - 1. the duty to beneficially use water and avoid waste;
  - 2. the duty to conserve water in accordance with applicable law, and comply with the District's water conservation plan;
  - 3. the duty to file all applicable reports with the District and other appropriate federal, state, or local governments;
  - 4. the duty to reduce water consumption during times of drought in accordance with applicable law, and comply with either the District's drought management plan;
  - 5. the District's groundwater management plan;
  - 6. the duty to use all reasonable diligence to protect the groundwater quality of the aquifer;
  - 7. the duty to comply with the District's rules;
  - 8. the continuing right of the District to prevent depletion of the aquifer;
  - 9. installation, equipping, operation, and maintenance of all meters in accordance with the District's rules;
  - 10. the duty to comply with the District's rules relating to transfers and amendments of permits;
  - 11. the duty to pay all applicable fees;
  - 12. the duty to give notice to District of any changes in name, address, or telephone number of the permittee, or the authorized representative, as may be appropriate;
  - 13. the duty to comply with all of the terms and conditions of the permit;
  - 14. the right of the District to enter land under § 36.123, Water Code; and
  - 15. any other conditions as the Board may deem appropriate.

#### **RULE 10.5 METHOD OF TRANSPORTATION:**

Transporting groundwater must take place through the most efficient means economically feasible, and under no circumstances may groundwater be transported via a surface water course or otherwise causing, suffering, or allowing groundwater to escape into any river, creek, natural watercourse, depression, lake, reservoir, drain, sewer, street, highway, road or road ditch.

#### **RULE 10.6 MONITORING AND REPORTING:**

- a. All transportation facilities utilized as part of a transportation permit shall be equipped with flow monitoring devices approved by the District and shall be available at all reasonable times for inspection by District personnel. The flow monitoring devices must accurately measure all groundwater transported under the permit.
- b. The operator of the transportation facility shall be required to keep records and make reports to the District as to the operation of the transportation facility.
  - 1. Transportation permittees shall report the volume of water transported on a monthly basis, beginning at the time the permit is issued. Such reports shall include, but not limited to, the amount of water transported during the preceding month.
  - 2. Permitted transportation facilities shall submit reports to the District on a monthly basis, beginning at the time the permit is issued to operate.

### **SECTION 11. SPACING AND PRODUCTION**

#### **RULE 11.1 SPACING AND PRODUCTION REQUIREMENTS:**

- a. Wells may not be drilled within one hundred (100) feet of any property line. In addition, new wells must be located so that the distance to any other existing well is at least one foot for each one gallon per minute of production capacity up to a maximum of one thousand (1000) gallons per minute. If the capacity of the well exceeds one thousand (1000) gallons per minute then the minimum spacing distance must be an additional one-half (1/2) foot per one gallon per minute in excess of one thousand gallons per minute.

#### EXAMPLES

500 gpm	=	500 feet
750 gpm	=	750 feet
1000 gpm	=	1000 feet
1250 gpm	=	1375 feet
1500 gpm	=	1750 feet
1750 gpm	=	2125 feet

- b. The Board reserves the right in particular subterranean water zones or reservoirs to enter special orders increasing distances provided by this requirement.
- c. The maximum cumulative amount of groundwater production may not exceed

Igneous Aquifer 651,851 gallons (2 acre foot)  
Edwards-Trinity Aquifer 651,851 gallons (2 acre foot)  
Rustler Downdip 651,851 gallons (2 acre foot)  
West Texas Bolsons 325,851 gallons (1 acre foot)

of groundwater per surface acre owned or controlled per year.

Well owners may compute this total by aggregating all contiguous surface acreage owned and then produce the cumulative total from a single well or well field within that acreage.

#### **RULE 11.2 EXCEPTIONS TO SPACING AND PRODUCTION RULE:**

- a. The Board may grant exceptions to the well spacing rule when the Board determines that an exception is necessary to provide water to that particular property or when the terrain requires locating a well within 100 feet of a property line.
- b. The Board may grant an exception to the production limit rule when the Board determines that granting the exception will not have a detrimental impact on aquifer levels, nearby well owners, or the quality of groundwater in the aquifer.
- c. If an exception to the spacing or production rule is desired, the application shall be submitted by the applicant in writing to the District office on forms furnished by the District. The application shall be accompanied by a plat or sketch, drawn to scale of one (1) inch equaling two thousand (2000) feet. The plat or sketch shall show thereon the property lines in the immediate area and shall show accurately to scale the location of the three (3) nearest wells within one-half (1/2) mile of the proposed well location. The application shall also contain the names and address of all property owners adjoining the tract on which the well is to be located, within one-half (1/2) mile, and the owners of the three (3) nearest wells within

one-half (1/2) mile of the proposed well location. Such application and plat shall be certified by some person actually acquainted with the facts who shall state that all the facts therein are true and correct.

- d. Hearing notices shall state that the application does not meet spacing or production requirements of the District, and an exception is requested by the applicant.

## **SECTION 12. FEES**

### **RULE 12.1 FEES:**

- a. The District may assess the following fees:
  - 1. maximum production fees of one dollars (\$1.00) per acre foot for water used in agriculture, and ten dollars (\$10.00) per acre foot for all other uses based on the amount of water actually withdrawn each month;
  - 2. maximum transportation fees equal to 50 percent of the production fee rate;
  - 2. application fees reasonably expected to meet the cost to the District of processing the application for which the fee is charged; and
  - 3. fees for all services provided outside the boundaries of the district.
- b. The Board shall set all fees by resolution. Fees for services outside the District may not unreasonably exceed the cost to the District of providing those services.
- c. Fees are due the first of each month, and are to be included with a monthly-pumping report.

February 27, 2024

The Board of Directors of the JDCUWCD met in the Fort Davis Water Supply Office in Fort Davis, Texas on February 27, 2024. Present were Johnny Wofford, Bud Coffey, Jim Dyer and Janet Adams, District Manager.

Mrs. Adams certified that the meeting had been posted in accordance with the Open Meetings Law. Mr. Wofford called the meeting to order with a quorum present at 8:04 am.

No public Comment

Recessed Regular meeting at 8:06

Opened Public Hearing at 8:07

No public in attendance to comment on 2024-2029 Management Plan

Board discussed Management Plan

Mr. Coffey made a motion to adjourn the Public Hearing at 8:15. Second by Mr. Dyer. Motion carried 3-0

Opened Regular meeting at 8:16

Mr. Coffey made a motion for the JDCUWCD Board to adopt the 2024-2029 Management Plan. Second by Mr. Dyer. Motion carried 3-0

The minutes of December 12, 2023 meeting were read and approved on a motion by Mr. Coffey. Second by Mr. Dyer. Motion carried 3-0.

The follow bills for 12/12/23 thru 02/27/24 were reviewed and approved for payment on a motion by Mr. Coffey. Second by Mr. Dyer. Motion carried 3-0.

<b>90,142.38</b>	Starting Balance 12/12/23
<b>CHECKS</b>	
571.64	Business Card - TWCA & Kaspersky
2,136.16	Janet Adams - Dec
2,000.48	Janet Adams - 2023 payroll
2,433.00	Taxes
82.00	P O Box Rent
285.00	Business Card - TAGD, Registration

3,136.16	Janet Adams - Jan
5,541.00	Janet Adams - Bonus
4,000.00	Richard Bowman CPA - Audit
520.00	ITInnovators - 6 years of security

<b>20,705.44</b>	<b>TOTAL CHECKS</b>
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**DEPOSITS**

<b>445.00</b>	Took off twice
<b>75.00</b>	Permit - 24-001
<b>97.79</b>	Fort Davis Estates
<b>110.50</b>	McDonald Observatory
<b>340.40</b>	Prude Ranch
<b>2,842.60</b>	County, C Dessert, Madera Valley
<b>75.00</b>	Permit 14-002
<b>31.03</b>	Miller, VISD
<b>90.30</b>	State Park
<b>10.00</b>	Duncan
<b>315.20</b>	Valentine

<b>4,432.82</b>	<b>TOTAL DEPOSITS</b>
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<b>73,869.76</b>	Ending Balance 02/27/24
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After a discussion Mr. Dyer made a motion to adopt on the 2023 amended budget.  
Second by Mr. Coffey. Motion carried 3-0

After reviewing the 2024 Investment Policy Mr. Dyer made a motion to adopt. Second by Mr. Coffey. Motion carried 3-0. The Board asked the District Manager to get with the Fort Davis State Bank regarding investing some of the funds.

The District Manager presented the 2023 end of year report.

On a motion by Mr. Dyer. Second by Mr. Coffey. The following exempt wells were approved. Motion carried 3-0.

Gordon Moller, 17840 State Highway 166

Brad Slaughter, 904 Court Street, deepen well

Manager Report:

- a. Drought Map
- b. Meetings attended
- c. Other information

Mr. Coffey made a motion to adjourn at 8:50. Second by Mr. Dyer. Motion carried  
3-0

Jim Dyer  
Secretary



**NOTICE OF MEETING OF BOARD OF DIRECTORS  
JEFF DAVIS COUNTY UNDERGROUND WATER CONSERVATION DISTRICT**

Notice is hereby given that the Board of Directors of the Jeff Davis County Underground Water Conservation District will meet at the Fort Davis Water Supply Corporation Building, located at 113 State Street, Fort Davis, Texas. On February 27, 2024 at 8:00 AM. This meeting is open to members of the public.

**AGENDA**

1. Call to order and establish a quorum.
2. Certify posting of notice of the meeting.
3. Public Comments.
4. Recess Regular meeting
5. Open Public Hearing

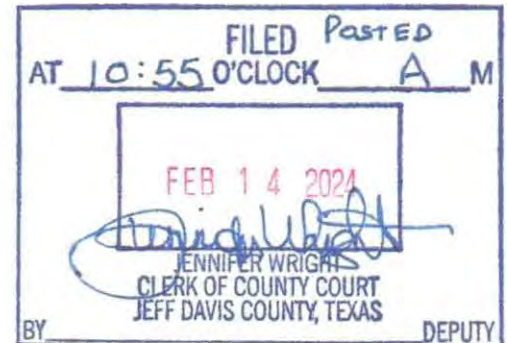
Receive public comments on draft 2024-2029 Management Plan

6. Adjourn Public Hearing
7. Open regular meeting
8. Board to consider/ approve 2024-2029 Management Plan
9. Consider / approve minutes from December 12 , 2023
10. Consider / approval of monthly bills
11. Adopt the 2023 amended budget
12. Review and Adopt 2024 Investment Policy
13. 2023 Year End Report
14. Exempt well applications for Board Approval

Gordon Moller, 17840 State Highway 166

Brad Slaughter, 904 Court Street, deepen well

15. Managers Report.
  - a. Drought Map
  - b. Meetings Attended
  - c. Other Information.
16. Items for the next meeting.
17. Adjourn.



I, the undersigned authority, do hereby certify that the above notice of meeting of the Board of Directors of the above named District, is a true and correct copy of said notice and that a true and correct copy was posted at the Jeff Davis County Courthouse, a place convenient and readily accessible to the general public at all times. The Jeff Davis County Underground Water Conservation District reserves the right to convene in Executive Session on any agenda or discussion item if discussion of said item falls under the exceptions listed in Chapter 551, Texas Government Code, known as the "Open Meetings Act". Consultation concerning attorney-client matters (551.071), deliberation regarding real property (551.072), deliberation regarding prospective gifts (551.073), personal matters (551.074), and deliberation regarding security devices (551.076).



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Janet Adams – District Manager