

Texana Groundwater Conservation District

Groundwater Management Plan

Texana Groundwater Conservation District Groundwater Management Plan Adoption:	July 15, 2021
Texas Water Development Board Administrative Approval:	

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DISTRICT MISSION

The mission of the Texana Groundwater Conservation District (District) is to develop sound water conservation and management strategies designed to conserve, preserve, protect, and prevent waste of groundwater resources for long-term sustainability within Jackson County for the benefit of Jackson County's landowners, citizens, economy, and environment.

The District will implement these strategies through the acquisition and dissemination of hydrogeological information, the development of programs and incentives to conserve and protect groundwater resources, and the adoption and enforcement of fair and appropriate rules governing the production and use of the groundwater resources within the Jackson County.

PURPOSE OF THE GROUNDWATER MANAGEMENT PLAN

Senate Bill 1, enacted by the 75th Texas Legislature in 1997, and Senate Bill 2, enacted by the 77th Texas Legislature in 2001, established a comprehensive statewide water resource planning process and the actions necessary for groundwater conservation districts to manage and conserve the groundwater resources of the state of Texas. These bills required all groundwater conservation districts to develop a management plan which defines the groundwater needs and groundwater supplies within each district and the goals each district has set to achieve its mission.

In addition, the 79th Texas Legislature enacted House Bill 1763 in 2005 that requires joint planning among districts that are in the same groundwater management area. These districts must jointly agree upon and establish the desired future conditions of the aquifers within their respective groundwater management areas. Through this process, the groundwater conservation districts will submit the desired future conditions to the Executive Administrator of the Texas Water Development Board who, in turn, will provide each district within the groundwater management area with estimates of modeled available groundwater within each district. The modeled available groundwater will be based on the desired future conditions jointly established for each aquifer within the groundwater management area.

Technical information, such as the desired future conditions within the District's jurisdiction and the amount of modeled available groundwater from such aquifers is required by statute to be included in the management plan of the District and will guide the regulatory and management policies of the District. This management plan is intended to satisfy the requirements of Senate Bill 1, Senate Bill 2, House Bill 1763, the statutory requirements of Chapter 36 of the Texas Water Code, and the rules and requirements of

the Texas Water Development Board.

DISTRICT INFORMATION

Creation

The District was created by Senate Bill 1911, 76th Legislature and codified as Chapter 8857, Special District and Local Laws Code. The citizens of Jackson County through a confirmation election held on November 6, 2001 ratified the District. The District was formed to protect, conserve, and prevent waste of the groundwater resources beneath the area of Jackson County. To manage the groundwater resources under its jurisdiction, the District is charged with the rights and responsibilities specified in its enabling legislation; the provisions of Chapter 36 of the Texas Water Code; this groundwater management plan, and the rules of the District.

Directors

The Texana Groundwater Conservation District Board of Directors consists of seven members. These directors are elected by the voters of Jackson County and serve a four-year term. The District observes the same four precincts as the Jackson County Commissioners with three at-large positions. Director terms are staggered on a two-year election interval in even numbered years.

Authority

The District has the rights and responsibilities provided in Chapter 36 of the Texas Water Code and Chapter 356 of Title 31 of the Texas Administrative Code. The District has the authority to undertake hydrogeological studies, adopt a groundwater management plan, provide for the permitting of certain water wells, and implement programs to achieve statutory requirements. The District has rule-making authority to implement its policies and procedures to manage the groundwater resources of Jackson County.

Location and Extent

The boundaries of the District are conterminous with those of Jackson County, Texas. This area encompasses approximately 829.25 square miles. The District is bounded by Calhoun County, Colorado County, Lavaca County, Matagorda County, Victoria County, and Wharton County.

GROUNDWATER RESOURCES OF JACKSON COUNTY

Depositions from sediment-laden rivers, currents from the Gulf of Mexico, and storm waves have influenced the geologic formations in Jackson County. The fluctuation of the coastline over geologic eons contributed to the deposition of sediments within the Jackson County as well. The geologic formations in the Jackson County according to their depositional age are summarized in Figure 1. The Gulf Coast Aquifer underlies Jackson County.

Figure 1: Geologic and Hydrogeological Units of the Gulf Coast Aquifer in Jackson County.

Stratigraphic Unit		Hydrogeologic Unit
Alluvium		Chicot Aquifer
Beaumont Clay		
Montgomery Formation	Lissie Formation	
Bentley Formation		
Willis Sand		
Goliad Sand		Evangeline Aquifer
Fleming Formation		
Oakville Sandstone		Jasper Aquifer
Catahoula Sandstone (Tuff)		

The Gulf Coast Aquifer System is conceptualized to comprise of four distinct aquifer components: Chicot, Evangeline, Burkeville Confining Unit and the Jasper Aquifer (Baker, 1979). These aquifer components are included within the Central Gulf Coast Groundwater Availability Model developed by the Texas Water Development Board (Chowdhury and Mace, 2004). The Chicot and the Evangeline aquifers are utilized the most within Jackson County. The Chicot Aquifer crops out across the entirety of Jackson County. The thickness of the Chicot Aquifer ranges up to approximately 1,000 feet in Jackson County. The thickness of the Evangeline Aquifer ranges from 1,000 feet to 1,600 feet in Jackson County. The Chicot and Evangeline aquifers consist of interbedded sands, silts and clays. The sand content is higher in the Evangeline Aquifer compared to the Chicot Aquifer. The water quality in the aquifer generally deteriorates along the coast.

STATEMENT OF GUIDING PRINCIPLES

The District recognizes that the groundwater resources of Jackson County and the region are of vital importance to the many users who are dependent on these valuable resources. In addition, the District recognizes that landowners have an ownership right in the groundwater resources associated with their properties and are the primary stewards of the groundwater resources associated with their properties. The District will work with interested parties, especially landowners, in Jackson County to conserve, preserve, protect, and prevent waste of this most valuable resource, for the benefit of the landowners, the public, the local economy, and the environment.

The groundwater management plan of the District is intended to serve as a tool to focus the thoughts and actions of those given the responsibility for the execution of the activities of the District as well as to provide information to the staff of the District, landowners, and others responsible for the execution of, or compliance with, the policies and rules of the District. The District will carry out its programs and responsibilities in implementing this groundwater management plan in a prudent and cost-effective manner. The District, with public input, will adopt and enforce rules necessary to implement this groundwater management plan.

CRITERIA FOR PLAN APPROVAL

Planning Horizon

The planning period for this plan is ten years from the date of approval by the Texas Water Development Board. This plan will be reviewed within five years as required by §36.1072(e) of the Texas Water Code. The District will consider the necessity to amend the plan and re-adopt this groundwater management plan with or without amendments as required by §36.1072(e) of the Texas Water Code.

This groundwater management plan will remain in effect until replaced by a revised management plan approved by the Texas Water Development Board.

Notice and Hearing Related to Plan Adoption - TWC §36.1071(a)

Public notices documenting that this plan was considered and adopted following appropriate public hearings are included in Appendix D.

Coordination with Regional Surface Water Management Entities - TWC §36.1071(a)

Letters transmitting this plan to the surface water management entities of the Jackson County region for coordination purposes are included in Appendix E.

Texana Groundwater Conservation District Board of Director Resolution Adopting Management Plan TWC §36.1071(a)

A copy of the resolution approved by the Board of Directors of the Texana Groundwater Conservation District adopting this plan is included in Appendix F.

ESTIMATES OF TECHNICAL INFORMATION REQUIRED BY §36.1071 OF THE TEXAS WATER CODE AND RULE 356.52 OF TITLE 31 OF THE TEXAS ADMINISTRATIVE CODE

Estimate of Modeled Available Groundwater in the DISTRICT based on Desired Future Conditions – TWC §36.1071(e)(3)(A) and 31 TAC 356.52(a)(5)(A)

Modeled available groundwater is defined in §36.001 of the Texas Water Code 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." Desired future condition is defined in §36.001 of the Texas Water Code as "a quantitative description, adopted in accordance with §36.108 of the Texas Water Code, of the desired condition of the groundwater resources in a management area at one or more specified future times." The desired future condition of an aquifer may only be determined through joint planning with other groundwater conservation districts in the same groundwater management area as specified under §36.108 of the Texas Water Code.

The District is located in Groundwater Management Area 15. District representatives of Groundwater Management Area 15 adopted, by resolution, the desired future condition for Gulf Coast Aquifer within Groundwater Management Area 15 on April 29, 2016. The administrator of Groundwater Management Area 15 submitted the adopted desired future conditions and explanatory report for Groundwater Management Area 15 on June 23, 2016 to Texas Water Development Board. The Texas Water Development Board designated the Groundwater Management Area 15 explanatory report administratively complete on October 20, 2016. The Texas Water Development Board provided the modeled available groundwater estimates for Groundwater Management Area 15 to district representatives on March 22, 2017.

The desired future condition for the entire area is stated as follows: *"Drawdown of the Gulf Coast Aquifer System shall not exceed an average of 13 feet in December 2069 from estimated year 2000 conditions."*

The desired future condition for Jackson County is stated as follows: *"Drawdown of the Gulf Coast Aquifer System shall not exceed an average of 15 feet in December 2069 from estimated year 2000 conditions."*

The Texas Water Development Board reported the modeled available groundwater for Groundwater Management Area 15 based on the desired future condition in GAM Run 16-025 MAG which is incorporated into this management plan as Appendix C. The modeled available groundwater, in acre-feet per year (AFY), of the Gulf Coast Aquifer within the District per Table 1 of the GAM Run 16-025 MAG report is as follows:

Year					
2020	2030	2040	2050	2060	2069
90,482	90,482	90,482	90,482	90,482	90,482

All values in acre-feet/year (AFY)

Estimate of amount of groundwater being used within the district on an annual basis – TWC §36.1071(e)(3)(B) and 31 TAC 356.52(a)(5)(B)

The District recognizes the estimate of the amount of groundwater being used within the District on an annual basis, according to information provided by the Texas Water Development Board, totals 61,064 acre-feet in year 2018. Please refer to Appendix A-Estimated Historical Water Use and 2017 State Water Plan Datasets for additional values for the most recent five required years of reporting.

Estimate of annual amount of recharge from precipitation to the groundwater resources within the district – TWC §36.1071(e)(3)(C) and 31 TAC 356.52(a)(5)(C)

The District recognizes the estimate of the amount of recharge from precipitation to the groundwater resources within the District, according to information provided by the Texas Water Development Board, totals 10,841 acre-feet. Please refer to Appendix B-GAM Run 20-006 for additional information.

Estimate for each aquifer, annual volume of water that discharges from the aquifer to springs and any surface water bodies, including lakes, streams, and rivers – TWC §36.1071(e)(3)(D) and 31 TAC 356.52(a)(5)(D)

The District recognizes the estimate for each aquifer, annual volume of water that discharges from the aquifer to springs and any surface water bodies, including lakes, streams, and rivers within the District, according to information provided by the Texas Water Development Board, totals 21,572 acre-feet. This estimate includes 7,787 acre-feet per year going to the Lavaca and Vaes Bays and 13,785 acre-feet per year going to springs, lakes, streams, and rivers within the Texana Groundwater Conservation District. Please refer to Appendix B-GAM Run 20-006 for additional information.

Estimate of annual volume of flow into and out of the district within each aquifer and between aquifers in the district – TWC §36.1071(e)(3)(E) and 31 TAC 356.52(a)(5)(E)

The District recognizes the estimate of annual volume of flow into the district within each aquifer, according to information provided by the Texas Water Development Board, totals 38,344 acre-feet. The District recognizes the estimate of annual volume of flow out of the district within each aquifer, according to information provided by the Texas Water Development Board, totals 17,643 acre-feet. The estimated net annual volume of flow between each aquifer in the district is not applicable because the model assumes a no flow barrier at the base of the Gulf Coast Aquifer System. Please refer to Appendix B-GAM Run 20-006 for additional information.

Estimate of projected surface water supply in the district according to the most recently adopted state water plan – TWC §36.1071(e)(3)(F) and 31 TAC 356.52(a)(5)(F)

The District recognizes the sum of projected surface water supplies, according to information provided by the Texas Water Development Board, is 1,000 acre-feet for year 2030 and 1,000 acre-feet for year 2070. Please refer to Appendix A-Estimated Historical Water Use and 2017 State Water Plan for additional information.

Estimate of projected total demand for water in the district according to the most recently adopted state water plan – TWC §36.1071(e)(3)(G) and 31 TAC 356.52(a)(5)(G)

The District recognizes the sum of projected surface water demands, according to information provided by the Texas Water Development Board, is 63,447 acre-feet for year 2030 and 63,502 acre-feet for year 2070. Please refer to Appendix A-Estimated Historical Water Use and 2017 State Water Plan for additional information.

CONSIDER THE WATER SUPPLY NEEDS AND WATER MANAGEMENT STRATEGIES INCLUDED IN THE ADOPTED STATE WATER PLAN – TWC §36.1071(e)(4)

The District recognizes that there are no water supply needs within the District, according to information provided by the Texas Water Development Board. Please refer to Appendix A- Estimated Historical Water Use and 2017 State Water Plan for additional information. The District recognizes that water management strategies for the cities of Edna and Ganado indicate drought management demand reduction of 87 acre-feet in year 2030 and 87 acre-feet in 2070. Please refer to Appendix A- Estimated Historical Water Use and 2017 State Water Plan for additional information.

DETAILS ON THE DISTRICT MANAGEMENT OF GROUNDWATER

The Texas Legislature established that groundwater conservation districts are the preferred method of groundwater management in §36.0015 of the Texas Water Code. The District will manage the use of groundwater within Jackson County in order to protect, preserve, conserve, and prevent waste of the resource while seeking to maintain the economic viability of all resource user groups, public and private. The District seeks to manage the groundwater resources of Jackson County as practicably as possible as established in the plan. In consideration of the economic and cultural activities occurring within Jackson County, the District will identify and engage in such activities and practices, that if implemented may result in the reasonable and effective protection, preservation, conservation, waste prevention of groundwater in Jackson County. The District will manage groundwater resources through rules developed and implemented in accordance with Chapter 36 of the Texas Water Code and the provisions of the enabling legislation of the District.

For the purposes of this management plan, the following definitions are used:

- Protection of groundwater is the activity and practice of seeking to prevent harm or injury to a groundwater resource.
- Preservation of groundwater is the activity and practice of seeking to extend the useful longevity or life of a groundwater resource.
- Conservation of groundwater is the activity and practice of seeking to use a groundwater resource in a manner that appropriately balances the impacts associated with consuming the resource and preserving the resource for the future.
- Waste prevention of groundwater is the activity and practices seeking to prevent the use of groundwater in any manner defined as waste in §36.001 of the Texas Water Code.

The District will monitor aquifer conditions in and around Jackson County in order to monitor changing water levels and water quality of groundwater resources within Jackson County. The District will make periodic assessments of aquifer conditions and will report those conditions to the Board of Directors of the District and to the public. The District may undertake, as necessary, investigations of the groundwater resources within Jackson County and will make the results of investigations available to the public. The District will cooperate with investigations of the groundwater resources of Jackson County undertaken by other local political subdivisions or agencies of the State of Texas.

In order to better manage groundwater resources, the District may establish management zones for; and adopt different rules for:

1. Each aquifer, subdivision of an aquifer, or geologic strata located in whole or in part within Jackson County; or
2. Each geographic area overlying an aquifer or subdivision of an aquifer located in whole or in part within Jackson County.

For the purpose of managing the use of groundwater within Jackson County, the District

may define sustainable use as the use of an amount of groundwater in Jackson County as a whole or any management zone established by the District that does not exceed any of the following conditions:

1. the long-term average historical groundwater production from aquifers in Jackson County established by the District prior to the establishment of the desired future condition of aquifers in a groundwater management area in which the District is located; or
2. the desired future conditions of aquifers in Jackson County established by a groundwater management area in which the District is located; or
3. The amount of modeled available groundwater resulting from the establishment of a desired future aquifer condition by the District or a groundwater management area in which the District is located; or
4. the estimated long-term average historical amount of annual recharge of the aquifer or aquifer subdivision in which the use occurs as recognized by the District; or
5. any other criteria established by the District as being a threshold of use beyond which further use of the aquifer or aquifer subdivision may result in a specified undesirable or injurious condition.

The District may adopt rules that protect historic use of groundwater in Jackson County to the maximum extent practical and consistent with this plan and the goals and objectives set forth herein. The District may impose more restrictive conditions on non-historic-use permits and non-historic-use permit amendments to increase use by historic users if the limitations:

1. apply to all non-historic-use permits and non-historic-use permit amendments to increase use by historic users, regardless of the type or location of use;
2. bear a reasonable relationship to the Desired Future Condition of the District; and
3. are reasonably necessary to protect historic use.

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

ACTIONS, PROCEDURES, PERFORMANCE AND AVOIDANCE FOR PLAN IMPLEMENTATION – TWC §36.1071(e)(2)

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

The Rules of the District adopted by the Board of Directors of the Texana Groundwater Conservation District shall comply with Chapter 36 of the Texas Water Code, including §36.113 of the Texas Water Code, and the provisions of this management plan. All rules will be adhered to and enforced. The promulgation and enforcement of the rules will be based on the best technical evidence available to the District.

The Rules of the District are available at the following website address:
<https://texanagcd.org/groundwater-policy.html>.

METHODOLOGY FOR TRACKING DISTRICT PROGRESS IN ACHIEVING MANAGEMENT GOALS – 31TAC 356.52(a)(4)

The staff of the District will prepare and present an annual report to the members of the Board of Directors regarding the performance of the District in achieving management goals and objectives. The report will be presented within 180 days following the completion of each fiscal year. The District will maintain the report on file for public inspection at the District's offices upon adoption at a meeting of the Texana Groundwater Conservation District Board of Directors.

GOALS, MANAGEMENT OBJECTIVES AND PERFORMANCE STANDARDS

Providing the most efficient use of groundwater – TWC §36.1071(a)(1) and 31 TAC 356.52(a)(1)(A)

Objective: Develop and maintain a program for processing permitting requests submitted to the District and tracking well registrations and permits issued by the District authorizing groundwater production during the fiscal year.

Performance Standard: The District will summarize within the annual report 1) the status of pending permitting requests and 2) the number of wells registered by the the District, and 3) volume of groundwater authorized to be produced under production permits issued by the District, as of the last day of the preceding fiscal year.

Controlling and preventing waste of groundwater – TWC §36.1071(a)(2) and 31 TAC 356.52(a)(1)(B)

Objective: Develop and maintain a program for inspecting at least twelve (12) water wells within the District during the fiscal year.

Performance Standard: The District will summarize within the annual report the number of wells inspected during the preceding fiscal year and those wells requiring corrective action.

Controlling and preventing subsidence – TWC §36.1071(a)(3) and 31 TAC 356.52(a)(1)(C)

This category of management goal is not applicable to the District at this time because no significant subsidence is occurring in Jackson County. The District will monitor geological conditions for evidence of subsidence, particularly in high groundwater production areas near the coast and take appropriate action should significant subsidence develop.

The District reviewed the technical report titled *Final Report: Identification of the Vulnerability of the Major and Minor Aquifers of Texas to Subsidence with Regard to Groundwater Pumping; TWDB Contract Number 1648302062*. The report describes estimates of historic subsidence within Jackson County in excess of 1 foot caused by groundwater production for irrigation. Furthermore, the report suggests that increased production in the Gulf Coast Aquifer may contribute to increased subsidence rates in some areas (see Section 4.1.1) with all portions of Jackson County being characterized as medium or higher subsidence risk (see Figure 4.23).

Addressing conjunctive surface water management issues – TWC §36.1071(a)(4) and 31 TAC 356.52(a)(1)(D)

Objective: Participate in the regional water planning process by attending and participating in at least one (1) Lavaca Regional Water Planning Group (Region P) meeting held during the fiscal year.

Performance Standard: The District will summarize within the annual report the dates of meetings of the Lavaca Regional Water Planning Group attended by representatives of the District during the preceding fiscal year.

Addressing natural resource issues which impact the use and availability of groundwater, and which are impacted by the use of groundwater – TWC §36.1071(a)(5) and 31 TAC §356.52(a)(1)(E)

Objective: Develop and maintain a program to monitor the water quality of at least

twelve (12) water wells within the District per year.

Performance Standard: The District will summarize within the annual report 1) the number of wells monitored and 2) the water quality measurements collected during the preceding fiscal year.

Addressing drought conditions – TWC §36.1071(a)(6) and 31 TAC 356.52(a)(1)(F)

Objective: Review drought condition information related to the District and the surrounding region of Texas collected from the following website at least four meetings of the Board of Directors during the fiscal year: <https://www.waterdatafortexas.org/>.

Performance Standard: The District will summarize within the annual report the number of instances drought condition information was considered by the Board of Directors during the preceding fiscal year.

Addressing conservation, recharge enhancement, rainwater harvesting, precipitation enhancement, or brush control, where appropriate and cost-effective – TWC §36.1071(a)(7) and 31 TAC 356.52(a)(1)(G)

Objective: Promote conservation, rainwater harvesting, or brush control within Jackson County at least once during the fiscal year.

Performance Standard: The District will summarize within the annual report the number of instances the District promoted conservation, rainwater harvesting, or brush control during the preceding fiscal year.

Addressing recharge enhancement and precipitation enhancement are deemed to be neither appropriate nor cost-effective activities for the District at this time because there are no existing recharge enhancement or precipitation enhancement programs operating in nearby counties in which the District could participate and share costs. The costs of operating a single-county recharge enhancement or precipitation enhancement program are prohibitive and would require the District to increase taxes. Therefore, these goals are not considered applicable to the District at this time.

Addressing the desired future conditions adopted by the district under Section 36.108 – TWC §36.1071(a)(8) and 31 TAC 356.52(a)(1)(H)

Objective: Develop and maintain a program to monitor the water level of at least

twelve (12) water wells within the District per year.

Performance Standard: The District will summarize within the annual report 1) the number of wells monitored and 2) the water level measurements collected during the preceding fiscal year.

Objective: Analyze aquifer monitoring information to evaluate achievement of the desired future conditions of the District based on information available during the fiscal year.

Performance Standard: The District will summarize within the annual report 1) the aquifer monitoring information and 2) the conclusions regarding the achievement of the desired future conditions of the District during the preceding fiscal year.

List of Appendices

- Appendix A.** Estimated Historical Water Use and 2017 State Water Plan Datasets provided by Texas Water Development Board
- Appendix B.** Groundwater Availability Model Run provided by Texas Water Development Board GAM Run 20-006
- Appendix C.** Modeled Available Groundwater GAM Run 16-025 MAG
- Appendix D.** Public Notices Regarding Hearings Related to Plan Adoption
- Appendix E.** Letters Coordinating with Regional Surface Water Management Entities
- Appendix F.** Texana Groundwater Conservation District Board of Director Resolution Adopting Management Plan
- Appendix G.** Minutes of Texana Groundwater Conservation District Board of Director Meeting related to the public hearings for and adoption of the Management Plan
- Appendix H.** Texana Groundwater Conservation District Contact Information

Appendix A. Estimated Historical Water Use and 2017 State Water Plan
Datasets provided by Texas Water Development Board

Estimated Historical Water Use And 2017 State Water Plan Datasets:

Texana Groundwater Conservation District

by Stephen Allen
Texas Water Development Board
Groundwater Division
Groundwater Technical Assistance Section
stephen.allen@twdb.texas.gov
(512) 463-7317
February 22, 2021

GROUNDWATER MANAGEMENT PLAN DATA:

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

<http://www.twdb.texas.gov/groundwater/docs/GCD/GMPChecklist0113.pdf>

The five reports included in this part are:

1. Estimated Historical Water Use (checklist item 2)
from the TWDB Historical Water Use Survey (WUS)
2. Projected Surface Water Supplies (checklist item 6)
3. Projected Water Demands (checklist item 7)
4. Projected Water Supply Needs (checklist item 8)
5. Projected Water Management Strategies (checklist item 9)
from the 2017 Texas State Water Plan (SWP)

Part 2 of the 2-part package is the groundwater availability model (GAM) report for the District (checklist items 3 through 5). The District should have received, or will receive, this report from the Groundwater Availability Modeling Section. Questions about the GAM can be directed to Dr. Shirley Wade, shirley.wade@twdb.texas.gov, (512) 936-0883.

DISCLAIMER:

The data presented in this report represents the most up-to-date WUS and 2017 SWP data available as of 2/22/2021. Although it does not happen frequently, either of these datasets are subject to change pending the availability of more accurate WUS data or an amendment to the 2017 SWP. District personnel must review these datasets and correct any discrepancies in order to ensure approval of their groundwater management plan.

The WUS dataset can be verified at this web address:

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

The 2017 SWP dataset can be verified by contacting Sabrina Anderson (sabrina.anderson@twdb.texas.gov or 512-936-0886).

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

Estimated Historical Water Use

TWDB Historical Water Use Survey (WUS) Data

Groundwater and surface water historical use estimates are currently unavailable for calendar year 2019. TWDB staff anticipates the calculation and posting of these estimates at a later date.

JACKSON COUNTY

All values are in acre-feet

Year	Source	Municipal	Manufacturing	Mining	Steam Electric	Irrigation	Livestock	Total
2018	GW	1,422	59	0	0	59,159	424	61,064
	SW	0	480	0	0	430	229	1,139
2017	GW	1,413	66	0	0	52,934	407	54,820
	SW	0	470	0	0	891	218	1,579
2016	GW	1,316	55	0	0	55,659	536	57,566
	SW	0	464	0	0	914	289	1,667
2015	GW	1,372	62	0	0	39,041	518	40,993
	SW	0	473	0	0	488	279	1,240
2014	GW	1,637	50	0	0	71,216	506	73,409
	SW	0	474	0	0	0	273	747
2013	GW	1,748	25	0	0	97,333	482	99,588
	SW	0	431	0	0	1,492	259	2,182
2012	GW	1,947	32	0	0	48,889	534	51,402
	SW	0	458	0	0	445	288	1,191
2011	GW	2,109	28	0	0	86,894	835	89,866
	SW	0	487	0	0	442	449	1,378
2010	GW	1,713	37	43	0	42,258	793	44,844
	SW	0	432	6	0	1,500	427	2,365
2009	GW	1,852	29	43	0	45,911	681	48,516
	SW	0	431	6	0	1,699	367	2,503
2008	GW	1,746	33	42	0	35,889	670	38,380
	SW	0	451	6	0	1,334	361	2,152
2007	GW	1,626	140	0	0	33,242	757	35,765
	SW	0	461	0	0	471	409	1,341
2006	GW	1,832	167	0	0	33,396	669	36,064
	SW	0	489	0	0	0	362	851
2005	GW	1,789	166	0	0	42,893	583	45,431
	SW	0	474	0	0	0	314	788
2004	GW	1,723	122	0	0	44,599	205	46,649
	SW	0	434	0	0	621	677	1,732
2003	GW	1,793	90	0	0	33,494	210	35,587
	SW	3	494	0	0	756	689	1,942

Projected Surface Water Supplies

TWDB 2017 State Water Plan Data

JACKSON COUNTY

All values are in acre-feet

RWPG	WUG	WUG Basin	Source Name	2020	2030	2040	2050	2060	2070
P	MANUFACTURING, JACKSON	COLORADO- LAVACA	TEXANA LAKE/RESERVOIR	1,000	1,000	1,000	1,000	1,000	1,000
Sum of Projected Surface Water Supplies (acre-feet)				1,000	1,000	1,000	1,000	1,000	1,000

Projected Water Demands

TWDB 2017 State Water Plan Data

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

JACKSON COUNTY

All values are in acre-feet

RWPG	WUG	WUG Basin	2020	2030	2040	2050	2060	2070
P	COUNTY-OTHER, JACKSON	COLORADO-LAVACA	229	226	222	220	220	221
P	COUNTY-OTHER, JACKSON	LAVACA	421	417	406	403	404	406
P	COUNTY-OTHER, JACKSON	LAVACA-GUADALUPE	50	49	48	47	48	48
P	EDNA	LAVACA	885	887	877	877	881	885
P	GANADO	LAVACA	270	270	267	266	267	268
P	IRRIGATION, JACKSON	COLORADO-LAVACA	18,061	18,061	18,061	18,061	18,061	18,061
P	IRRIGATION, JACKSON	LAVACA	36,370	36,370	36,370	36,370	36,370	36,370
P	IRRIGATION, JACKSON	LAVACA-GUADALUPE	5,370	5,370	5,370	5,370	5,370	5,370
P	LIVESTOCK, JACKSON	COLORADO-LAVACA	228	228	228	228	228	228
P	LIVESTOCK, JACKSON	LAVACA	708	708	708	708	708	708
P	LIVESTOCK, JACKSON	LAVACA-GUADALUPE	98	98	98	98	98	98
P	MANUFACTURING, JACKSON	COLORADO-LAVACA	666	686	705	721	766	815
P	MANUFACTURING, JACKSON	LAVACA	4	4	4	4	5	5
P	MINING, JACKSON	COLORADO-LAVACA	10	11	8	6	4	3
P	MINING, JACKSON	LAVACA	39	40	30	22	14	10
P	MINING, JACKSON	LAVACA-GUADALUPE	21	22	17	12	8	6
Sum of Projected Water Demands (acre-feet)			63,430	63,447	63,419	63,413	63,452	63,502

Projected Water Supply Needs

TWDB 2017 State Water Plan Data

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

JACKSON COUNTY

All values are in acre-feet

RWPG	WUG	WUG Basin	2020	2030	2040	2050	2060	2070
P	COUNTY-OTHER, JACKSON	COLORADO-LAVACA	0	3	7	9	9	8
P	COUNTY-OTHER, JACKSON	LAVACA	0	4	15	18	17	15
P	COUNTY-OTHER, JACKSON	LAVACA-GUADALUPE	0	1	2	3	2	2
P	EDNA	LAVACA	2	0	10	10	6	2
P	GANADO	LAVACA	0	0	3	4	3	2
P	IRRIGATION, JACKSON	COLORADO-LAVACA	0	0	0	0	0	0
P	IRRIGATION, JACKSON	LAVACA	0	0	0	0	0	0
P	IRRIGATION, JACKSON	LAVACA-GUADALUPE	0	0	0	0	0	0
P	LIVESTOCK, JACKSON	COLORADO-LAVACA	0	0	0	0	0	0
P	LIVESTOCK, JACKSON	LAVACA	0	0	0	0	0	0
P	LIVESTOCK, JACKSON	LAVACA-GUADALUPE	0	0	0	0	0	0
P	MANUFACTURING, JACKSON	COLORADO-LAVACA	334	314	295	279	234	185
P	MANUFACTURING, JACKSON	LAVACA	1	1	1	1	0	0
P	MINING, JACKSON	COLORADO-LAVACA	1	0	3	5	7	8
P	MINING, JACKSON	LAVACA	1	0	10	18	26	30
P	MINING, JACKSON	LAVACA-GUADALUPE	1	0	5	10	14	16
Sum of Projected Water Supply Needs (acre-feet)			0	0	0	0	0	0

Projected Water Management Strategies

TWDB 2017 State Water Plan Data

JACKSON COUNTY

WUG, Basin (RWPG)

All values are in acre-feet

Water Management Strategy	Source Name [Origin]	2020	2030	2040	2050	2060	2070
EDNA, LAVACA (P)							
DROUGHT MANAGEMENT	DEMAND REDUCTION [JACKSON]	33	33	33	33	33	33
		33	33	33	33	33	33
GANADO, LAVACA (P)							
DROUGHT MANAGEMENT	DEMAND REDUCTION [JACKSON]	54	54	53	53	53	54
		54	54	53	53	53	54
Sum of Projected Water Management Strategies (acre-feet)		87	87	86	86	86	87

Appendix B. Groundwater Availability Model Run provided by Texas Water
Development Board GAM Run 20-006

GAM RUN 20-006: TEXANA GROUNDWATER CONSERVATION DISTRICT MANAGEMENT PLAN

By Shirley C. Wade, Ph.D., P.G.
Texas Water Development Board
Groundwater Division
Groundwater Availability Modeling Department
(512) 936-0883
November 18, 2020



Shirley C. Wade
11/18/20

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GAM RUN 20-006: TEXANA GROUNDWATER CONSERVATION DISTRICT MANAGEMENT PLAN

By Shirley C. Wade, Ph.D, P.G.
Texas Water Development Board
Groundwater Division
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(512) 936-0883
November 18, 2020

EXECUTIVE SUMMARY:

Texas State Water Code, Section 36.1071, Subsection (h) (Texas Water Code, 2011), states that, in developing its groundwater management plan, a groundwater conservation district shall use groundwater availability modeling information provided by the Executive Administrator of the Texas Water Development Board (TWDB) in conjunction with any available site-specific information provided by the district for review and comment to the Executive Administrator.

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

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

The groundwater management plan for the Texana Groundwater Conservation District should be adopted by the district on or before March 15, 2021 and submitted to the executive administrator of the TWDB on or before April 14, 2021. The current management plan for the Texana Groundwater Conservation District expires on June 13, 2021.

We used the groundwater availability model for the central portion of the Gulf Coast Aquifer System version 1.01 (Chowdhury and others, 2004) to estimate the management plan information for the Gulf Coast Aquifer System within the Texana Groundwater Conservation District. An updated groundwater availability model for the central portion of the Gulf Coast Aquifer System is currently under development and is expected to be complete by the end of 2021. If Texana Groundwater Conservation District would like their management plan information from the updated model they can request a new GAM Run report when the model is available.

This report replaces the results of GAM Run 14-012 (Bahaya and Anaya, 2015), as the approach used for analyzing model results has been since refined to more accurately delineate flows to surface water and geographic information for the model grid has recently been updated. Table 1 summarizes the groundwater availability model data required by statute and Figure 1 shows the area of the groundwater availability model from which the values in the table was extracted. If, after review of Figure 1, the Texana Groundwater Conservation District determines that the district boundaries used in the assessment do not reflect current conditions, please notify the TWDB at your earliest convenience.

METHODS:

In accordance with the provisions of the Texas State Water Code, Section 36.1071, Subsection (h), the groundwater availability model described in the next section was used to estimate information for the Texana Groundwater Conservation District management plan. Water budgets were extracted for the Gulf Coast Aquifer System (1981-1999). We used ZONEBUDGET Version 3.01 (Harbaugh, 2009) to extract water budgets from the model results. The average annual water budget values for recharge, surface-water outflow, inflow to the district, outflow from the district, and the flow between aquifers within the district are summarized in this report.

PARAMETERS AND ASSUMPTIONS:

Gulf Coast Aquifer System

- We used version 1.01 of the groundwater availability model for the central portion of the Gulf Coast Aquifer for this analysis. See Chowdhury and others (2004) and Waterstone and others (2003) for assumptions and limitations of the groundwater availability model.
- The model for the central portion of the Gulf Coast Aquifer assumes partially penetrating wells in the Evangeline Aquifer due to a lack of data for aquifer properties in the deeper section of the aquifer located closer to the Gulf of Mexico.
- This groundwater availability model includes four layers, which generally represent the Chicot Aquifer (Layer 1), the Evangeline Aquifer (Layer 2), the Burkeville Confining Unit (Layer 3), and the Jasper Aquifer including parts of the Catahoula Formation (Layer 4).
- The model was run with MODFLOW-96 (Harbaugh and McDonald, 1996).

RESULTS:

A groundwater budget summarizes the amount of water entering and leaving the aquifer according to the groundwater availability model. Selected groundwater budget components listed below were extracted from the model results for the aquifers located within the district and averaged over the historical calibration periods, as shown in Table 1.

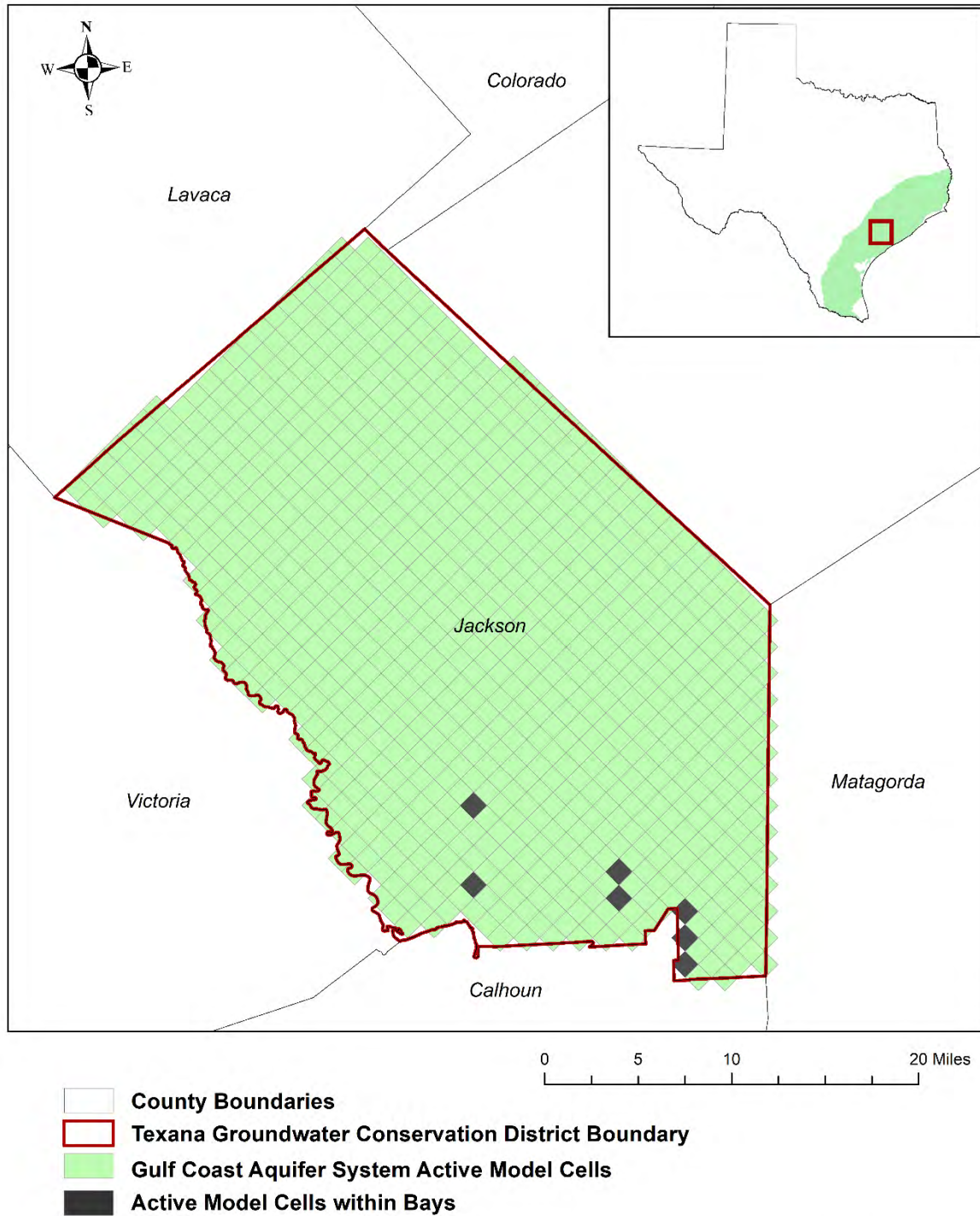
1. Precipitation recharge—the areally distributed recharge sourced from precipitation falling on the outcrop areas of the aquifers (where the aquifer is exposed at land surface) within the district.
2. Surface-water outflow—the total water discharging from the aquifer (outflow) to surface-water features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

The information needed for the district's management plan is summarized in Table 1. It is important to note that sub-regional water budgets are not exact. This is due to the size of the model cells and the approach used to extract data from the model. To avoid double accounting, a model cell that straddles a political boundary, such as a district or county boundary, is assigned to one side of the boundary based on the location of the centroid of the model cell. For example, if a cell contains two counties, the cell is assigned to the county where the centroid of the cell is located.

TABLE 1: SUMMARIZED INFORMATION FOR THE GULF COAST AQUIFER SYSTEM THAT IS NEEDED FOR THE TEXANA GROUNDWATER CONSERVATION DISTRICT'S GROUNDWATER MANAGEMENT PLAN. ALL VALUES ARE REPORTED IN ACRE-FEET PER YEAR AND ROUNDED TO THE NEAREST 1 ACRE-FOOT.

Management Plan requirement	Aquifer or confining unit	Results
Estimated annual amount of recharge from precipitation to the district	Gulf Coast Aquifer System	10,841
Estimated annual volume of water that discharges from the aquifer to springs and any surface water body including lakes, streams, and rivers.	Gulf Coast Aquifer System	21,572 ¹
Estimated annual volume of flow into the district within each aquifer in the district	Gulf Coast Aquifer System	38,344
Estimated annual volume of flow out of the district within each aquifer in the district	Gulf Coast Aquifer System	17,643
Estimated net annual volume of flow between each aquifer in the district	Flow between the Gulf Coast Aquifer System and Underlying Units	Not Applicable ²

1. 7,787 acre-feet per year goes to the Lavaca and Vaes Bays, while 13,785 acre-feet per year goes to springs, lakes, streams, and rivers within the Texana Groundwater Conservation District.
2. Not applicable because the model also assumes a no flow barrier at the base of the Gulf Coast Aquifer System.



gcd boundaries date = 06.26.2020, county boundaries date = 07.03.2019, glfc_c model grid date = 06.26.2020

FIGURE 1: AREA OF THE GROUNDWATER AVAILABILITY MODEL FOR THE CENTRAL PORTION OF THE GULF COAST AQUIFER SYSTEM FROM WHICH THE INFORMATION IN TABLE 1 WAS EXTRACTED (THE GULF COAST AQUIFER SYSTEM EXTENT WITHIN THE DISTRICT BOUNDARY).

LIMITATIONS:

The groundwater models 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 interaction with streams are specific to particular historic time periods.

Because the application of the groundwater models was designed to address regional scale questions, the results are most effective on a regional scale. The TWDB makes no warranties or representations related to the actual conditions of any aquifer at a particular location or at a particular time.

It is important for groundwater conservation districts to monitor groundwater pumping and overall conditions of the aquifer. Because of the limitations of the groundwater model and the assumptions in this analysis, it is important that the groundwater conservation districts work with the TWDB to refine this analysis in the future given the reality of how the aquifer responds to the actual amount and location of pumping now and in the future. Historic precipitation patterns also need to be placed in context as future climatic conditions, such as dry and wet year precipitation patterns, may differ and affect groundwater flow conditions.

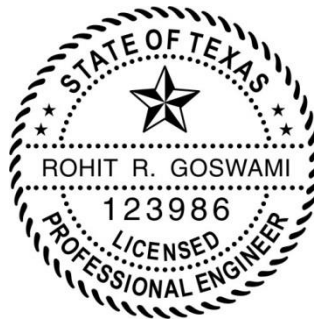
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Appendix C. Modeled Available Groundwater GAM Run 16-025 MAG

GAM RUN 16-025 MAG: MODELED AVAILABLE GROUNDWATER FOR THE GULF COAST AQUIFER SYSTEM IN GROUNDWATER MANAGEMENT AREA 15

Rohit Raj Goswami, Ph.D., P.E.
Texas Water Development Board
Groundwater Division
Groundwater Availability Modeling Section
(512) 463-0495
March 22, 2017



Rohit R. Goswami
3/22/2017

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GAM RUN 16-025 MAG: MODELED AVAILABLE GROUNDWATER FOR THE GULF COAST AQUIFER SYSTEM IN GROUNDWATER MANAGEMENT AREA 15

Rohit Raj Goswami, Ph.D., P.E.
Texas Water Development Board
Groundwater Division
Groundwater Availability Modeling Section
(512) 463-0495
March 22, 2017

EXECUTIVE SUMMARY:

The modeled available groundwater for Groundwater Management Area 15 for the Gulf Coast Aquifer System is summarized by decade for the groundwater conservation districts (Table 1) and for use in the regional water planning process (Table 2). The modeled available groundwater estimates range from approximately 515,000 acre-feet per year in 2020 to approximately 518,000 acre-feet per year in 2069 (Table 1). The estimates were extracted from results of a model run using the groundwater availability model for the central part of the Gulf Coast Aquifer System (version 1.01). The model run files, which meet the desired future conditions adopted by district representatives of Groundwater Management Area 15, were submitted to the Texas Water Development Board (TWDB) on June 28, 2016, as part of the Desired Future Conditions Explanatory Report for Groundwater Management Area 15. The explanatory report and other materials submitted to the Texas Water Development Board (TWDB) were determined to be administratively complete on October 20, 2016.

REQUESTOR:

Mr. Tim Andruss, chair of Groundwater Management Area 15.

DESCRIPTION OF REQUEST:

In a letter dated June 23, 2016, Mr. Tim Andruss provided the TWDB with the desired future conditions of the Gulf Coast Aquifer System adopted by the groundwater conservation districts in Groundwater Management Area 15. The Gulf Coast Aquifer System includes the Chicot Aquifer, Evangeline Aquifer, Burkeville Confining Unit and the Jasper Aquifer (including parts of the Catahoula Formation). TWDB staff worked with INTERA Incorporated, the consultant for Groundwater Management Area 15, in reviewing

model files associated with the desired future conditions. We received clarification from INTERA Incorporated, on behalf of Groundwater Management Area 15, on September 18, 2016, concerning assumptions on variances of average drawdown values per county to model results, which was ± 3.5 feet for nearly all areas within the Groundwater Management Area 15. The exception is Goliad County which has a variance in drawdown of ± 5 feet. The desired future conditions for the Gulf Coast Aquifer System, as described in Resolution No. 2016-01 and adopted April 29, 2016, by the groundwater conservation districts within Groundwater Management Area 15, are described below:

Groundwater Management Area 15 [all counties]

Drawdown of the Gulf Coast Aquifer System shall not exceed an average of 13 feet in December 2069 from estimated year 2000 conditions.

Aransas County

Drawdown of the Gulf Coast Aquifer System shall not exceed an average of 0 feet in December 2069 from estimated year 2000 conditions.

Bee County

Drawdown of the Gulf Coast Aquifer System shall not exceed an average of 7 feet in December 2069 from estimated year 2000 conditions.

Calhoun County

Drawdown of the Gulf Coast Aquifer System shall not exceed an average of 5 feet in December 2069 from estimated year 2000 conditions.

Colorado County

Drawdown shall not exceed an average of 17 feet in Chicot and Evangeline Aquifers and 23 feet in in the Jasper Aquifer in December 2069 from estimated year 2000 conditions.

DeWitt County

Drawdown of the Gulf Coast Aquifer System shall not exceed an average of 17 feet in December 2069 from estimated year 2000 conditions.

Fayette County

Drawdown of the Gulf Coast Aquifer System shall not exceed an average of 16 feet in December 2069 from estimated year 2000 conditions.

Goliad County

Drawdown of the Gulf Coast Aquifer System shall not exceed an average of 10 feet in December 2069 from estimated year 2000 conditions.

Jackson County

Drawdown of the Gulf Coast Aquifer System shall not exceed an average of 15 feet in December 2069 from estimated year 2000 conditions.

Karnes County

Drawdown of the Gulf Coast Aquifer System shall not exceed an average of 22 feet in December 2069 from estimated year 2000 conditions.

Lavaca County

Drawdown of the Gulf Coast Aquifer System shall not exceed an average of 18 feet in December 2069 from estimated year 2000 conditions.

Matagorda County

Drawdown shall not exceed an average of 11 feet in Chicot and Evangeline Aquifers in December 2069 from estimated year 2000 conditions.

Refugio County

Drawdown of the Gulf Coast Aquifer System shall not exceed an average of 5 feet in December 2069 from estimated year 2000 conditions.

Victoria County

Drawdown of the Gulf Coast Aquifer System shall not exceed an average of 5 feet in December 2069 from estimated year 2000 conditions.

Wharton County

Drawdown shall not exceed an average of 15 feet in Chicot and Evangeline Aquifers in December 2069 from estimated year 2000 conditions.

Based on the adopted desired future conditions, TWDB has estimated the modeled available groundwater for the Gulf Coast Aquifer System in Groundwater Management Area 15.

METHODS:

The groundwater availability model for the central part of the Gulf Coast Aquifer System (Figure 1) was run using the model files submitted with the explanatory report (GMA 15 and others, 2016). Model-calculated water levels were extracted for the year 2000 and the end of the year 2069, and drawdown was calculated as the difference between water levels at the beginning of 2000 and water levels at the end of 2069. Drawdown averages were calculated for each county by aquifer and for the entire Groundwater Management Area 15 by aquifer. As specified in the explanatory report (GMA 15 and others, 2016), drawdown for cells which became dry during the simulation (water level dropped below the base of the cell) were excluded from the averaging. The calculated drawdown averages were compared with the desired future conditions to verify that the pumping scenario achieved the desired future conditions within 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 are presented by county and groundwater conservation district, subtotaled by groundwater conservation district, and then summed by Groundwater Management Area 15 (Figure 2 and Table 1). Annual pumping rates are also presented by county, river basin, and regional water planning area within Groundwater Management Area 15 (Figure 2 and Table 2).

Modeled Available Groundwater and Permitting

As defined in Chapter 36 of the Texas Water Code, “modeled available groundwater” is the estimated average amount of water that may be produced annually to achieve a desired future condition. 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 groundwater availability are described below:

- Version 1.01 of the groundwater availability model for the central portion of the Gulf Coast Aquifer System was used for this analysis. See Chowdhury and others (2004) and Waterstone and others (2003) for assumptions and limitations of the model.
- The model has four layers which represent the Chicot Aquifer (Layer 1), the Evangeline Aquifer (Layer 2), the Burkeville Confining Unit (Layer 3), and the Jasper Aquifer and parts of the Catahoula Formation in direct hydrologic communication with the Jasper Aquifer (Layer 4).
- The model was run with MODFLOW-96 (Harbaugh and others, 1996).
- Drawdown averages and modeled available groundwater values are based on the extent of the model area rather than official aquifer boundaries (Figures 1 and 2).
- Drawdown for cells with water levels below the base elevation of the cell (“dry” cells) were excluded from the averaging per emails exchanged with INTERA, Inc. dated October 21, 2015.
- Estimates of modeled available groundwater from the model simulation were rounded to whole numbers.
- A model drawdown tolerance of up to 5 feet was assumed for Goliad County and up to 3.5 feet for the rest of Groundwater Management Area 15 when comparing desired future conditions (average drawdown values per county) to model drawdown results.
- Average drawdown by county may include some model cells that represent portions of surface water such as bays, reservoirs, and the Gulf of Mexico.

RESULTS:

The modeled available groundwater for the Gulf Coast Aquifer System that achieves the desired future conditions adopted by Groundwater Management Area 15 increases from approximately 515,000 acre-feet per year in 2020 to approximately 518,000 acre-feet per year in 2069 (Table 1). The modeled available groundwater is summarized by groundwater conservation district and county (Table 1). 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 (Table 2). Small differences of values between table summaries are due to rounding.

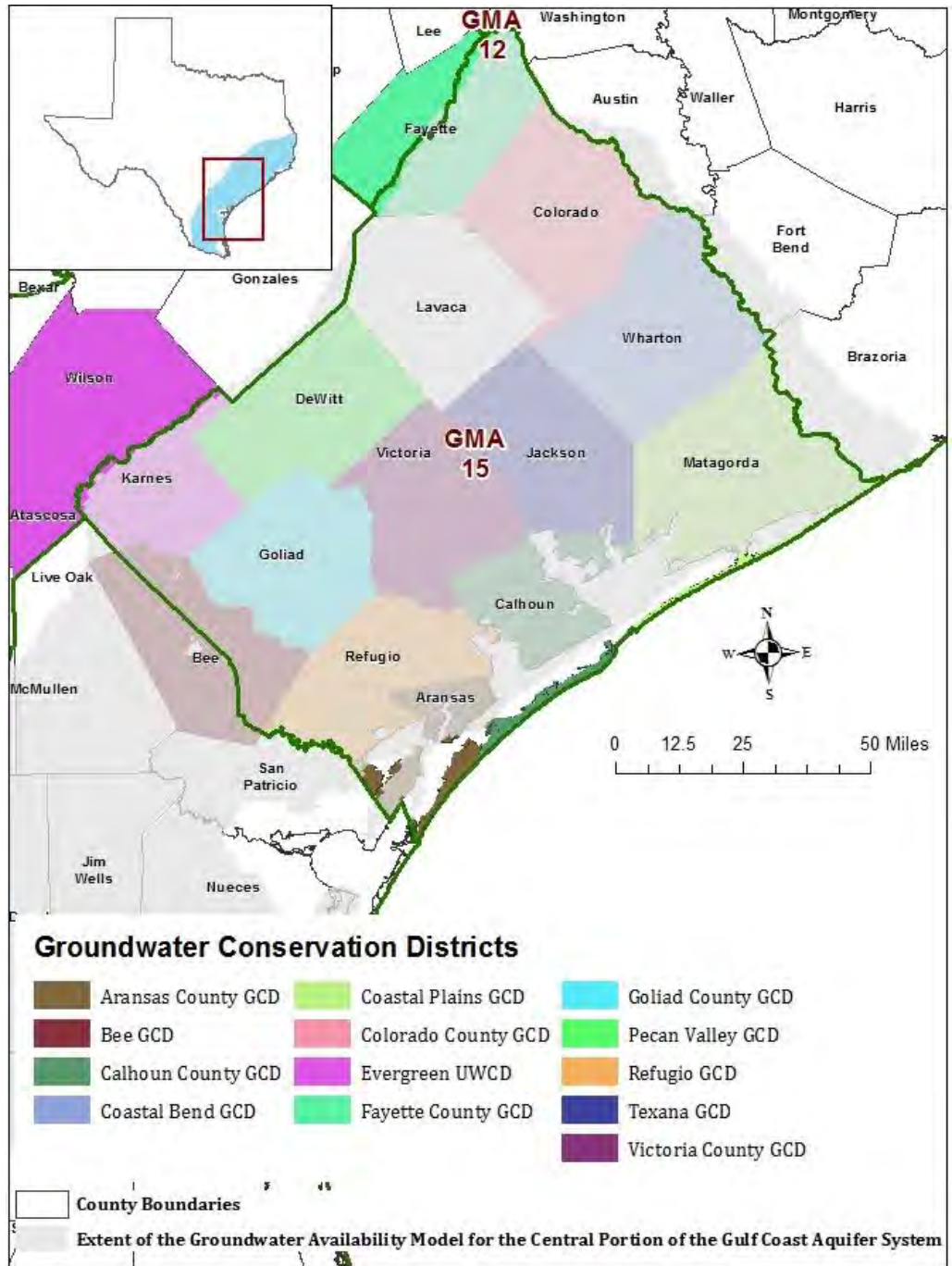


FIGURE 1. MAP SHOWING GROUNDWATER CONSERVATION DISTRICTS (GCDs) AND COUNTIES IN GROUNDWATER MANAGEMENT AREA 15 OVERLAIN ON THE EXTENT OF THE GROUNDWATER AVAILABILITY MODEL FOR THE CENTRAL PORTION OF THE GULF COAST AQUIFER SYSTEM.

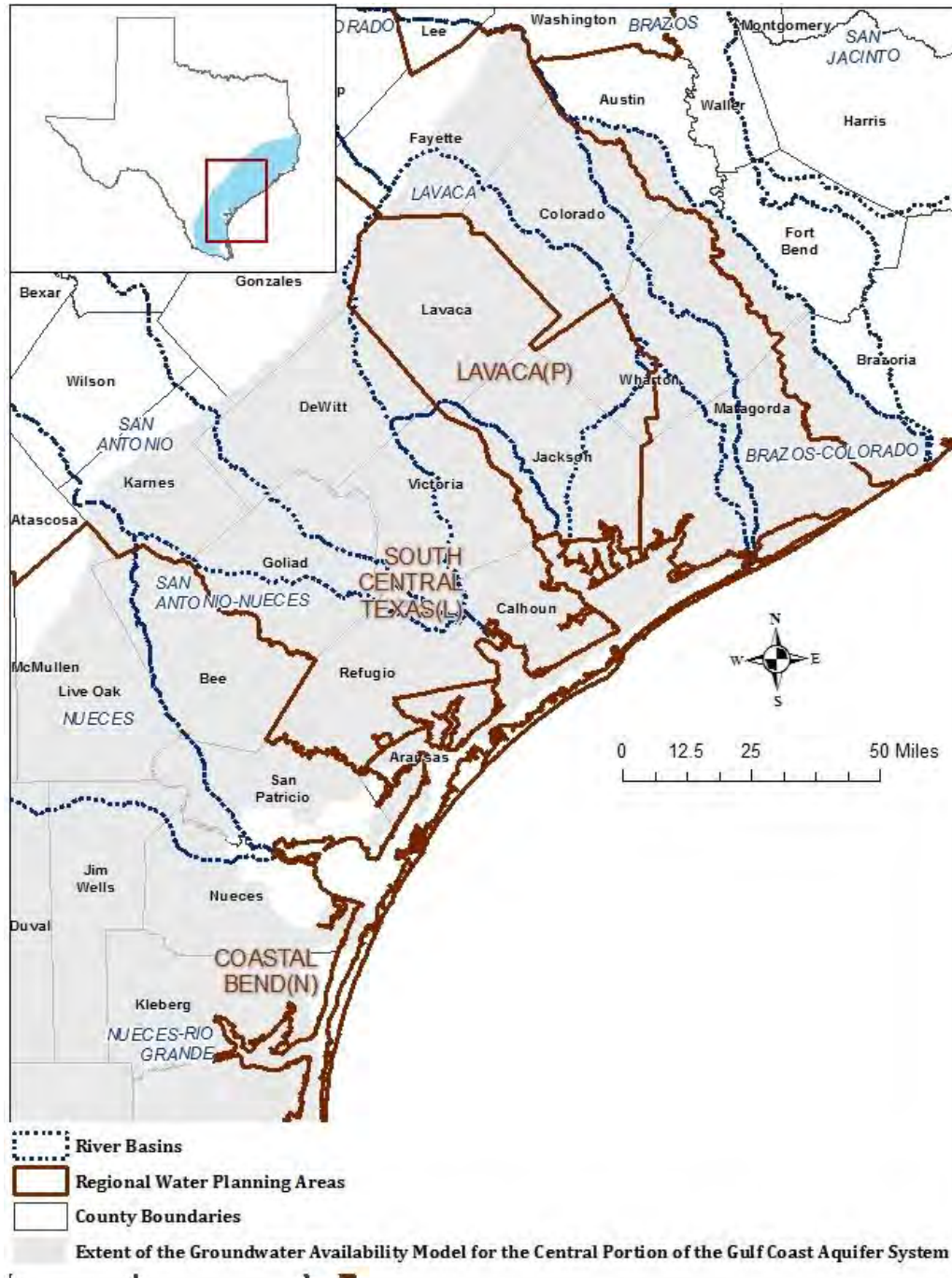


FIGURE 2. MAP SHOWING REGIONAL WATER PLANNING AREAS, GROUNDWATER CONSERVATION DISTRICTS (GCDs), COUNTIES, AND RIVER BASINS IN GROUNDWATER MANAGEMENT AREA 15 OVERLAIN ON THE EXTENT OF THE GROUNDWATER AVAILABILITY MODEL FOR THE CENTRAL PORTION OF THE GULF COAST AQUIFER SYSTEM.

TABLE 1. MODELED AVAILABLE GROUNDWATER FOR THE GULF COAST AQUIFER SYSTEM IN GROUNDWATER MANAGEMENT AREA 15 SUMMARIZED BY GROUNDWATER CONSERVATION DISTRICT (GCD) AND COUNTY FOR EACH DECADE BETWEEN 2010 AND 2069. VALUES ARE IN ACRE-FEET PER YEAR.

Groundwater Conservation District	County	Aquifer	2010	2020	2030	2040	2050	2060	2069
Aransas County GCD Total	Aransas	Gulf Coast Aquifer System	1,542	1,542	1,542	1,542	1,542	1,542	1,542
Bee County GCD Total	Bee	Gulf Coast Aquifer System	9,456	9,456	9,431	9,431	9,379	9,379	9,361
Calhoun County GCD Total	Calhoun	Gulf Coast Aquifer System	2,569	7,565	7,565	7,565	7,565	7,565	7,565
Coastal Bend GCD Total	Wharton	Gulf Coast Aquifer System (Chicot and Evangeline)	181,168	181,168	181,168	181,168	181,168	181,168	181,168
Coastal Plains GCD Total	Matagorda	Gulf Coast Aquifer System (Chicot and Evangeline)	38,828	38,828	38,828	38,828	38,828	38,828	38,828
Colorado County GCD	Colorado	Gulf Coast Aquifer System (Chicot and Evangeline)	79,780	74,964	74,964	72,765	72,765	71,618	71,618
Colorado County GCD	Colorado	Gulf Coast Aquifer System (Jasper)	918	918	918	918	918	918	918
Colorado County GCD Total	Colorado	Gulf Coast Aquifer System	80,698	75,882	75,882	73,683	73,683	72,536	72,536
Evergreen UWCD Total	Karnes	Gulf Coast Aquifer System	10,196	10,196	10,196	3,015	2,917	2,751	2,751
Fayette County GCD Total	Fayette	Gulf Coast Aquifer System	1,977	1,853	1,853	1,853	1,853	1,853	1,703
Goliad County GCD Total	Goliad	Gulf Coast Aquifer System	11,420	11,539	11,539	11,539	11,539	11,552	11,539

Groundwater Conservation District	County	Aquifer	2010	2020	2030	2040	2050	2060	2069
Pecan Valley GCD Total	DeWitt	Gulf Coast Aquifer System	15,471	15,476	15,476	14,485	14,485	14,485	14,485
Refugio GCD Total	Refugio	Gulf Coast Aquifer System	5,847	5,847	5,847	5,847	5,847	5,847	5,847
Texana GCD Total	Jackson	Gulf Coast Aquifer System	76,787	90,482	90,482	90,482	90,482	90,482	90,482
Victoria County GCD Total	Victoria	Gulf Coast Aquifer System	35,640	44,974	49,970	54,966	54,966	59,963	59,963
Total (GCDs)		Gulf Coast Aquifer System	471,599	494,808	499,779	494,404	494,254	497,951	497,770
No District-County	Bee	Gulf Coast Aquifer System	10	10	10	10	10	10	10
No District-County	Lavaca	Gulf Coast Aquifer System	20,253	20,253	20,253	20,253	20,253	20,253	20,239
No district-County Total		Gulf Coast Aquifer System	20,263	20,263	20,263	20,263	20,263	20,263	20,249
Total for GMA 15		Gulf Coast Aquifer System	491,862	515,071	520,042	514,667	514,517	518,214	518,019

TABLE 2 MODELED AVAILABLE GROUNDWATER BY DECADE FOR THE GULF COAST AQUIFER SYSTEM IN GROUNDWATER MANAGEMENT AREA 15. 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	2020	2030	2040	2050	2060
Aransas	N	San Antonio- Nueces	Gulf Coast Aquifer System	1,542	1,542	1,542	1,542	1,542
Bee	N	San Antonio- Nueces	Gulf Coast Aquifer System	9,439	9,414	9,414	9,362	9,362
Bee	N	Nueces	Gulf Coast Aquifer System	27	27	27	27	27
Calhoun	L	Colorado- Lavaca	Gulf Coast Aquifer System	5,210	5,210	5,210	5,210	5,210
Calhoun	L	Guadalupe	Gulf Coast Aquifer System	18	18	18	18	18
Calhoun	L	Lavaca-Guadalupe	Gulf Coast Aquifer System	2,330	2,330	2,330	2,330	2,330
Calhoun	L	San Antonio- Nueces	Gulf Coast Aquifer System	7	7	7	7	7
Colorado	K	Brazos-Colorado	Gulf Coast Aquifer System (Chicot and Evangeline)	15,342	15,342	15,342	15,342	15,342
Colorado	K	Brazos-Colorado	Gulf Coast Aquifer System (Jasper Aquifer)	49	49	49	49	49
Colorado	K	Colorado	Gulf Coast Aquifer System (Chicot and Evangeline)	20,506	20,506	20,066	20,066	20,066
Colorado	K	Colorado	Gulf Coast Aquifer System (Jasper Aquifer)	273	273	273	273	273
Colorado	K	Lavaca	Gulf Coast Aquifer System (Chicot and Evangeline)	39,116	39,116	37,357	37,357	36,210
Colorado	K	Lavaca	Gulf Coast Aquifer System (Jasper Aquifer)	596	596	596	596	596
Dewitt	L	Guadalupe	Gulf Coast Aquifer System	11,358	11,358	10,470	10,470	10,470
Dewitt	L	Lavaca-Guadalupe	Gulf Coast Aquifer System	417	417	417	417	417
Dewitt	L	Lavaca	Gulf Coast Aquifer System	2,935	2,935	2,935	2,874	2,874
Dewitt	L	San Antonio	Gulf Coast Aquifer System	766	766	724	724	724

GAM Run 16-025 MAG: Modeled Available Groundwater for the Gulf Coast Aquifer System in Groundwater Management Area 15

March 22, 2017

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County	RWPA	River Basin	Aquifer	2020	2030	2040	2050	2060
Fayette	K	Brazos	Gulf Coast Aquifer System	2	2	2	2	2
Fayette	K	Colorado	Gulf Coast Aquifer System	989	989	989	989	989
Fayette	K	Lavaca	Gulf Coast Aquifer System	862	862	862	862	862
Goliad	L	Guadalupe	Gulf Coast Aquifer System	4,377	4,377	4,377	4,377	4,380
Goliad	L	San Antonio- Nueces	Gulf Coast Aquifer System	1,190	1,190	1,190	1,190	1,195
Goliad	L	San Antonio	Gulf Coast Aquifer System	5,972	5,972	5,972	5,972	5,977
Jackson	P	Colorado-Lavaca	Gulf Coast Aquifer System	28,025	28,025	28,025	28,025	28,025
Jackson	P	Lavaca-Guadalupe	Gulf Coast Aquifer System	12,875	12,875	12,875	12,875	12,875
Jackson	P	Lavaca	Gulf Coast Aquifer System	49,582	49,582	49,582	49,582	49,582
Karnes	L	Guadalupe	Gulf Coast Aquifer System	11	11	11	11	11
Karnes	L	Nueces	Gulf Coast Aquifer System	1,057	1,057	78	78	78
Karnes	L	San Antonio	Gulf Coast Aquifer System	9,082	9,082	2,880	2,782	2,616
Karnes	L	San Antonio-Nueces	Gulf Coast Aquifer System	46	46	46	46	46
Lavaca	P	Guadalupe	Gulf Coast Aquifer System	41	41	41	41	41
Lavaca	P	Lavaca-Guadalupe	Gulf Coast Aquifer System	401	401	401	401	401
Lavaca	P	Lavaca	Gulf Coast Aquifer System	19,811	19,811	19,811	19,811	19,811
Matagorda	K	Brazos-Colorado	Gulf Coast Aquifer System (Chicot and Evangeline)	15,282	15,282	15,282	15,282	15,282
Matagorda	K	Colorado-Lavaca	Gulf Coast Aquifer System (Chicot and Evangeline)	20,329	20,329	20,329	20,329	20,329
Matagorda	K	Colorado	Gulf Coast Aquifer System (Chicot and Evangeline)	3,217	3,217	3,217	3,217	3,217
Refugio	L	San Antonio- Nueces	Jasper Aquifer	5,526	5,526	5,526	5,526	5,526
Refugio	L	San Antonio	Gulf Coast Aquifer System	321	321	321	321	321
Victoria	L	Guadalupe	Gulf Coast Aquifer System	17,600	22,596	27,592	27,592	27,592
Victoria	L	Lavaca-Guadalupe	Gulf Coast Aquifer System	25,451	25,451	25,451	25,451	30,448
Victoria	L	Lavaca	Gulf Coast Aquifer System	234	234	234	234	234
Victoria	L	San Antonio	Gulf Coast Aquifer System	1,689	1,689	1,689	1,689	1,689

County	RWPA	River Basin	Aquifer	2020	2030	2040	2050	2060
Wharton	K	Brazos-Colorado	Gulf Coast Aquifer System (Chicot and Evangeline)	50,527	50,527	50,527	50,527	50,527
Wharton	K	Colorado-Lavaca	Gulf Coast Aquifer System (Chicot and Evangeline)	16,196	16,196	16,196	16,196	16,196
Wharton	P	Colorado-Lavaca	Gulf Coast Aquifer System (Chicot and Evangeline)	14,091	14,091	14,091	14,091	14,091
Wharton	K	Colorado	Gulf Coast Aquifer System (Chicot and Evangeline)	35,910	35,910	35,910	35,910	35,910
Wharton	P	Colorado	Gulf Coast Aquifer System (Chicot and Evangeline)	873	873	873	873	873
Wharton	K	Lavaca	Gulf Coast Aquifer System (Chicot and Evangeline)	579	579	579	579	579
Wharton	P	Lavaca	Gulf Coast Aquifer System (Chicot and Evangeline)	62,992	62,992	62,992	62,992	62,992
GMA 15 Total			Gulf Coast Aquifer System	515,071	520,042	514,667	514,517	518,214

LIMITATIONS:

The groundwater model used in completing this analysis is the best available scientific tool that can be used to meet the stated objectives. To the extent that this analysis will be used for planning purposes and/or regulatory purposes related to pumping in the past and into the future, it is important to recognize the assumptions and limitations associated with the use of the results. In reviewing the use of models in environmental regulatory decision making, the National Research Council (2007) noted:

“Models will always be constrained by computational limitations, assumptions, and knowledge gaps. They can best be viewed as tools to help inform decisions rather than as machines to generate truth or make decisions. Scientific advances will never make it possible to build a perfect model that accounts for every aspect of reality or to prove that a given model is correct in all respects for a particular regulatory application. These characteristics make evaluation of a regulatory model more complex than solely a comparison of measurement data with model results.”

A key aspect of using the groundwater model to evaluate historic groundwater flow conditions includes the assumptions about the location in the aquifer where historic pumping was placed. Understanding the amount and location of historic pumping is as important as evaluating the volume of groundwater flow into and out of the district, between aquifers within the district (as applicable), interactions with surface water (as applicable), recharge to the aquifer system (as applicable), and other metrics that describe the impacts of that pumping. In addition, assumptions regarding precipitation, recharge, and streamflow are specific to a particular historic time period.

Because the application of the groundwater model was designed to address regional scale questions, the results are most effective on a regional scale. The TWDB makes no warranties or representations relating to the actual conditions of any aquifer at a particular location or at a particular time.

It is important for groundwater conservation districts to monitor groundwater pumping and groundwater levels in the aquifer. Because of the limitations of the groundwater model and the assumptions in this analysis, it is important that the groundwater conservation districts work with the TWDB to refine this analysis in the future given the reality of how the aquifer responds to the actual amount and location of pumping now and in the future. Historic precipitation patterns also need to be placed in context as future climatic conditions, such as dry and wet year precipitation patterns, may differ and affect groundwater flow conditions.

REFERENCES:

Chowdhury, A., Wade, S., Mace, R.E., and Ridgeway, C. 2004. Groundwater Availability of the Central Gulf Coast Aquifer System: Numerical Simulations through 1999: Texas Water Development Board, unpublished report.

Harbaugh, A. W., 2009, Zonebudget Version 3.01, A computer program for computing subregional water budgets for MODFLOW ground-water flow models, U.S. Geological Survey Groundwater Software.

Harbaugh, A.W. and McDonald, M.G., 1996, User's documentation for MODFLOW-96, an update to the U.S. Geological Survey Modular Finite-Difference Ground-Water Flow Model: U.S. Geological Survey, Open-File Report 96-485.

National Research Council, 2007, Models in Environmental Regulatory Decision Making Committee on Models in the Regulatory Decision Process, National Academies Press, Washington D.C., 287 p., http://www.nap.edu/catalog.php?record_id=11972.

Texas Water Code, 2011, <http://www.statutes.legis.state.tx.us/docs/WA/pdf/WA.36.pdf>.

Waterstone Engineering, Inc., and Parsons, Inc., 2003, Groundwater Availability of the Central Gulf Coast Aquifer: Numerical Simulations to 2050, Central Gulf Coast, Texas: Contract draft report submitted to Texas Water Development Board

Appendix D. Public Notices Regarding Hearings Related to Plan Adoption

Public Hearing Notice

Pursuant to Chapter 36, Texas Water Code, the Texana Groundwater Conservation District will conduct a public hearing on the Management Plan of the District with proposed revisions on July 15, 2021 at 8:30 AM at the Jackson County Annex Building at 411 N. Wells, Edna, Texas. The hearing will be conducted to receive comments and suggestions from the public concerning the proposed management plan.

The Management Plan of the District with proposed revisions was developed using the best available data and 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.

The Management Plan of the District with proposed revisions (1) identifies the performance standards and management objectives under which the district will operate to achieve the management goals; (2) specifies the actions, procedures, performance, and avoidance that are or may be necessary to effect the plan; (3) includes estimates of (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) considers the water supply needs and water management strategies included in the adopted state water plan.

A copy of the Management Plan of the District with proposed revisions may be viewed on the District's website at www.texanagcd.org.

Submit comments, questions, or requests for additional information regarding the Proposed Desired Future Condition of Groundwater Management Area 15 to Tim Andruss, General Manager, Texana Groundwater Conservation District at 361-781-0624, 411 N. Wells, Edna, TX 77957, or admin@texanagcd.org

FILED 6/17/21

Katherine R. Brooks, Clerk of County Court
JACKSON COUNTY, TEXAS

BY Janet White

Appendix E. Letters Coordinating with Regional Surface Water Management Entities

Texana Groundwater Conservation District

411 N. Wells St., Room 118, Edna, Texas 77957

P.O. Box 1098, Edna, Texas 77957

Phone (361) 781-0624 | Fax (361) 781-0453 | www.texanagcd.org

August 17, 2021

Lavaca-Navidad River Authority

P.O. Box 429

Edna, Texas 77957

Mr. Brzozowski,

Please find enclosed a copy of the adopted District Management Plan for the Texana Groundwater Conservation District.

Regards,



Tim Andruss
General Manager

Texana Groundwater Conservation District

411 N. Wells St., Room 118, Edna, Texas 77957

P.O. Box 1098, Edna, Texas 77957

Phone (361) 781-0624 | Fax (361) 781-0453 | www.texanagcd.org

August 17, 2021

Commissioners' Court
Jackson County Courthouse
115 West Main
Edna, Texas 77957

Judge Sklar,

Please find enclosed a copy of the adopted District Management Plan for the Texana Groundwater Conservation District.

Regards,



Tim Andruss
General Manager

Texana Groundwater Conservation District

411 N. Wells St., Room 118, Edna, Texas 77957

P.O. Box 1098, Edna, Texas 77957

Phone (361) 781-0624 | Fax (361) 781-0453 | www.texanagcd.org

July 8, 2021

Lavaca-Navidad River Authority
P.O. Box 429
Edna, Texas 77957

Mr. Brzozowski,

Please find enclosed a copy of the public notice of the hearing regarding the proposed District Management Plan for the Texana Groundwater Conservation District. The purpose of the hearing is to receive comments and suggestions from the public concerning the proposed management plan.

Regards,



Tim Andruss
General Manager

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FILED 6/17/21

Katherine R. Brooks, Clerk of County Court
JACKSON COUNTY, TEXAS

BY Janet White

Texana Groundwater Conservation District

411 N. Wells St., Room 118, Edna, Texas 77957

P.O. Box 1098, Edna, Texas 77957

Phone (361) 781-0624 | Fax (361) 781-0453 | www.texanagcd.org

July 8, 2021

Commissioners' Court
Jackson County Courthouse
115 West Main
Edna, Texas 77957

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Regards,



Tim Andruss
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FILED 6/17/21

Katherine R. Brooks, Clerk of County Court
JACKSON COUNTY, TEXAS

BY Janet White

tim.andruss@vcgcd.org

From: Patrick Brzozowski <pbrzozowski@lnra.org>
Sent: Wednesday, July 14, 2021 1:58 PM
To: tim.andruss@vcgcd.org
Cc: For File; Doug Anders; Scott Hartl
Subject: Texana GCD Management Plan

Tim,

I appreciate your time and for the conversation. As discussed, I would like to submit a comment on the District's Groundwater Management Plan that is being adopted.

Upon review of the District's Groundwater Management Plan, I would propose that the District consider undertaking the effort to establish goal(s) and objective(s) for the management of the brackish groundwater supplies in the District.

The desalination of brackish water, from groundwater and/or brackish surface water sources, is a water management strategy identified and adopted by the Region P Regional Water Planning Group and this strategy was included in the most recently adopted 2021 State Water Plan. Because the timeline to develop a new water supply can be extensive, no matter the source, I propose the District consider taking the necessary steps to establish the framework under which this water resource might be developed, managed and/or governed.

Thank you.

Patrick Brzozowski, P.E.

P.S. Don't be a DRIP! Conserve Water.

. CONFIDENTIALITY NOTICE - The information contained in this transmission is intended solely for the addressee and may be considered confidential. If you are not the intended recipient of this message, you are notified that you may not disclose, print, copy or disseminate this information. If you have received this transmission in error, please reply and notify the sender (only) and delete the message. Unauthorized interception of this e-mail may be a violation of criminal law.

Appendix F. Texana Groundwater Conservation District Board of Director
Resolution Adopting Management Plan

RESOLUTION

Resolution Number: 2021-07-15-A

Resolution Adopting the Texana Groundwater Conservation
District Management Plan

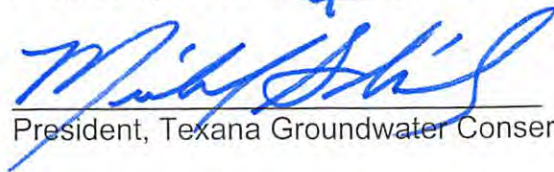
WHEREAS on June 18, 2021, a Notice of Hearing was published in the Victoria Advocate newspaper regarding a public hearing on the adoption of the Texana Groundwater Conservation District Management Plan; and

WHEREAS on July 15, 2021, the Texana Groundwater Conservation District Board of Directors with a quorum being present, conducted a public hearing regarding the adoption of the Texana Groundwater Conservation District Management Plan; and

WHEREAS, the Texana Groundwater Conservation District Management Plan had been developed in coordination with surface water management entities and other interested parties;

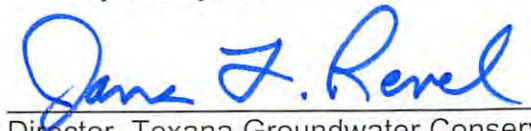
NOW THEREFORE BE IT RESOLVED that the Texana Groundwater Conservation District Management Plan is ADOPTED as described in the Texana Groundwater Conservation District Management Plan attached hereto and made part hereof for all purposes and that said management plan shall be submitted to the Executive Administrator of the Texas Water Development Board for review and approval with all necessary documentation.

Adopted by a vote of 6 ayes and 0 nays on this 15th day of July 2021.



President, Texana Groundwater Conservation District

I, the undersigned, do hereby certify that the above resolution was adopted by the Board of Directors of the Texana Groundwater Conservation District on the 15th day of July 2021.



Director, Texana Groundwater Conservation District

Appendix G. Minutes of Texana Groundwater Conservation District Board of Director Meeting related to the public hearings for and adoption of the Management Plan

Texana Groundwater Conservation District

411 N. Wells, Room 118, Edna, Texas 77957

P.O. Box 1098, Edna, Texas 77957

Phone (361) 781-0624 | Fax (361) 781-0453 | www.texanagcd.org

The meeting of the Texana Groundwater Conservation District Board of Directors convened on July 15, 2021, at 8:30 AM at the 411 N. Wells, Edna, Texas.

The following representatives of Texana Groundwater Conservation District attended the meeting:

Precinct 1:	Kenneth Koop	Present
Precinct 2:	Michael Skalicky	Present
Precinct 3:	Robert Martin	Absent
Precinct 4:	Fredrick Woodland	Present
At Large:	Jim Revel	Present
At Large:	Johnny Dugger	Present
At Large:	Robert Gendke	Present
General Manager:	Tim Andruss	Present
Legal Counsel:	Jim Allison of Allison, Bass & Magee, LLP	Present

Agenda Items:

1. Call the meeting to order and welcome guests.

Mr. Skalicky called the meeting to order at 8:30 AM.

2. Receive public comments.

Meeting Discussion: None.

Board Action: None.

3. Consideration and possible action regarding matters related to the litigation filed by Edna Masonic Lodge against the taxing entities of Jackson County.

3.1 - Edna Masonic Lodge Litigation

Meeting Discussion: Mr. Andruss explained that on June 23, 2021, the District learned, via email, that a suit had been filed against the Jackson County Central Appraisal District and certain taxing entities of Jackson County including the District.

The information received by the District regarding the case was forwarded to Mr. Allison for his review.

As of July 12, 2021, the District had received correspondence from Jackson County Commissioners' Court and the Edna ISD through which these entities authorized the legal counsel of the appraisal district to seek dismissal of the case on their behalf.

Texana Groundwater Conservation District

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Board Action: Mr. Dugger moved to request that the appraisal district to file a response on behalf of the District and seek dismissal of the case. Mr. Koop seconded the motion. The motion passed unanimously.

4. Consideration of and possible action on matters related to groundwater management including the efforts and activities of the District regarding permitting as well as complaints, investigations, and enforcement cases associated with permitting.

4.1 - Report regarding Groundwater Management

Meeting Discussion: Mr. Andruss explained that as of July 12, 2021, the District had four permitting cases related to non-exempt use wells, and 16 well logs awaiting processing by the District.

Board Action: None.

4.2 - Groundwater Production from Ekstrom Aquaculture Well Field

Meeting Discussion: Mr. Andruss explained that on July 12, 2021, Ekstrom Aquaculture submitted the performance report for June 2021.

Ekstrom has reported groundwater production totaling 427.016 acre-feet between January 2021 and June 2021 with 2.830 acre-feet being produced during June 2021. While conductivity levels had shown a modest decrease in the lower fresh monitoring well as the East Monitoring Site, the levels remain above the established performance condition

Based on the failure to achieve the performance standards established with waiver WV-20191219-01 during the preceding reporting period for April 2021, May 2021, and June 2021, production curtailment is required from wells producing from the Fresh Zone. The average conductivity measurement for June 2021 was 2,725 $\mu\text{S}/\text{cm}$. The maximum allowable conductivity average under waiver WV-20191219-01 is 2,087 $\mu\text{S}/\text{cm}$.

Board Action: None.

4.3 - Groundwater Production

Meeting Discussion: Mr. Andruss explained that per the Board's authorization on April 15, 2021, the District has initiated 36 enforcement cases related to potential failures to report groundwater production for CY2020. The District must extend the time period to respond to settlement offer from July 1, 2021, to August 15, 2021, due to the delay in developing the enforcement case and transmittal of notices of violation letters to well owners.

Board Action: Mr. Skalicky moved to revise the previously approved settlement offers as follows: "offer to settle the alleged violation without penalty or fee if, by September 1, 2021, a) groundwater production for the subject well for calendar year 2020 is reported and b) the well owner of the

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subject well acknowledges the violation." Mr. Revel seconded the motion. The motion passed unanimously.

4.4 - Production Permit Renewals

Meeting Discussion: Mr. Andruss explained that the District has received Applications to Renew a Production Permit. In order for the District to approve the request to renew a production permit, the Rules of the District require the permit holder to a) be current in paying any fee required by the district; b) not be subject to a pending enforcement action for a substantive violation of a district permit, order, or rule that has not been settled by agreement with the district or a final adjudication; or c) be current in paying any civil penalty or otherwise comply with any order resulting from a final adjudication of a violation of a district permit, order, or rule.

Board Action: Mr. Revel moved to authorize the general manager to issue production permit renewals for the permits associated with the following renewal requests: Permitting Request Cases - PRC-20210422-02 - ARPP-20210422-01 - Kinder Morgan Tejas Pipeline, LLC; Permitting Request Cases - PRC-20210527-02 - ARPP-20210525-01 - Tennessee Gas Pipeline Company, LLC. Mr. Dugger seconded the motion. The motion passed unanimously.

4.5.1 - Permitting Request Case - PRC-20210621-01 - Black Sheep Ag. LLC

Meeting Discussion: Mr. Andruss explained that Mr. Houston Hennigh for Black Sheep Ag, LLC seeks, under permitting request case PRC-20210621-01, a drilling permit and production permit authorizing construction of a well and the production of groundwater for crop irrigation uses at rates not to exceed 475 gallons per minute or 37.5 acre-feet per year. The proposed well will be located on a 75-acre tract of land near the intersection of County Road 256 and County Road 257 in Jackson County, Texas.

The applications and supplemental information associated with this permitting request case are considered administratively complete and contain sufficient information evaluate the request relative to the Rules of the District. Provided the resulting permits are properly conditioned, the drilling and operation of the proposed well would satisfy the requirements as established within the Rules of the District without a waiver or variance.

On July 2, 2021, the public notice related to the consideration of the permit case was completed.

As of July 13, 2021, the District had not received notice of intent to contest the permitting request.

Board Action: Mr. Revel moved to cancel the permit hearing and proceed with the permitting case as an uncontested matter. Mr. Skalicky seconded the motion. The motion passed unanimously.

Board Action: Mr. Skalicky moved to approve the drilling permit to Black Sheep Ag, LLC under application ADW-20210618-01 with the requirement that the proposed well be offset from the nearest property line by 50 feet and 475 feet from wells owned by other landowners. Mr. Revel seconded the motion. The motion passed unanimously.

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Board Action: Mr. Revel moved to issue a production permit to Black Sheep Ag, LLC under application AOW-20210618-02 with the following conditions in accordance with the Rules of the District: Authorized Purpose of Use: crop irrigation uses; Authorized Maximum Rate of Production per Minute: 475 gallons per minute; Authorized Maximum Rate of Production per Year: 37.5 acre-feet per year; and Expiration Date: July 31, 2026. Mr. Skalicky seconded the motion. The motion passed unanimously.

4.5.2 - Permitting Request Case - PRC-20210518-01 - Punta de Vista, LLC

Meeting Discussion: Mr. Andruss explained that Mr. John Murray for Punta de Vista, LLC seeks, under permitting request case PRC-20210518-01, a production permit authorizing production of groundwater for irrigation and wildlife management uses at rates not to exceed 499 gallons per minute or 364 acre-feet per year from well GW-00565. The subject well is located on a 728.32-acre tract of land near the intersection of County Road 110 and County Road 111 in Jackson County, Texas.

The applications and supplemental information associated with this permitting request case are considered administratively complete and contain sufficient information to evaluate the request relative to the Rules of the District. Provided the resulting permits are properly conditioned, the drilling and operation of the proposed well would satisfy the requirements as established within the Rules of the District without a waiver or variance.

On July 2, 2021, the public notice related to the consideration of the permit case was completed.

As of July 13, 2021, the District had not received notice of intent to contest the permitting request.

Board Action: Mr. Skalicky moved to 1) cancel the permit hearing and proceed with the permitting case as an uncontested matter; 2) issue a production permit to Punta de Vista, LLC under application AOW-20210512-02 with the following conditions in accordance with the Rules of the District: Authorized Purpose of Use: irrigation and wildlife management uses; Authorized Maximum Rate of Production per Minute: 499 gallons per minute; Authorized Maximum Rate of Production per Year: 364 acre-feet per year; and Expiration Date: July 31, 2026. Mr. Woodland seconded the motion. The motion passed unanimously.

5. Consideration of and possible action on matters related to groundwater protection including complaints, investigations, violations, and enforcement cases.

Meeting Discussion: None.

Board Action: None.

6. Consideration of and possible action on matters related to groundwater monitoring.

Meeting Discussion: Mr. Andruss explained that the United States Drought Monitor, an information source produced through a partnership between the National Drought Mitigation Center at the University of Nebraska-Lincoln, the United States Department of Agriculture, and

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the National Oceanic and Atmospheric Administration, indicates that no portions of Jackson County were experiencing moderate drought conditions as of July 8, 2021.

Board Action: None.

7. Consideration of and possible action on matters related to groundwater conservation.

Meeting Discussion: None.

Board Action: None.

8. Consideration of and possible action on matters related to groundwater resource planning including Groundwater Management Area 15 Joint Planning, regional water planning, and the Desired Future Conditions Proposed for Adoption by Groundwater Management Area 15.

8.1 - Report regarding Groundwater Resource Planning

Meeting Discussion: Mr. Andruss explained that the District participated in the Region P Regional Water Planning Group Meeting held virtually on June 14, 2021.

The District will participate in the Management Area 15 Meeting scheduled for October 14, 2021.

Board Action: None.

8.2 - Public Hearing regarding DFCs Proposed for Adoption by GMA 15

Meeting Discussion: Mr. Andruss explained that on May 4, 2021, the desired future conditions proposed for Groundwater Management Area 15 were mailed to the member districts initiating the public comment period (period of not less than 90 days) for the desired future conditions proposed for adoption by the representatives of GMA 15.

The representatives of Groundwater Management Area 15 proposed the following Desired Future Conditions for Adoption on April 8, 2021:

1. The Desired Future Condition for the counties in the groundwater management area (gma-specific DFC) shall not exceed an average drawdown of 13 feet for the Gulf Coast Aquifer System at December 2080; and
2. The Desired Future Conditions for each county within the groundwater management area (county-specific DFCs) shall not exceed the values specified in Table A at December 2080:

Table A. Desired Future Conditions for Counties of GMA 15 expressed as an Average Drawdown between January 2000 and December 2080.

- Aransas County: 0 feet of drawdown of the Gulf Coast Aquifer System.
- Bee County: 7 feet of drawdown of the Gulf Coast Aquifer System.
- Calhoun County: 5 feet of drawdown of the Gulf Coast Aquifer System.

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- Colorado County: 17 feet of drawdown of the Chicot and Evangeline Aquifers; and 25 feet of drawdown of the Jasper Aquifer.
- DeWitt County: 17 feet of drawdown of the Gulf Coast Aquifer System.
- Fayette County: 44 feet of drawdown of the Gulf Coast Aquifer System.
- Goliad County: 4 feet of recovery of the Chicot Aquifer; 2 feet of recovery of the Evangeline Aquifer; 7 feet of drawdown of the Burkeville Aquifer; and 14 feet of drawdown of the Jasper Aquifer.
- Jackson County: 15 feet of drawdown of the Gulf Coast Aquifer System.
- Karnes County: 22 feet of drawdown of the Gulf Coast Aquifer System.
- Lavaca County: 18 feet of drawdown of the Gulf Coast Aquifer System.
- Matagorda County: 11 feet of drawdown of the Chicot and Evangeline Aquifers.
- Refugio County: 5 feet of drawdown of the Gulf Coast Aquifer System.
- Victoria County: 5 feet of drawdown of the Gulf Coast Aquifer System.
- Wharton County: 15 feet of drawdown of the Chicot and Evangeline Aquifers.

During this period, the District has made available in its office a copy of the proposed desired future conditions and supporting materials, such as the documentation of factors considered under Subsection (d) and groundwater availability model run results.

On July 11, 2021, the District completed the posting requirements established for the public hearing on the proposed desired future conditions.

While the District has been informed that public comments may be submitted to the District or other GCDs with GMA 15, as of July 13, 2021, the District had not received any public comments on the DFCs proposed for adoption by GMA 15.

Mr. Skalicky opened the public hearing.

Public Comments: Mr. Andruss informed the Board that the District had received written comments from organization called Neighbors Against Destroying Aquifers regarding the DFC proposed for adoption and would be incorporated into the summary report of the public comment period.

Mr. Skalicky moved to close the public hearing at 10:00 AM, after receiving all public comments regarding the DFC's proposed for adoption by GMA 15 and moved to terminate the public comment period on September 1, 2021, and authorize the General Manager to compile and submit for consideration at the next joint planning meeting a summary of relevant comments received, any suggested revisions to the proposed desired future conditions, and the basis for the revisions. Mr. Dugger seconded the motion. The motion passed unanimously.

9. Consideration of and possible action on matters related to groundwater policy including the proposed Management Plan of the District with revisions and the Rules of the District.

9.1 - Report regarding Groundwater Policy

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Meeting Discussion: Mr. Andruss explained that the regular session of the 87th Legislature concluded without the passage of any legislation that would have a negative and direct impact on the ability of the District to manage groundwater resources with Jackson County. Mr. Allison provided additional comments regarding legislative changes that may impact the District.

Board Action: None.

9.2 - Public Hearing regarding Proposed Management Plan of the District

Meeting Discussion: Mr. Andruss explained that the District proposes for adoption a revised management plan that (1) identifies the performance standards and management objectives under which the district will operate to achieve the management goals ; (2) specifies the actions, procedures, performance, and avoidance that are or may be necessary to effect the plan; (3) includes estimates of (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) considers the water supply needs and water management strategies included in the adopted state water plan.

On May 21, 2021, the TWDB notified the District that the draft management plan passed the pre-adoption review process. On June 16, 2021, the District complete the requirements for public notice. On July 8, 2021, the District sent notice to the Lavaca-Navidad River Authority and Jackson County Commissioners' Court of the hearing on the management plan.

On July 14, 2021, the District received comments from Patrick Brzozowski of the Lavaca-Navidad River Authority. Mr. Brzozowski commented: "Upon review of the District's Groundwater Management Plan, I would propose that the District consider undertaking the effort to establish goal(s) and objective(s) for the management of the brackish groundwater supplies in the District. The desalination of brackish water, from groundwater and/or brackish surface water sources, is a water management strategy identified and adopted by the Region P Regional Water Planning Group and this strategy was included in the most recently adopted 2021 State Water Plan. Because the timeline to develop a new water supply can be extensive, no matter the source, I propose the District consider taking the necessary steps to establish the framework under which this water resource might be developed, managed and/or governed."

Mr. Skalicy opened the public hearing on the proposed management plan of the District.

Mr. Brzozowski provided oral comments.

Board Action: Mr. Dugger moved to 1) close the public hearing after receiving all public comments regarding the proposed management plan of the District, and 2) approve and adopt the proposed

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management plan of the District by Resolution 2021-07-15-A. Mr. Woodland seconded the motion. The motion passed unanimously with 6 ayes and 0 nays.

10. Consideration of and possible action on matters related to groundwater research.

Meeting Discussion: None.

Board Action: None.

11. Consideration of and possible action on matters related to performance management including management goals and objectives of the District.

Meeting Discussion: None.

Board Action: None.

12. Consideration of and possible action on matters related to meeting management including minutes of previous meetings.

12.1 - Report regarding Meeting Management

Meeting Discussion: Mr. Andruss explained that the next meeting of the Board of Directors is scheduled for August 19, 2021, at 8:30 AM in the Jackson County Services Building, 411 N. Wells, Edna, Texas 77957.

Board Action: None.

12.2 - Minutes of Previous Meeting

Meeting Discussion: Mr. Andruss explained that the minutes for the meeting held on May 20, 2021, were sent the board members prior to the meeting.

Board Action: Mr. Dugger moved to accept and approved the meeting minutes for May 20, 2021, as drafted. Mr. Gendke seconded the motion. The motion passed unanimously.

13. Consideration of and possible action on matters related to financial management including the annual budget of the district, financial reports of the district, bills and invoices of the district.

13.1 - Report on Financial Management

Meeting Discussion: Mr. Andruss explained that the financial reports for June 2021 have been compiled, reviewed, and sent to the board members prior to the meeting. All accounts reconcile with internal records. All expenditures are related to business of the District and properly authorized.

Board Action: Mr. Skalicky moved to accept and approve the financial records for June 2021. Mr. Dugger seconded the motion. The motion passed unanimously.

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13.2 - Unpaid Accounts Payable

Meeting Discussion: Mr. Andruss explained that the District has outstanding accounts payable invoices that are not considered regular and routine for which the District has received the goods and services billed for under the invoices.

Board Action: Mr. Revel moved to authorize the general manager to pay the following items: TGCD - Adm - FM - Accounts Payable - ACCTP-20210712-01 - \$270.88 - Invoice No. 2903 - Prosperity Bank - OPEN; TGCD - Adm - FM - Accounts Payable - ACCTP-20210618-02 - \$1,685.15 - Invoice No. 354352 - Victoria Advocate - OPEN; TGCD - Adm - FM - Accounts Payable - ACCTP-20210617-01 - \$1,890.55 - Invoice No. 6140 - Allison, Bass and Magee, L.L.P. - OPEN; TGCD - Adm - FM - Accounts Payable - ACCTP-20210714-13- \$6,603.82 - Invoice No. ILA-202106-T - VCGCD - OPEN; TGCD - Adm - FM - Accounts Payable - ACCTP-20210714-12 - \$6,694.88 - Invoice No. ILA-202105-T - VCGCD - OPEN; TGCD - Adm - FM - Accounts Payable - ACCTP-20210714-11 - \$6,720.98- Invoice No. ILA-202104-T - VCGCD - OPEN; TGCD - Adm - FM - Accounts Payable - ACCTP-20210714-10- \$6,876.42 - Invoice No. ILA-202103-T - VCGCD - OPEN; TGCD - Adm - FM - Accounts Payable - ACCTP-20210714-09 - \$6,763.32 - Invoice No. ILA-202102-T - VCGCD - OPEN; TGCD - Adm - FM - Accounts Payable - ACCTP-20210714-08 - \$6,597.44 - Invoice No. ILA-202101-T - VCGCD - OPEN; TGCD - Adm - FM - Accounts Payable - ACCTP-20210714-07- \$6,629.92 - Invoice No. ILA-202012-T- VCGCD - OPEN; TGCD - Adm - FM - Accounts Payable - ACCTP-20210714-06 - \$150.00 - Invoice No. ILA-202106-T-LS - VCGCD - OPEN; TGCD - Adm - FM - Accounts Payable - ACCTP-20210714-05 - \$450.00 - Invoice No. ILA-202105-T-LS - VCGCD - OPEN; TGCD - Adm - FM - Accounts Payable - ACCTP-20210714-04 - \$450.00 - Invoice No. ILA-202104-T-LS - VCGCD - OPEN; TGCD - Adm - FM - Accounts Payable - ACCTP-20210714-03 - \$450.00 - Invoice No. ILA-202103-T-LS - VCGCD - OPEN; TGCD - Adm - FM - Accounts Payable - ACCTP-20210714-02 - \$450.00 - Invoice No. ILA-202102-T-LS - VCGCD - OPEN; TGCD - Adm - FM - Accounts Payable - ACCTP-20210714-01 - \$17,500.00 - Invoice No. ILA-20210104-T - VCGCD - OPEN. Mr. Dugger seconded the motion. The motion passed unanimously.

14. Consideration of and possible action on matters related to office administration and management including personnel, staffing, employment agreements, consultant agreements, interlocal cooperation agreements, and support services provided to and from other groundwater conservation districts.

14.1 - Report regarding Administration and Management

Meeting Discussion: Mr. Andruss explained that the agreement between the District and VCGCD (INTERLOCAL AGREEMENT FOR SERVICES RELATED TO GENERAL MANAGEMENT AND ADMINISTRATIVE ACTIVITIES) states "[t]his agreement will automatically renew for an additional one (1) year period on October 1 of each year unless either party provides 90-day written notice of their Intent to not renew the agreement." The agreement presently costs the District \$6,500 per month (i.e., \$78,000 per year) unless a qualifying event occurs resulting in a credit by VCGCD to the District.

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The VCGCD Board of Directors will be asked to consider significant changes to staffing which support the District via the interlocal agreement. The changes include the addition of an enforcement specialist position (VCGCD Office), the reclassification of an administrative assistant position to an office assistant position (VCGCD Office), wage increases for existing staff, and revision to the fee credit provisions. If approved, VCGCD will likely propose a revised agreement to for services to be provided during FY2022.

Mr. Andruss explained that the District had received an interlocal cooperation agreement from the Jackson County Tax-Assessor Collector titled the 2021-2022 Property Tax Assessment/Collection Agreement.

Board Action: Mr. Skalicky moved to accept and approve 2021-2022 Property Tax Assessment/Collection Agreement. Mr. Gendke seconded the motion. The motion passed unanimously.

15. Consideration of and possible action on matters related to legal counsel report.

Meeting Discussion: None.

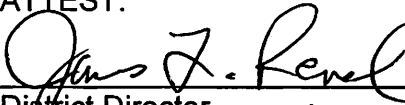
Board Action: None.


16. Adjourn.

Mr. Skalicky moved to adjourn the meeting. Mr. Gendke seconded the motion. The motion passed unanimously.

The above and foregoing minutes were read and approved on this the 19TH day of AUGUST, 2021.

ATTEST:


District Director
Sec'y


District Director
PRES.

Appendix H. Texana Groundwater Conservation District Contact Information



District Registration Form

Legal Name of District or Authority: Texana Groundwater Conservation District

P.O. Box 1098

Edna, Texas

77957

District's Mailing Address

City, State

Zip Code

361-781-0624

admin@texanagcd.org

www.texanagcd.org

District's Telephone Number (AC)

E-mail

Web Address

A. BOARD MEMBERS (as applicable):

TITLE	FULL NAME OF DIRECTOR (First, Middle, Last)	FULL MAILING ADDRESS According to U.S. Post Office Standards	Business Phone	Fax Number	Home Phone	Elected(E), Appointed (A), or Elected by Precinct (P)	Term Begins (MM/DD/YYYY)	Term Ends (MM/DD/YYYY)
President or Chairman	Michael Skalicky	P.O. Box 428 Ganado, TX 77962			361-771-5816	P <input type="checkbox"/>		12/2022
Vice-President	Johnny Dugger	1918 CR 303 Edna, TX 77957			361-782-8435	P <input type="checkbox"/>		12/2022
Secretary	James Revel	326 Trout St. Palacios, TX 77465			281-883-7640	P <input type="checkbox"/>		12/2024
Treasurer	Kenneth Koop	1422 CR 110 Edna, TX 77957			410-210-4540	P <input type="checkbox"/>		12/2024
Director	Robert Martin	750 CR 317 Edna, TX 77957			361-550-2159			12/2024

B. CONSULTANTS AND REPRESENTATIVES (as applicable):

POSITION	FULL NAME OF INDIVIDUAL	NAME OF FIRM OR ORGANIZATION	FULL MAILING ADDRESS According to U.S. Post Office Standards	Business Phone	Fax Number
General Manager	Tim Andruss	Texana Groundwater Conservation District	P.O. Box 1098 Edna, TX 77957	361-781-0624	
Operator					
Attorney	James Allison	Allison, Bass, and Magee, L.L.P	A.O. Watson House, 402 W. 12 St., Austin, TX 78701	512-482-0701	
Engineer					
Bookkeeper					
Financial Advisor					
Tax Collector	Monica Foster	Jackson County Tax Assessor	115 W. Main Edna, TX 77957	361-782-3473	
Agent for Notice					

*All information provided herein is subject to the Public Information Act and will be made available on our web site (www.tceq.texas.gov)

District Registration Form (continued)

A. BOARD MEMBERS (continued):

TITLE	FULL NAME OF DIRECTOR (First, Middle, Last)	FULL MAILING ADDRESS <small>According to U.S. Post Office Standards</small>	Business Phone	Fax Number	Home Phone	Elected(E), Appointed (A), or Elected by Precinct (P)	Term Begins (MM/DD/YYYY)	Term Ends (MM/DD/YYYY)
Director	Robert Gendke Jr.	P.O. Box 7 Vanderbilt, TX 77991			361-771-6330	P <input type="checkbox"/>		12/2022
Director	Fredrick Woodland	20740 State HWY 172 Port Lavaca, TX 77979			361-920-1526	P <input type="checkbox"/>		12/2022

Certification: I certify that the information contained herein is correct and complete to the best of my knowledge.

Tammy Amaimo <small>Digitally signed by Tammy Amaimo Date: 2021.03.15 11:48:42 -05'00'</small>	Tammy Amaimo	361-579-6863	3/15/2021
Signature	Printed Name and Title	(Area Code) Daytime Telephone	Date Signed

If you have questions on how to fill out this form, please contact us at (512) 239 - 4691. Individuals are entitled to request and review their personal information the Agency gathers on its forms. They may also have errors in their information corrected. To review such information, contact us at (512) 239 - 3282.

Texas Statutes can be viewed at: <https://statutes.capitol.texas.gov/>

Submit completed form using the Submit button (if using electronic signature), via fax to 512-239-6190, or mail to:

DISTRICTS SECTION, MC-152
 TCEQ
 PO BOX 13087
 Austin, Texas 78711-3087

Submit

TRANSMISSION VERIFICATION REPORT

TIME : 03/15/2021 21:32
SER.# : F6W545479

DATE, TIME	03/15 21:31
FAX NO./NAME	15122396190
DURATION	00:01:07
PAGE(S)	02
RESULT	OK
MODE	STANDARD



RECEIVED

MAR 16 2021

Texana Groundwater
Conservation District

RECEIVED

MAR 18 2021

Technical Director
Tucson Convention Center