NOTICE OF PUBLIC HEARING
OF
GONZALES COUNTY UNDERGROUND
WATER CONSERVATION DISTRICT
On Proposed Additions and Amendments to the
District's Management Plan

The Gonzales County Underground Water Conservation District ("the District) will hold a public hearing for the purpose of receiving comments on proposed additions and amendments to the Management Plan of the District.

The Board of Directors will take public comments on the proposed amendments to the Management Plan on Tuesday, October 10, 2023, at the District office located at 522 Saint Matthew Street, Gonzales, Texas. The public hearing will begin at 5:30 p.m. Agenda is as follows:

1. Call to order.
2. President of the Board to make comments.
3. Receive comments from the public on the District's proposed Management Plan.
4. Discussion of other items of interest by the Board and direction to management.
5. Adjourn.

Copies of the proposed additions and amendments to the Management Plan of the District are available at the offices of the Gonzales County Underground Water Conservation District, 522 Saint Matthew Street, Gonzales, Texas, from 8:00 a.m. to 5:00 p.m., Monday through Friday.

Written comments should be submitted to the General Manager, PO Box 1919, Gonzales, Texas 78629 by October 10, 2023 at 12:00 p.m. or presented at the hearing.

POSTED
SEP 18 2023
11:24 AM
LONA ACKMAN
COUNTY CLERK, GONZALES COUNTY TEXAS
BY _____ DEPUTY

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Filed this 19th day of Sept 2023
1:53 PM
TERESA RODRIGUEZ
COUNTY CLERK, CALDWELL COUNTY, TEXAS
By Sandra Guerra Deputy
Sandra Guerra

Texas Water Development Board (TWDB) Groundwater Conservation District & Groundwater Management Plan FAQ's

Groundwater Conservation District and Groundwater Management Plan FAQs

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Answers to Frequently Asked Questions

1. How much groundwater is used in the state?

In 2015, the total reported groundwater usage in the state was approximately 6.95 million acre-feet, and the total reported groundwater usage in all confirmed GCDs was approximately 90 percent of all groundwater used, or about 6.26 million acre-feet (TWDB Estimated Historical Water Use Survey (WUS)).

2. What is a groundwater management plan and what are its required elements?

A groundwater management plan describes a GCD's groundwater management goals. A groundwater management plan is statutorily required to address the management goals and information listed below (Texas Water Code §36.1071 - §36.1073; 31 Texas Administrative Code 356.10, 356.51-356.54)

Goals:

- providing the most efficient use of groundwater;
- controlling and preventing waste of groundwater;
- controlling and preventing subsidence;
- addressing conjunctive surface water management issues;
- addressing natural resource issues that impact the use and availability of groundwater, and which are impacted by the use of groundwater;
- addressing drought conditions;
- addressing conservation, recharge enhancement, rainwater harvesting, precipitation enhancement, and brush control, where appropriate and cost-effective; and
- addressing the desired future conditions established pursuant to the Texas Water Code.

Information:

- performance standards and management objectives under which the GCD will operate to achieve its management goals;
- details of how the GCD will manage groundwater supplies in the district, including a methodology by which the GCD will track its progress in achieving its management goals;
- detailed descriptions of actions, procedures, performance and avoidance that are, or may be necessary, to effect the plan including specifications and proposed rules;
- estimates of the following:
  - modeled available groundwater (MAG) in the GCD based on the desired future condition (DFC) established under Texas Water Code §36.108;
  - the amount of groundwater being used within the GCD on an annual basis;
  - the annual amount of recharge from precipitation, if any, to the groundwater resources within the GCD;
  - the annual volume of water that discharges from each aquifer in the GCD to springs and surface water bodies;
  - the annual volumes of flow into and out of the GCD within each aquifer and between aquifers in the GCD if a groundwater availability model is present;
  - the projected surface water supply in the GCD according to the most recent state water plan;
  - the projected total demand for water within the GCD according to the most recent state water plan; and
- consideration of the water supply needs and water management strategies within the county(s) covered by the GCD according to the most recent state water plan.

3. What was the first groundwater management plan to be approved?

The first groundwater management plan to be approved by the TWDB was the Gonzales County UWCD's plan in 1998.

4. Are all GCDs required to develop a groundwater management plan?

Yes. All GCDs are required to develop a groundwater management plan and submit it to the TWDB for approval. A newly created GCD is required to submit its management plan no later than three years after its creation. If a GCD requires a confirmation election after its creation, a management plan should be submitted no later than three years after the confirmation election (Texas Water Code §36.1072 [a-1]).

5. How often are GCDs required to renew their management plan?

A GCD is required to review and readopt its management plan with or without revisions, and submit it to the TWDB for approval, at least once every five years. It can however, review and submit its plan more frequently if it desires (Texas Water Code §36.1072 [e]).

6. If a GCD amends its management plan before the statutory five-year limit, is it required to submit the plan to the TWDB for approval?

If the district proposes to amend its plan for revisions of items other than the MAG or DFC, the district shall submit a written copy of the proposed amendment to TWDB's Executive Administrator so that he may determine whether the amendment requires approval. If the amendment requires approval, it should be submitted to the TWDB within 60 days of being adopted by the district (31 Texas Administrative Code 356.56). Changes in the DFC and/or MAG are changes that require approval.

Back to List of Questions

7. Who approves a GCD's management plan?

The TWDB Executive Administrator is charged with reviewing and approving a GCD's groundwater management plan as being administratively complete. The TWDB will notify the GCD in writing of its determination (Texas Water Code §36.1072; 31 Texas Administrative Code 356.54).

8. How long does it take TWDB to approve a management plan?

The TWDB is required to make its determination on a management plan within 60 days of receiving all elements of a plan (Texas Water Code §36.1072).

9. What action can a GCD take if the TWDB denies approval of its management plan?

A GCD has two choices: it can revise and resubmit its plan within 180 days of receiving notification from the TWDB, or it can, within 60 days, appeal the executive administrator's decision to the TWDB Board members (Texas Water Code §36.1072; Texas Administrative Code 356.55).

10. Can a GCD get help from the TWDB in the development of its management plan?

Yes. The TWDB can provide technical assistance to a district in the development of its management plan. This consists of at least one preliminary review, if requested, and comment on the plan prior to its adoption by the GCD. If a GCD requests a preliminary review of its draft plan the TWDB can usually provide its comments within 30 days of the date of the request. The TWDB will review management plans in the order in which they are received. A preliminary review is not required but is highly recommended to make the approval process more efficient.

11. What happens to my Groundwater Management Plan once the TWDB releases a new or updated Groundwater Availability Model?

Nothing needs to change in your GCD's Management Plan upon release of a new or updated Groundwater Availability Model. However, the TWDB offers two options if you intend to update your management plan in the next year prior to your next management plan expiration date or deadline to amend your plan with modeled available groundwater values:

- 1) Send a request in writing to the TWDB if you would like to receive new groundwater budget values calculated by the TWDB. Once you receive the updated groundwater budget values, you only need to make an amendment to the plan by replacing the old budget values in text, tables, and appendices with the updated budget numbers. There is no requirement to update groundwater budget values outside of regular plan adoption.
- 2) Do nothing. The TWDB will provide updated budget values in accordance with your GCD's management plan expiration date, even if you do not request the new groundwater budget values after release of a new groundwater availability model.

Back to List of Questions

12. Where can I find more information on the items required in a groundwater management plan for administrative completeness?

A checklist of items required for a management plan to be approved as administratively complete is available here.

13. Is there a rule in Chapter 36 that addresses how transport and production fees can be used? Are the permit fees different from the production and transport fees?

Section 36.205(c) of the Texas Water Code states that a GCD can use the revenues generated by production fees for "any lawful purpose." Section 36.205(g) says transport fees may be assessed pursuant to §36.122. Under Section 36.122, it says, in subsection (l), that a GCD is prohibited from using revenues obtained from the transport fee to prohibit the transfer of groundwater outside of a GCD but is not prohibited from using revenues for paying expenses related to enforcement of Chapter 36 or the GCD's rules.

14. Does the TWDB have information about the budgets and expenditures for GCDs?

Our agency does not track individual GCD budgets and expenditures except if a GCD applies for a loan or grant with us. Currently, only a few GCDs have loans or grants. Please contact GCDs directly for budget information; these data are sometimes posted on their websites.

15. Who should I contact for more information about groundwater management plans?

The Groundwater Technical Assistance team will be happy to assist you with any questions you have about groundwater management plans. Contact us at 512-463-7317.

Texas Water Development Board (TWDB) Management Plan Checklist

Texas Water Development Board

Groundwater Conservation District Management Plan Checklist, effective December 6, 2012

District name: ☐ Official review ☐ Prereview

Reviewing staff: **Date plan received:** **Date plan reviewed:**

A management plan shall contain, unless explained as not applicable, the following elements, 31 TAC §356.52(a):

	Citation of rule	Citation of statute	Present in plan and administratively complete	Source of data	Evidence that best available data was used	Notes
Is a paper hard copy of the plan available?	31 TAC §356.53(a)(1)					
Is an electronic copy of the plan available?	31 TAC §356.53(a)(2)					
1. Is an estimate of the modeled available groundwater in the District based on the desired future condition established under Section 36.108 included?	31 TAC §356.52(a)(5)(A)	TWC §36.1071(e)(3)(A)				p.
2. Is an estimate of the amount of groundwater being used within the District on an annual basis for at least the most recent five years included?	31 TAC §356.52(a)(5)(B); §356.10(2)	TWC §36.1071(e)(3)(B)				p.
For sections 3-5 below, each district must use the groundwater availability modeling information provided by the TWDB in conjunction with available site-specific information provided by the district when developing the required estimates, 31 TAC §356.52(c):						
3. Is an estimate of the annual amount of recharge, from precipitation, if any, to the groundwater resources within the District included?	31 TAC §356.52(a)(5)(C)	TWC §36.1071(e)(3)(C)				p.
4. For each aquifer in the district, is an estimate of the annual volume of water that discharges from the aquifer to springs and any surface water bodies, including lakes, streams and rivers, included?	31 TAC §356.52(a)(5)(D)	TWC §36.1071(e)(3)(D)				p.
5. Is an estimate of the annual volume of flow	31 TAC §356.52(a)(5)(E)	TWC §36.1071(e)(3)(E)				
a) into the District within each aquifer,						p.
b) out of the District within each aquifer,						p.
c) and between aquifers in the District,						p.
if a groundwater availability model is available, included?						
6. Is an estimate of the projected surface water supply within the District according to the most recently adopted state water plan included?	31 TAC §356.52(a)(5)(F)	TWC §36.1071(e)(3)(F)				p.
7. Is an estimate of the projected total demand for water within the District according to the most recently adopted state water plan included?	31 TAC §356.52(a)(5)(G)	TWC §36.1071(e)(3)(G)				p.
8. Did the District consider and include the water supply needs from the adopted state water plan?		TWC §36.1071(e)(4)				p.
9. Did the District consider and include the water management strategies from the adopted state water plan?		TWC §36.1071(e)(4)				p.
10. Did the district include details of how it will manage groundwater supplies in the district	31 TAC §356.52(a)(4)					p.
11. Are the actions, procedures, performance, and avoidance necessary to effectuate the management plan, including specifications and proposed rules, all specified in as much detail as possible, included in the plan?		TWC §36.1071(e)(2)				p.
12. Was evidence that the plan was adopted, after notice and hearing, included? Evidence includes the posted agenda, meeting minutes, and copies of the notice printed in the newspaper(s) and/or copies of certified receipts from the county courthouse(s).	31 TAC §356.53(a)(3)	TWC §36.1071(a)				p.
13. Was evidence that, following notice and hearing, the District coordinated in the development of its management plan with regional surface water management entities?	31 TAC §356.51	TWC §36.1071(a)				p.
14. Has any available site-specific information been provided by the district to the executive administrator for review and comment before being used in the management plan when developing the estimates required in subsections 31 TAC §356.52(a)(5)(C),(D), and (E) ?	31 TAC §356.52(c)	TWC §36.1071(h)				p.

Mark an affirmative response with YES
Mark a negative response with NO
Mark a non-applicable checklist item with N/A

Management goals required to be addressed unless declared not applicable	**Management goal** (time-based and quantifiable) 31 TAC §356.51	**Methodology for tracking progress** 31TAC §356.52(a)(4)	**Management objective(s)** (specific and time-based statements of future outcomes) 31 TAC §356.52 (a)(2)	**Performance standard(s)** (measures used to evaluate the effectiveness of district activities) 31 TAC §356.52 (a)(3)	**Notes**
Providing the most efficient use of groundwater 31 TAC 356.52(a)(1)(A); TWC §36.1071(a)(1)	15)	16)	17)	18)	p.
Controlling and preventing waste of groundwater 31 TAC 356.52(a)(1)(B); TWC §36.1071(a)(2)	19)	20)	21)	22)	p.
Controlling and preventing subsidence 31 TAC 356.52(a)(1)(C); TWC §36.1071(a)(3)	23)	24)	25)	26)	p.
Addressing conjunctive surface water management issues 31 TAC 356.52(a)(1)(D); TWC §36.1071(a)(4)	27)	28)	29)	30)	p.
Addressing natural resource issues that impact the use and availability of groundwater and which are impacted by the use of groundwater 31 TAC 356.52(a)(1)(E); TWC §36.1071(a)(5)	31)	32)	33)	34)	p.
Addressing drought conditions 31 TAC 356.52(a)(1)(F); TWC §36.1071(a)(6)	35)	36)	37)	38)	p.
Addressing	39)	40)	41)	42)	
a) conservation,	39a)	40a)	41a)	42a)	p.
b) recharge enhancement,	39b)	40b)	41b)	42b)	p.
c) rainwater harvesting,	39c)	40c)	41c)	42c)	p.
d) precipitation enhancement, and	39d)	40d)	41d)	42d)	p.
e) brush control	39e)	40e)	41e)	42e)	p.
where appropriate and cost effective 31 TAC 356.52(a)(1)(G); TWC §36.1071(a)(7)					
Addressing the desired future conditions established under TWC §36.108. 31 TAC 356.52(a)(1)(H); TWC §36.1071(a)(8)	43)	44)	45)	46)	p.
Does the plan identify the performance standards and management objectives for effecting the plan? 31 TAC §356.52(a)(2)&(3); TWC §36.1071(e)(1)			47)	48)	

Mark required elements that are present in the plan with YES
Mark any required elements that are missing from the plan with NO
Mark plan elements that have been indicated as not applicable to the district with N/A

Texas Water Code

Chapter 36

Section 36.1071

Management Plan

Sec. 36.1071. MANAGEMENT PLAN. (a) Following notice and hearing, the district shall, in coordination with surface water management entities on a regional basis, develop a management plan that addresses the following management goals, as applicable:

(1) providing the most efficient use of groundwater;

(2) controlling and preventing waste of groundwater;

(3) controlling and preventing subsidence;

(4) addressing conjunctive surface water management issues;

(5) addressing natural resource issues;

(6) addressing drought conditions;

(7) addressing conservation, recharge enhancement, rainwater harvesting, precipitation enhancement, or brush control, where appropriate and cost-effective; and

(8) addressing the desired future conditions adopted by the district under Section 36.108.

(b) The management plan, or any amendments to the plan, shall be developed using the district's best available data and forwarded to the regional water planning group for use in their planning process.

(c) The commission and the Texas Water Development Board shall provide technical assistance to a district in the development of the management plan required under Subsection (a) which may include, if requested by the district, a preliminary review and comment on the plan prior to final approval by the board. If such review and comment by the commission is requested, the commission shall provide comment not later than 30 days from the date the request is received.

(d) The commission shall provide technical assistance to a district during its initial operational phase. If requested by a district, the Texas Water Development Board shall train the district on basic data collection methodology and provide technical assistance to districts.

(e) In the management plan described under Subsection (a), the district shall:

(1) identify the performance standards and management objectives under which the district will operate to achieve the management goals identified under Subsection (a);

(2) specify, in as much detail as possible, the actions, procedures, performance, and avoidance that are or may be necessary to effect the plan, including specifications and proposed rules;

(3) include estimates of the following:

(A) modeled available groundwater in the district based on the desired future condition established under Section 36.108;

(B) the amount of groundwater being used within the district on an annual basis;

(C) the annual amount of recharge from precipitation, if any, to the groundwater resources within the district;

(D) for each aquifer, the annual volume of water that discharges from the aquifer to springs and any surface water bodies, including lakes, streams, and rivers;

(E) the annual volume of flow into and out of the district within each aquifer and between aquifers in the district, if a groundwater availability model is available;

(F) the projected surface water supply in the district according to the most recently adopted state water plan; and

(G) the projected total demand for water in the district according to the most recently adopted state water plan; and

(4) consider the water supply needs and water management strategies included in the adopted state water plan.

(f) The district shall adopt rules necessary to implement the management plan. Prior to the development of the management plan and its approval under Section 36.1072, the district

may not adopt rules other than rules pertaining to the registration and interim permitting of new and existing wells and rules governing spacing and procedure before the district's board; however, the district may not adopt any rules limiting the production of wells, except rules requiring that groundwater produced from a well be put to a nonwasteful, beneficial use. The district may accept applications for permits under Section 36.113, provided the district does not act on any such application until the district's management plan is approved as provided in Section 36.1072.

(g) The district shall adopt amendments to the management plan as necessary. Amendments to the management plan shall be adopted after notice and hearing and shall otherwise comply with the requirements of this section.

(h) In developing its management plan, the district shall use the groundwater availability modeling information provided by the executive administrator together with any available site-specific information that has been provided by the district to the executive administrator for review and comment before being used in the plan.

Added by Acts 1995, 74th Leg., ch. 933, Sec. 2, eff. Sept. 1, 1995. Redesignated from 36.107(b) and (c) and amended by Acts 1997, 75th Leg., ch. 1010, Sec. 4.28, eff. Sept. 1, 1997. Amended by Acts 2001, 77th Leg., ch. 966, Sec. 2.46, eff. Sept. 1, 2001.
Amended by:

Acts 2005, 79th Leg., Ch. 970 (H.B. 1763), Sec. 5, eff. September 1, 2005.

Acts 2011, 82nd Leg., R.S., Ch. 17 (S.B. 727), Sec. 1, eff. April 29, 2011.

Acts 2011, 82nd Leg., R.S., Ch. 18 (S.B. 737), Sec. 2, eff. September 1, 2011.

Acts 2011, 82nd Leg., R.S., Ch. 1233 (S.B. 660), Sec. 16, eff. September 1, 2011.

Sec. 36.1072. TEXAS WATER DEVELOPMENT BOARD REVIEW AND APPROVAL OF MANAGEMENT PLAN. (a) In this section, "development board" means the Texas Water Development Board.

(a-1) A district shall, not later than three years after the creation of the district or, if the district required confirmation, not later than three years after the election confirming the district's creation, submit the management plan required under Section 36.1071 to the executive administrator for review and approval.

(b) Within 60 days of receipt of a district's management plan adopted under Section 36.1071, readopted under Subsection (e) or (g) of this section, or amended under Section 36.1073, the executive administrator shall approve the district's plan if the plan is administratively complete. A management plan is administratively complete when it contains the information required to be submitted under Section 36.1071(a) and (e). The executive administrator may determine whether conditions justify waiver of the requirements under Section 36.1071(e)(4).

(c) Once the executive administrator has approved a district's management plan:

(1) the executive administrator may not revoke but may require revisions to the approved management plan as provided by Subsection (g); and

(2) the executive administrator may request additional information from the district if the information is necessary to clarify, modify, or supplement previously submitted material, but a request for additional information does not render the management plan unapproved.

(d) A management plan takes effect on approval by the executive administrator or, if appealed, on approval by the development board.

(e) The district may review the plan annually and must review and readopt the plan with or without revisions at least once every five years. The district shall provide the readopted plan to the executive administrator not later than the 60th day after the date on which the plan was readopted. Approval of the preceding management plan remains in effect until:

(1) the district fails to timely readopt a management plan;

(2) the district fails to timely submit the district's readopted management plan to the executive administrator; or

(3) the executive administrator determines that the readopted management plan does not meet the requirements for approval, and the district has exhausted all appeals to the Texas Water Development Board or appropriate court.

(f) If the executive administrator does not approve the district's management plan, the executive administrator shall provide to the district, in writing, the reasons for the action. Not later than the 180th day after the date a district receives notice that its management plan has not been approved, the district may submit a revised management plan for review and approval. The executive administrator's decision may be appealed to the development board. If the development board decides not to approve the district's management plan on appeal, the district may request that the conflict be mediated. The district and the board may seek the assistance of the Center for Public Policy Dispute Resolution at The University of Texas School of Law or an alternative dispute resolution system established under Chapter 152, Civil Practice and Remedies Code, in obtaining a qualified impartial third party to mediate the conflict. The cost of the mediation services must be specified in the agreement between the parties and the Center for Public Policy Dispute Resolution or the alternative dispute resolution system. If the parties do not resolve the conflict through mediation, the decision of the development board not to approve the district's management plan may be appealed to a district court in Travis County. Costs for the appeal shall be set by the court hearing the appeal. An appeal under this subsection is by trial de novo. The commission shall not take enforcement action against a district under Subchapter I until the latest of the expiration of the 180-day period, the date the development board has taken final action withholding approval of a revised management plan, the date the mediation is completed, or the date a final judgment upholding the board's decision is entered by a district court. An enforcement action may not be taken against a district by the commission or the state auditor under Subchapter I because the district's management plan and the approved regional water plan are in conflict while the parties are attempting to resolve the conflict before the development board, in mediation, or in court. Rules of the district continue in full force and effect until all appeals under this subsection have been exhausted and the final judgment is adverse to the district.

(g) A person with a legally defined interest in groundwater in a district, or the regional water planning group, may file a petition with the development board stating that a conflict requiring resolution may exist between the district's approved management plan developed under Section 36.1071 and the state water plan. If a conflict exists, the development board shall provide technical assistance to and facilitate coordination between the involved person or regional water planning group and the district to resolve the conflict. Not later than the 45th day after the date the person or the regional water planning group files a petition with the development board, if the conflict has not been resolved, the district and the involved person or regional planning group may mediate the conflict. The district and the involved person or regional planning group may seek the assistance of the Center for Public Policy Dispute Resolution at The University of Texas School of Law or an alternative dispute resolution system established under Chapter 152, Civil Practice and Remedies Code, in obtaining a qualified impartial third party to mediate the conflict. The cost of the mediation services must be specified in the agreement between the parties and the Center for Public Policy Dispute Resolution or the alternative dispute resolution system. If the district and the involved person or regional planning group cannot resolve the conflict through mediation, the development board shall resolve the conflict not later than the 60th day after the date the mediation is completed. The development board action under this provision may be consolidated, at the option of the board, with related action under Section 16.053(p). If the development board determines that resolution of the conflict requires a

revision of the approved management plan, the development board shall provide information to the district. The district shall prepare any revisions to the plan based on the information provided by the development board and shall hold, after notice, at least one public hearing at some central location within the district. The district shall consider all public and development board comments, prepare, revise, and adopt its management plan, and submit the revised management plan to the development board for approval. On the request of the district or the regional water planning group, the development board shall include discussion of the conflict and its resolution in the state water plan that the development board provides to the governor, the lieutenant governor, and the speaker of the house of representatives under Section 16.051(e). If the groundwater conservation district disagrees with the decision of the development board under this subsection, the district may appeal the decision to a district court in Travis County. Costs for the appeal shall be set by the court hearing the appeal. An appeal under this subsection is by trial de novo.

Added by Acts 1997, 75th Leg., ch. 1010, Sec. 4.28, eff. Sept. 1, 1997. Amended by Acts 2001, 77th Leg., ch. 966, Sec. 2.47, eff. Sept. 1, 2001.
Amended by:
Acts 2005, 79th Leg., Ch. 970 (H.B. 1763), Sec. 6, eff. September 1, 2005.
Acts 2011, 82nd Leg., R.S., Ch. 17 (S.B. 727), Sec. 2, eff. April 29, 2011.

Sec. 36.1073. AMENDMENT TO MANAGEMENT PLAN. Any amendment to the management plan shall be submitted to the executive administrator within 60 days following adoption of the amendment by the district's board. The executive administrator shall review and approve any amendment which substantially affects the management plan in accordance with the procedures established under Section 36.1072.

Added by Acts 1997, 75th Leg., ch. 1010, Sec. 4.28, eff. Sept. 1, 1997.
Amended by:
Acts 2005, 79th Leg., Ch. 970 (H.B. 1763), Sec. 7, eff. September 1, 2005.

GONZALES COUNTY
UNDERGROUND WATER CONSERVATION DISTRICT

MANAGEMENT PLAN

Original: February 10, 1998

Revision 1.0: July 8, 2003

Revision 2.0: May 14, 2009

Revision 3.0: February 18, 2014

Revision 4.0: November 13, 2018

Revision 5.0: November 14, 2023

~~**Original:** February 10, 1998~~

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APPENDICES

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1.0 DISTRICT MISSION

The mission of the Gonzales County Underground Water Conservation District ("GCUWCD" or "District") is to conserve, preserve, protect, and prevent waste of groundwater resources. It shall be the policy of the Board of Directors that the most efficient use of groundwater in the District is to provide for the needs of the citizens and ensure growth for future generations. The Board of Directors, with the cooperation of the citizens of the District, shall implement this management plan and its accompanying rules to achieve this goal. If it appears this management plan, or production ~~limists~~limits do not achieve the desired ~~futre~~future conditions the District will amend them. GCUWCD shall also establish, as part of this plan, the policies of water conservation, public information and technical research by cooperation and coordination with the citizens of the District and equitable enforcement of this plan and its accompanying rules.

2.0 PURPOSE OF THE MANAGEMENT PLAN

Senate Bill 1, enacted in 1997, and Senate Bill 2, enacted in 2001, established a comprehensive statewide planning process, including requirements for groundwater conservation districts ("GCDs") under the Texas Water Code Chapter 36 to manage and conserve the groundwater resources of the State of Texas. Section 36.1071, Water Code, requires that each groundwater conservation district develop a management plan that addresses the following management goals, as applicable: (1) providing the most efficient use of groundwater, (2) controlling and preventing waste of groundwater, (3) controlling and preventing subsidence, (4) addressing conjunctive surface water management issues, (5) addressing natural resource issues that impact the use and availability of groundwater, and which are impacted by the use of groundwater;, (6) addressing drought conditions, (7) addressing conservation, recharge enhancement, rainwater harvesting, precipitation enhancement, or brush control, where appropriate and cost-effective, and (8) addressing the desired future conditions adopted by the district under Section 36.108.

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House Bill 1763, enacted in 2005, requires joint planning among GCDs within the same Groundwater Management Area ("GMA"). These Districts must establish the Desired Future Conditions ("DFCs") of the aquifers within their respective GMAs. Through this process, the GCDs will submit the DFCs of the aquifer to the executive administrator of the Texas Water Development Board ("TWDB"). The TWDB will calculate the modeled available groundwater ("MAG") in each District within the management area based upon the submitted DFCs of the aquifer within the GMA. Technical information, such as the DFCs of the aquifers within the District's jurisdiction and the amount of MAG from such aquifers is required by statute to be included in the District's management plan and will guide the District's regulatory and management policies.

3.0 DISTRICT INFORMATION

~~3.1 Creation~~3.1 Creation

The GCUWCD was created on an order of the Texas Commission on Environmental Quality (TCEQ), formerly the Texas Natural Resource Conservation Commission (TNRCC), on November 19, 1993. A copy of TNRCC order number 101692-DO4, approving the petition for creation of the GCUWCD, is available on the District's website at: http://www.gcuwcd.org/documentsandforms.html.~~.~~

~~3.2 Directors~~3.2 Directors

The GCUWCD Board of Directors is comprised of five (5) members elected from single member districts. The Board of Directors meets in regular sessions on the second Tuesday each month in the City of Gonzales, Texas. All meetings of the Board of Directors are open to the public as set forth in the

Texas Open Meetings Act, Title 5, Chapter 551 of the Texas Government Code, and advanced written notices of such meetings are posted as required.

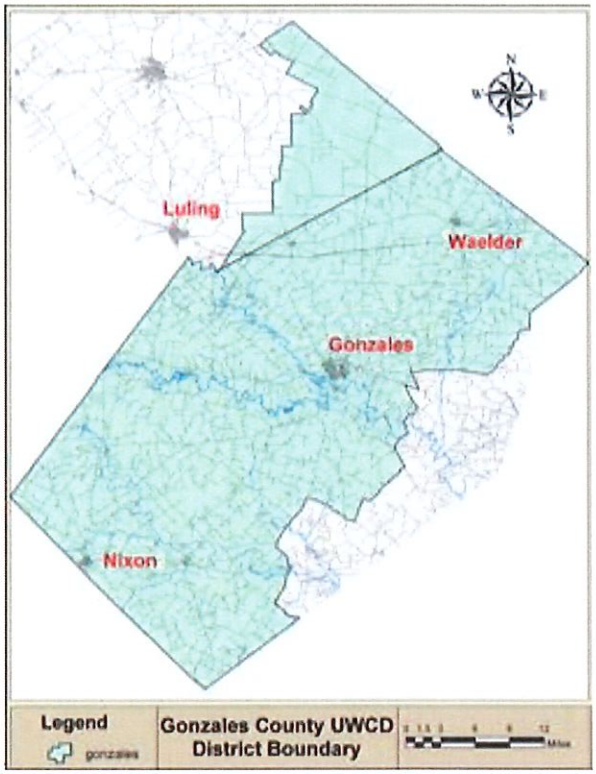
~~3.3 Authority~~3.3 Authority of the District

As stated in TNRCC order number 101692-DO4, the GCUWCD has all the rights, powers, privileges, authority, and functions conferred by, and subject to all duties imposed by, the TCEQ and the general laws of the State of Texas relating to groundwater conservation districts. The District is governed by the provisions of Texas Water Code (TWC) Chapter 36 and 31 Texas Administrative Code (TAC) Chapter 356.

~~3.4 District~~3.4 District Boundaries

GCUWCD serves the areas of Gonzales County and the southeast portion of Caldwell County (**Figure 1**). Gonzales County is bounded by Guadalupe, Wilson, Karnes, DeWitt, Lavaca, Fayette and Caldwell counties. There are approximately 677,000 acres in Gonzales County, of which 101,000 acres are excluded from the District leaving 576,000 acres within the boundaries of the county. Incorporated towns within Gonzales County include Gonzales, Waelder, Nixon, and Smiley. In December 2007, GCUWCD approved a resolution to annex the southeastern portion of Caldwell County into the District. An election was held in Caldwell County on May 10, 2008, with voters approving the annexation. The Board approved the canvass of the proposition election to ratify the annexation on May 13, 2008. The annexed area of Caldwell County encompassed approximately 77,440 acres. A dispute with the Plum Creek Conservation District over portions of this annexed territory was settled through the passage of Senate Bill No. 1225 (2011) leaving approximately 72,767 acres within the GCUWCD. Delhi and Taylorsville are the principal communities in the area. The District's economy is primarily agricultural, with poultry production being the primary income producer, followed by beef cattle and farming. Oil and gas production also ~~contributes~~contribute to the local economy.

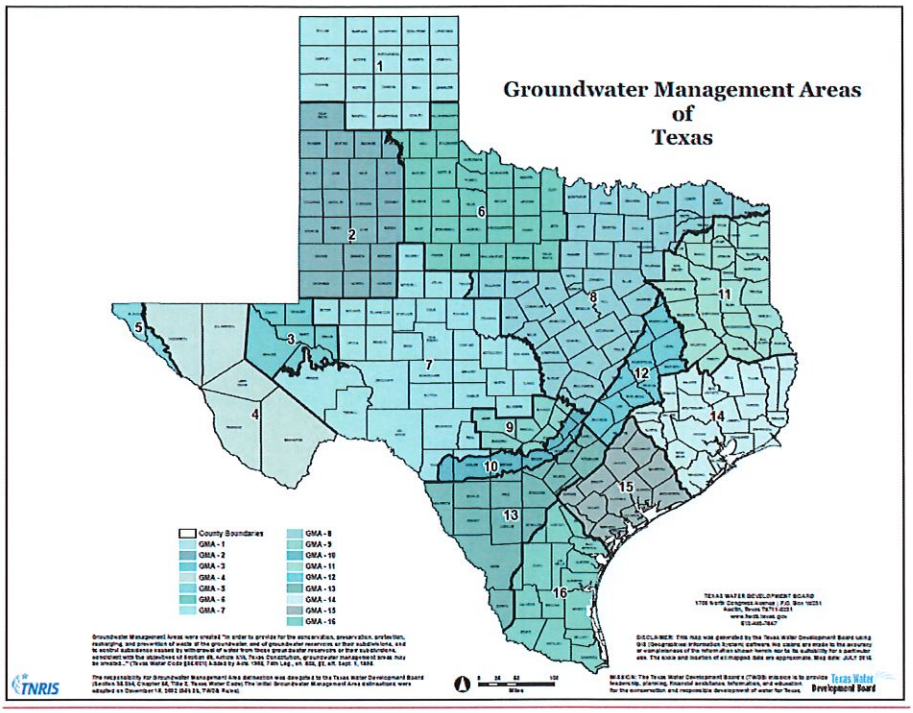
Figure 1



The GCUWCD is located within Groundwater Management Area 13 ("GMA 13"). GMA 13 includes seventeen (17) counties and nine (9) GCDs (**Figure 2.1 and Figure 2.2**). Section 36.108, Water Code, requires joint planning among the GCDs within GMA 13. The District is actively engaged in the joint planning process and provides input to GMA 13. The District has a joint management agreement with Evergreen Underground Water Conservation District, Guadalupe County Underground Water Conservation District, Medina County Groundwater Conservation District, and Wintergarden Groundwater Conservation District. This agreement, signed on August 8, 2000, states that the GCDs will cooperate in managing the groundwater resources of the Carrizo aquifer. The District has provided and will continue to provide the other GCDs in the aquifer management area with copies of its management plan and rules when changes are made.

Interlocal agreements with neighboring GCD's are renewed on a five (5) year cycle to ensure a mutually advantageous benefit of constituents to coordinate statutory duties related to scientific data collection and the associated management of groundwater resources and underlie neighboring districts, particularly within the context of the "joint planning" process and establishment and achievement of DFC's set within GMA 13.

Figure 2.1


Groundwater Management Areas
of
Texas
1
2
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5
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7
8
9
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11
12
13
14
15
16
County Boundaries
GMA - 1
GMA - 2
GMA - 3
GMA - 4
GMA - 5
GMA - 6
GMA - 7
GMA - 8
GMA - 9
GMA - 10
GMA - 11
GMA - 12
GMA - 13
GMA - 14
GMA - 15
GMA - 16
TNRIS
Texas Water Development Board

Groundwater Management Areas in Texas

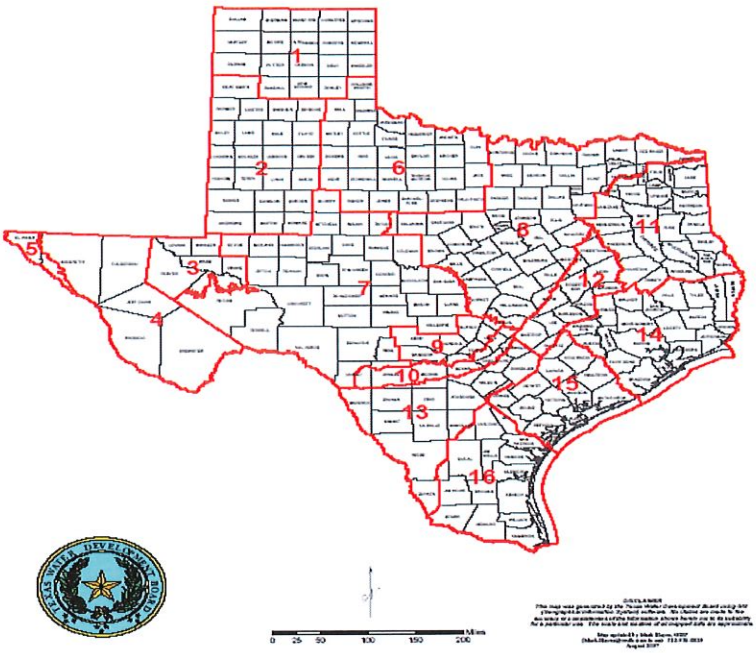
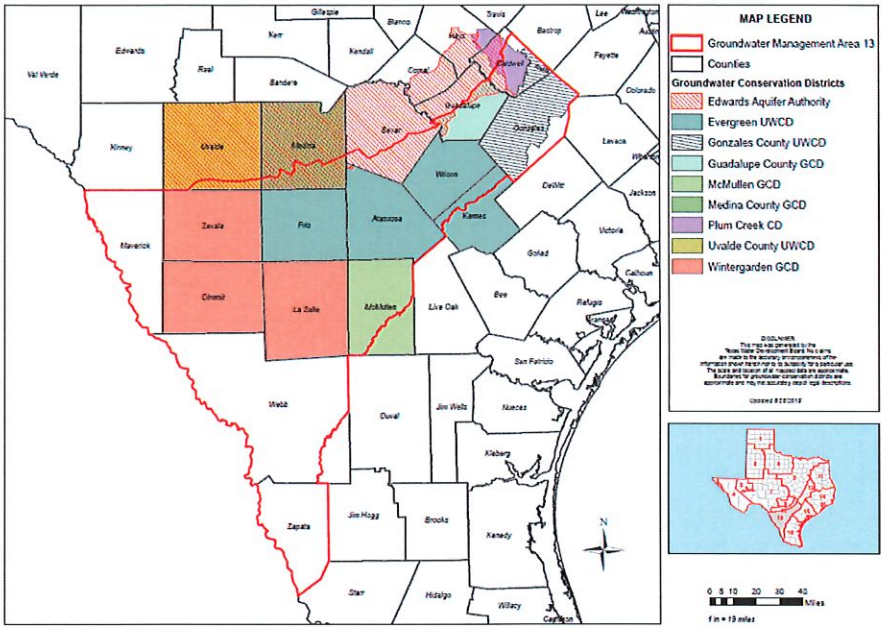


Figure 2.2

Groundwater Management Area 13



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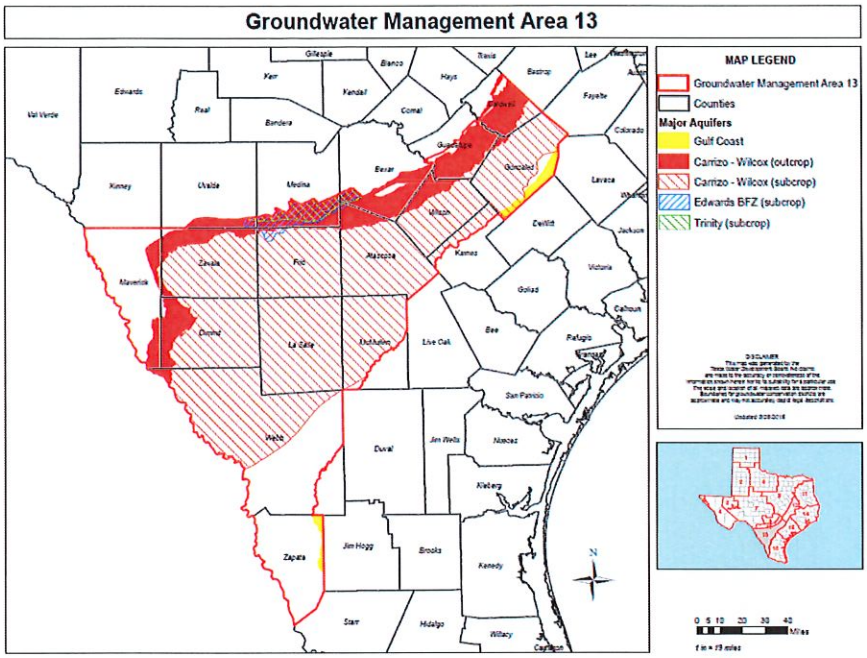
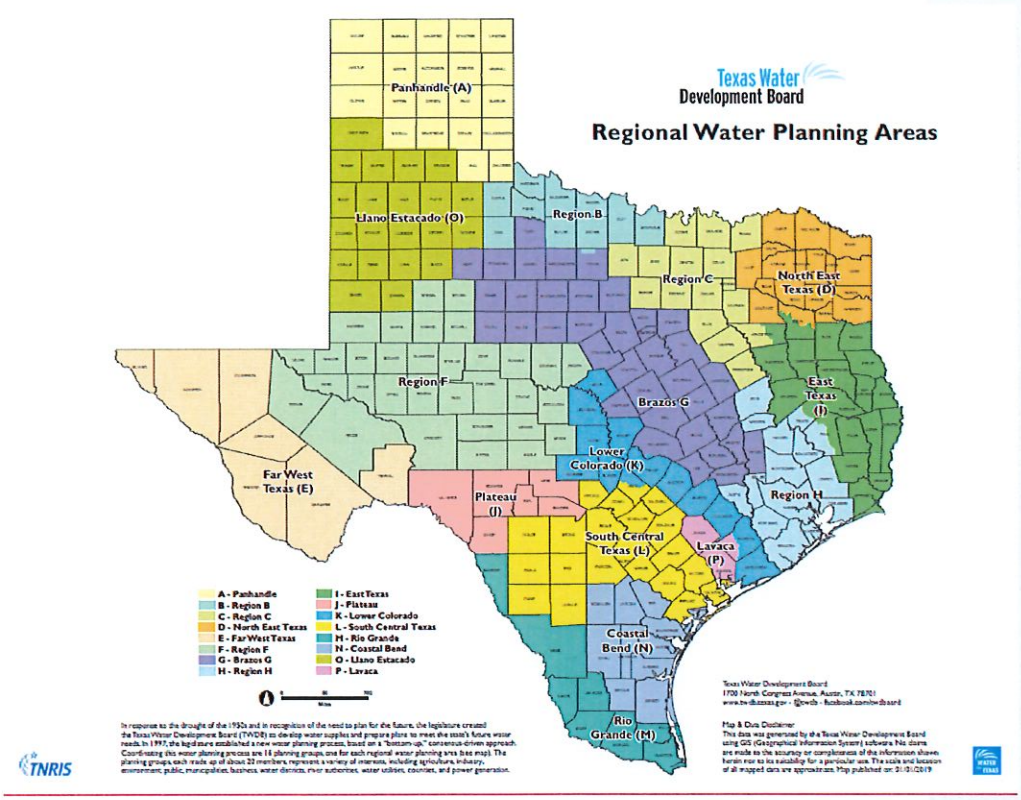


The GCUWCD is located within planning Region L (South Central Texas Regional Planning Group). Region L includes all or parts of 21 counties, portions of nine river and coastal basins, the Guadalupe Estuary, and San Antonio Bay (**Figure 3.1 and 3.2**). The Board of Directors unanimously supports the concept of a grassroots planning effort. The District will actively provide input to the regional plan and participate in the planning effort.


Texas Water Development Board
Regional Water Planning Areas
Panhandle (A)
Llano Estacado (O)
Region B
Region C
North East Texas (D)
Region F
Brazos G
East Texas (I)
Lower Colorado (K)
Far West Texas (E)
Plateau (J)
Region H
South Central Texas (L)
Lavaca (P)
Coastal Bend (N)
Rio Grande (M)
A - Panhandle
B - Region B
C - Region C
D - North East Texas
E - Far West Texas
F - Region F
G - Brazos G
H - Region H
I - East Texas
J - Plateau
K - Lower Colorado
L - South Central Texas
M - Rio Grande
N - Coastal Bend
O - Llano Estacado
P - Lavaca
TNRIS

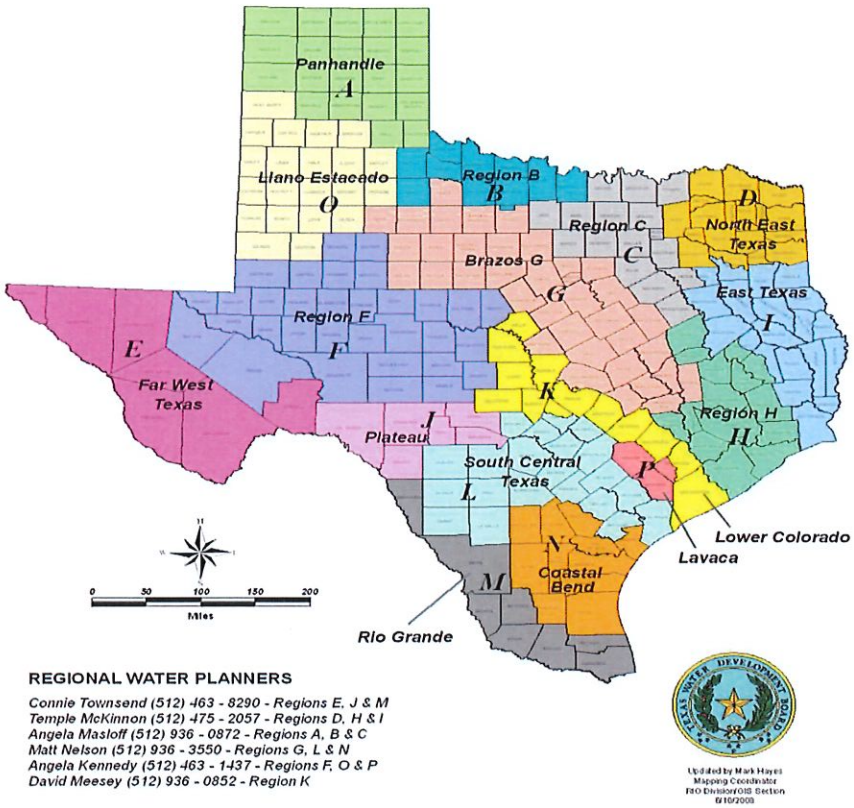
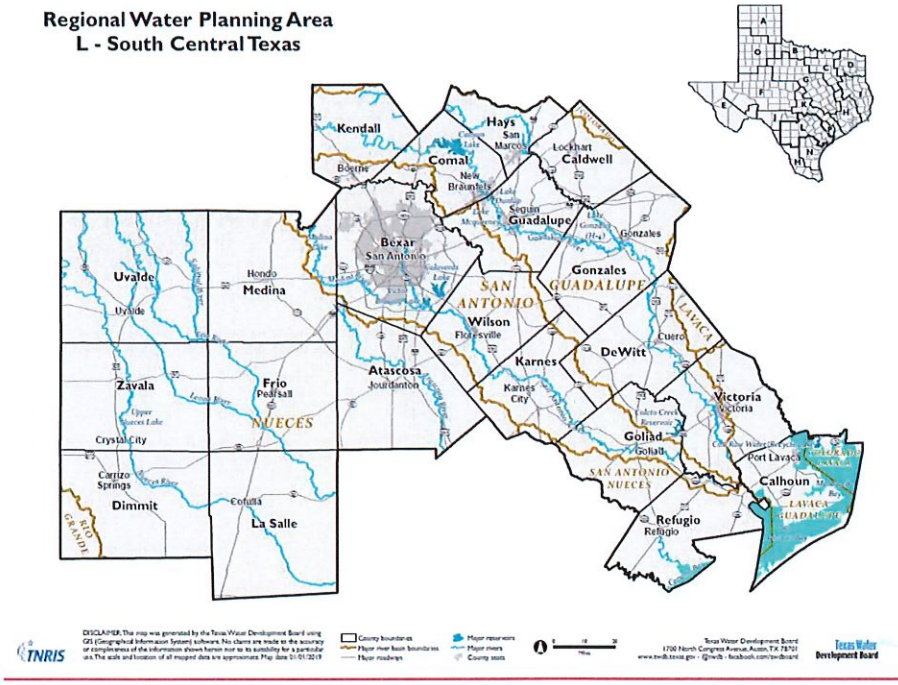

Regional Water Planning Areas
Panhandle
A
Llano Estacado
O
Region B
B
Region C
C
North East Texas
D
Brazos G
G
East Texas
I
Region F
F
E
Far West Texas
K
Region H
H
Plateau
J
South Central Texas
L
P
Lower Colorado
Lavaca
N
Coastal Bend
M
Rio Grande
0 50 100 150 200
Miles
REGIONAL WATER PLANNERS
Connie Townsend (512) 463 - 8290 - Regions E, J & M
Temple McKinnon (512) 475 - 2057 - Regions D, H & I
Angela Masloff (512) 936 - 0872 - Regions A, B & C
Matt Nelson (512) 936 - 3550 - Regions G, L & N
Angela Kennedy (512) 463 - 1437 - Regions F, O & P
David Meesey (512) 936 - 0852 - Region K
Updated by Mark Hayes
Mapping Coordinator
RIO Division/GIS Section
6/10/2008

Figure 3.24



~~3.5 Topography~~3.5 Topography and Drainage

The GCUWCD lies within south-central Texas on the Gulf Coastal Plain. In most of the District the topography ranges from flat to rolling. However, two prominent lines of hills extend across parts of Gonzales County – one along the northwestern boundary from Ottine to about seven (7) miles northwest of Dewville and the other along the boundary with Lavaca County. In Caldwell County, the minimum elevation, about 295 feet, is at the southern tip of the County where Plum Creek joins the San Marcos River. The maximum elevation is in the area of the so-called "Iron Mountains" peaks southeast and south of McMahan.

Most of the District lies in the drainage basin of the Guadalupe River. Two small areas in the eastern and southeastern parts of the District are drained by the Colorado River. Most of the southern and southwestern parts of Gonzales County are drained by Sandies Creek, which flows southeastward and enters the Guadalupe River near Cuero in Dewitt County. Most of the northern and northeastern parts of Gonzales County are drained by Peach Creek, which flows southward, entering the Guadalupe River about ten (10) miles southeast of Gonzales. Plum Creek, the major tributary to the San Marcos River in Caldwell County, drains about 310 square miles (about 60 percent) of the County.

~~3.6 Groundwater~~3.6 Groundwater Resources

The Wilcox Group yields small to moderate quantities of fresh to slightly saline water to a few wells in and near the outcrop in the northwestern part of Gonzales County. In Caldwell County, the Wilcox yields small to large quantities of water to many wells for domestic and stock purposes, public supply, and some irrigation. The Wilcox Group crops out in a small area in the GCUWCD near Ottine. The Wilcox is

composed of clay, silt, fine to medium-grained sand and sandstone, sandy shale, and thin beds of lignite. The thickness of the Wilcox ranges from about 1,300 to 3,200 feet, with a maximum thickness of 2,000 feet occurring in an erosional channel in the southeastern part of the District. This erosional channel is filled largely with silty shale.

The principal water-bearing formation in the GCUWCD is the Carrizo Aquifer, which yields moderate to large quantities of fresh to slightly saline water throughout a large part of its subsurface extent. Most of the Carrizo in the GCUWCD has at least 80 percent sand. Portions of the Carrizo in the eastern half of the GCUWCD have 60 to 80 percent sand, generally corresponding to the area of the Yoakum Channel. Geologic thickness maps produced for the GCUWCD indicate that the Carrizo varies from less than 200 feet over the San Marcos Arch in the central portion of the county to more than 600 feet in the western portion of the GCUWCD and about 800 feet in the Yoakum Channel in the eastern portion of the GCUWCD. The Carrizo crops out in a small area along the western edge of Gonzales County and across the southeast portion of Caldwell County in a belt 1.5 to 3.5 miles wide. The Carrizo consists of beds of massive, commonly cross-bedded coarse sand and some minor amounts of sandstone and clay.

The Queen City aquifer yields small to moderate quantities of fresh to slightly saline water to wells in the area of the outcrop and downdip for a distance of about 5 to 8 miles. The Queen City aquifer crops out in a northeastward trending belt across Gonzales and Caldwell Counties about 2 to 4 miles wide and is composed of massive to thin bedded medium to fine sand and clay. The thickness of the Queen City ranges from about 400 to 825 feet where the entire section is present.

The Sparta aquifer yields small to moderate quantities of fresh to slightly saline water in the outcrop and for a few miles downdip. The Sparta aquifer crops out in a belt about 1 mile wide trending northeastward across Gonzales County and consists of fine to medium grained sand with some shale. The thickness of the Sparta aquifer averages about 100 feet.

The Yegua-Jackson aquifer runs approximately parallel to the Gulf of Mexico coastline and is aligned across the south-central portion of the GCUWCD in a narrow band approximately 7 to 10 miles wide. In Gonzales County, the Yegua Formation yields small quantities of slightly to moderately saline water for domestic use and for livestock. At some places in the County, sands in the Jackson also yield small quantities of fresh to slightly saline water for domestic use and for livestock. The Yegua Formation is composed of medium to fine sand, clay, silt, small amounts of gypsum, and beds of lignite. The Yegua has a maximum thickness of about 1,000 feet. The Jackson Group conformably overlies the Yegua Formation and consists of clay, silt, tuffaceous sand, sandstone, bentonitic clay, and some volcanic ash, and has a maximum thickness of at least 950 feet and possibly as much as 1,200 feet.

4.0 CRITERIA FOR PLAN APPROVAL

4.1 Planning Horizon

This plan shall be used for the ten (10) year period following approval as administratively complete by the Texas Water Development Board (TWDB) as required by *31 TAC §356.52(a)*. The GCUWCD shall implement these goals and policies for a planning period of ten (10) years and will review the plan in five (5) years or sooner as circumstances warrant.

4.2 Board Resolution

A certified copy of the GCUWCD's resolution adopting this plan as required by *31 TAC §356.53(a)(2)* is included in **Appendix 1**.

4.3 Plan Adoption

Public notices documenting that this plan was adopted following appropriate public meetings and hearings, as required by *31 TAC §356.53(a)(3)*, are included in **Appendix 2**.

4.4 Coordination with Surface Water Management Entities

Letters transmitting copies of this plan to the Guadalupe Blanco River Authority and Region L are included in **Appendix 3** as required by *31 TAC §356.51*.

5.0 DESIRED FUTURE CONDITIONS AND MODELED AVAILABLE GROUNDWATER

Section 36.108, Texas Water Code, requires joint planning among the groundwater conservation districts within GMA 13. A key part of joint planning is determining "desired future conditions" (DFCs) that are used to calculate "modeled available groundwater" (MAG). These conditions and volumes are used for regional water plans, groundwater management plans, and permitting. DFCs are the desired, quantified conditions of groundwater resources (such as water levels, water quality, spring flows, or volumes) at a specified time or times in the future or in perpetuity.

The desired future conditions for the Carrizo-Wilcox, Queen City, and Sparta aquifers described in Resolution 21-02 from Groundwater Management Area 13, adopted November 19, 2021, are:

- *"The first desired future condition for the Carrizo-Wilcox, Queen City and Sparta aquifers in Groundwater Management Area 13 is that 75 percent of the saturated thickness in the outcrop at the end of 2012 remains in 2080. Due to the limitations of the current Groundwater Availability Model, this desired future condition cannot be simulated as documented during 2016 Joint Planning in GMA 13 Technical Memorandum 16-08 (Hutchison, 2017a)."*

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- *"In addition, a secondary proposed desired future condition for the Carrizo-Wilcox, Queen City, and Sparta aquifers in Groundwater Management Area 13 is an average drawdown of 49 feet (+/- 5 feet) for all of GMA 13. The drawdown is calculated from the end of 2012 conditions to the year 2080. This desired future condition is consistent with simulation "GMA13_2019_001" summarized during a meeting of Groundwater Management Area 13 members on March 19, 2021."*

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~~Due to limitations with the model as described in Technical Memorandum 16-08, two proposed desired future conditions were selected for the Carrizo-Wilcox, Queen City, and Sparta aquifers as described below.~~

- ~~The first proposed desired future condition for the Carrizo-Wilcox, Queen City and Sparta aquifers in Groundwater Management Area 13 is that 75 percent of the saturated thickness in the outcrop at the end of 2012 remains in 2070. This desired future condition is considered feasible as detailed in GMA 13 Technical Memorandum 16-08.~~

- ~~A secondary proposed desired future condition for the Carrizo-Wilcox, Queen City, and Sparta aquifers in Groundwater Management Area 13 is an average drawdown of 48 feet for all of GMA 13. The drawdown is calculated from the end of 2012 conditions to the year 2070. This desired future condition is consistent with Scenario 9 as detailed in GMA 13 Technical Memorandum 16-01 and GMA 13 Technical Memorandum 16-08.~~

~~The desired future conditions for the Yegua-Jackson Aquifer in Groundwater Management Area 13 are summarized in GMA 13 Technical Memorandum 16-04:~~

- ~~For Gonzales County, the average drawdown from 2010 to 2070 is 3 feet~~

The desired future conditions for the Yegua-Jackson Aquifer described in Resolution 21-03 from Groundwater Management Area 13, adopted November 19, 2021 are:

- *"For Gonzales County, the average drawdown from 2010 to 2080 is 3 feet (+/- 1 foot)."*

The Edwards (Balcones Fault Zone), Gulf Coast, and Trinity aquifers were declared not relevant for purposes of joint planning by Groundwater Management Area 13 in Resolution 21-01

For each aquifer, the DFC average drawdowns encompass the full extent of the aquifers within the District, from the outcrop to the downdip limit of the aquifer within the District boundary. The GMA13 wide DFCs for the Carrizo-Wilcox, Queen City, Sparta, and Yegua-Jackson aquifers equate to drawdowns in the District's aquifers as shown in **Table 1** below.

Table 1
Desired Future Conditions
Appendix 4: GMA 13 Technical Memorandums ~~16-01 and 16-04~~GMA13-2019-001
Gonzales County Underground Water Conservation District

Aquifer	Average Drawdown (feet)
~~Wilcox (Upper)~~Wilcox (Upper)	~~139~~120
~~Wilcox (Middle)~~Wilcox (Middle)	~~137~~129
~~Wilcox (Lower)~~Wilcox (Lower)	~~216~~145
Wilcox (Upper)	120
Wilcox (Middle)	129
Wilcox (Lower)	145
Carrizo-Wilcox	120~~140~~
Queen City	31~~42~~
Sparta	23~~28~~
Yegua-Jackson	3

Modeled Available Groundwater (MAG) is defined in the Texas Water Code, Section 36.001, Subsection (25) as "the amount of water that the executive administrator determines may be produced on an average annual basis to achieve a desired future condition established under Section 36.108." MAG estimates for the Wilcox, Carrizo, Queen City, Sparta and Yegua-Jackson Aquifers were received from the TWDB in October 2017. Presentation of this data in the management plan is required by *31 TAC §356.52 (a)(5)(A)*.

Table 2
Modeled Available Groundwater
Gonzales County Underground Water Conservation District
Appendix 5: GAM Run ~~10-017-027~~21-018 MAG

Aquifer	Year

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	2020 (ac-ft/yr)~~2012 (ac-ft/yr)~~	2030 (ac-ft/yr)~~2020 (ac-ft/yr)~~	2040 (ac-ft/yr)~~2030 (ac-ft/yr)~~	2050 (ac-ft/yr)~~2040 (ac-ft/yr)~~	2060 (ac-ft/yr)~~2050 (ac-ft/yr)~~	2070 (ac-ft/yr)~~2060 (ac-ft/yr)~~	2080 (ac-ft/yr)~~2070 (ac-ft/yr)~~
~~Upper Wilcox~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~
~~Middle Wilcox~~	~~12,187~~	~~12,187~~	~~12,187~~	~~12,187~~	~~12,187~~	~~12,187~~	~~12,187~~
~~Lower Wilcox~~	~~25,836~~	~~25,836~~	~~25,836~~	~~25,836~~	~~25,836~~	~~25,836~~	~~25,836~~
Carrizo-Wilcox	~~83,284~~60,899	~~83,284~~85,737	~~83,284~~107,189	~~84,026~~127,883	~~84,390~~132,834	~~81,607~~133,794	~~81,615~~126,248
Queen City	~~5,351~~9,815	~~5,351~~9,789	~~5,351~~9,530	~~5,351~~9,505	~~5,351~~9,505	~~5,351~~8,477	~~5,351~~8,477
Sparta	3,524~~3,554~~	~~3,554~~2,451	~~3,554~~2,457	~~3,554~~2,451	~~3,554~~2,451	~~3,554~~2,451	~~3,554~~2,451
Yegua Jackson	~~4,140~~4,728	~~4,140~~4,728	~~4,140~~4,728	~~4,140~~4,728	~~4,140~~4,728	~~4,140~~4,728	~~4,140~~4,728

The GAM run used to determine the MAG included all groundwater from the outcrop to the downdip extent within the GCUWCD for all of the aquifers. The quality of the water was not ~~taken into account~~considered so the MAG volumes include water with total dissolved solids concentrations (TDS) up to and possibly exceeding 3,000 ppm.

According to information included in the Final Reports of Groundwater Availability Models for the Carrizo-Wilcox, Queen City and Sparta Aquifers, prepared for the TWDB, limitations are intrinsic to models. Model limitations can be grouped into several categories including: (1) limitations in the data supporting a model, (2) limitations in the implementation of a model which may include assumptions inherent to the model application, and (3) limitations regarding model applicability. The report also states that the GAMs were developed on a regional scale and are applicable for assessing regional aquifer conditions resulting from groundwater development over a fifty-year time period. At this scale, the models are not capable of precisely predicting aquifer responses at specific points such as a particular well. Thus, the estimation of available groundwater calculated by the Southern Carrizo-Wilcox Queen City and Sparta (SCWQCS) GAM should be considered as a tool to assist the District in managing the aquifers to comply with the District's adopted DFCs.

Drawdown averages and modeled available groundwater values were based on the TWDB defined aquifer boundaries rather than the model extent. Drawdowns for cells that became dry during the simulation (water level dropped below the base of the cell) were calculated as the reference year water level elevation minus the elevation of the model cell bottom. Pumping in dry cells was excluded from the modeled available groundwater calculations for the decades after the cell went dry. A tolerance of five feet was assumed when comparing desired future conditions to modeled drawdown results. This tolerance was specified by the GMA in their definition of the desired future conditions. Estimates of modeled available groundwater from the model simulation were rounded to the nearest whole number. The verification calculation for the desired future conditions is based on an average of all model layers (Layers 1 through 8). The modeled available groundwater calculations are based on Layer 1 for the Sparta Aquifer, Layer 3 for the Queen City Aquifer, and the sum of Layers 5 through 8 for the Carrizo-Wilcox Aquifer.

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6.0 Estimated Historical Groundwater Use and 2017 State Water Plan Datasets

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The TWDB provides a package of data reports (Parts 1 and 2) to groundwater conservation districts to assist them in meeting the requirements for approval of their five-year groundwater Management Plan. Each report in the package addresses a specific numbered requirement in the TWDB's groundwater Management Plan checklist. The five reports in Part 1 are:

1. **Estimated Historical Groundwater Use** - the TWDB Uses Unit operates an annual survey of ground and surface water use by municipal and industrial entities within the state of Texas. This survey collects the volume of both ground and surface water used, the source of the water, water sales and other pertinent data from the users. The data provides an important source of information in helping guide water supply studies and regional and state water planning. Presentation of this data in the management plan is required by *§36.1071(e)(3)(B), Texas Water Code.*
2. **Projected Surface Water Supplies** - estimates of projected water supplies represent the estimated capacity of water systems to deliver water to meet user needs on an annual basis. Estimates of projected water supplies are compared with estimates of projected water demand to determine if the existing infrastructure is capable of meeting the expected needs of the water user group. Presentation of this data in the management plan is required by *§36.1071(e)(3)(F), Texas Water Code.*
3. **Projected Water Demands** - the projected water demand estimates are derived from the TWDB 2012 State Water Plan. These water demand projections are separated into the following designated uses: municipal, manufacturing, steam electric, irrigation, mining, and livestock. Water demand is the total volume of water required to meet the needs of the specified user groups located within the District's planning area. Presentation of this data in the management plan is required by *§36.1071(e)(3)(G), Texas Water Code.*
4. **Projected Water Supply Needs** - the projected water supply needs estimates are derived from the 2012 State Water Plan. Estimates of Projected Water Supplies are compared with estimates of Projected Water Demand to determine if the existing infrastructure is capable of meeting the expected Water Supply Needs of the water user group. Presentation of Water Supply Needs in the management plan is required by *§36.1071(e)(4), Texas Water Code.*
5. **Projected Water Management Strategies** - water management strategies are specific plans to increase water supply or maximize existing supply to meet a specific need. Municipal water conservation strategies focus on reducing residential, commercial, and institutional water use through a variety of social or technological approaches. Local Carrizo-Wilcox temporary overdraft strategies involve temporarily over-drafting the aquifer during drought conditions to supplement water supplies. Presentation of water management strategies in the management plan is required by *§36.1071(e)(4), Texas Water Code.*

The Part 1 data package reports are included in **Appendix 6**.

7.0 Groundwater Availability Model Report

Part 2 of the TWDB data package is the Groundwater Availability Model report. Texas Water Code, Section 36.1071, Subsection (h) states that, in developing a groundwater management plan, GCDs shall use groundwater availability modeling provided by the TWDB. Information derived from the groundwater availability models that shall be included in the management plan includes:

1. the annual amount of recharge from precipitation, if any, to the groundwater resources within the District – required by *§36.1071(e)(3)(E), Texas Water Code.*
2. for each aquifer within the District, the annual volume of water that discharges from the aquifer to springs and any surface water bodies, including lakes, streams, and rivers – required by *§36.1071(e)(3)(E), Texas Water Code.*
3. the annual volume of flow into and out of the District within each aquifer and between aquifers in the District – required by *§36.1071(e)(3)(E), Texas Water Code.*

The TWDB ran a groundwater availability model (GAM Run 18-006) for the central and southern Carrizo-Wilcox, Queen City, and Sparta aquifers, the Yegua-Jackson Aquifer, and the central portion of the Gulf Coast Aquifer to create a groundwater budget. A groundwater budget summarizes water entering and leaving the aquifer according to input parameters assigned in the models to simulate the groundwater flow system. The components of the water budgets include:

1. **Precipitation Recharge** – this is the aerially distributed recharge sourced from precipitation falling on the outcrop areas of the aquifers (where the aquifer is exposed at the land surface) within the District.
2. **Surface Water Outflow** – this is the total water exiting the aquifer (outflow) to surface water features such as streams, reservoirs, and drains (springs).
3. **Flow ~~Into~~into and Out of District** – this component describes lateral flow within the aquifer between the District and adjacent counties.
4. **Flow Between Aquifers** – this describes the vertical flow, or leakage, between aquifers or confining units. Inflow to an aquifer from an overlying aquifer will always equal the outflow from the other aquifer.

The Part 2 data package is included in **Appendix 7**.

8.0 MANAGEMENT OF GROUNDWATER RESOURCES

The GCUWCD will manage groundwater resources consistent with the intent and purpose of the District to conserve, preserve, protect and prevent waste of groundwater resources so that the economy of the areas within the District will be ensured of growth for future generations. Details of how the District will manage groundwater supplies, as required by *31 TAC 356.52(a)(4)*, as well as the actions, procedures, performance and avoidance necessary to effectuate the management plan, including specifications and the proposed rules, as required ~~by §~~by *§36.1071(e)(2), Texas Water Code* are presented below.

~~8.1 Regulatory~~8.1 Regulatory Action Plan

Pursuant to Chapter 36 of the Texas Water Code, the District has adopted rules limiting groundwater production based on tract size and the spacing of wells, to provide for conserving, preserving, protecting, preventing degradation of water quality and to prevent the waste of groundwater. This District will enforce the rules of the District to meet the goals of regulating the production of groundwater within the District. These rules will govern the permitting of wells to be drilled and the production of water from permitted wells. The rules shall be adhered to and shall be based on the best technical evidence available. Copies of the District's Rules and the Management Plan shall be available at the District's office at no charge to residents of the District.

The District will monitor water levels in selected observation wells and evaluate whether the annual change in water levels is in conformance with the DFCs adopted by GMA 13 for each aquifer. The

District will use information readily available (Groundwater Availability Models, TWDB reports, etc.) or install observation wells to assess the saturated thickness of the outcrops for the Carrizo-Wilcox, Queen City, and Sparta aquifers. The District will use the saturated thickness of the approximate center of the outcrop as the monitoring location for the DFC. Water levels will be collected from nearby observation wells to monitor the saturated thickness levels of the aquifers.

For the Yegua-Jackson aquifer the starting water level date for the District's DFC is January 2010. The District will measure water levels in designated observation wells during the winter months (November through February). Water level measurements will be obtained by automatic or manual water level monitoring equipment. The District will calculate the average yearly change in water level based on all of the wells in the observation well network. These changes will be summed each year over the DFC planning period. The average water level declines over time will be compared to production amounts to assist in predicting future water level declines.

The District will estimate total annual groundwater production for each aquifer based on water use reports, estimated exempt use, and other relevant information and compare these production estimates to the MAGs. The District will base future permitting decisions on the amount of existing water permitted, amount existing water being produced, and the condition of the aquifer (water level drawdowns) at the time the permit application is filed in order to achieve the DFC.

~~8.2 Permits~~8.2 Permits and Enforcement

The District may deny permits or limit groundwater withdrawals following the guidelines stated in the rules of the District and this plan. In determining whether to issue a permit or limit groundwater withdrawal, the District will consider the public benefit against individual hardship after considering all relevant evidence, appropriate testimony and all relevant factors.

In carrying out its purpose, the District may require the reduction of groundwater withdrawal to amounts that will not cause the water table or artesian pressure to drop to a level that would cause harm to the aquifer or exceed the specified drawdown limitations under the adopted Desired Future Conditions. To achieve this purpose the District may, at its discretion and based on information obtained through its groundwater monitoring procedures, amend or revoke any permits after notice and hearing. The monitoring procedures include calculation of yearly average drawdowns which will ensure that the District and permit holders are fully aware of the condition of the aquifers and corrective action measures can be reasonably implemented over appropriate intervals without causing harm to human health.

The District will enforce the terms and conditions of permits and its rules by enjoining the permittee in a court of competent jurisdiction as provided for in Section 36.102 of the Texas Water Code.

~~8.3 Exempt~~8.3 Exempt Use Wells

This plan and its accompanying rules shall exempt certain uses from the permit requirement as provided for in Section 36.117 of the Texas Water Code. The District, by rule, also provides exemptions for other categories of groundwater use including agricultural use, fracking use, and monitoring wells.

~~8.4 Permit~~8.4 Permit Fees

The District will assess reasonable fees for processing a permit application to drill a test hole, for processing drilling and production permit applications, for processing export permit applications, and for processing permit applications to rework, re-equip, or alter a water well. No application fees are required for registering and recording the location of an existing well with the District.

~~8.5 Equity~~8.5 Equity and Discretion

The District shall treat all citizens and entities of the District equally. Upon applying for a permit to drill a water well or a permit to increase the capacity of an existing well, the Board of Directors shall take into consideration all circumstances concerning the applicant's situation. The Board may grant an exception to the rules of the District when granting permits to prevent hardship or economic loss, also taking into consideration hydrological, physical or geophysical characteristics. Therefore, temporary exceptions to the general rule for a specific area may be necessary if an economic hardship will be created that is significantly greater for one person than for others in the District. In considering a request for an exception, the Board will also consider any potential adverse impacts on adjacent landowners. The exercising of discretion by the Board may not be construed to limit the power of the Board.

~~8.6 Spacing~~8.6 Spacing Requirements

Spacing of wells from the property line shall be in accordance with the rules of the District.

~~8.7 Production~~8.7 Production Ratios

The District may adopt rules to regulate groundwater withdrawals by means of production limits. The District may deny a well permit or limit groundwater withdrawals in accordance with guidelines stated in the rules of the District. In ~~making a determination~~deciding to deny a permit or reduce the amount of groundwater withdrawals authorized in an existing permit, the District may weigh the public benefit in managing the aquifer to be derived from denial of a groundwater withdrawal permit or the reduction of the amount of authorized groundwater withdrawals against the individual hardship imposed by the permit denial or authorization reduction.

~~8.8 Cooperation~~8.8 Cooperation and Coordination

Public cooperation is essential for this plan to accomplish its objectives. The District will work with the public and local and state governments to achieve the goals set forth in this plan. The District will coordinate activities with all public water suppliers, private water suppliers, industrial users and agricultural users to help them conserve groundwater. The Guadalupe Blanco River Authority is the local entity regulating all surface water in the District and the District will work closely with this agency to achieve our mutual water related goals. The TCEQ is the agency charged with protecting the state's water resources, and the TWDB is the agency responsible for water resources planning and promotion of water conservation practices. The District will continue to work with both of these agencies to conserve, preserve and protect water resources and to prevent waste as outlined in this plan.

~~8.9 Subsidence~~8.9 Subsidence

Subsidence is not a relevant factor with the aquifers managed by this District; the District includes a portion of the Gulf Coast Aquifer, which is known for its susceptibility to subsidence, but the District's creation order does not give the District any jurisdiction over the Gulf Coast Aquifer.

~~8.10 Transportation~~8.10 Transportation of Water from the District

In accordance with Section 36.122 of the Texas Water Code, if the proposed use of a water well or wells is for transportation of water outside the District additional information shall be required and an export permit must be obtained from the Board before operating a transportation facility. The District may, in considering renewal of an export permit, review the amount of water that may be transferred out of the District. At any time during the term of an export permit, the District may revise or revoke a permit if the use of water unreasonably affects existing groundwater and surface water resources or existing Permit Holders.

~~8.11 Groundwater~~8.11 Groundwater Protection

Section 26.401 of the Texas Water Code states that: "In order to safeguard present and future groundwater supplies, usable and potential usable groundwater must be protected and maintained."

Groundwater contamination may result from many sources, including current and past oil and gas production, agricultural activities, industrial and manufacturing processes, commercial and business endeavors, domestic activities and natural sources that may be influenced by or may result from human activities. The District will take appropriate measures to monitor activities that are either causing, or have the potential threat to cause groundwater contamination. Due to permeability of aquifer outcrops and recharge zones, there is a greater threat of groundwater contamination from surface pollution in recharge and outcrop regions, and the District will monitor those areas more closely.

~~8.12 Drought~~8.12 Drought Management

Periodic drought is a condition that plagues the GCUWCD. The Board of Directors of the District is very concerned that water will be available for the needs of the citizens during times of drought. The General Manager of the District will update the Board at every monthly meeting on drought conditions in the District. The General Manager will report the Palmer Drought Severity Index to the Board during the manager's report for the month. The Board of Directors will instruct the General Manager of the appropriate actions to be taken upon notification of moderate to severe drought. The possible actions to be taken may include public service announcements on the radio, newspaper articles on conditions of the aquifer, water conservation information, and/or notices to municipal suppliers to implement their drought plan.

~~8.13 Technical~~8.13 Technical Research and Studies

The District, in cooperation with the TWDB and the TCEQ, will conduct studies to monitor the water level in the Yegua Jackson, Sparta, Queen City, Carrizo, and Wilcox aquifers to determine if there is any danger of damaging these aquifers due to over production. The District will also establish water quality monitoring wells through out the District to determine if any degradation of water quality is occurring. The District is currently cooperating with the Texas Water Development Board with its monitoring of the Wilcox, Carrizo, Queen City, Sparta and Yegua Jackson aquifers.

~~8.14 Groundwater~~8.14 Groundwater Recharge

The GCUWCD is prohibited from financing any groundwater recharge enhancement projects by order of the Texas Natural Resource Conservation Commission number 101692-DO4. The District has adopted rules to regulate Managed Aquifer Recharge projects.

~~8.15 Public~~8.15 Public Information

A ~~well-informed~~well-informed public is vital to the proper operation of a groundwater conservation district. The District will keep the citizens of the District informed by means of a website, timely newspaper articles and/or public service radio announcements. As part of the public information program the directors of the District and the District manager will make presentations to public gatherings, as requested, in order to keep the citizens informed about District activities and to promote proper use of available groundwater. ~~The District has an ongoing program to assist teachers at public schools with the education of children on issues of groundwater conservation and the hydrology of our area.~~ The District conducts community outreach in the form of providing rain gauges and informational presentations at community group events.

~~8.16 Conservation~~8.16 Conservation and Natural Resource Issues

Water is the most precious natural resource on Earth. The District will promote conservation as a way of life in order to conserve fresh water for future generations. The District will require wells in areas that are in danger of over producing groundwater and damaging the aquifers to restrict production by means of production permits and metering of the amount of water produced. The District will work with water utilities, agricultural and industrial users to promote the efficient use of water so that we may conserve

water. The District will keep abreast of developments in water conservation and update requirements as needed. The District will, upon request, provide information on wells and water levels to the Natural Resources Conservation Service to develop waste management plans for the poultry producers.

Abandoned oil wells pose the greatest threat to the aquifers of the District. District personnel will monitor oilfield activity and notify the public that they may report abandoned oil wells and other problems associated with oil production to the District.

9.0 METHODOLOGY FOR TRACKING DISTRICT PROGRESS IN ACHIEVING MANAGEMENT GOALS

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. The Annual Report will be presented to the Board on or before March 31st of each new year. The Board will maintain the report on file for public inspection at the District's offices upon adoption.

10.0 GOALS, MANAGEMENT OBJECTIVES, PERFORMANCE STANDARDS AND METHODOLOGY FOR TRACKING PROGRESS

The District's management goals, objectives, performance standards, and methodology for tracking progress, as specified in *36.1071(e)(2), Texas Water Code* are addressed below.

~~10.1 Plan~~10.1 Plan Elements Required by State Law and Rule

Providing the Most Efficient Use of Groundwater
31 TAC 356.52(a)(1)(A)

The District's goal is to provide for the most efficient use of the groundwater resources of the GCUWCD.

Management Objective 1: The District will register at least 20 exempt use wells and will compile the data into a database.

> **Performance:** Record the date and number of exempt use wells registered in a database and include the information in the District's Annual Report.

Management Objective 2: The District will measure water levels in at least 40 observation wells to provide coverage across the Wilcox, Carrizo, Queen City, Sparta, and Yegua-Jackson Aquifers three times a year and will compile the water level data into a database.

> **Performance:** Record the number of wells and water level measurements measured for each aquifer annually in a database and include this information in the District's Annual Report.

Management Objective 3: The District will meet with the cities of Gonzales, Nixon, Smiley, and Waelder, and the Gonzales Area Development Corporation at least once a year to inform them on water availability for economic development.

> **Performance:** Record the date and number of meetings annually and include a copy of the meeting attendee's sheet and information on the topics of discussion with each entity in the District's Annual Report.

Management Objective 4: The District will gather water production data from local public water suppliers including the Gonzales County Water Supply Corporation, City of Gonzales, City of Nixon, City of Smiley, and City of Waelder, ten permitted or registered irrigation wells, and two livestock production facilities annually and compile the data into a database.

Performance: Record the amount of water used by each public water supplier, irrigation well, and livestock production facility and include the information into the District's Annual Report.

Controlling and Preventing Waste of Groundwater
31 TAC 356.52(a)(1)(B)

Management Objective 1: The District will provide educational resources to citizens within the District on controlling and preventing waste of groundwater. The District will, at least annually, submit an information article on controlling and preventing waste of groundwater within the District for publication in a newspaper of general circulation in the District or may publish the article on the District's website. The District may also make a presentation to the public through local service organizations or public schools describing measures that can be taken by water users within the District.

Performance: Record the dates of each control and prevention of waste article submitted for publication, published on the District's website, or presentation made to the public and include this information in the District's Annual Report.

Controlling and Preventing Subsidence
31 TAC 356.52(a)(1)(C)

Because of the rigid geologic framework of the aquifers regulated by the District subsidence is not a relevant issue within the GCUWCD. The District includes a portion of the Gulf Coast Aquifer, which is known for its susceptibility to subsidence, but the District's creation order does not give the District any jurisdiction over the Gulf Coast Aquifer. Therefore, the management goal is not relevant or applicable.

Conjunctive Surface Water Management
31 TAC 356.52(a)(1)(D)

The District's goal is to maximize the efficient use of groundwater and surface water for the benefit of the residents of the District.

Management Objective 1: The District will meet with the staff of the Guadalupe Blanco River Authority ("GBRA"), at least once a year, to share information updates about conjunctive use potential.

Performance: Record the number of GBRA meetings attended annually and include a copy of the meeting attendee's sheet and information on the topics of discussion in the District's Annual Report.

Management Objective 2: The District will attend at least one Regional Water Planning Group ("RWPG") meeting annually to share information updates about conjunctive use potential.

Performance: Record the number of RWPG meetings attended annually and include a copy of each RWPG meeting agenda and a copy of the meeting minutes in the District's Annual Report.

Addressing Natural Resource Issues

31 TAC 356.52(a)(1)(E)

The District's goal is to protect the Natural Resources of the GCUWCD. The District believes that preventing the contamination of groundwater is the single most important waste prevention activity it can undertake.

Management Objective 1: The District will collect water quality data in at least 20 wells annually at locations throughout the District and will compile the data into a database. In selecting wells the District will emphasize the wells at or near the zone of bad water or potential pollution sources based on best available data. The District may conduct field measurements using hand held meters and/or collect samples for laboratory analysis from each well.

> **Performance:** Record the number of wells in which water quality measurements were collected and the water quality results for each well and include this information in the District's Annual Report.

Management Objective 2: The District will monitor new facilities and activities on the recharge zones of the Carrizo/Wilcox, Queen City, Sparta, and Yegua-Jackson aquifers on at least an annual basis for point source and non-point source pollution and compile this data into a database.

> **Performance:** Record the date and results of the visual survey of all recharge zones for point source and nonpoint source activities and facilities and include the information in the District's Annual Report.

Management Objective 3: The District will meet with the local Texas Railroad Commission ("TRC") engineering technician at least once annually to review oil well permits and oil related activity that could endanger the aquifers and coordinate its efforts with this agency in locating abandoned or deteriorated oil wells.

> **Performance:** Record the date and number of meetings with the TRC, the number of oil related activities that endangered the aquifers, the number of abandoned or deteriorated wells filed with the District and include the information in the District's Annual Report.

Management Objective 4: The District will meet with Natural Resources Conservation Service representatives to exchange information on irrigation demands, NRCS programs, and wells and water levels at least once annually.

> **Performance:** Record the date and number of meetings with the Natural Resources Conservation Service representatives and include the information in the District's Annual Report.

Addressing Drought Conditions
31 TAC 356.52(a)(1)(F)

The District's goal is to provide information and coordinate an appropriate response with local water users and water managers regarding the existence of extreme drought events in the District.

Management Objective 1: The General Manager will access the National Weather Service – Climate Prediction Center website (http://www.cpc.ncep.noaa.gov/products/monitoring_and_data/drought.shtml) to determine the Palmer Drought Severity Index and will submit a report to the Board of Directors monthly. The District will provide information to and coordinate with local water users and water managers regarding drought response activities.

Performance: Record the number of monthly reports made to the District Board of Directors and the date and number of times when the District was under extreme drought conditions and the number of times letters were sent to public water suppliers. Include this information in the District's Annual Report.

Addressing Conservation, Recharge Enhancement, Rainwater Harvesting, Precipitation Enhancement, Brush Control
31 TAC 356.52(a)(1)(G)

The District believes that the most efficient and effective ways to facilitate conservation within the District are through sound data collection, dissemination, and the distribution of public information about the groundwater resources in the GCUWCD, its current use and more effective ways to use it.

Management Objective 1: The District will, at least annually, submit an information article describing conservation measures that can be taken by water users within the District for publication in a newspaper of general circulation in the District or may publish the article on the District's website.

Performance: Record the dates of each conservation article submitted for publication or published on the District's website and include this information in the District's Annual Report.

Management Objective 2: The District will, at least annually, submit an information article describing recharge enhancement measures for publication in a newspaper of general circulation in the District or may publish the article on the District's website.

Performance: Record the dates of each recharge enhancement article submitted for publication or published on the District's website and include this information in the District's Annual Report.

Management Objective 3: The District will, at least annually, submit an information article describing rainwater harvesting measures that can be taken by water users within the District for publication in a newspaper of general circulation in the District or may publish the article on the District's website.

Performance: Record the dates of each rainwater harvesting article submitted for publication or published on the District's website and include this information in the District's Annual Report.

Management Objective 4: The District will publish an information article in a publication of wide circulation in the District or on its website, at least annually, describing brush control measures that can be used by landowners within the District

Performance: Record the date and number of brush control articles published and include this information in the Annual Report.

Addressing the Desired Future Conditions of the Groundwater Resources
31 TAC 356.52(a)(1)(H)

Management Objective 1: A District representative will attend all Groundwater Management Area 13 meetings annually.

Performance: Record the number of GMA13 meetings attended annually and include a copy of each GMA13 meeting agenda and a copy of the meeting minutes in the District's Annual Report.

Management Objective 2: The District will monitor water levels and evaluate whether the change in water levels is in conformance with the DFCs adopted by the District. The District will estimate total annual groundwater production for each aquifer based on water use reports, estimated exempt use, and other relevant information and compare these production estimates to the MAGs.

Performance: Record the water level data and annual change in water levels for each aquifer and compare to the DFCs. Include this information in the District's Annual Report.

Performance: Record the total estimated annual production for each aquifer and compare these amounts to the MAG. Include this information in the District's Annual Report.

10.2 Plan Elements Developed at the Discretion of the District

Transportation of Water from the District

The District will seek an accurate accounting of water transported from the District to users outside its boundaries.

Management Objective: The District will obtain monthly usage reports from individuals or entities that transport groundwater out of the District and will compile this data into a database.

Performance: Record the monthly transporter usage reports and present the results in the District's Annual Report.

This Management Plan is approved by the undersigned on November 13, 2018. This Management Plan takes effect on approval by the Texas Water Development Board.

Gonzales County Underground Water Conservation District
Board of Directors

Bruce Tieken, President

Kermit Thiele, Vice President

Barry Miller, Secretary

Mark Ainsworth, Director
~~Bruce Patteson, Director~~

Mike St. John, Director
~~Mark Ainsworth, Director~~

Location of District Office:

Gonzales County UWCD
522 Saint Matthew Street
P.O. Box 1919
Gonzales, TX 78629

Telephone: 830.672.1047
Fax: 830.672.1387

Email: ~~greg.sengelmann@gcuwcd.org~~generalmanager@gcuwcd.org
Website: www.gcuwcd.org

APPENDIX 1

Certified Copy of GCUWCD Resolution Adopting Management Plan

Gonzales County Underground
Water Conservation District

Board Resolution 10-10-2023

Resolution Adopting the 2023 Management Plan

WHEREAS, §§36.1071 and 36.1073, Water Code, require the Gonzales County Underground Water Conservation District to develop and adopt a Management Plan that addresses the following management goals, as applicable:

(1) providing the most efficient use of groundwater;
(2) controlling and preventing waste of groundwater;
(3) controlling and preventing subsidence;
(4) addressing conjunctive surface water management issues;
(5) addressing natural resource issues;
(6) addressing drought conditions;
(7) addressing conservation, recharge enhancement, rainwater harvesting, or brush control, where appropriate and cost-effective; and
(8) addressing the desired future conditions adopted by the district;

WHEREAS, §36.1072(e), Water Code, requires each groundwater conservation district to review and re-adopt the Management Plan at least every five years; and

WHEREAS, after providing notice and holding a public hearing, the Board of Directors of the Gonzales County Underground Water Conservation District has developed a Management Plan in accordance with the statutory requirements and utilizing the best available science, attached hereto and incorporated herein for purposes.

NOW THEREFORE, BE IT RESOLVED:

1) The Board of Directors of the Gonzales County Underground Water Conservation District do hereby adopt the attached 2023 Management Plan pursuant to §36.1071, Water Code.

2) The General Manager is hereby ordered to file the adopted Management Plan with the Texas Water Development Board for certification as administratively complete.

3) The General Manager is hereby authorized to take any and all reasonable action necessary for the implementation of this resolution.

This Resolution shall become effective on _____.

Adopted this 10th day of October, 2023.

_____
Bruce Tieken, President
Gonzales County Underground

_____
Barry Miller, Secretary
Gonzales County Underground

APPENDIX 2

Public Notices ~~For~~for Adoption of Management Plan

NOTICE OF PUBLIC HEARING
OF
GONZALES COUNTY UNDERGROUND
WATER CONSERVATION DISTRICT
On Proposed Additions and Amendments to the
District's Management Plan

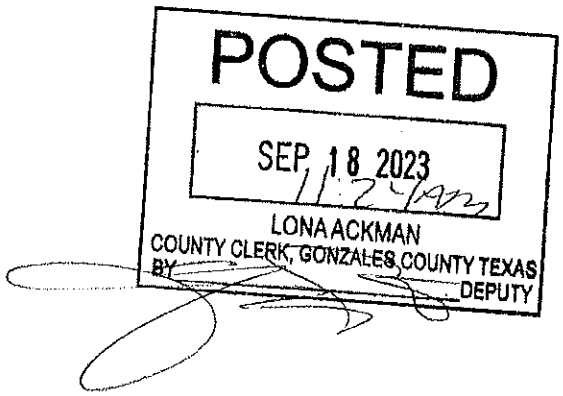
The Gonzales County Underground Water Conservation District ("the District) will hold a public hearing for the purpose of receiving comments on proposed additions and amendments to the Management Plan of the District.

The Board of Directors will take public comments on the proposed amendments to the Management Plan on Tuesday, October 10, 2023, at the District office located at 522 Saint Matthew Street, Gonzales, Texas. The public hearing will begin at 5:30 p.m. Agenda is as follows:

1. Call to order.
2. President of the Board to make comments.
3. Receive comments from the public on the District's proposed Management Plan.
4. Discussion of other items of interest by the Board and direction to management.
5. Adjourn.

Copies of the proposed additions and amendments to the Management Plan of the District are available at the offices of the Gonzales County Underground Water Conservation District, 522 Saint Matthew Street, Gonzales, Texas, from 8:00 a.m. to 5:00 p.m., Monday through Friday.

Written comments should be submitted to the General Manager, PO Box 1919, Gonzales, Texas 78629 by October 10, 2023 at 12:00 p.m. or presented at the hearing.



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OF
GONZALES COUNTY UNDERGROUND
WATER CONSERVATION DISTRICT
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1. Call to order.
2. President of the Board to make comments.
3. Receive comments from the public on the District's proposed Management Plan.
4. Discussion of other items of interest by the Board and direction to management.
5. Adjourn.

Copies of the proposed additions and amendments to the Management Plan of the District are available at the offices of the Gonzales County Underground Water Conservation District, 522 Saint Matthew Street, Gonzales, Texas, from 8:00 a.m. to 5:00 p.m., Monday through Friday.

Written comments should be submitted to the General Manager, PO Box 1919, Gonzales, Texas 78629 by October 10, 2023 at 12:00 p.m. or presented at the hearing.

Filed this 19th day of Sept 2023
1:53 PM
TERESA RODRIGUEZ
COUNTY CLERK, CALDWELL COUNTY, TEXAS
By Sandra Guerra Deputy
Sandra Guerra

APPENDIX 3

Certified Mail Receipts ~~From~~from Surface Water Management Entities

APPENDIX 4

Technical Memorandums 16-01/16-04/16-08

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APPENDIX 5

GAM Run 10-017-027 MAG

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GAM RUN 21-018 MAG:
MODELED AVAILABLE GROUNDWATER FOR THE CARRIZO-WILCOX, QUEEN CITY, SPARTA, AND YEGUA-JACKSON AQUIFERS IN GROUNDWATER MANAGEMENT AREA 13

Shirley C. Wade, Ph.D., P.G.
Texas Water Development Board
Groundwater Division
Groundwater Availability Modeling Department
(512) 936-0883
July 25, 2022

Shirley C. Wade
7/25/22

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GAM Run 21-018 MAG: Modeled Available Groundwater for the Carrizo-Wilcox, Queen City, Sparta, and Yegua-Jackson aquifers in Groundwater Management Area 13

Shirley C. Wade, Ph.D., P.G.
Texas Water Development Board
Groundwater Division
Groundwater Availability Modeling Department
(512) 936-0883
July 25, 2022

EXECUTIVE SUMMARY:

The modeled available groundwater for Groundwater Management Area 13 for the Carrizo-Wilcox, Queen City, Sparta, and Yegua-Jackson aquifers is summarized by decade for the groundwater conservation districts (Tables 1 through 4 respectively) and for use in the regional water planning process (Tables 5 through 8 respectively). The modeled available groundwater estimates for the Carrizo-Wilcox Aquifer range from approximately 470,000 acre-feet per year in 2020 to approximately 575,000 acre-feet per year in 2080 (Table 1). The modeled available groundwater estimates for the Queen City Aquifer range from approximately 23,000 acre-feet per year in 2020 to approximately 18,000 acre-feet per year in 2080 (Table 2). The modeled available groundwater estimates for the Sparta Aquifer range from approximately 6,000 acre-feet per year in 2020 to approximately 4,000 acre-feet per year in 2080 (Table 3). The estimates for the Carrizo-Wilcox, Queen City, and Sparta Aquifers were extracted from the results of a model run using the groundwater availability model for the southern part of the Carrizo-Wilcox, Queen City, and Sparta aquifers (version 2.01). The modeled available groundwater estimates for the Yegua-Jackson Aquifer are approximately 6,700 acre-feet per year from 2020 to 2080 (Table 4). The estimates for the Yegua-Jackson Aquifer were extracted from the results of a model run using the groundwater availability model for the Yegua-Jackson Aquifer (version 1.01). The explanatory report and other materials submitted to the TWDB were determined to be administratively complete on April 15, 2022.

REQUESTOR:

Ms. Kelley Cochran, coordinator of Groundwater Management Area 13.

DESCRIPTION OF REQUEST:

The desired future conditions for the Carrizo-Wilcox, Queen City, and Sparta aquifers described in Resolution 21-02 from Groundwater Management Area 13, adopted November 19, 2021, are:

- *"The first desired future condition for the Carrizo-Wilcox, Queen City and Sparta aquifers in Groundwater Management Area 13 is that 75 percent of the saturated thickness in the outcrop at the end of 2012 remains in 2080. Due to the limitations of the current Groundwater Availability Model, this desired future condition cannot be simulated as documented during 2016 Joint Planning in GMA 13 Technical Memorandum 16-08 (Hutchison, 2017a)."*
- *"In addition, a secondary proposed desired future condition for the Carrizo-Wilcox, Queen City, and Sparta aquifers in Groundwater Management Area 13 is an average drawdown of 49 feet (+/- 5 feet) for all of GMA 13. The drawdown is calculated from the end of 2012 conditions to the year 2080. This desired future condition is consistent with simulation "GMA13_2019_001" summarized during a meeting of Groundwater Management Area 13 members on March 19, 2021."*

The desired future conditions for the Yegua-Jackson Aquifer described in Resolution 21-03 from Groundwater Management Area 13, adopted November 19, 2021 are:

- *"For Gonzales County, the average drawdown from 2010 to 2080 is 3 feet (+/- 1 foot)."*
- *"For Karnes County, the average drawdown from 2010 to 2080 is 1 foot (+/- 1 foot)."*
- *"For all other counties in GMA 13, the Yegua-Jackson is classified as not relevant for purposes of joint planning."*

The Edwards (Balcones Fault Zone), Gulf Coast, and Trinity aquifers were declared not relevant for purposes of joint planning by Groundwater Management Area 13 in Resolution 21-01 (Groundwater Management Area 13 Joint Planning Committee and others, 2022; Appendix B).

On January 14, 2022, Dr. Jordan Furnans, on behalf of Groundwater Management Area 13, submitted the Desired Future Conditions Packet to the TWDB. TWDB staff reviewed the model files associated with the desired future conditions and received clarifications on procedures and assumptions from the Groundwater Management Area 13 Technical Coordinator on March 3, 2022, and on March 7, 2022. Groundwater Management Area 13 adopted two desired future conditions for the Carrizo-Wilcox, Queen City, and Sparta Aquifers and they were not mutually compatible in the groundwater availability model. The

technical coordinator for the groundwater management area confirmed that their intention was for the modeled available groundwater values to be based on the secondary desired future condition and MODFLOW pumping simulation GMA13_2019_001 (Groundwater Management Area 13 Joint Planning Committee and others, 2022; Appendix 2). The first proposed desired future condition was not intended for the calculation of modeled available groundwater.

The model run pumping file, which meets the secondary desired future condition adopted by district representatives of Groundwater Management Area 13 for the Carrizo-Wilcox, Queen City, and Sparta Aquifers, was submitted to the TWDB as supplemental information for the original submittal on February 9, 2022. The model run files, which meet the desired future conditions adopted by district representatives of Groundwater Management Area 13 for the Yegua-Jackson Aquifer, were submitted to the TWDB on January 14, 2022, as part of the Desired Future Conditions Explanatory Report for Groundwater Management Area 13.

In an email dated March 3, 2022, the Technical Coordinator and consultant for Groundwater Management Area 13 confirmed that they intended to use the end of 2011 as the reference year for the drawdown calculations for the Carrizo-Wilcox, Queen City, and Sparta aquifers and they intended to use the end of 2009 as the reference year for the Yegua-Jackson Aquifer. In an email dated March 7, 2022, they also confirmed that the confining unit model layers representing the Reklaw and Weches formations should be included in the desired future condition calculation of average drawdown for the combined Carrizo-Wilcox, Queen City, and Sparta aquifers.

All clarifications are included in the Parameters and Assumptions Section of this report.

METHODS:

The groundwater availability model for the southern part of the Carrizo-Wilcox, Queen City, and Sparta aquifers (Figures 1 through 3) was run using the model files submitted with the explanatory reports (Groundwater Management Area 13 Joint Planning Committee and others, 2022) on January 14 and February 9, 2022. Model-calculated water levels were extracted for the years 2011 (stress period 12) and 2080 (stress period 81). An overall drawdown average was calculated for the entire Groundwater Management Area 13 using all model layers in the average. As described in the Technical Memorandum submitted with the Explanatory Report on January 14, 2022 (Furnans, 2022) drawdowns for cells that became dry during the simulation (water level dropped below the base of the cell) were calculated as the reference year water level elevation minus the elevation of the model cell bottom. The calculated drawdown average was compared with the desired future condition of 49 feet to verify that the pumping scenario achieved the desired future conditions within the stated tolerance of five feet.

The groundwater availability model for the Yegua-Jackson Aquifer (Figure 4) was run using the model files submitted on January 14, 2022. Model-calculated water levels were extracted for the years 2009 (stress period 39) and 2080 (stress period 110). County-wide average drawdowns were calculated for Gonzales and Karnes counties within Groundwater Management Area 13 by averaging the drawdown values for all model layers. There were no dry cells in Karnes County or Gonzales County, so no additional dry cell calculations were needed. The calculated drawdown averages were compared with the desired future conditions for Gonzales and Karnes counties to verify that the pumping scenario achieved the desired future conditions within the stated tolerance of one foot.

The modeled available groundwater values were determined by extracting pumping rates by decade from the model results using ZONEBUDGET Version 3.01 (Harbaugh, 2009). Annual pumping rates by aquifer are presented by county and groundwater conservation district, subtotaled by groundwater conservation district, and then summed for Groundwater Management Area 13 (Tables 1 through 4). Annual pumping rates by aquifer are also presented by county, river basin, and regional water planning area within Groundwater Management Area 13 (Tables 5 through 8) in order to be consistent with the format used in the regional water planning process.

Modeled Available Groundwater and Permitting

As defined in Chapter 36 of the Texas Water Code (2011), "modeled available groundwater" is 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:

The parameters and assumptions for the modeled available groundwater estimates are described below:

Carrizo-Wilcox, Queen City, and Sparta aquifers

- We used Version 2.01 of the groundwater availability model for the southern part of the Carrizo-Wilcox, Queen City, and Sparta aquifers. See Deeds and others (2003) and Kelley and others (2004) for assumptions and limitations of the groundwater availability model for the southern part of the Carrizo-Wilcox, Queen City, and Sparta aquifers.
- This groundwater availability model includes eight layers, which generally represent the Sparta Aquifer (Layer 1), the Weches Confining Unit (Layer 2), the Queen City Aquifer (Layer 3), the Reklaw Confining Unit (Layer 4), the Carrizo (Layer 5), the Upper Wilcox (Layer 6), the Middle Wilcox (Layer 7), and the Lower Wilcox (Layer 8). Since the model extends beyond the official TWDB aquifer extents, please note that model layers 1 and 3 instead represent geologic units equivalent to the Sparta and Queen City aquifers, respectively, in those areas falling outside of the official aquifer extents.
- The model was run with MODFLOW-96 (Harbaugh and McDonald, 1996).
- Although the original groundwater availability model was only calibrated to 1999, an analysis during the second round of joint planning (Hutchison, 2017b) verified that the model satisfactorily matched measured water levels for the period from 1999 to 2011. For this reason, TWDB considers it acceptable to use the end of 2011 as the reference year for drawdown calculations.
- Drawdown averages and modeled available groundwater values were based on the TWDB defined aquifer boundaries rather than the model extent.
- Drawdowns for cells that became dry during the simulation (water level dropped below the base of the cell) were calculated as the reference year water level elevation minus the elevation of the model cell bottom. Pumping in dry cells was excluded from the modeled available groundwater calculations for the decades after the cell went dry.
- A tolerance of five feet was assumed when comparing desired future conditions to modeled drawdown results. This tolerance was specified by the GMA in their definition of the desired future conditions.
- Estimates of modeled available groundwater from the model simulation were rounded to the nearest whole number.
- The verification calculation for the desired future conditions is based on an average of all model layers (Layers 1 through 8). The modeled available groundwater

calculations are based on Layer 1 for the Sparta Aquifer, Layer 3 for the Queen City Aquifer, and the sum of Layers 5 through 8 for the Carrizo-Wilcox Aquifer.

Yegua-Jackson Aquifer

- We used version 1.01 of the groundwater availability model for the Yegua-Jackson Aquifer. See Deeds and others (2010) for assumptions and limitations of the groundwater availability model.
- This groundwater availability model includes five layers which represent the outcrop of the Yegua-Jackson Aquifer and younger overlying units—the Catahoula Formation (Layer 1), the upper portion of the Jackson Group (Layer 2), the lower portion of the Jackson Group (Layer 3), the upper portion of the Yegua Group (Layer 4), and the lower portion of the Yegua Group (Layer 5).
- The model was run with MODFLOW-2000 (Harbaugh and others, 2000).
- Although the original groundwater availability model was only calibrated to 1997, a TWDB analysis (Oliver, 2010) verified that the model satisfactorily matched measured water levels for the period from 1997 to 2009. For this reason, TWDB considers it acceptable to use the end of 2009 as the reference year for drawdown calculations.
- Drawdown averages and modeled available groundwater values were based on the TWDB-defined aquifer boundaries rather than the model extent.
- No dry cells occurred in the simulation in Gonzales County or Karnes County. As these were the only counties with defined desired future conditions, no dry cell considerations were required during the verification calculation for the desired future conditions. Pumping in dry cells was excluded from the modeled available groundwater calculations for the decades after the cell went dry.
- A tolerance of one foot was assumed when comparing desired future conditions to modeled drawdown results. This tolerance was specified by the GMA in their definition of the desired future conditions.
- Estimates of modeled available groundwater from the model simulation were rounded to the nearest whole number.
- The verification calculation for the desired future conditions is based on an average of all model layers representing the Yegua or Jackson formations (Layers 1 through 5). The modeled available groundwater calculations are the sum of all model layers representing the Yegua or Jackson formations (Layers 1 through 5).

RESULTS:

The modeled available groundwater estimates for the Carrizo-Wilcox Aquifer range from approximately 470,000 acre-feet per year in 2020 to approximately 575,000 acre-feet per year in 2080 (Table 1). The modeled available groundwater estimates for the Queen City Aquifer range from approximately 23,000 acre-feet per year in 2020 to approximately 18,000 acre-feet per year in 2080 (Table 2). The modeled available groundwater estimate for the Sparta Aquifer ranges from approximately 6,000 acre-feet per year in 2020 to approximately 4,000 acre-feet per year in 2080 (Table 3). The modeled available groundwater is summarized by groundwater conservation district and county for the Carrizo-Wilcox, Queen City, and Sparta aquifers (Tables 1, 2, and 3 respectively). The modeled available groundwater has also been summarized by county, river basin, and regional water planning area for use in the regional water planning process for the Carrizo-Wilcox, Queen City, and Sparta aquifers (Tables 5, 6, and 7 respectively). Small differences in values between table summaries are due to rounding.

The modeled available groundwater estimate for the Yegua-Jackson Aquifer is approximately 7,000 acre-feet per year from 2020 to 2080 (Table 4). The modeled available groundwater for the Yegua-Jackson Aquifer is summarized by groundwater conservation district and county (Table 4) and by county, river basin, and regional water planning area for use in the regional water planning process (Table 8). Small differences of values between table summaries are due to rounding.

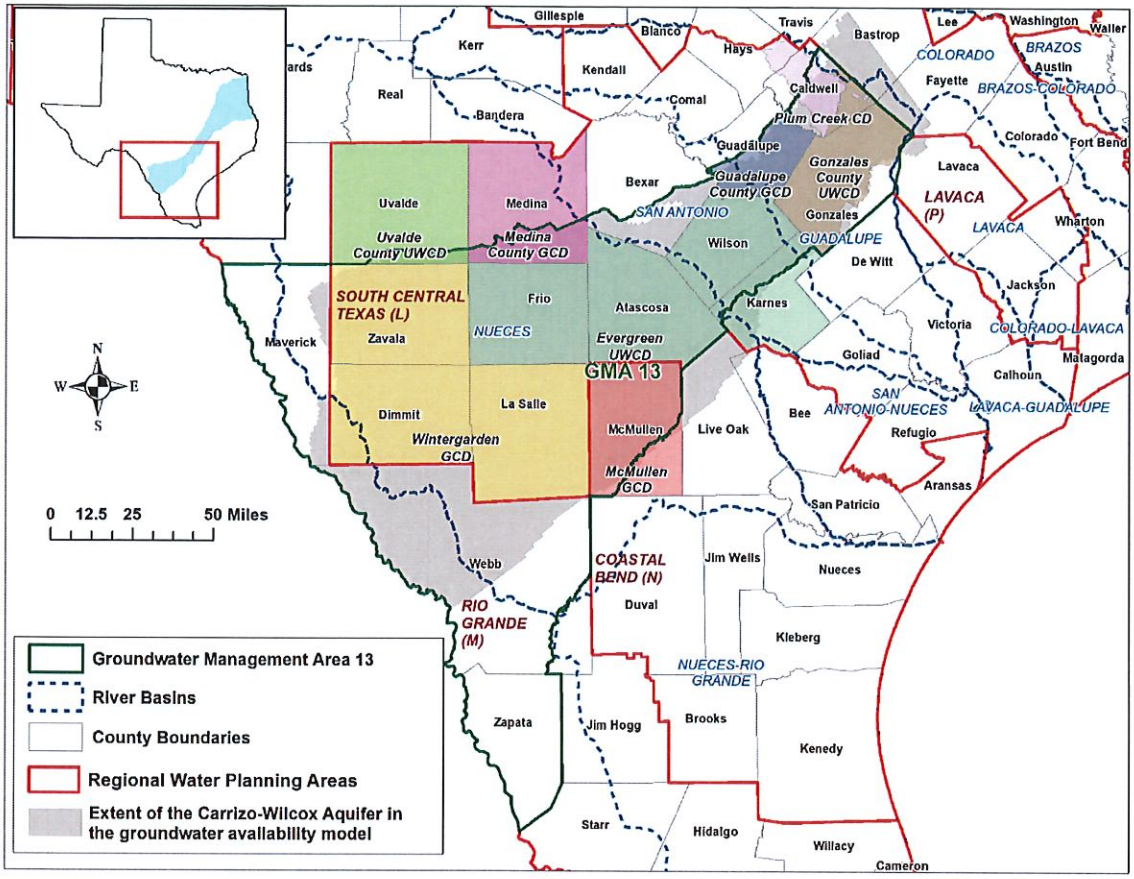

FIGURE 1. **GROUNDWATER MANAGEMENT AREA (GMA) 13 BOUNDARY, REGIONAL WATER PLANNING AREAS (RWPAS), RIVER BASINS, GROUNDWATER CONSERVATION DISTRICTS (GCDS), AND COUNTIES OVERLAIN ON THE EXTENT OF THE CARRIZO-WILCOX AQUIFER.**

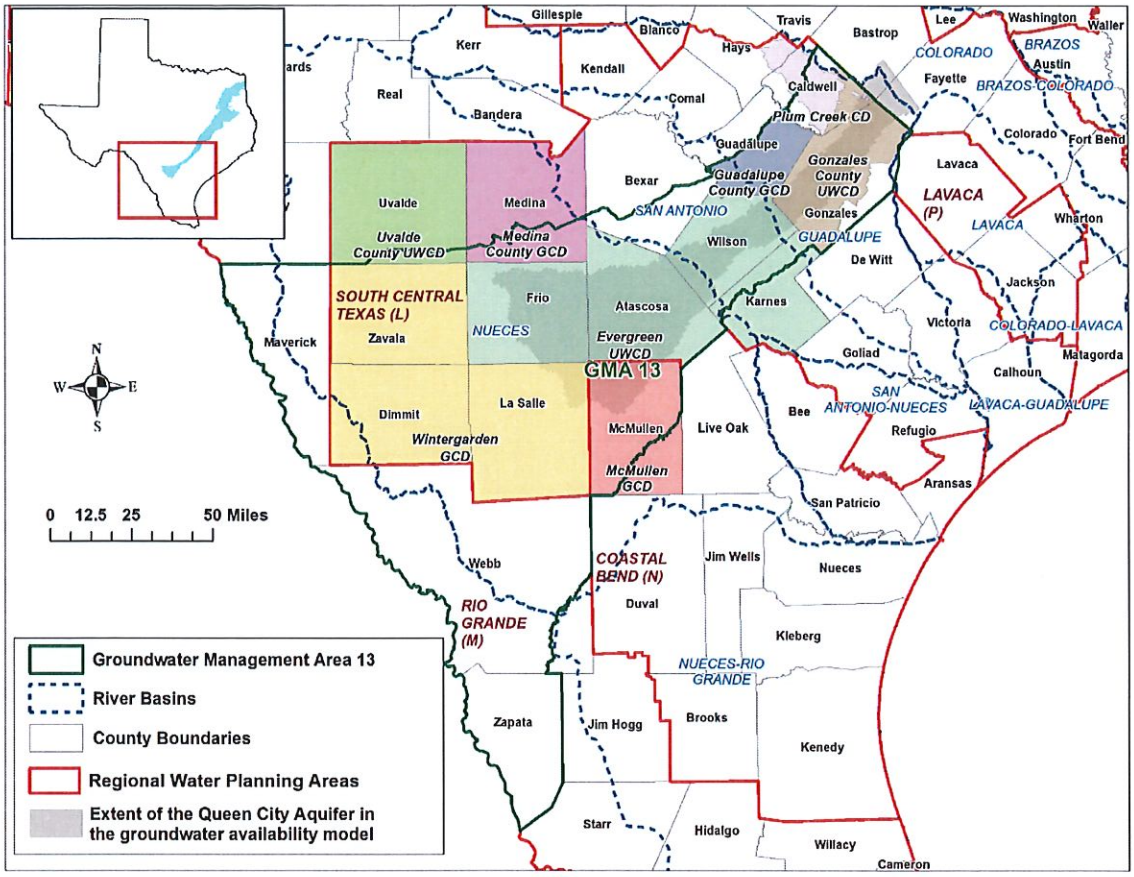

FIGURE 2. GROUNDWATER MANAGEMENT AREA (GMA) 13 BOUNDARY, REGIONAL WATER PLANNING AREAS (RWPAS), RIVER BASINS, GROUNDWATER CONSERVATION DISTRICTS (GCDS), AND COUNTIES OVERLAIN ON THE EXTENT OF THE QUEEN CITY AQUIFER.

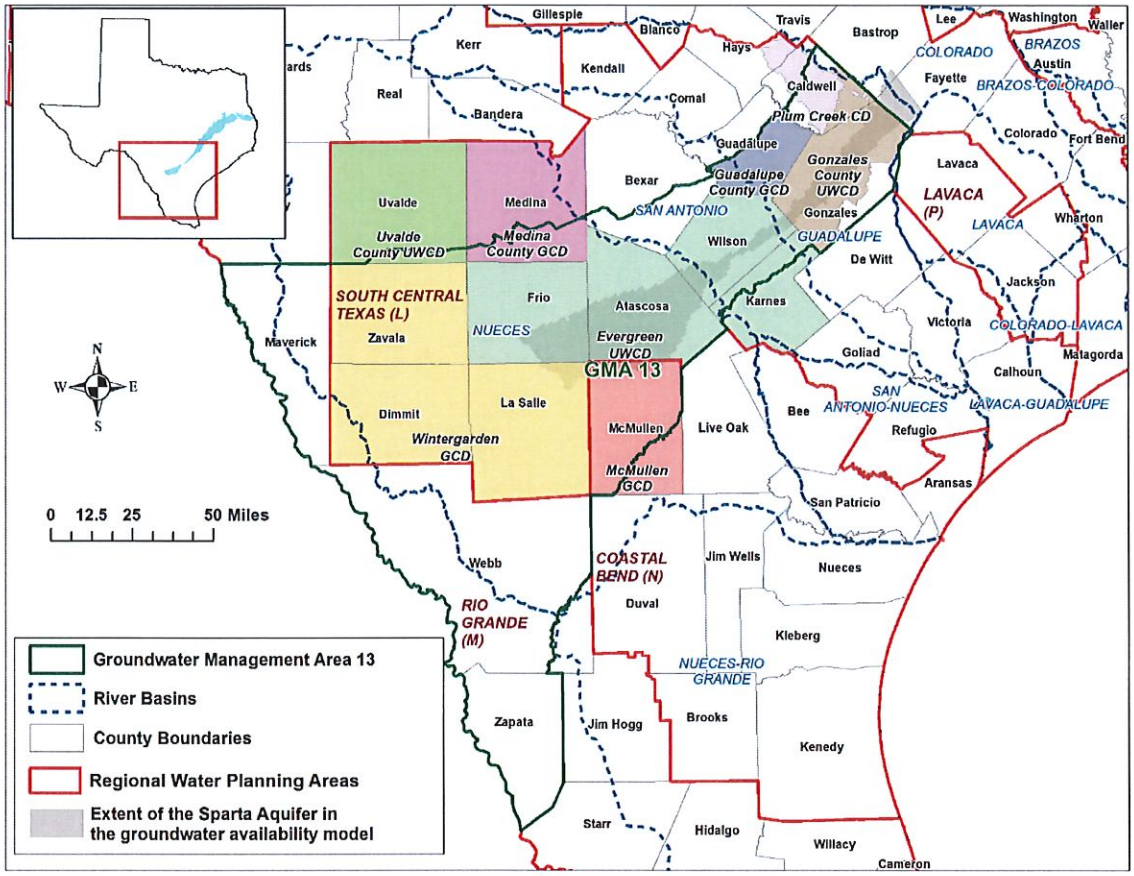

FIGURE 3. GROUNDWATER MANAGEMENT AREA (GMA) 13 BOUNDARY, REGIONAL WATER PLANNING AREAS (RWPAS), RIVER BASINS, GROUNDWATER CONSERVATION DISTRICTS (GCDS), AND COUNTIES OVERLAIN ON THE EXTENT OF THE SPARTA AQUIFER.

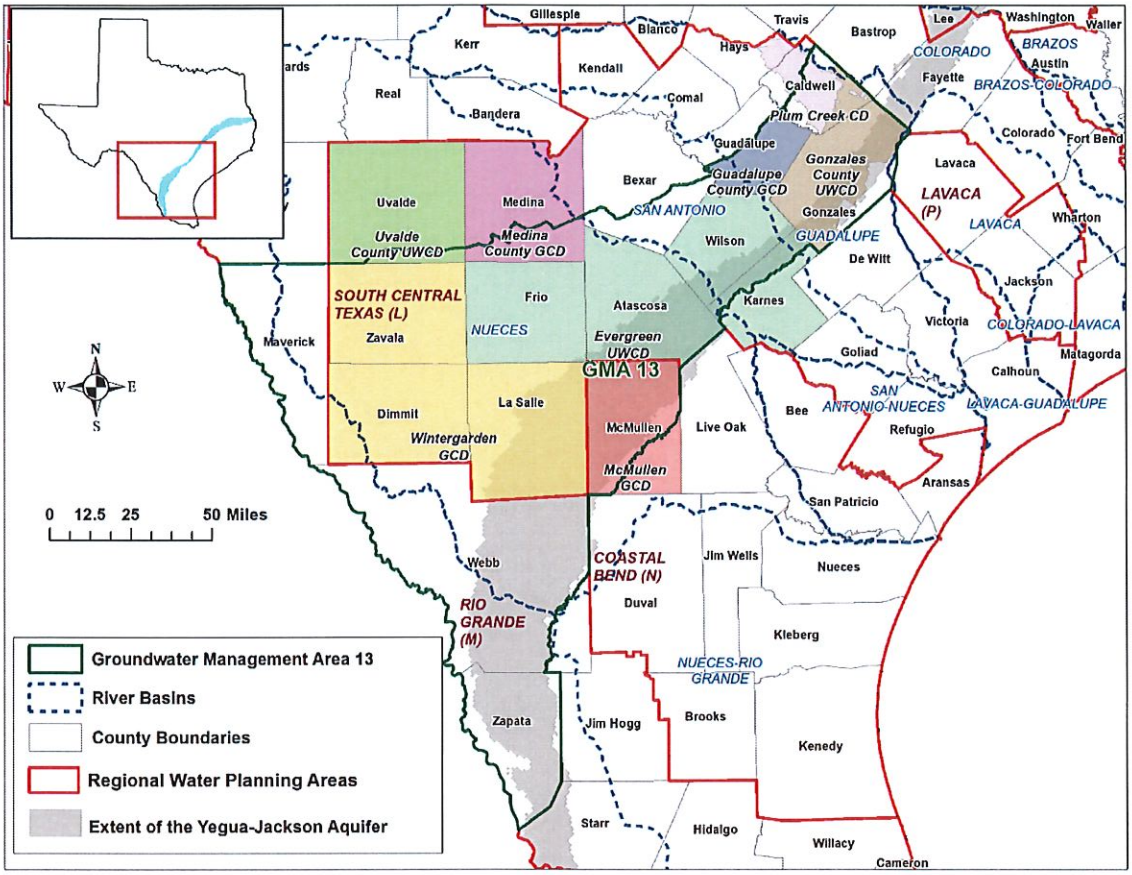

FIGURE 4. **GROUNDWATER MANAGEMENT AREA (GMA) 13 BOUNDARY, REGIONAL WATER PLANNING AREAS (RWPAS), RIVER BASINS, GROUNDWATER CONSERVATION DISTRICTS (GCDS), AND COUNTIES OVERLAIN ON THE EXTENT OF THE YEGUA-JACKSON AQUIFER.**

TABLE 1. MODELED AVAILABLE GROUNDWATER FOR THE CARRIZO-WILCOX AQUIFER IN GROUNDWATER MANAGEMENT AREA 13 SUMMARIZED BY GROUNDWATER CONSERVATION DISTRICT (GCD) AND COUNTY FOR EACH DECADE BETWEEN 2020 AND 2080. VALUES ARE IN ACRE-FEET PER YEAR.

Groundwater Conservation District	County	Aquifer	2020	2030	2040	2050	2060	2070	2080
Evergreen UWCD	Atascosa	Carrizo-Wilcox	51,924	54,397	55,329	56,828	58,406	59,982	59,982
Evergreen UWCD	Frio	Carrizo-Wilcox	114,827	86,995	85,143	82,950	81,018	79,131	79,131
Evergreen UWCD	Karnes	Carrizo-Wilcox	693	758	843	931	1,001	1,043	1,043
Evergreen UWCD	Wilson	Carrizo-Wilcox	38,229	38,284	43,604	68,609	105,947	125,670	125,670
Evergreen UWCD Total		**Carrizo-Wilcox**	**205,673**	**180,434**	**184,919**	**209,318**	**246,372**	**265,826**	**265,826**
Gonzales County UWCD	Caldwell	Carrizo-Wilcox	468	9,472	16,401	25,510	30,087	30,087	30,087
Gonzales County UWCD	Gonzales	Carrizo-Wilcox	60,431	76,265	90,788	102,373	102,747	103,707	96,161
Gonzales County UWCD Total		**Carrizo-Wilcox**	**60,899**	**85,737**	**107,189**	**127,883**	**132,834**	**133,794**	**126,248**
Guadalupe County GCD	**Guadalupe**	**Carrizo-Wilcox**	**55,637**	**39,563**	**41,668**	**43,315**	**42,118**	**42,199**	**41,659**
McMullen GCD	**McMullen**	**Carrizo-Wilcox**	**7,789**	**7,768**	**4,867**	**4,854**	**4,854**	**4,854**	**4,854**
Medina County GCD	**Medina**	**Carrizo-Wilcox**	**2,635**	**2,628**	**2,635**	**2,628**	**2,628**	**2,628**	**2,628**
Plum Creek CD	**Caldwell**	**Carrizo-Wilcox**	**17,673**	**15,366**	**16,335**	**16,965**	**15,562**	**19,509**	**19,468**
Uvalde County UWCD	**Uvalde**	**Carrizo-Wilcox**	**0**[1]	**0**	**0**	**0**	**0**	**0**	**0**

[1] A zero value indicates the groundwater availability model pumping scenario did not include any pumping in the aquifer.

TABLE 1 (CONTINUED)

Groundwater Conservation District	County	Aquifer	2020	2030	2040	2050	2060	2070	2080
Wintergarden GCD	Dimmit	Carrizo-Wilcox	**3,895**	**3,885**	**3,895**	**3,885**	**3,885**	**3,885**	**3,885**
Wintergarden GCD	La Salle	Carrizo-Wilcox	**6,554**	**6,536**	**6,554**	**6,536**	**6,536**	**6,536**	**6,536**
Wintergarden GCD	Zavala	Carrizo-Wilcox	**38,303**	**36,675**	**35,399**	**35,204**	**35,006**	**34,831**	**34,540**
Wintergarden GCD Total		**Carrizo-Wilcox**	**48,752**	**47,096**	**45,848**	**45,625**	**45,427**	**45,252**	**44,961**
No District-County	Bexar	Carrizo-Wilcox	69,727	68,451	68,928	68,739	67,653	67,849	67,849
No District-County	Caldwell	Carrizo-Wilcox	39	39	39	39	39	39	39
No District-County	Gonzales	Carrizo-Wilcox	0[2]	0	0	0	0	0	0
No District-County	Maverick	Carrizo-Wilcox	547	545	547	545	545	276	276
No District-County	Webb	Carrizo-Wilcox	912	910	912	910	910	910	910
No District-County Total		**Carrizo-Wilcox**	**71,225**	**69,945**	**70,426**	**70,233**	**69,147**	**69,074**	**69,074**
Total for GMA 13		**Carrizo-Wilcox**	**470,283**	**448,537**	**473,887**	**520,821**	**558,942**	**583,136**	**574,718**

[2] A zero value indicates the groundwater availability model pumping scenario did not include any pumping in the aquifer.

TABLE 2. MODELED AVAILABLE GROUNDWATER FOR THE QUEEN CITY AQUIFER IN GROUNDWATER MANAGEMENT AREA 13 SUMMARIZED BY GROUNDWATER CONSERVATION DISTRICT (GCD) AND COUNTY FOR EACH DECADE BETWEEN 2020 AND 2080. VALUES ARE IN ACRE-FEET PER YEAR.

Groundwater Conservation District	County	Aquifer	2020	2030	2040	2050	2060	2070	2080
Evergreen UWCD	Atascosa	Queen City	4,070	4,525	4,537	4,495	4,390	4,285	4,285
Evergreen UWCD	Frio	Queen City	6,702	4,533	4,380	4,231	4,066	3,927	3,927
Evergreen UWCD	Wilson	Queen City	2,631	1,423	1,267	1,123	1,000	892	892
Evergreen UWCD Total		**Queen City**	**13,403**	**10,481**	**10,184**	**9,849**	**9,456**	**9,104**	**9,104**
Gonzales County UWCD	Caldwell	Queen City	4,842	4,829	4,557	4,545	4,545	3,977	3,977
Gonzales County UWCD	Gonzales	Queen City	4,973	4,960	4,973	4,960	4,960	4,500	4,500
Gonzales County UWCD Total		**Queen City**	**9,815**	**9,789**	**9,530**	**9,505**	**9,505**	**8,477**	**8,477**
Guadalupe County GCD	**Guadalupe**	**Queen City**	**0**[3]	**0**	**0**	**0**	**0**	**0**	**0**
McMullen GCD	**McMullen**	**Queen City**	**3**	**3**	**3**	**3**	**3**	**3**	**3**
Plum Creek CD	**Caldwell**	**Queen City**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Wintergarden GCD	**La Salle**	**Queen City**	**1**	**1**	**1**	**1**	**1**	**1**	**1**
Total for GMA 13		**Queen City**	**23,222**	**20,274**	**19,718**	**19,358**	**18,965**	**17,585**	**17,585**

[3] A zero value indicates the groundwater availability model pumping scenario did not include any pumping in the aquifer.

TABLE 3. MODELED AVAILABLE GROUNDWATER FOR THE SPARTA AQUIFER IN GROUNDWATER MANAGEMENT AREA 13 SUMMARIZED BY GROUNDWATER CONSERVATION DISTRICT (GCD) AND COUNTY FOR EACH DECADE BETWEEN 2020 AND 2080. VALUES ARE IN ACRE-FEET PER YEAR.

Groundwater Conservation District	County	Aquifer	2020	2030	2040	2050	2060	2070	2080
Evergreen UWCD	Atascosa	Sparta	1,218	1,187	1,043	998	961	932	932
Evergreen UWCD	Frio	Sparta	897	623	603	576	557	534	534
Evergreen UWCD	Wilson	Sparta	335	182	163	144	128	114	114
Evergreen UWCD Total		**Sparta**	**2,450**	**1,992**	**1,809**	**1,718**	**1,646**	**1,580**	**1,580**
Gonzales County UWCD	**Gonzales**	**Sparta**	**3,524**	**2,451**	**2,457**	**2,451**	**2,451**	**2,451**	**2,451**
McMullen GCD	**McMullen**	**Sparta**	**0**[4]	**0**	**0**	**0**	**0**	**0**	**0**
Wintergarden GCD	**La Salle**	**Sparta**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Total for GMA 13		**Sparta**	**5,974**	**4,443**	**4,266**	**4,169**	**4,097**	**4,031**	**4,031**

TABLE 4. MODELED AVAILABLE GROUNDWATER FOR THE YEGUA-JACKSON AQUIFER IN GROUNDWATER MANAGEMENT AREA 13 SUMMARIZED BY GROUNDWATER CONSERVATION DISTRICT (GCD) AND COUNTY FOR EACH DECADE BETWEEN 2020 AND 2080. VALUES ARE IN ACRE-FEET PER YEAR.

Groundwater Conservation District	County	Aquifer	2020	2030	2040	2050	2060	2070	2080
Evergreen UWCD	Karnes	Yegua-Jackson	2,013	2,013	2,013	2,013	2,013	2,013	2,013
Gonzales County UWCD	Gonzales	Yegua-Jackson	4,155	4,155	4,155	4,155	4,155	4,155	4,155
No District-County	Gonzales	Yegua-Jackson	573	573	573	573	573	573	573
Total for GMA 13		**Yegua-Jackson**	**6,741**	**6,741**	**6,741**	**6,741**	**6,741**	**6,741**	**6,741**

[4] A zero value indicates the groundwater availability model pumping scenario did not include any pumping in the aquifer.

TABLE 5. MODELED AVAILABLE GROUNDWATER BY DECADE FOR THE CARRIZO-WILCOX AQUIFER IN GROUNDWATER MANAGEMENT AREA 13. RESULTS ARE IN ACRE-FEET PER YEAR AND ARE SUMMARIZED BY COUNTY, REGIONAL WATER PLANNING AREA (RWPA), RIVER BASIN, AND AQUIFER.

County	RWPA	River Basin	Aquifer	2030	2040	2050	2060	2070	2080
Atascosa	L	Nueces	Carrizo-Wilcox	54,310	55,241	56,739	58,316	59,890	59,890
Atascosa	L	San Antonio	Carrizo-Wilcox	87	88	89	90	92	92
Bexar	L	Nueces	Carrizo-Wilcox	38,762	38,993	39,134	39,134	39,287	39,287
Bexar	L	San Antonio	Carrizo-Wilcox	29,689	29,935	29,605	28,519	28,562	28,562
Caldwell	L	Colorado	Carrizo-Wilcox	0[5]	0	0	0	0	0
Caldwell	L	Guadalupe	Carrizo-Wilcox	24,877	32,775	42,514	45,688	49,635	49,594
Dimmit	L	Nueces	Carrizo-Wilcox	3,765	3,775	3,765	3,765	3,765	3,765
Dimmit	L	Rio Grande	Carrizo-Wilcox	120	120	120	120	120	120
Frio	L	Nueces	Carrizo-Wilcox	86,995	85,143	82,950	81,018	79,131	79,131
Gonzales	L	Guadalupe	Carrizo-Wilcox	76,265	90,788	102,373	102,747	103,707	96,161
Gonzales	L	Lavaca	Carrizo-Wilcox	0	0	0	0	0	0
Guadalupe	L	Guadalupe	Carrizo-Wilcox	32,400	34,200	35,631	34,655	34,736	34,345
Guadalupe	L	San Antonio	Carrizo-Wilcox	7,163	7,468	7,684	7,463	7,463	7,314
Karnes	L	Guadalupe	Carrizo-Wilcox	0	0	0	0	0	0
Karnes	L	Nueces	Carrizo-Wilcox	0	0	0	0	0	0
Karnes	L	San Antonio	Carrizo-Wilcox	758	843	931	1,001	1,043	1,043
La Salle	L	Nueces	Carrizo-Wilcox	6,536	6,554	6,536	6,536	6,536	6,536
Medina	L	Nueces	Carrizo-Wilcox	2,623	2,630	2,623	2,623	2,623	2,623

[5] A zero value indicates the groundwater availability model pumping scenario did not include any pumping in the aquifer.

TABLE 5 (CONTINUED)

County	RWPA	River Basin	Aquifer	2030	2040	2050	2060	2070	2080
Medina	L	San Antonio	Carrizo-Wilcox	5	5	5	5	5	5
Uvalde	L	Nueces	Carrizo-Wilcox	0[6]	0	0	0	0	0
Wilson	L	Guadalupe	Carrizo-Wilcox	443	653	762	3,870	3,982	3,982
Wilson	L	Nueces	Carrizo-Wilcox	10,774	11,171	11,578	12,027	12,546	12,546
Wilson	L	San Antonio	Carrizo-Wilcox	27,067	31,780	56,269	90,050	109,142	109,142
Zavala	L	Nueces	Carrizo-Wilcox	36,675	35,399	35,204	35,006	34,831	34,540
Maverick	M	Nueces	Carrizo-Wilcox	542	544	542	542	273	273
Maverick	M	Rio Grande	Carrizo-Wilcox	3	3	3	3	3	3
Webb	M	Nueces	Carrizo-Wilcox	890	892	890	890	890	890
Webb	M	Rio Grande	Carrizo-Wilcox	20	20	20	20	20	20
McMullen	N	Nueces	Carrizo-Wilcox	7,768	4,867	4,854	4,854	4,854	4,854
GMA 13 Total			**Carrizo-Wilcox**	**448,537**	**473,887**	**520,821**	**558,942**	**583,136**	**574,718**

[6] A zero value indicates the groundwater availability model pumping scenario did not include any pumping in the aquifer.

TABLE 6. MODELED AVAILABLE GROUNDWATER BY DECADE FOR THE QUEEN CITY AQUIFER IN GROUNDWATER MANAGEMENT AREA 13. RESULTS ARE IN ACRE-FEET PER YEAR AND ARE SUMMARIZED BY COUNTY, REGIONAL WATER PLANNING AREA (RWPA), RIVER BASIN, AND AQUIFER.

County	RWPA	River Basin	Aquifer	2030	2040	2050	2060	2070	2080
Atascosa	L	Nueces	Queen City	4,525	4,537	4,495	4,390	4,285	4,285
Caldwell	L	Guadalupe	Queen City	4,829	4,557	4,545	4,545	3,977	3,977
Frio	L	Nueces	Queen City	4,533	4,380	4,231	4,066	3,927	3,927
Gonzales	L	Guadalupe	Queen City	4,960	4,973	4,960	4,960	4,500	4,500
Guadalupe	L	Guadalupe	Queen City	0[7]	0	0	0	0	0
La Salle	L	Nueces	Queen City	1	1	1	1	1	1
Wilson	L	Guadalupe	Queen City	106	95	84	75	67	67
Wilson	L	Nueces	Queen City	181	161	143	127	114	114
Wilson	L	San Antonio	Queen City	1,136	1,011	896	798	711	711
McMullen	N	Nueces	Queen City	3	3	3	3	3	3
GMA 13 Total			**Queen City**	**20,274**	**19,718**	**19,358**	**18,965**	**17,585**	**17,585**

[7] A zero value indicates the groundwater availability model pumping scenario did not include any pumping in the aquifer.

TABLE 7. MODELED AVAILABLE GROUNDWATER BY DECADE FOR THE SPARTA AQUIFER IN GROUNDWATER MANAGEMENT AREA 13. RESULTS ARE IN ACRE-FEET PER YEAR AND ARE SUMMARIZED BY COUNTY, REGIONAL WATER PLANNING AREA (RWPA), RIVER BASIN, AND AQUIFER.

County	RWPA	River Basin	Aquifer	2030	2040	2050	2060	2070	2080
Atascosa	L	Nueces	Sparta	1,187	1,043	998	961	932	932
Frio	L	Nueces	Sparta	623	603	576	557	534	534
Gonzales	L	Guadalupe	Sparta	2,451	2,457	2,451	2,451	2,451	2,451
La Salle	L	Nueces	Sparta	0[8]	0	0	0	0	0
Wilson	L	Guadalupe	Sparta	12	11	10	9	8	8
Wilson	L	Nueces	Sparta	19	17	15	13	12	12
Wilson	L	San Antonio	Sparta	151	135	119	106	94	94
McMullen	N	Nueces	Sparta	0	0	0	0	0	0
GMA 13 Total			**Sparta**	**4,443**	**4,266**	**4,169**	**4,097**	**4,031**	**4,031**

[8] A zero value indicates the groundwater availability model pumping scenario did not include any pumping in the aquifer.

TABLE 8. MODELED AVAILABLE GROUNDWATER BY DECADE FOR THE YEGUA-JACKSON AQUIFER IN GROUNDWATER MANAGEMENT AREA 13. RESULTS ARE IN ACRE-FEET PER YEAR AND ARE SUMMARIZED BY COUNTY, REGIONAL WATER PLANNING AREA (RWPA), RIVER BASIN, AND AQUIFER.

County	RWPA	River Basin	Aquifer	2030	2040	2050	2060	2070	2080
Atascosa	L	Nueces	Yegua-Jackson	NR	NR	NR	NR	NR	NR
Frio	L	Nueces	Yegua-Jackson	NR	NR	NR	NR	NR	NR
Gonzales	L	Guadalupe	Yegua-Jackson	4,709	4,709	4,709	4,709	4,709	4,709
Gonzales	L	Lavaca	Yegua-Jackson	19	19	19	19	19	19
Karnes	L	Guadalupe	Yegua-Jackson	292	292	292	292	292	292
Karnes	L	Nueces	Yegua-Jackson	91	91	91	91	91	91
Karnes	L	San Antonio	Yegua-Jackson	1,630	1,630	1,630	1,630	1,630	1,630
La Salle	L	Nueces	Yegua-Jackson	NR	NR	NR	NR	NR	NR
Wilson	L	Guadalupe	Yegua-Jackson	NR	NR	NR	NR	NR	NR
Wilson	L	Nueces	Yegua-Jackson	NR	NR	NR	NR	NR	NR
Wilson	L	San Antonio	Yegua-Jackson	NR	NR	NR	NR	NR	NR
Webb	M	Nueces	Yegua-Jackson	NR	NR	NR	NR	NR	NR
Webb	M	Rio Grande	Yegua-Jackson	NR	NR	NR	NR	NR	NR
Zapata	M	Rio Grande	Yegua-Jackson	NR	NR	NR	NR	NR	NR
McMullen	N	Nueces	Yegua-Jackson	NR	NR	NR	NR	NR	NR
GMA 13 Total			**Yegua-Jackson**	**6,741**	**6,741**	**6,741**	**6,741**	**6,741**	**6,741**

NR: Groundwater Management Area 13 declared the Yegua-Jackson Aquifer not relevant in these areas.

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.

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APPENDIX A

Total Pumping Associated with Modeled Available Groundwater Run for the Carrizo-Wilcox Aquifer Split by Model Layers for Groundwater Management Area 13

TABLE A.1. TOTAL PUMPING SPLIT BY MODEL LAYERS FROM THE MODELED AVAILABLE GROUNDWATER RUN FOR THE CARRIZO-WILCOX AQUIFER IN GROUNDWATER MANAGEMENT AREA 13. THE VALUES ARE SUMMARIZED BY GROUNDWATER CONSERVATION DISTRICT (GCD) AND COUNTY FOR EACH DECADE BETWEEN 2020 AND 2080. VALUES ARE IN ACRE-FEET PER YEAR.

GCD	County	Aquifer	2020	2030	2040	2050	2060	2070	2080
Evergreen UWCD	Atascosa	Carrizo	50,266	52,745	53,671	55,176	56,754	58,330	58,330
Evergreen UWCD	Atascosa	Upper Wilcox	250	249	250	249	249	249	249
Evergreen UWCD	Atascosa	Middle Wilcox	224	223	224	223	223	223	223
Evergreen UWCD	Atascosa	Lower Wilcox	1,184	1,180	1,184	1,180	1,180	1,180	1,180
Evergreen UWCD	Frio	Carrizo	114,827	86,995	85,143	82,950	81,018	79,131	79,131
Evergreen UWCD	Frio	Upper Wilcox	0[9]	0	0	0	0	0	0
Evergreen UWCD	Frio	Middle Wilcox	0	0	0	0	0	0	0
Evergreen UWCD	Frio	Lower Wilcox	0	0	0	0	0	0	0
Evergreen UWCD	Karnes	Carrizo	693	758	843	931	1,001	1,043	1,043
Evergreen UWCD	Karnes	Upper Wilcox	0	0	0	0	0	0	0
Evergreen UWCD	Karnes	Middle Wilcox	0	0	0	0	0	0	0
Evergreen UWCD	Karnes	Lower Wilcox	0	0	0	0	0	0	0
Evergreen UWCD	Wilson	Carrizo	36,086	32,648	34,096	35,482	36,994	38,730	38,730
Evergreen UWCD	Wilson	Upper Wilcox	125	125	125	125	125	125	125
Evergreen UWCD	Wilson	Middle Wilcox	125	125	125	125	125	125	125
Evergreen UWCD	Wilson	Lower Wilcox	1,893	5,386	9,258	32,877	68,703	86,690	86,690
Evergreen UWCD Total		**Carrizo-Wilcox**	**205,673**	**180,434**	**184,919**	**209,318**	**246,372**	**265,826**	**265,826**

[9] A zero value indicates the groundwater availability model pumping scenario did not include any pumping in the aquifer.

TABLE A.1. (CONTINUED)

GCD	County	Aquifer	2020	2030	2040	2050	2060	2070	2080
Gonzales County UWCD	Caldwell	Carrizo	453	9,457	16,386	25,495	30,072	30,072	30,072
Gonzales County UWCD	Caldwell	Upper Wilcox	15	15	15	15	15	15	15
Gonzales County UWCD	Caldwell	Middle Wilcox	0[10]	0	0	0	0	0	0
Gonzales County UWCD	Caldwell	Lower Wilcox	0	0	0	0	0	0	0
Gonzales County UWCD	Gonzales	Carrizo	47,131	51,908	55,242	55,832	56,206	57,166	49,620
Gonzales County UWCD	Gonzales	Upper Wilcox	0	0	0	0	0	0	0
Gonzales County UWCD	Gonzales	Middle Wilcox	11,096	15,563	20,114	24,556	24,556	24,556	24,556
Gonzales County UWCD	Gonzales	Lower Wilcox	2,204	8,794	15,432	21,985	21,985	21,985	21,985
Gonzales County UWCD Total		**Carrizo-Wilcox**	**60,899**	**85,737**	**107,189**	**127,883**	**132,834**	**133,794**	**126,248**
Guadalupe County GCD	Guadalupe	Carrizo	28,943	14,834	14,627	14,532	14,224	14,624	14,624
Guadalupe County GCD	Guadalupe	Upper Wilcox	0	0	0	0	0	0	0

[10] A zero value indicates the groundwater availability model pumping scenario did not include any pumping in the aquifer.

TABLE A.1 (CONTINUED)

GCD	County	Aquifer	2020	2030	2040	2050	2060	2070	2080
Guadalupe County GCD	Guadalupe	Middle Wilcox	6,609	6,373	7,926	9,428	9,207	9,075	8,986
Guadalupe County GCD	Guadalupe	Lower Wilcox	20,085	18,356	19,115	19,355	18,687	18,500	18,049
Guadalupe County GCD Total		**Carrizo-Wilcox**	**55,637**	**39,563**	**41,668**	**43,315**	**42,118**	**42,199**	**41,659**
McMullen County GCD	McMullen	Carrizo	7,789	7,768	4,867	4,854	4,854	4,854	4,854
McMullen County GCD	McMullen	Upper Wilcox	0[11]	0	0	0	0	0	0
McMullen County GCD	McMullen	Middle Wilcox	0	0	0	0	0	0	0
McMullen County GCD	McMullen	Lower Wilcox	0	0	0	0	0	0	0
McMullen County GCD Total		**Carrizo-Wilcox**	**7,789**	**7,768**	**4,867**	**4,854**	**4,854**	**4,854**	**4,854**
Medina County GCD	Medina	Carrizo	517	515	517	515	515	515	515
Medina County GCD	Medina	Upper Wilcox	0	0	0	0	0	0	0
Medina County GCD	Medina	Middle Wilcox	1,252	1,249	1,252	1,249	1,249	1,249	1,249
Medina County GCD	Medina	Lower Wilcox	866	864	866	864	864	864	864
Medina County GCD Total		**Carrizo-Wilcox**	**2,635**	**2,628**	**2,635**	**2,628**	**2,628**	**2,628**	**2,628**
Plum Creek CD	Caldwell	Carrizo	0	1,990	5,048	5,709	6,046	9,993	9,993
Plum Creek CD	Caldwell	Upper Wilcox	0	0	0	0	0	0	0
Plum Creek CD	Caldwell	Middle Wilcox	5,733	5,717	5,733	5,717	3,977	3,977	3,936
Plum Creek CD	Caldwell	Lower Wilcox	11,940	7,659	5,554	5,539	5,539	5,539	5,539
Plum Creek CD Total		**Carrizo-Wilcox**	**17,673**	**15,366**	**16,335**	**16,965**	**15,562**	**19,509**	**19,468**

[11] A zero value indicates the groundwater availability model pumping scenario did not include any pumping in the aquifer.

TABLE A.1 (CONTINUED)

GCD	County	Aquifer	2020	2030	2040	2050	2060	2070	2080
Uvalde County GCD	Uvalde	Carrizo	0[12]	0	0	0	0	0	0
Uvalde County GCD	Uvalde	Upper Wilcox	0	0	0	0	0	0	0
Uvalde County GCD	Uvalde	Middle Wilcox	0	0	0	0	0	0	0
Uvalde County GCD	Uvalde	Lower Wilcox	0	0	0	0	0	0	0
Uvalde County GCD Total		**Carrizo-Wilcox**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Wintergarden GCD	Dimmit	Carrizo	2,722	2,715	2,722	2,715	2,715	2,715	2,715
Wintergarden GCD	Dimmit	Upper Wilcox	993	990	993	990	990	990	990
Wintergarden GCD	Dimmit	Middle Wilcox	142	142	142	142	142	142	142
Wintergarden GCD	Dimmit	Lower Wilcox	38	38	38	38	38	38	38
Wintergarden GCD	La Salle	Carrizo	4,597	4,584	4,597	4,584	4,584	4,584	4,584
Wintergarden GCD	La Salle	Upper Wilcox	1,957	1,952	1,957	1,952	1,952	1,952	1,952
Wintergarden GCD	La Salle	Middle Wilcox	0	0	0	0	0	0	0
Wintergarden GCD	La Salle	Lower Wilcox	0	0	0	0	0	0	0
Wintergarden GCD	Zavala	Carrizo	27,969	26,368	25,065	24,897	24,699	24,524	24,233
Wintergarden GCD	Zavala	Upper Wilcox	6,329	6,312	6,329	6,312	6,312	6,312	6,312
Wintergarden GCD	Zavala	Middle Wilcox	3,683	3,673	3,683	3,673	3,673	3,673	3,673
Wintergarden GCD	Zavala	Lower Wilcox	322	322	322	322	322	322	322
Wintergarden GCD Total		**Carrizo-Wilcox**	**48,752**	**47,096**	**45,848**	**45,625**	**45,427**	**45,252**	**44,961**
No District-County	Bexar	Carrizo	43,057	42,939	43,346	43,227	43,227	43,423	43,423
No District-County	Bexar	Upper Wilcox	10	10	10	10	10	10	10
No District-County	Bexar	Middle Wilcox	58	58	58	58	58	58	58
No District-County	Bexar	Lower Wilcox	26,602	25,444	25,514	25,444	24,358	24,358	24,358

[12] A zero value indicates the groundwater availability model pumping scenario did not include any pumping in the aquifer.

TABLE A.1 (CONTINUED)

GCD	County	Aquifer	2020	2030	2040	2050	2060	2070	2080
No District-County	Caldwell	Carrizo	NP[13]	NP	NP	NP	NP	NP	NP
No District-County	Caldwell	Upper Wilcox	NP	NP	NP	NP	NP	NP	NP
No District-County	Caldwell	Middle Wilcox	39	39	39	39	39	39	39
No District-County	Caldwell	Lower Wilcox	0[14]	0	0	0	0	0	0
No District-County	Gonzales	Carrizo	0	0	0	0	0	0	0
No District-County	Gonzales	Upper Wilcox	0	0	0	0	0	0	0
No District-County	Gonzales	Middle Wilcox	0	0	0	0	0	0	0
No District-County	Gonzales	Lower Wilcox	0	0	0	0	0	0	0
No District-County	Maverick	Carrizo	543	541	543	541	541	272	272
No District-County	Maverick	Upper Wilcox	0	0	0	0	0	0	0
No District-County	Maverick	Middle Wilcox	2	2	2	2	2	2	2
No District-County	Maverick	Lower Wilcox	2	2	2	2	2	2	2
No District-County	Web	Carrizo	898	896	898	896	896	896	896
No District-County	Web	Upper Wilcox	13	13	13	13	13	13	13
No District-County	Web	Middle Wilcox	1	1	1	1	1	1	1
No District-County	Web	Lower Wilcox	0	0	0	0	0	0	0
No District-County Total		**Carrizo-Wilcox**	**71,225**	**69,945**	**70,426**	**70,233**	**69,147**	**69,074**	**69,074**
Total for GMA 13		**Carrizo-Wilcox**	**470,283**	**448,537**	**473,887**	**520,821**	**558,942**	**583,136**	**574,718**

[13] NP: The aquifer is not present in this part of the county.
[14] A zero value indicates the groundwater availability model pumping scenario did not include any pumping in the aquifer.

APPENDIX 6

Part 1
Estimated Historical Groundwater Use
And
2017 State Water Plan Datasets

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APPENDIX 7

Part 2
Groundwater Availability Model Report
GAM Run 18-006

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APPENDIX 8

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