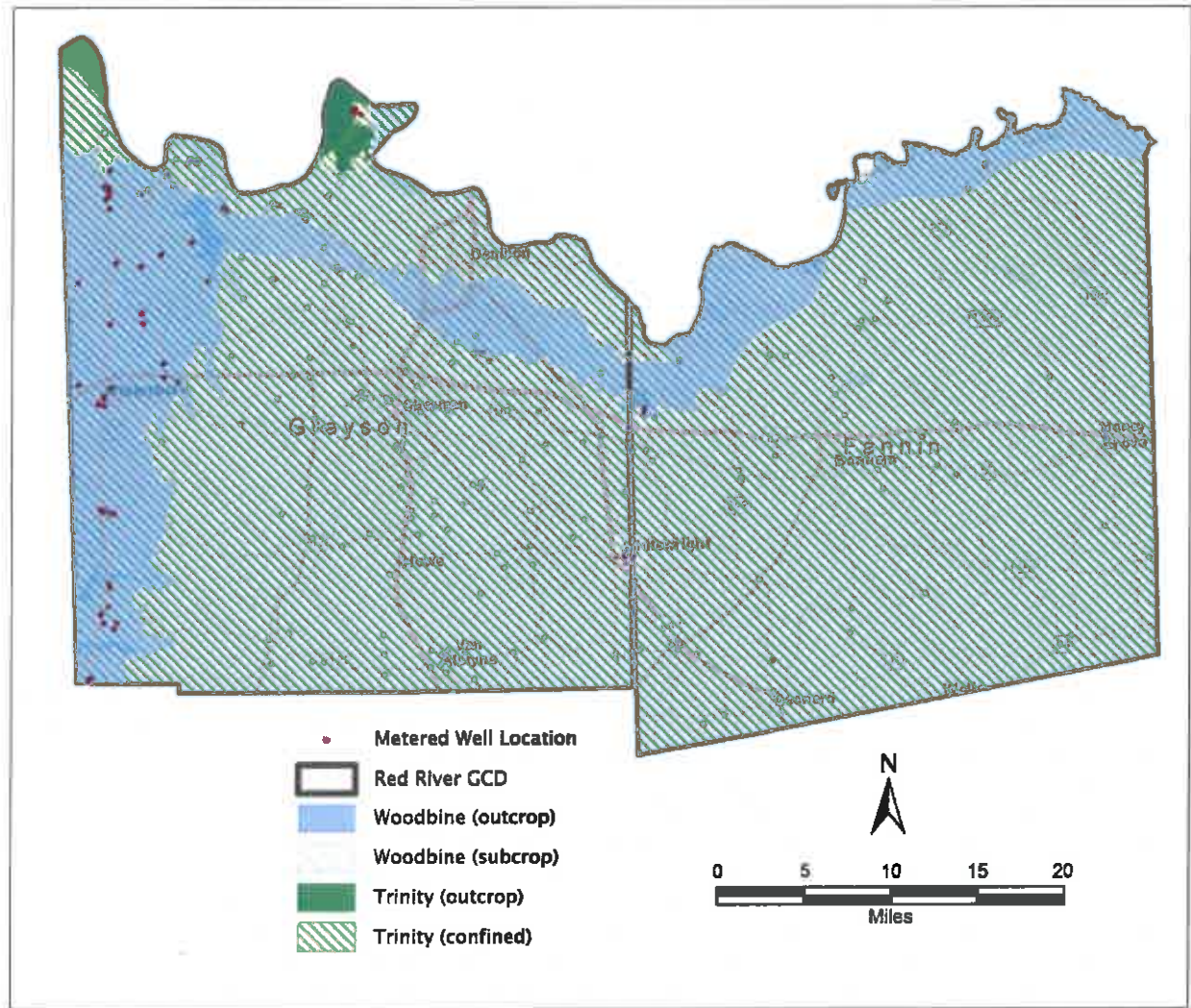


RED RIVER GROUNDWATER CONSERVATION DISTRICT MANAGEMENT PLAN



Adopted March 16, 2017

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GLOSSARY OF SYMBOLS/TERMS/ACRONYMS IN MANAGEMENT PLAN

§:	Section (referring to a statutory provision)
Board:	Board of Directors of the Red River Groundwater Conservation District
District:	Red River Groundwater Conservation District
District Act:	Enabling legislation of Red River Groundwater Conservation District (codified at Tex. Spec. Dist. Loc. Laws Code Ch. 8859)
DFC:	Desired Future Condition
GPM:	Gallons per minute
GAM:	Groundwater Availability Model
GCD:	Groundwater Conservation District
GMA:	Groundwater Management Area
HB:	House Bill
MAG:	Modeled Available Groundwater
SB:	Senate Bill
TWDB:	Texas Water Development Board
WUG:	Water user group

1 Introduction

The Red River Groundwater Conservation District (the District), after notice and hearing, adopts this Management Plan according to the requirements of Texas Water Code § 36.1071. The Red River Groundwater Conservation District Management Plan represents the management goals of the District for the next five years, including the desired future conditions of the aquifers within the jurisdictional boundaries of the District. These desired future conditions were adopted through the joint planning process in Groundwater Management Area 8 as prescribed in Chapter 36, Texas Water Code.

1.1 District Mission

The Mission of the Red River Groundwater Conservation District is to develop rules to provide protection to existing wells, prevent waste, promote conservation, provide a framework that will allow availability and accessibility of groundwater for future generations, protect the quality of the groundwater in the recharge zone of the aquifer, insure that the residents of Fannin and Grayson Counties maintain local control over their groundwater, and operate the District in a fair and equitable manner for all residents of the District.

1.2 Guiding Principles

The District is committed to managing and protecting the groundwater resources within its jurisdiction and to working with others to ensure a sustainable, adequate, high quality and cost effective supply of water, now and in the future. The District will strive to develop, promote, and implement water conservation, augmentation, and management strategies to protect water resources for the benefit of the citizens, economy and environment of the District. The preservation of this most valuable resource can be managed in a prudent and cost effective manner through conservation, education, and management. The District will endeavor to consider and respect individual property owner rights when acting on related matters.

2 History and Purpose of the Management Plan

The 75th Texas Legislature in 1997 enacted Senate Bill 1 (“SB 1”) to establish a comprehensive statewide water planning process. In particular, SB 1 contained provisions that required groundwater conservation districts to prepare management plans to identify the water supply resources and water demands that will shape the decisions of each district. SB 1 designed the management plans to include management goals for each district to manage and conserve the groundwater resources within their boundaries. In 2001, the Texas Legislature enacted Senate Bill 2 (“SB 2”) to build on the planning requirements of SB 1 and to further clarify the actions necessary for districts to manage and conserve the groundwater resources of the state of Texas.

The Texas Legislature enacted significant changes to the management of groundwater resources in Texas with the passage of House Bill 1763 (“HB 1763”) in 2005. HB 1763 created a long-term planning process in which groundwater conservation districts (“GCDs”) in each Groundwater Management Area (“GMA”) are required to meet and determine the Desired Future Conditions (“DFCs”) for the groundwater resources within their boundaries by September 1, 2010. In addition, HB 1763 required GCDs to share management plans with the other GCDs in the GMA for review by the other GCDs. In 2011, Senate Bills 660 and 737 further modified these groundwater laws and GCD management requirements in Texas.

Senate Bill 660 required that GMA representatives must participate within each applicable RWPG. It also required the Regional Water Plans be consistent with the DFCs in place when the regional plans are initially developed. TWDB technical guidelines for the current round of planning establishes that the MAG (within each county and basin) is the maximum amount of groundwater that can be used for existing uses and new strategies in Regional Water Plans. In other words, the MAG volumes are a cap on groundwater production for TWDB planning purposes.

“Managed available groundwater” was redefined as “modeled available groundwater” in Senate Bill 737 by the 82nd Legislature. Modeled available groundwater is “the amount of water that can be produced on an average annual basis” to achieve a desired future condition.

All of these changes in laws have been incorporated into the Texas Water Code and used as a framework to develop this management plan.

3 District Information

3.1 Creation

The Red River Groundwater Conservation District (the “District”) was created by the 81st Texas Legislature under the authority of Section 59, Article XVI, of the Texas Constitution, and in accordance with Chapter 36 of the Texas Water Code (“Water Code”), by the Act of May 25, 2009, 81st Leg., R.S., Ch. 248, 2009 Tex. Gen. Laws 686, codified at Tex. Spec. Dist. Loc. Laws Code Ch. 8859 (“the District Act”).

The District is a governmental agency and a body politic and corporate. The District was created to serve a public use and benefit, and is essential to accomplish the objectives set forth in Section 59, Article XVI, of the Texas Constitution. The District’s boundaries are coextensive with the boundaries of Fannin and Grayson Counties, Texas, and lands and other property within these boundaries will benefit from the works and projects that will be accomplished by the District.

3.2 Directors

The District is governed by a board of seven appointed directors. Directors serve staggered four-year terms, with the terms of three or four directors from each appointing county expiring on August 31 of each odd-numbered year. A director serves until the director's successor has qualified to serve.

3.3 Authority

The District has the rights and responsibilities provided for in Chapter 36 of the Texas Water Code and 31 Texas Administrative Code Chapter 356. The District is charged with conducting hydrogeological studies, adopting a management plan, providing for the permitting of non-exempt water wells and implementing programs to achieve statutory mandates. The District has rulemaking authority to implement the policies and procedures needed to manage the groundwater resources of Grayson and Fannin Counties.

3.4 Location and Extent

The District's boundaries are coextensive with the boundaries of Grayson and Fannin Counties, Texas. The District covers an area of approximately 1,878 square miles. A map is included as Figure 1.

3.5 Topography and Drainage

The District is located within the Red, Trinity and Sulphur River Basins. The northern two-thirds of Grayson and Fannin Counties drain north and east to the Red River, the southern portion of Grayson County drains toward the south to the Trinity River, the southeastern one-third of Fannin County drains east to the Sulphur River. Elevations in the District range from approximately 500 to 900 ft. above mean sea level (amsl) and the physiography consists primarily of gently rolling prairieland, blacklands, woodlands and wooded bottomlands in the river valleys. Average annual rainfall is about 43 inches.

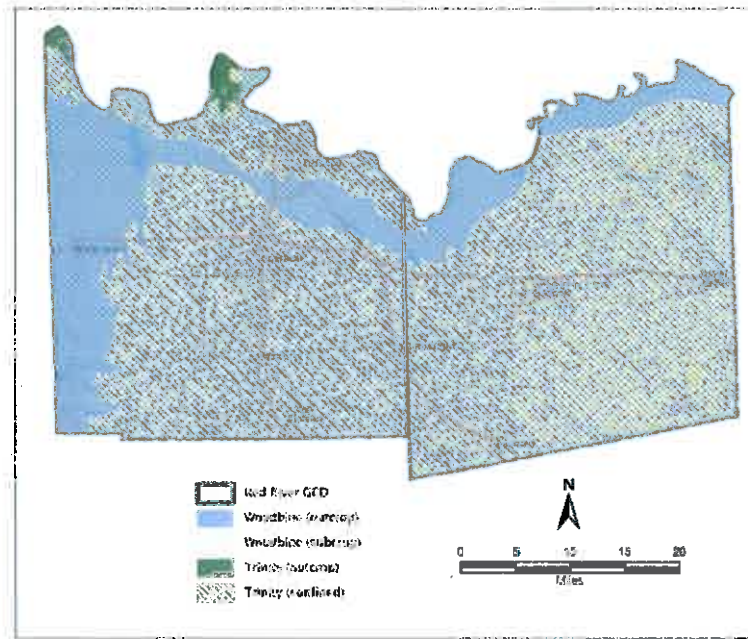


Figure 1. District Map

4 Criteria for Plan Approval

4.1 Planning Horizon

This management plan becomes effective upon adoption by the District Board of Directors and subsequent approval by the Executive Administrator of the Texas Water Development Board (TWDB). This management plan incorporates a planning period of ten years in accordance with 31 Texas Administrative Code §356.5(a).

4.2 Board Resolution

A certified copy of the Red River Groundwater Conservation District resolution adopting the plan is located in Appendix A – Resolution Adopting the Management Plan.

4.3 Plan Adoption

Public notices documenting that the plan was adopted following appropriate public meetings and hearings are located in Appendix B – Evidence that the Management Plan was adopted.

4.4 Coordination with Surface Water Management Entities

A template letter transmitting copies of this plan to the surface water management entities in the District along with a list of the surface water management entities to which the plan was sent are located in Appendix C – Evidence that the District coordinated development of the Management Plan with surface water entities.

5 Actions, Procedures, Performance, and Avoidance for Plan Implementation, and Management of Groundwater Supplies

The District is currently operating pursuant to a set of temporary rules adopted on August 29, 2011 and most recently amended on January 1, 2017 (Appendix D). The temporary rules are housed on the District's website <http://www.redrivergcd.org/district-information.html>. The District anticipates operating under permanent rules beginning in the Spring of 2018 and will amend the Plan accordingly at that time. In the meantime, the temporary rules were adopted under the authority of Sections 36.101 and 36.1071(f), Texas Water Code, and the District Act for the purpose of conserving, preserving, protecting, and recharging groundwater in the District in order to prevent subsidence, prevent degradation of water quality, prevent waste of groundwater, and to carry out the powers and duties of Chapter 36, Texas Water Code, and the District Act.

These rules are used by the District in the exercise of the powers conferred on the District by law and in the accomplishment of the purposes of the law creating the District. These rules may be used as guides in the exercise of discretion, where discretion is warranted. However, under no circumstances and in no particular case will they or any part therein, be construed as a limitation or restriction upon the District to exercise powers, duties and jurisdiction conferred by law. These rules create no rights or privileges in any person or water well, and shall not be construed to bind the Board in any manner in its promulgation of the District Management Plan, amendments to these Temporary Rules, or promulgation of permanent rules.

The District may amend the District rules as necessary to comply with changes to Chapter 36 of the Texas Water Code and to insure the best management of the groundwater within the District. The development and enforcement of the rules of the District has been and will continue to be based on the best scientific and technical evidence available to the District.

The District has encouraged and will continue to encourage public cooperation and coordination in the implementation of the management plan for the District, as it is amended. All operations and activities of the District have been and will be performed in a manner that best encourages cooperation with the appropriate state, regional or local water entity. The meetings of the Board of the District are noticed and conducted at all times in accordance with the Texas Open Meetings Law. The District has also made available for public inspection all official documents, reports, records and minutes of the District pursuant to the Texas Public Information Act and will continue to do so in the future.

6 Methodology to Track District Progress in Achieving Management Goals

An annual report ("Annual Report") will be created by the general manager and staff of the District and provided to the members of the Board of Directors. The Annual Report will cover the activities of the District including information on the District's performance in regards to achieving the

District's management goals and objectives. The Annual Report will be delivered to the Board within 180 days following the completion of the District's fiscal year, beginning with the fiscal year that started on January 1, 2012. A hard copy of the Annual Report will be kept on file and will be available for public inspection at the District's offices upon adoption. Annual reports will also be available via the District's website.

7 Management Objectives and Performance Standards

The following goals, management objectives, and performance standards have been developed and adopted to ensure the management and conservation of groundwater resources within the District's jurisdiction.

For purposes of this management plan, an exempt well means wells that meet any one of the following, unless a different meaning is set forth in the District rules, or the context clearly provides otherwise: (1) any new or existing well of any size or capacity used solely for domestic use, livestock use, or poultry use; (2) any new or existing well that does not have the capacity, as equipped, to produce more than 25 gallons per minute and is used in whole or in part for commercial, industrial, municipal, manufacturing, or public water supply use, use for oil or gas or other hydrocarbon exploration or production, or any other purpose of use other than solely for domestic, livestock, or poultry use, except that if the total sum of the capacities of wells that operate as part of a well system is greater than 25 gallons per minute, the well system and individual wells that are part of it are not considered to be exempt; or (3) leachate wells, monitoring wells, and piezometers. All wells that do not meet one of these criteria are considered to be non-exempt for purposes of this management plan. The characterization of exempt and non-exempt wells is intended to apply only to wells described in this management plan and shall not be interpreted to mean that the wells will be considered exempt or not exempt from permitting under any permanent rules adopted by the District in the future.

Goal 1 - Providing the most efficient use of groundwater

The District, through strategies and programs adopted in this management plan and rules, strives to ensure the most efficient use of groundwater in order to sustain available resources for the future while maintaining the economic growth of the District.

Management Objective 1.1

The District will require that all wells be registered in accordance with its current rules.

Performance Standard 1.1

The Board of Directors will receive quarterly briefings by the General Manager regarding the District's well registration program. These quarterly reports will be included in the Annual Report to

the Board of Directors. The District is currently in the beginning phase of making improvements to the online geodatabase that will make additional statistics available for this report such as the aquifer in which wells are being completed. In addition, a handout will be provided annually to local realtor associations detailing the requirement of new property owners to register their existing wells within 90 days of transfer of ownership.

Management Objective 1.2

It is the goal of the District that all non-exempt wells and exempt wells be registered. In order to ensure that all wells required by District rules to be registered have been accurately registered the District's Field Technician manages a Field Inspections Program, with the objective of conducting field inspections of at least five wells per month. These inspections will confirm that a well has been registered, accuracy of well location, and accuracy of other required well registration information.

Performance Standard 1.2

Quarterly briefings by the General Manager will be provided to the Board of Directors regarding the number of well sites inspected each month to confirm well registration requirements have been met. This information will also be included in the Annual Report to the Board of Directors.

Management Objective 1.3 (a)

In order to evaluate continually the effectiveness of the District's rules in meeting the goal of ensuring the efficient use of groundwater, the District will operate a groundwater monitoring program to collect information on the quantity and quality of groundwater resources throughout the District. This monitoring program is based on the establishment of a network of monitoring wells. The District staff has assumed the responsibility of monitoring all available TWDB wells at least annually. In addition, one additional well will be added in each county, for a total of two new wells to the system in accordance with the District's well monitoring plan.

For the purpose of water quality sampling, samples collected for water quality taken by Texas Commission on Environmental Quality staff every five years will be used for monitoring purposes initially, and may be supplemented in the future as determined by the Board. All information collected in the monitoring program will be entered into the District's geodatabase after the current geodatabase improvements project is complete. The results of the monitoring program will be included in the Annual Report presented by the General Manager.

Performance Standard 1.3 (a)(1)

Track the number of wells in Fannin and Grayson counties for which water levels were measured per year as reported in the Annual Report presented by the General Manager to the Board of Directors.

Performance Standard 1.3 (a)(2)

Number of wells in Fannin and Grayson counties for which water samples were collected for the testing of water quality: The Texas Commission on Environmental Quality provides a Consumer Confidence Report that provides consumers with information about the quality of drinking water. This data may be reviewed at: <https://www.tceq.texas.gov/drinkingwater/ccr> for water systems.

Management Objective 1.3 (b)

In order to ensure the efficient use of groundwater, adequate data must be collected to facilitate groundwater availability modeling activities necessary to understand current groundwater resources and the projected availability of those resources in the future. Monitoring wells will be established by the District on a schedule determined by the Board of Directors as funds are available.

Performance Standard 1.3 (b)

Track the number of wells for which water level data is available will be accessible online after the current geodatabase improvements project is complete.

Management Objective 1.4

A critical component of the District's goal of ensuring the efficient use of groundwater is the collection of accurate water use information. The District has established by temporary rule a requirement that all non-exempt wells be equipped with meters to measure the use of groundwater. The well owner/operator is responsible for maintaining a meter log with at least monthly records of water use. Cumulative water use is to be reported to the District by the well owner/operator quarterly. All water use information will be entered and maintained in the District's geodatabase. It is the objective of the District that 95 percent of all registered non-exempt wells will report water use by the reporting deadlines established in the District's rules.

Performance Standard 1.4

Percent of registered non-exempt wells meeting reporting requirements of water use will be provided in the Annual Report to the Board of Directors.

Management Objective 1.5

In order to ensure that registered non-exempt wells have been equipped with District-approved meters and that water use is being accurately reported, the District Field Technician facilitates a meter inspection program to insure that all registered non-exempt wells will be inspected on at least a five-year cycle by District personnel. These inspections will, at a minimum, verify proper installation and operational status of meters and record the meter reading at the time of inspection. This meter reading will be compared to the most recent water use report for the inspected well. Any potential violations of District rules regarding meter installation and reporting requirements will be reported to the Board of Directors at the next practicable meeting for consideration of possible enforcement actions. Annual water use will be included in the Annual Report presented by the General Manager to the Board of Directors.

Performance Standard 1.5 (a)

Percentage of registered non-exempt wells inspected by District personnel annually is provided in the Annual Report presented by the General Manager.

Performance Standard 1.5 (b)

Comparison of annual water use versus estimates of modeled available groundwater established as a result of the adopted Desired Future Conditions shall be included in the Annual Report presented by the General Manager no later than 2019, after the current geodatabase improvements project is completed.

Management Objective 1.6

A critical component to accomplishing the District's mission is to ensure that proper data is being collected and that the data is being utilized to the fullest extent and efficiently. Shortly after the District's creation, the District hired a consultant to build an online geodatabase that would make workflows, data entry and data utilization easier and more efficient for well owners, well drillers, general public, District staff and the Board of Directors. After several years of utilizing the geodatabase the District had built, the District has identified areas in which the existing system can be upgraded.

Performance Standard 1.6

The District will make substantial upgrades and improvements to the online geodatabase by 2019, in order to make workflows, data entry and data utilization easier and more efficient.

Management Objective 1.7

The District will develop a methodology to quantify current and projected annual groundwater production from exempt wells.

Performance Standard 1.7

The District will provide the TWDB with its methodology and estimates of current and projected annual groundwater production from exempt wells. The District will also utilize the information in the future in developing and achieving desired future conditions and in developing and implementing its production allocation and permitting system and rules. Information related to implementation of this objective will be included in the Annual Report to the Board of Directors by 2019.

Goal 2 - Controlling and preventing the waste of groundwater

Another important goal of the District is to implement strategies that will control and prevent the waste of groundwater.

Management Objective 2.1

The District will annually provide information to the public on eliminating and reducing wasteful practices in the use of groundwater by publishing information on groundwater waste reduction on the District's website at least once a year.

Performance Standard 2.1

Information on groundwater waste reduction will be provided on the District's website and the information published on the website will be included in the District's Annual Report to be provided to the Board of Directors.

Management Objective 2.2

The District will encourage the elimination and reduction of groundwater waste through a collection of water-use fees for non-exempt production wells within the District.

Performance Standard 2.2

Annual reporting of the total fees paid and total groundwater used by non-exempt wells will be included in the Annual Report provided to the Board of Directors.

Management Objective 2.3

The District will identify well owners that are not in compliance with District well registration, reporting, and fee payment requirements and bring them into compliance.

Performance Standard 2.3

The District will compare existing state records and field staff observations with well registration database to identify noncompliant well owners.

Management Objective 2.4

The District will investigate instances of potential waste of groundwater.

Performance Standard 2.4

District staff will report to Board of Directors as needed regarding potential waste of groundwater and include number of investigations in Annual Report.

Goal 3 - Controlling and preventing subsidence

Due to the geology of the Northern Trinity/Woodbine Aquifers in the District, problems resulting from water level declines causing subsidence are not technically feasible and as such, a goal addressing subsidence is not applicable.

Goal 4 - Addressing conjunctive surface water management issues

Surface water resources represent a vital component in meeting current and future water demands in all water use sectors within the District. The District coordinates with surface water management entities within the region by designating a board member or the general manager to attend and coordinate on water supply and management issues with the Region C Water Planning Group.

Management Objective 4.1

Coordination with surface water management agencies - the designated board member or General Manager will attend, at a minimum, 75 percent of the meetings and events of the Region C Water Planning Group. Participation in the regional water planning process will ensure coordination with surface water management agencies that are participating in the regional water planning process.

Performance Standard 4.1

The designated board member or General Manager will report on actions of the Region C Water Planning Group as appropriate to the board, and the General Manager will document meetings attended in the Annual Report.

Management Objective 4.2

The General Manager of the District will monitor and participate in relevant stakeholder meetings concerning water resources relevant to the District.

Performance Standard 4.2

The General Manager of the District will monitor and participate in relevant stakeholder meetings that concern water resources relevant to the District. The meetings that are attended will be presented in the District's Annual Report.

Goal 5 - Addressing natural resource issues

The District understands the important nexus between water resources and natural resources. The exploration and production of natural resources such as oil and gas along with mining efforts for road aggregate materials such as sand and gravel clearly represent potential management issues for the District. For example, improperly plugged oil and gas wells may provide a conduit for various hydrocarbon and drilling fluids to potentially migrate and contaminate groundwater resources in the District.

Management Objective 5.1

The District has engaged a firm to monitor all injection well applications within the District and notify the General Manager of any potential impacts.

Performance Standard 5.1

General Manager will report to the Board of Directors any information provided by the consultant engaged to monitor injection well applications within the District to the Board of Directors and document the information in the Annual Report to the Board of Directors.

Management Objective 5.2

The District will monitor compliance by oil and gas companies of well registration, metering, production reporting, and fee payment requirements of the District's rules.

Performance Standard 5.2

As with other types of wells, instances of non-compliance by owners and operators of water wells for oil and gas activities will be reported to the Board of Directors as appropriate for enforcement action. A summary of such enforcement activities will be included in the Annual Report to the Board of Directors.

Goal 6 - Addressing drought conditions

Management Objective 6.1

The District will make available through the District's website easily accessible drought information with an emphasis on developing droughts and on any current drought conditions. Examples of links that will be provided include routine updates to the Palmer Drought Severity Index (PDSI) map for the region, the Drought Preparedness Council Situation Report (routinely posted on the Texas Water Information Network, and the TWDB Drought Page at <https://waterdatafortexas.org/drought>.

Performance Standard 6.1

Current drought conditions information from multiple resources including the Palmer Drought Severity Index (PDSI) map for the region and the Drought Preparedness Council Situation Report is available to the public through the District's website

Goal 7 - Address conservation, recharge and precipitation enhancement, rainwater harvesting, and brush control

Texas Water Code § 36.1071(a)(7) requires that a management plan include a goal that addresses conservation, recharge enhancement, rainwater harvesting, precipitation enhancement, or brush control, where appropriate and cost-effective. The District has determined that a goal addressing recharge enhancement and precipitation enhancement is not appropriate or cost-effective, and therefore is not applicable to the District.

Management Objective 7.1

The primary goal, perhaps viewed as the *"umbrella goal"* of the District is to provide for and facilitate the conservation of groundwater resources within the District. The District will include a link on the District's website to the electronic library of water conservation resources supported by the Water Conservation Advisory Council. For example, one important resource available through this internet-based resource library is the Water Conservation Best Management Practices Guide developed by the Texas Water Conservation implementation Task Force. This Guide contains over 60 Best Management Practices for municipalities, industry, and agriculture that will be beneficial to water users in the District.

Performance Standard 7.1

Link to the electronic library of water conservation resources supported by the Water Conservation Advisory Council is available on the District's website.

Management Objective 7.2

The District will submit at least one article regarding water conservation for publication each year to at least one newspaper of general circulation in the District's Counties.

Performance Standard 7.2

A copy of the article submitted by the District for publication to a newspaper of general circulation in one of the District's Counties regarding water conservation will be included in the Annual Report to the Board of Directors.

Management Objective 7.3

The District will provide educational curriculum regarding water conservation offered by the Texas Water Development Board (Major Rivers) to at least one elementary school in each county of the District.

Performance Standard 7.3

Each year the District will seek to provide water conservation curriculum to at least one elementary school in each county within the District. The elementary schools for which the curriculum is provided will be listed in the Annual Report to the Board of Directors.

Management Objective 7.4

While the District does not regulate rainwater harvesting, it has become a viable water source either as a supplemental water supply or as the primary water supply in both urban and rural areas of Texas. As a result, Texas has become internationally recognized for the widespread use and innovative technologies that have been developed, primarily through efforts at the TWDB. To ensure these educational materials are readily available to citizens in the District, a link to rainwater harvesting materials including system design specifications and water quality requirements will be maintained on the District's website.

Performance Standard 7.4

Link to rainwater harvesting resources at the TWDB is available on the District's website.

Management Objective 7.5

Educate public on importance of brush control as it relates to water table consumption.

Performance Standard 7.5

Link to information concerning brush control is available on the District's website.

Goal 8 - Achieving desired future conditions of groundwater resources

The desired future conditions of the aquifers in Groundwater Management Area 8 represent average water levels in the various aquifers at the end of 50-years based on meeting current and projected groundwater supply needs. The Board of Directors has adopted a strategic approach that includes the adoption of this management plan and rules necessary to achieve the desired future conditions. This management plan and the companion rules have been designed as an integrated program that will systematically collect and review water data on water quantity, water quality, and water use, while at the same time, implementing public awareness and public education activities that will result in a better informed constituency.

Management Objective 8.1

State statute requires GCDs to review, amend as necessary, and readopt management plans at least every five years. The General Manager will annually present a summary report on the status of achieving the adopted desired future conditions. Prior to the adoption date of the next management plan, the General Manager will work with the Board of Directors to conduct a focused review to determine if any elements of this management plan or rules need to be amended in order to achieve the adopted desired future conditions, or if the adopted desired future conditions need to be revised to better reflect the needs of the District.

Performance Standard 8.1

The General Manager will include a summary report on the status of achieving the adopted desired future conditions in the Annual Report beginning by 2019, after the geodatabase improvements project is complete. This summary report will primarily be based on data collected from the District's groundwater monitoring program.

Four years after the adoption of this management plan, and based on the annual review conducted by the General Manager and the Board of Directors, the Board of Directors will determine which of the following apply to the District; (1) the current management plan and rules are working effectively to meet the adopted desired future conditions, (2) specific amendments need to be made to this management plan and/or rules in order to achieve the adopted desired future conditions, (3) amendments are needed to the adopted desired future conditions in order to better meet the needs of the District, or (4) a combination of (2) and (3). This determination will be made at a regularly scheduled meeting of the Board of Directors.

8 Estimates of Technical Information

8.1 Modeled Available Groundwater based on Desired Future Conditions

Texas Water Code § 36.001 defines modeled available groundwater 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”.

The amount of water that may be permitted from an aquifer is not the same amount as the total amount that can be pumped from an aquifer. Total pumping includes uses of water both subject to permitting and exempt from permitting (“exempt use”). Examples of exempt use include: domestic, livestock, and some types of water use associated with oil and gas exploration.

To determine the DFCs, a series of simulations using the TWDB's Groundwater Availability Model (“GAM”) for the Northern Trinity and Woodbine aquifers were completed. Each GAM simulation was done by iteratively applying various amounts of simulated groundwater pumping from the

aquifer over a predictive period that included a simulated repeat of the drought of record. Pumping was increased until the amount of pumping that could be sustained by the aquifer without impairing the aquifer conditions selected for consideration as the indicator of the aquifer desired future condition was identified.

The desired future conditions of the Northern Trinity aquifer in GMA 8 are documented in GAM Run 10-063 MAG, which is included as Appendix E. The DFCs are based on average drawdown in feet after 50 years for each Trinity aquifer unit. DFCs for the Woodbine aquifer are documented in GAM Run 10-064 MAG, which is also included as Appendix E.

In the Red River District, the geologic units comprising the Trinity are: the Antlers (which includes all of the Trinity Group Formations), the Paluxy Sand, the Glen Rose Limestone, and the Twin Mountain (which includes the Hensell and the Hosston Formations that are differentiated further to the south). The old Trinity DFCs are not reported in terms of the Region-specific formations that were incorporated into the updated North Trinity GAM. The District is located in Regions 1 and 2. Figure 2 presents the location of each hydrogeologic region in the area.

The joint planning process set forth in Texas Water Code § 36.108 must be collectively conducted by all groundwater conservation districts within the same GMA. The District is a member of GMA 8. During the second round of joint planning, GMA-8 passed and adopted a resolution proposing DFCs for all relevant aquifers by letter dated April 1, 2016. The adopted DFCs were then forwarded to the TWDB for development of the MAG calculations. The District is awaiting the updated MAG estimates from the TWDB, and will amend the Plan when this data is made available. A summary of the desired future conditions and the modeled available groundwater are presented in Tables 1 and 2 below.

Table 1. Current desired future conditions for the Trinity and Woodbine aquifers based on total average feet of drawdown

GMA-8 Adopted DFCs						
County	Woodbine	Paluxy	Glen Rose	Twin Mountain	Travis Peak	Antlers
Fannin	247	688	280	372	269	251
Grayson	160	922	337	417	-	348

**Table 2. Estimates of Modeled Available Groundwater
for pumping in the Trinity and Woodbine aquifers
(GAM Run 10-063 and GAM Run 10-064)**

County	Desired Future Condition (feet of drawdown after 50 years)	Modeled Available Groundwater (acre-feet per year)
Fannin	Paluxy - 212	288
Fannin	Glen Rose - 196	0
Fannin	Hensell - 182	203
Fannin	Hosston - 181	209
Fannin	Woodbine -186	3,297
Fannin	County Total	3,997
Grayson	Paluxy - 175	4,708
Grayson	Glen Rose - 161	0
Grayson	Hensell - 160	2,345
Grayson	Hosston - 165	2,347
Grayson	Woodbine - 28	12,087
Grayson	County Total	21,487
District Total		25,484

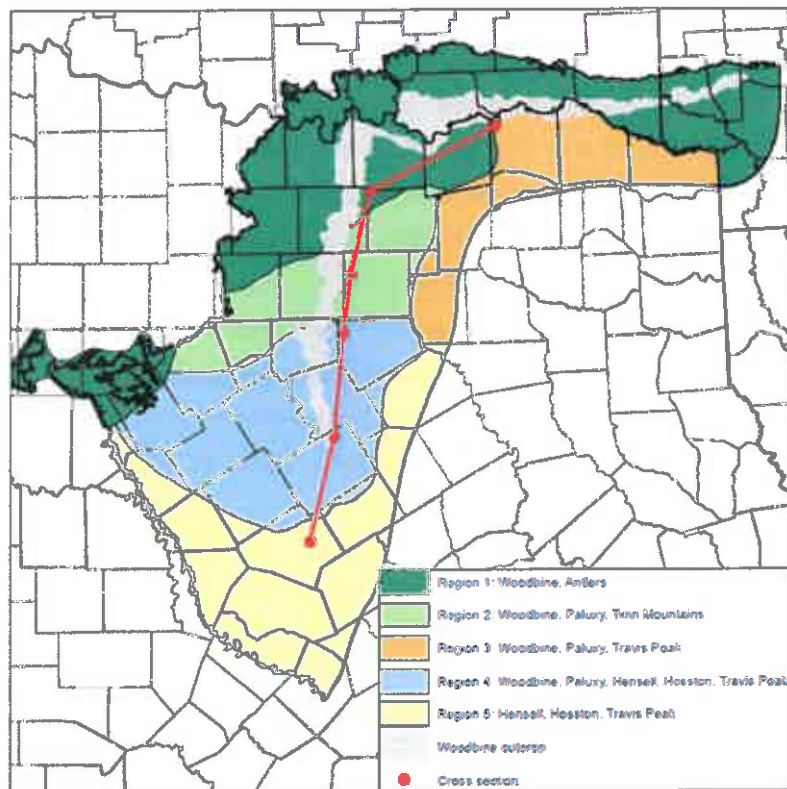


Figure 2. Hydrogeologic Region Extents

8.2 Amount of Groundwater Being Used within the District

Each year the TWDB conducts an annual survey of ground and surface water use by municipal and industrial entities within the state of Texas. The information obtained is then utilized by the TWDB for water resources planning. The historical water use estimates are subject to revision as additional data and corrections are made available to the TWDB.

Estimates of historical water use in Grayson and Fannin Counties in the years 2000 through 2015 is presented in Appendix F. TWDB data included in Appendix F do not differentiate between exempt and non-exempt use.

Estimated groundwater use in the District by category in 2015 was approximately 70 percent for municipal use, 15 percent for irrigation use, 10 percent for livestock use, 5 percent for manufacturing use, less than one percent for mining use, and zero percent for steam-electric power use. In the TWDB Water Use Survey, the municipal use category includes small water providers and rural domestic pumping in addition to municipalities.

Total groundwater use was about 21,320 acre-feet in 2000, with a gradual decline between 2001 and 2004 to a minimum of about 16,322 acre-feet in 2004. Between 2005 and 2008 water use continued to decline on average by 490 acre-feet per year. Starting in 2009, total usage increased reaching a peak in 2012 with a maximum use of 27,638 acre-feet. Total water use decreased to 19,474 acre-feet in 2013, 18,232 acre-feet in 2014, and to 16,472 in 2015. Water use for irrigation purposes decreased to zero in 2008 and was greatest from 2009 through 2014, with a slight decline shown for 2015. Usage for mining purposes increased in 2008 through 2012. Livestock use remained between about 100 and 255 acre-feet per year from 2000 through 2004 and then increased to a maximum use of approximately 1,892 acre-feet in 2005. Water use for steam-electric power generation was greatest in 2000 at approximately 503 acre-feet. Between 2008 through 2010 usage steadily declined and reached zero acre-feet per year in 2011 through 2015. Generally, municipal water use has been greater than about 11,000 acre-feet per year throughout the historical record with maximum usage in 2009 through 2012. Historic water use from 2000 to 2015 is taken from the 2017 State Water Plan. Figure 3 and Figure 4 present the historic water usage for Fannin and Grayson Counties, respectively. Refer to Appendix F for the data table.

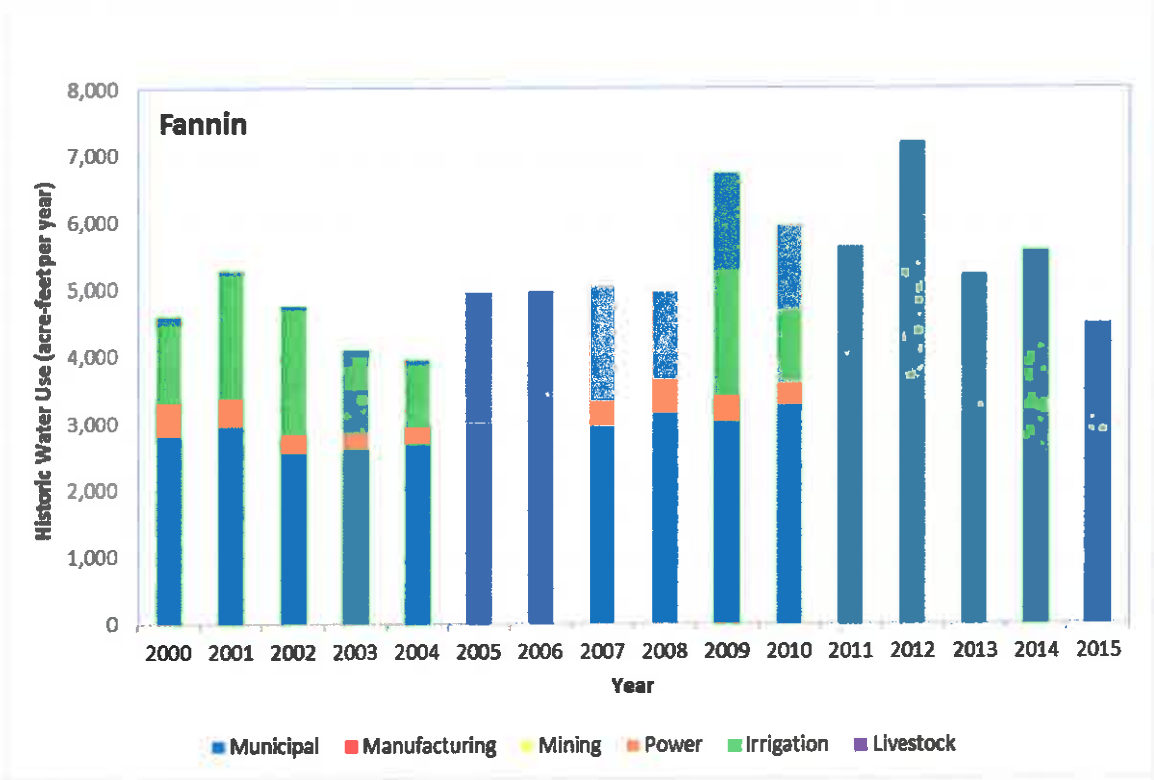


Figure 3. Historic Groundwater Use Estimate for Fannin County

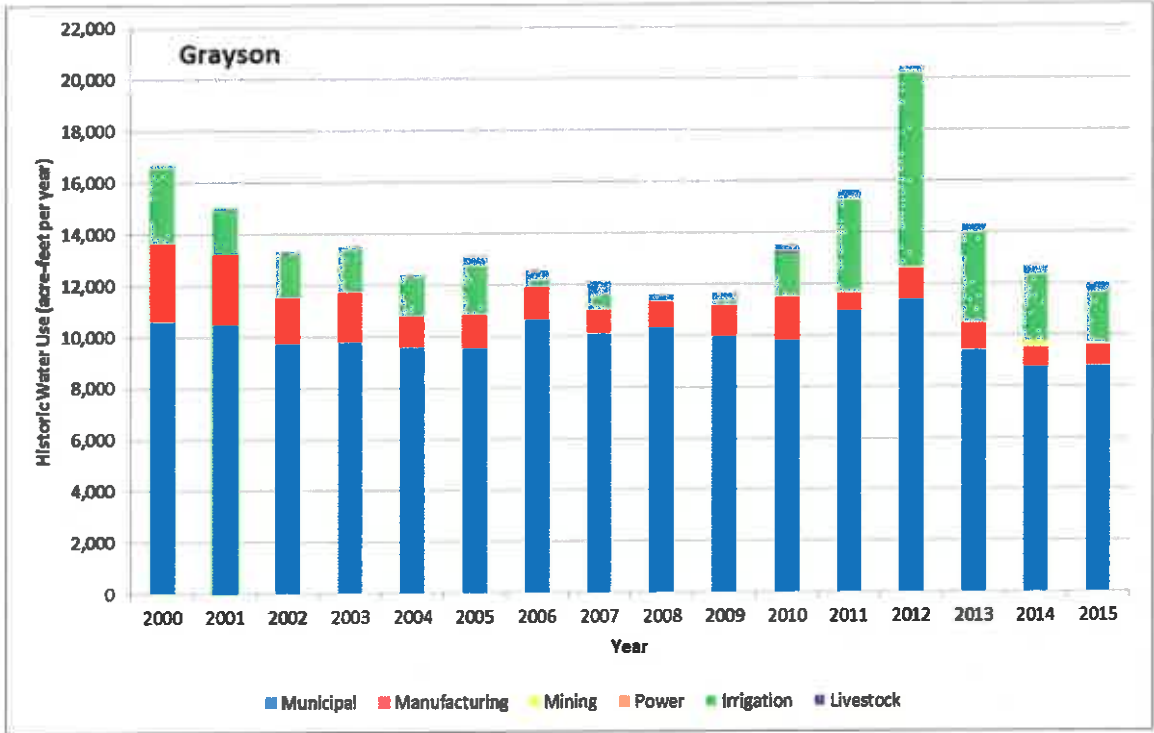


Figure 4. Historic Groundwater Use Estimate for Grayson County

8.3 Annual Amount of Recharge from Precipitation

Recharge from precipitation falling on the outcrop of the aquifer (where the aquifer is exposed to the surface) within the Red River GCD was estimated by the TWDB in the GAM Run 16-005 dated May 16, 2016. Water budget values of recharge extracted for the transient model period indicate that precipitation accounts for 428 acre-feet per year of recharge to the Trinity aquifer and 73,888 acre-feet per year of recharge to the Woodbine aquifer within the boundaries of the Red River GCD (Appendix E).

8.4 Annual Volume of Water that Discharges from the Aquifer to Springs and Surface Water Bodies

The total water discharged from the aquifer to surface water features such as streams, reservoirs and springs is defined as the surface water outflow. Water budget values of surface water outflow within the Red River GCD were estimated by the TWDB in the GAM Run 16-005 (Appendix E). Modeled values are 258 acre-feet per year of discharge from the Trinity aquifer and 46,096 acre-feet per year of discharge from the Woodbine aquifer to surface water bodies that are located within the Red River GCD.

8.5 Annual Volume of Flow In and Out of the District and Between Aquifers in the District

Flow into and out of the District is defined as the lateral flow within an aquifer between the District and adjacent counties. Flow between aquifers is defined as the vertical flow between aquifers or confining units that occurs within the boundaries of the District. The flow is controlled by hydrologic properties as well as relative water levels in the aquifers and confining units. Water budget values of flow for the Red River GCD were estimated by the TWDB in the GAM Run 16-005 (Appendix E).

8.6 Projected Surface Water Supply within the District

The 2017 Texas State Water Plan, the most recent plan available, provides an estimate of projected surface water supplies in Grayson and Fannin Counties. These estimates are included in Appendix F.

Total projected surface water supplies by county are illustrated in Figure 5. The estimated projections range from a maximum of 15,618 acre-feet in 2030 to a minimum of 14,934 acre-feet in 2020 for Fannin County, from a maximum of 30,846 acre-feet in 2070 to a minimum of 30,244 acre-feet in 2050 for Grayson County. They also indicate that projected surface water supplies for the District, which are on the order of 46,464 acre-feet per year, are even or slightly less than historical groundwater use in the District, which is on the order of 20,000 to 50,000 acre-feet per year for 2000 through 2015.

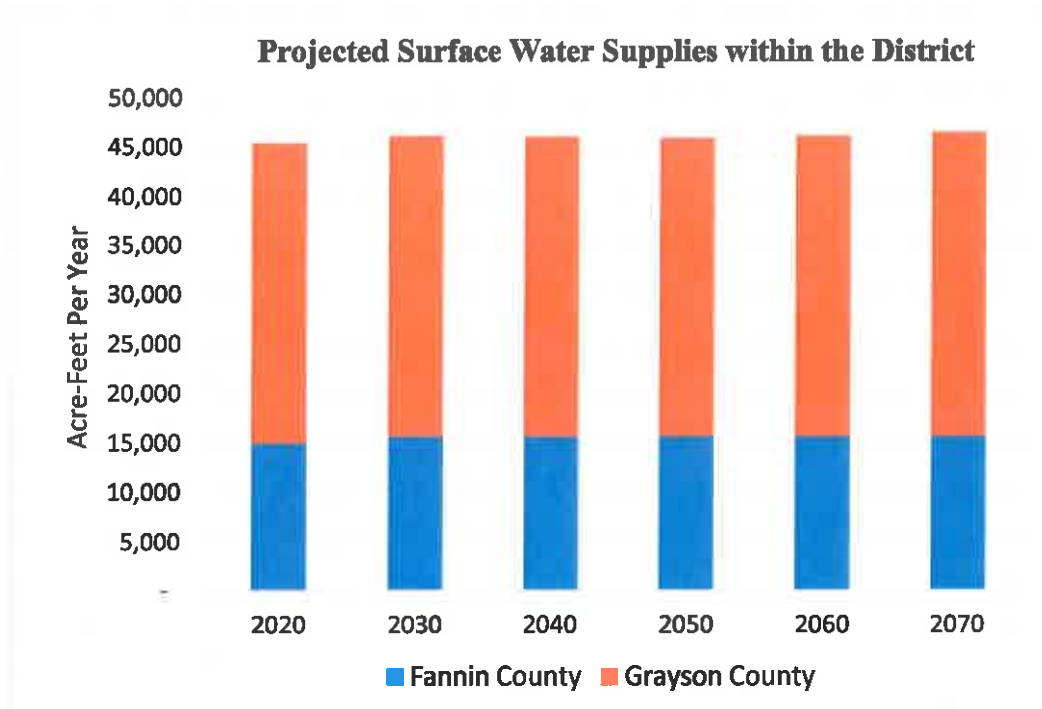


Figure 5. Projected Surface Water Supplies within the District

8.7 Projected Total Demand for Water within the District

Appendix F contains an estimate of projected net water demand in Fannin and Grayson Counties based on the 2017 Texas State Water Plan.

The analyses to develop water demand projections are primarily conducted in Texas as part of the regional water supply planning process (created by the 75th Texas Legislature through the passage of Senate Bill 1 in 1997). Water demand projections are developed for the following water user categories; municipal, rural (county-other), irrigation, livestock, manufacturing, mining, and steam-electric power generation.

Texas Water Code § 36.1071(e)(3)(G) requires that a management plan include projections of the total demand for water (surface water and groundwater) from the most recently adopted state water plan. The projected total demand for the District increases significantly from 62,140 acre-feet per year in 2020 to 126,130 acre-feet per year in 2070. Projected demands are significantly higher in Grayson than in Fannin County (Figure 6).

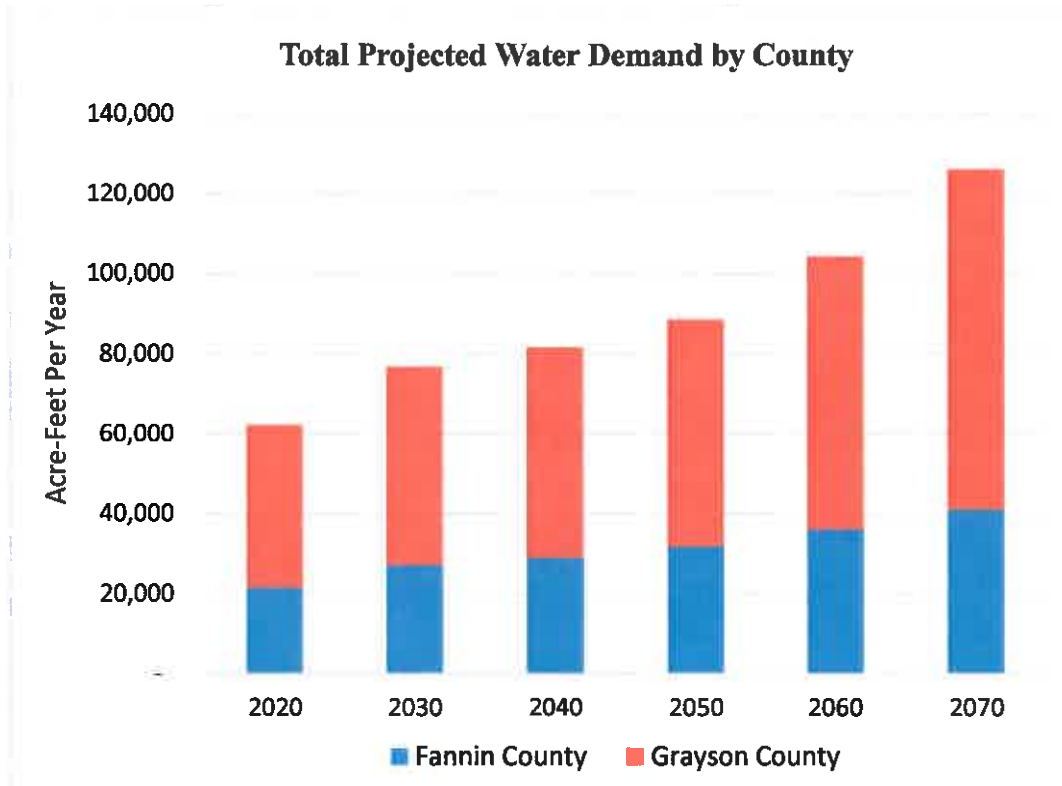


Figure 6. Total Projected Water Demand within the District

8.8 Projected Water Supply Needs

Projected water needs for the counties in the District were developed for the 2017 State Water Plan. Those needs reflect conditions when projected water demands exceed projected water supplies in the event of a drought of record. Projected water needs were estimated on the county-basin level for all water user group categories for every decade from 2020 through 2070. Appendix F lists the total water supply needs for Grayson and Fannin Counties as adopted in the TWDB 2017 State Water Plan.

Data for the 2017 State Water Plan projects future water needs for both counties in the District. There are 17 water user groups in Fannin County. A water need at some point between 2020 and 2070 is projected for all but five of those water user groups. The projected need in Fannin County increases significantly from 56 acre-feet per year in 2020 to 18,776 acre-feet per year in 2070. Of the 26 water user groups in Grayson County, a need at some point between 2020 and 2070 is projected for 20 of those water user groups. For the District as a whole, the total projected water need increases from 142 acre-feet per year in 2020 to 55,020 acre-feet per year in 2070. Figure 7 shows the total projected water needs for the District through 2070.

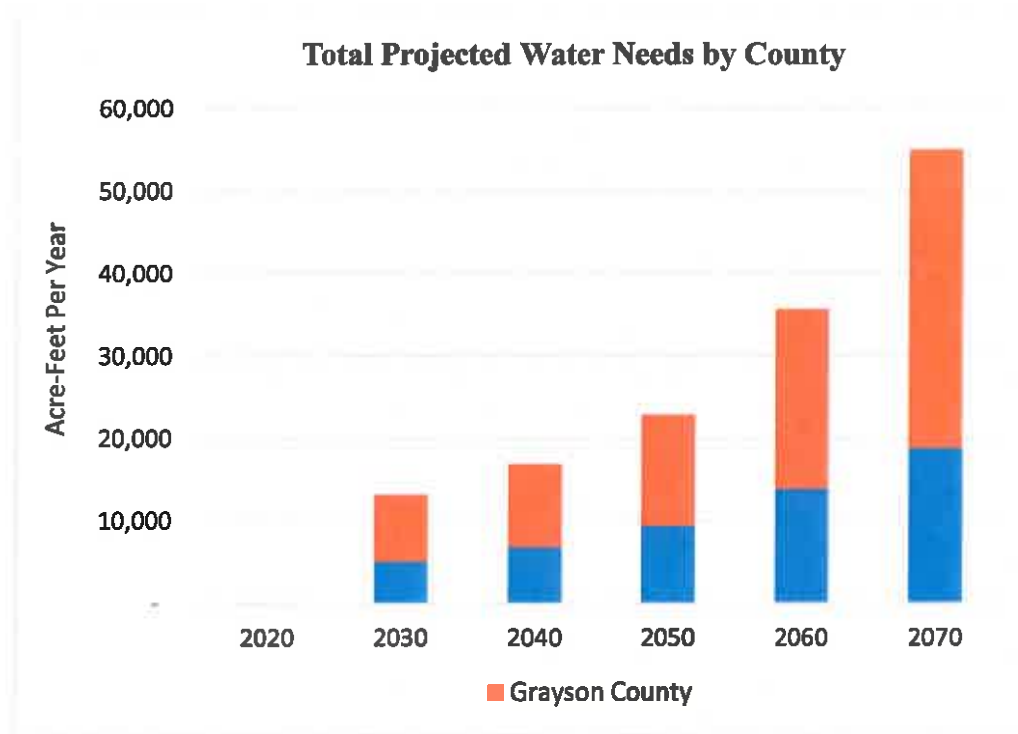


Figure 7. Total Projected Water Needs by County

8.9 Water Management Strategies

The 2017 State Water Plan assessed and recommended water management strategies to meet the identified needs for every decade from 2020 through 2070. Potential strategies include water conservation, developing additional groundwater and surface water supplies, expanding and improving management of existing water supplies, water reuse, and alternative approaches such as desalination. The projected water management strategies for the counties in the District from the 2017 State Water Plan are shown in Appendix F by water user group (WUG).

9 Groundwater Resources of Fannin and Grayson Counties

A map showing the extent of the aquifers in the District is included as Figure 8. Cross sections through the aquifers are included as Figures 9 and 10.

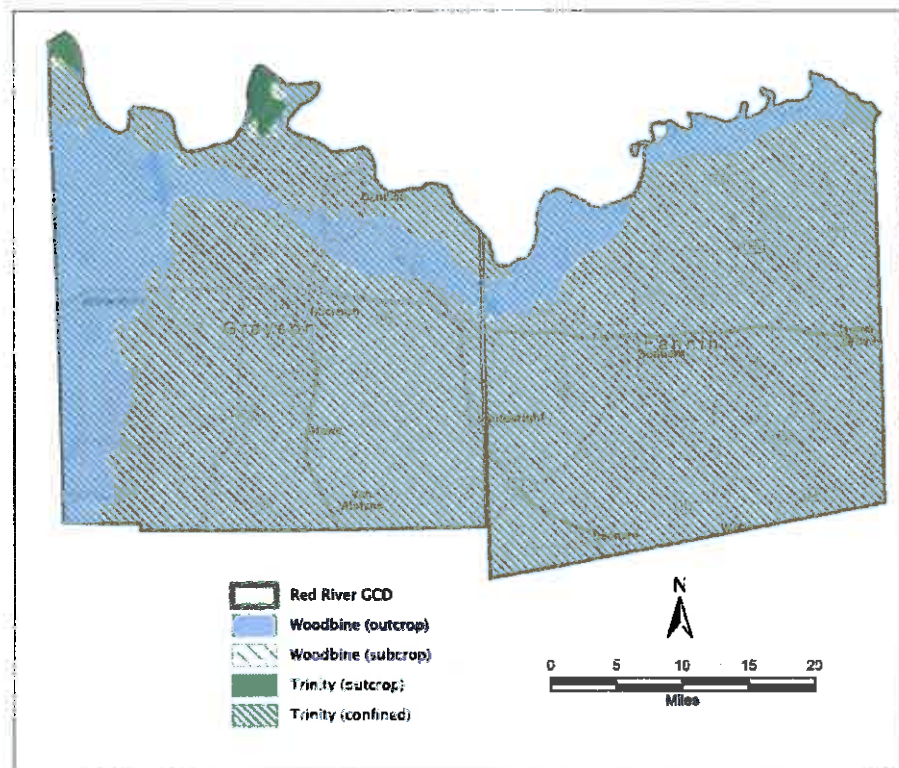


Figure 8. Red River District Aquifers

The Trinity aquifer consists of early Cretaceous age formations of the Trinity Group where they occur in a band extending through the central part of the state in all or parts of 55 counties, from the Red River in North Texas to the Hill Country of South-Central Texas. Trinity Group deposits also occur in the Panhandle and Edwards Plateau regions where they are included as part of the Edwards-Trinity (High Plains and Plateau) aquifers.

Formations comprising the Trinity Group are (from youngest to oldest) the Paluxy, Glen Rose, and Twin Mountains-Travis Peak. Up-dip, where the Glen Rose thins or is missing, the Paluxy and Twin Mountains coalesce to form the Antlers Formation. The Antlers consists of up to 900 feet of sand and gravel, with clay beds in the middle section. Water from the Antlers is mainly used for irrigation in the outcrop area of North and Central Texas. Forming the upper unit of the Trinity Group, the Paluxy Formation consists of up to 400 feet of predominantly fine-to-coarse-grained sand interbedded with clay and shale. The formation pinches out downdip and does not occur south of the Colorado River.

Underlying the Paluxy, the Glen Rose Formation forms a gulf-ward-thickening wedge of marine carbonates consisting primarily of limestone. South of the Colorado River, the Glen Rose is the upper unit of the Trinity Group and is divisible into an upper and lower member.

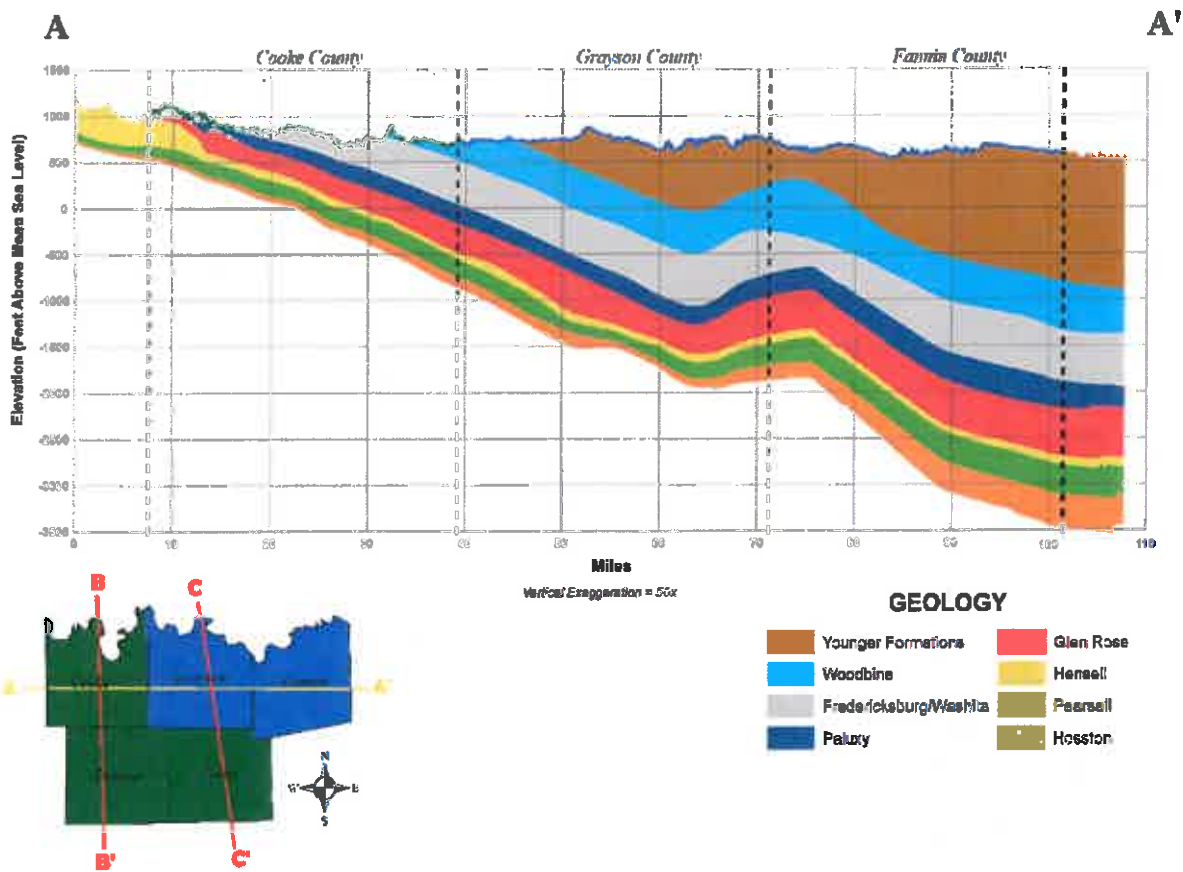


Figure 9. Cross Section A-A'

The basal unit of the Trinity Group consists of the Twin Mountains and Travis Peak formations, which are laterally separated by a facies change. To the north, the Twin Mountains formation consists mainly of medium- to coarse-grained sands, silty clays, and conglomerates. The Twin Mountains is the most prolific of the Trinity aquifers in North-Central Texas; however, the quality of the water is generally not as good as that from the Paluxy or Antlers Formations. To the south, the Travis Peak Formation contains calcareous sands and silts, conglomerates, and limestones. The formation is subdivided into the following members in descending order: Hensell, Pearsall, Cow Creek, Hammett, Sligo, Hosston, and Sycamore.

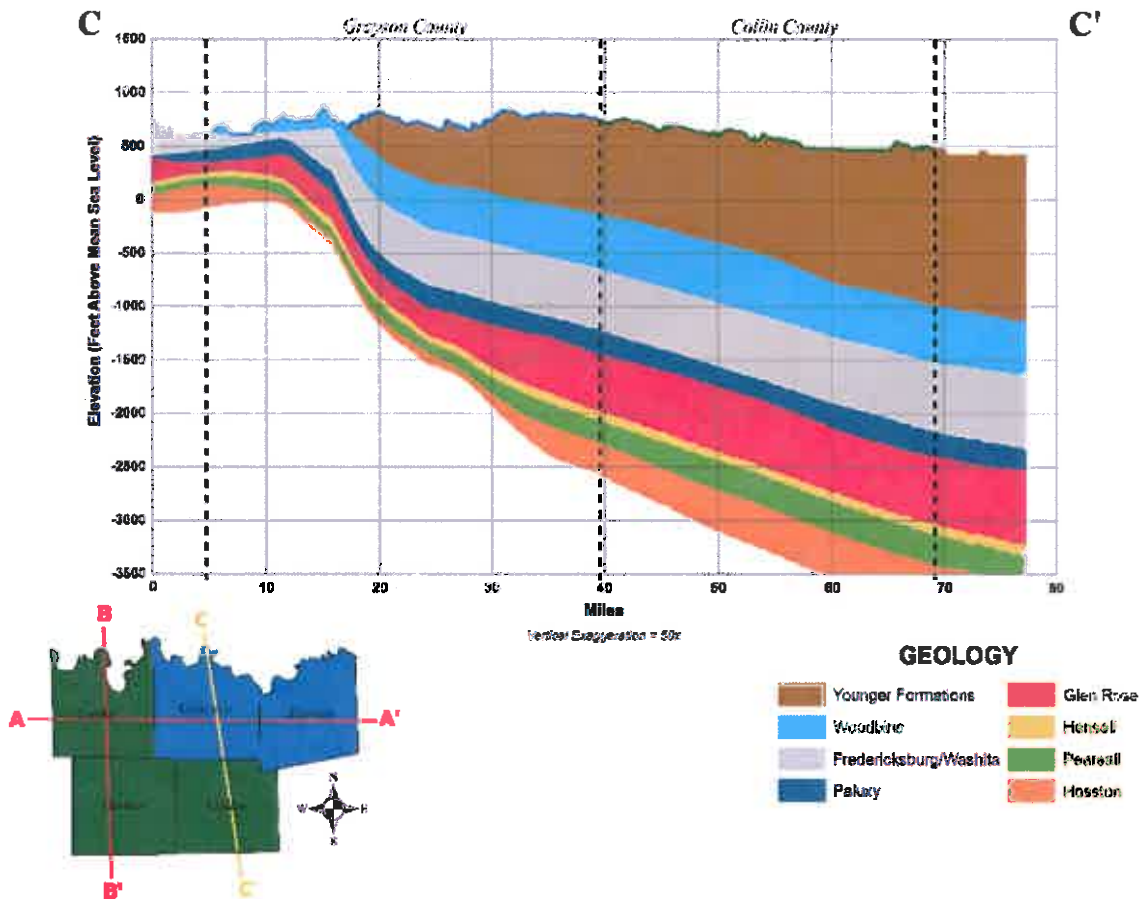


Figure 10. Cross Section C-C'

The depth to the top of the Trinity Group Antlers and Paluxy Formations ranges between approximately 500 feet in northwest Grayson County to over 3,500 feet in southeast Fannin County. The depth to the base of Cretaceous ranges between 900 ft and 4,500 feet from northwest to southeast across Grayson and Fannin Counties. The total thickness of the Trinity Formations ranges from 400 and 1,000 feet across the District.

The Woodbine aquifer extends from McLennan County in North-Central Texas northward to Cooke County and eastward to Red River County, paralleling the Red River. Groundwater produced from the aquifer furnishes municipal, industrial, domestic, livestock, and small irrigation supplies throughout its North Texas extent. The Woodbine Formation is composed of water-bearing sandstone beds interbedded with shale and clay. Within the District, the Woodbine Formation dips eastward into the subsurface where the top of the formation reaches a maximum depth of

approximately 1,200 feet below land surface and a maximum thickness of approximately 600 feet near the eastern Fannin County line.

The Woodbine aquifer is divided into three water-bearing zones that differ considerably in productivity and quality. Only the lower two zones of the aquifer are developed to supply water for domestic and municipal uses. Chemical quality deteriorates rapidly in well depths below 1,500 feet. In areas between the outcrop and this depth, quality is considered good overall as long as ground water from the upper Woodbine is sealed off. The upper Woodbine contains water of extremely poor quality in down-dip locales and contains excessive iron concentrations along the outcrop.

Red River Alluvium

A review of state well reports in both northern Fannin County and the northeast corner of Grayson County indicates that significant water-bearing alluvial deposits have accumulated along the Red River Basin. The depth from land surface to the base of the river alluvium occurs up to a maximum depth of about 95 feet, with an average alluvium thickness of 50 feet. The thick deposits that parallel the sides of the river channel are a result of the river down-cutting through existing fluvial deposits, which are typically composed of clay, sand and gravel. Gravel is usually identified at the base of the alluvial sequences. The extent of the alluvial aquifer in the District is shown on Figure 11.

There are 66 wells registered within the District that have been completed in the alluvium that have not been plugged or drilled as dry holes. Ten of those wells are non-exempt. These numbers are based on District well registry data collected through October 2015.

Sand pit operations that are located in the alluvium aquifer discharge a significant amount of groundwater for dewatering operations. Other uses include irrigation and domestic use. Well yields range from one gallons per minute ("gpm") to 150 gpm, with an average yield of approximately 25 gpm.

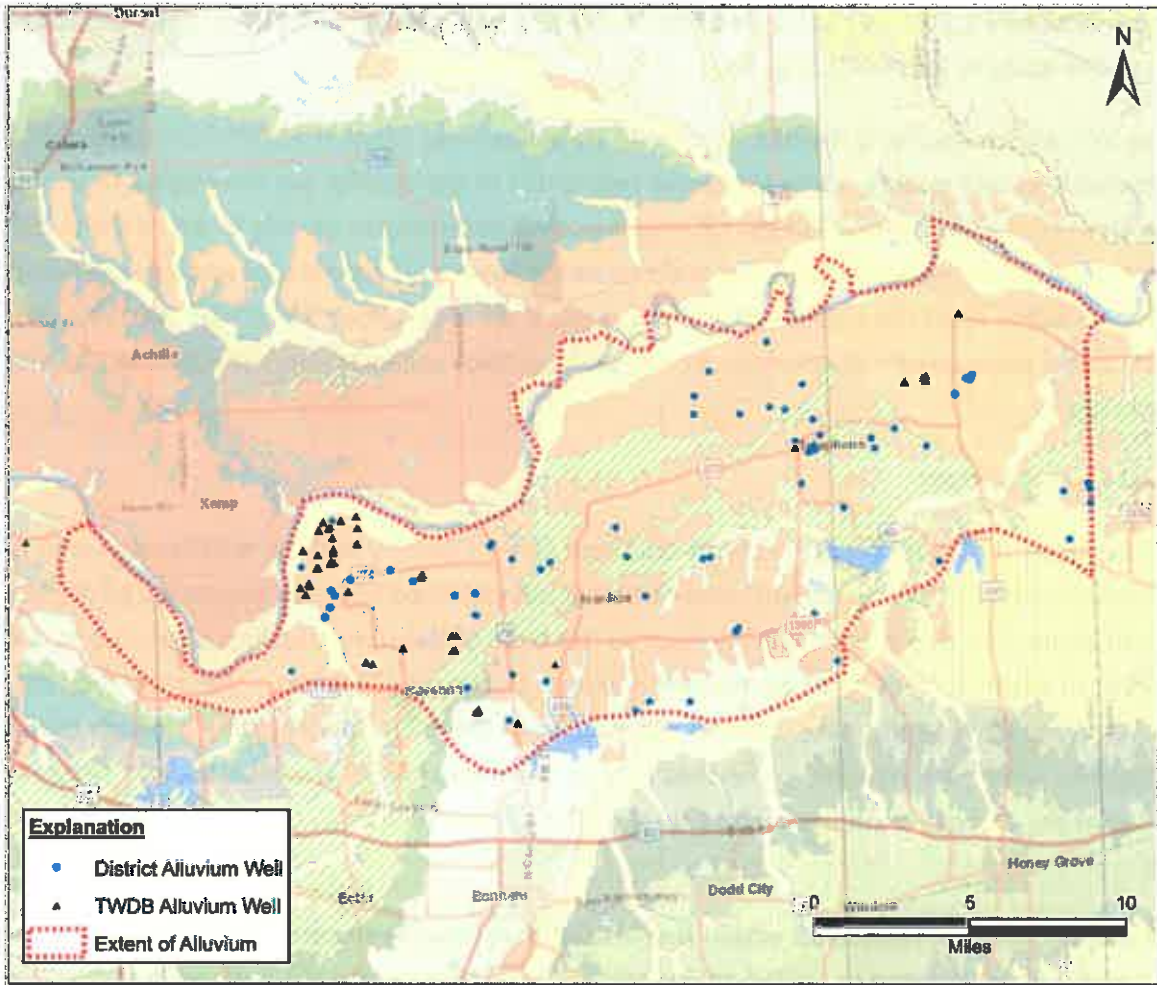


Figure 11. Extent of Alluvium within the District

APPENDIX A

Resolution Adopting District Management Plan

CERTIFICATE OF SECRETARY

STATE OF TEXAS §

**RED RIVER GROUNDWATER
CONSERVATION DISTRICT** §
§

I, the undersigned, Secretary of the Board of Directors of the Red River Groundwater Conservation District, DO HEREBY CERTIFY as follows:

I. That on the 16th day of March, 2017, the Board of Directors of the Red River Groundwater Conservation District (the "Board"), convened a Public Hearing at its designated meeting place; the duly constituted members of the Board being as follows:

Mark Patterson	President
Harold Latham	Vice-President
Don Wortham	Secretary/Treasurer
David Gattis	Member
Mark Gibson	Member
Mark Newhouse	Member
William Purcell	Member

All of said persons were present at said meeting, except the following:
_____. Among other business considered at
said meeting, the attached resolution entitled:

**A RESOLUTION by the Board of Directors of the Red River Groundwater Conservation
District adopting District Management Plan**

was submitted to the Board for passage and adoption. After presentation and due consideration of the resolution, and upon motion being made by David Gattis and seconded by Mark Newhouse, the resolution was finally passed to be effective immediately upon its adoption by the following vote:

7 voted "For"

0 voted "Against"

0 abstained

all as shown in the official Minutes of the Board for the meeting held on the aforesaid date.

2. That the attached resolution is a true and correct copy of the original on file in the official records of the Board; the duly qualified and acting members of the Board of said District on the date of the aforesaid meeting are those persons shown above and, according to the records of my office, each member of the Board was given actual notice that the matter would be considered; and that said meeting, and deliberation of the aforesaid public business, was open to the public and written notice of said meeting, including the subject of the above-entitled resolution, was posted and given in advance thereof in compliance with the provisions of Chapter 551 of the Texas Government Code.

IN WITNESS WHEREOF, I have hereunto signed my name officially and affixed the seal of said District, this the 16th day of March 2017.

(Seal)



Secretary, Board of Directors
Red River Groundwater Conservation District

RESOLUTION NO. 2017-03-16-02

A RESOLUTION OF THE BOARD OF DIRECTORS OF THE RED RIVER GROUNDWATER CONSERVATION DISTRICT ADOPTING A DISTRICT MANAGEMENT PLAN

WHEREAS, the Red River Groundwater Conservation District (the "District") is a political subdivision of the State of Texas organized and existing under and by virtue of Article XVI, Section 59, of the Texas Constitution as a groundwater conservation district, acting pursuant to and in conformity with Chapter 36, Texas Water Code and Act of May 25, 2009, 81st Leg., R.S., ch. 884, 2009 Tex. Gen. Laws 2313 codified at Chapter 8859 of the Texas Special District Local Laws Code (the "District Act");

WHEREAS, under the direction of the Board of Directors of the District (the "Board"), and in accordance with Sections 36.1071, 36.1072, and 36.108 of the Texas Water Code, and 31 Texas Administrative Code Chapter 356, the District has undertaken the readoption of its Management Plan;

WHEREAS, Section 36.1085 of the Texas Water Code requires the District to ensure that its Management Plan contains the goals and objectives consistent with achieving the Desired Future Conditions ("DFCs") adopted through the joint planning process set forth in Chapter 36 of the Texas Water Code;

WHEREAS, Section 36.1071(a) requires the District, after notice and hearing, to readopt its Management Plan at least once every five years;

WHEREAS, the District initially adopted its Management Plan on May 17, 2012;

WHEREAS, as part of the process of readopting its Management Plan with revisions, the District requested and received the assistance of the Texas Water Development Board (the "TWDB") and worked closely with the TWDB staff to obtain its input and comments on the draft Management Plan and its technical and legal sufficiency;

WHEREAS, the Board, District staff, and the District's geoscientist have reviewed and analyzed the District's best available data, groundwater availability modeling information, and other information and data required by the TWDB to readopt the Management Plan with revisions;

WHEREAS, the District issued notice in the manner required by state law and held a public hearing on March 16, 2017, at 11:00 a.m. at the District's office and meeting place located at 5100 Airport Drive, Denison, Texas 75020, to receive public and written comments on the revised Management Plan;

WHEREAS, the District coordinated its planning efforts on a regional basis with the appropriate surface water management entities during the preparation of the Management Plan;

WHEREAS, the Board finds that the Management Plan meets all of the requirements of Chapter 36, Water Code, and 31 Texas Administrative Code Chapter 356; and

WHEREAS, after the public hearing, the Board of Directors met in a regular board meeting on March 16, 2017, properly noticed in accordance with state law, and considered adoption of the attached Management Plan and approval of this resolution after due consideration of all comments received.

NOW, THEREFORE, BE IT RESOLVED BY THE BOARD OF DIRECTORS OF THE RED RIVER GROUNDWATER CONSERVATION DISTRICT AS FOLLOWS:

1. The above recitals are true and correct;
2. The Board of Directors of the District hereby adopts the attached Management Plan as the Management Plan for the District, subject to those amendments necessary based on comments received from the public at the public hearing or Board meeting, recommendations from the District Board, staff, or legal counsel, or to incorporate technical information received from the Texas Water Development Board and/or District geoscientist;
3. The Board President and the General Manager of the District are further authorized to take all steps necessary to implement this resolution and submit the Management Plan to the TWDB for its approval; and
4. The Board President and General Manager of the District are further authorized to take any and all action necessary to coordinate with the TWDB as may be required in furtherance of TWDB's approval pursuant to the provisions of Section 36.1072 of the Texas Water Code.

AND IT IS SO ORDERED.

Upon motion by David Gattis, seconded by Mark Newhouse the foregoing Resolution was passed and approved on this 16th day of March, 2017, by the following vote:

AYE: 7 NAY: 0 ABSTAIN: 0

At a meeting of the Board of Directors of the Red River Groundwater Conservation District.



President

ATTEST:



Secretary-Treasurer

APPENDIX B

Evidence that the Management Plan was Adopted

MINUTES OF THE BOARD OF DIRECTORS' PUBLIC HEARING
RED RIVER GROUNDWATER CONSERVATION DISTRICT

THURSDAY, MARCH 16, 2017

GREATER TEXOMA UTILITY AUTHORITY
BOARD ROOM
5100 AIRPORT DRIVE
DENISON TX 75020

Members Present: David Gattis, Mark Gibson, Harold Latham, Mark Newhouse, Mark Patterson,
William Purcell, Don Wortham

Members Absent: None

Staff: Drew Satterwhite, Velma Starks, Allen Burks, and Carolyn Bennett

Visitors: James Beach, LBG Guyton Associates
Kristen Fancher, Law Offices of Kristen Fancher, PLLC

1. Call to order, establish quorum; declare public hearing open to the public; introduction of Board

President Patterson called the meeting to order at 11:03 a.m., established a quorum was present, and declared the public hearing open to the public.

2. Summary presentation and review of proposed Management Plan

James Beach provided the Board with updates and revisions to the Management Plan. General Manager Satterwhite reviewed the updated goals and performance standards contained in the Management Plan with the Board.

3. Public comment on proposed District Management Plan (verbal comments limited to three (3) minutes each; written comments may also be submitted for the Board's consideration).

There were no public comments

4. Adjourn public hearing on the Management Plan

President Patterson declared the public hearing closed at 11:37 a.m.

#####


Recording Secretary


Secretary-Treasurer

**MINUTES OF THE BOARD OF DIRECTORS' BOARD MEETING
RED RIVER GROUNDWATER CONSERVATION DISTRICT**

THURSDAY, MARCH 16, 2017

**GREATER TEXOMA UTILITY AUTHORITY
BOARD ROOM
5100 AIRPORT DRIVE
DENISON TX 75020**

Members Present: David Gattis, Mark Gibson, Harold Latham, Mark Newhouse, Mark Patterson, William Purcell, Don Wortham

Members Absent: None

Staff: Drew Satterwhite, Velma Starks, Allen Burks, and Carolyn Bennett

Visitors: None

1. Call to order, establish quorum; declare meeting open to the public.

President Patterson called the meeting to order at 11:37 am, established a quorum was present, and declared the meeting open to the public.

2. Public comment

There were no citizens present requesting to appear before the Board of Directors for public comment.

3. Consider and act upon approval of Minutes from the February 16, 2017 board meeting

Board Member Purcell requested that the minutes of the February 26, 2017 meeting be revised to reflect the names of the Geodatabase Committee Members who were present at the all-day meeting held to interview geodatabase providers. Board Member Purcell made a motion to approve the minutes of the February 16, 2017 meeting, with the requested revision. The motion was seconded by Board Member Newhouse and passed unanimously.

4. Review and approval of monthly invoices.

General Manager Satterwhite reviewed the monthly invoices with the Board of Directors. Board Member Gattis made a motion to approve Resolution 2017-03-16-01. Board Member Gibson seconded the motion. Motion passed unanimously.

5. Receive monthly financial information

General Manager Satterwhite discussed and reviewed the monthly financial information with the Board.

6. Consider and act upon a Resolution adopting the District Management Plan

Discussion ensued regarding the revised Management Plan for the Red River GCD. The Board of Directors provided several comments on the management plan and directed the staff to make

changes as accordingly.

Board Member Gattis made a motion to adopt the Management Plan as the Management Plan for the District, subject to those amendments necessary based on comments received at the public hearing or Board meeting, recommendations from the District Board, staff, or legal counsel, or to incorporate technical information received from the Texas Water Development Board and/or District Geoscientist, and review of the Management Plan Committee. The motion was seconded by Board Member Newhouse and passed unanimously.

7. Appointment of Permanent Rules and Bylaws Committee

General Manager Satterwhite stated since the Permanent Rules development begins with the adoption of the revised Management Plan, he recommended President Patterson appoint a Permanent Rules and Bylaws Committee. The Committee was appointed as follows: President Mark Patterson, Harold Latham and David Gattis.

8. Update and possible action regarding the process for the development of Desired Future Conditions

General Manager Satterwhite informed the Board that the Explanatory Report and Resolution adopted by GMA8 has been forwarded to the Texas Water Development Board, along with the modeling files.

9. Consider and act upon compliance and enforcement activities for violations of District Rules

General Manager Satterwhite reported there were no new compliance or enforcement activities for violations to provide to the Board. We are waiting for a response to a letter that was sent.

10. General Manager's Report

General Manager Satterwhite informed the Board of Directors there were 8 new wells registered in February, with a total of 717 registered wells in the Red River GCD. A meeting with INTERA was held to work on the scope and costs.

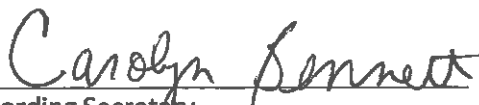
11. Open Quorum/discussion of new business

President Patterson asked if there were any items of discussion requested by the Board for future agendas. The next regularly scheduled meeting will be April 20, 2017.

15. Adjourn public meeting

President Patterson declared the meeting adjourned at 12:17 pm.

#####


Recording Secretary


Secretary-Treasurer

AGENDA
RED RIVER GROUNDWATER CONSERVATION DISTRICT
BOARD OF DIRECTORS BOARD MEETING
GREATER TEXOMA UTILITY AUTHORITY BOARD ROOM
5100 AIRPORT DRIVE
DENISON, TEXAS 75020
THURSDAY, MARCH 16, 2017

Public Hearing

The Public Hearing will begin at 11:00 A.M.

Notice is hereby given that the Board of Directors of the Red River Groundwater Conservation District ("District") will hold a public hearing, accept public comment, and may discuss, consider, and take all necessary action, including expenditure of funds, regarding modification and adoption of the District's proposed Management Plan.

Agenda:

1. Call to Order; establish quorum; declare hearing open to the public; introduction of Board.
2. Summary presentation and review of proposed Management Plan.
3. Public Comment on Proposed District Management Plan (verbal comments limited to three (3) minutes each; written comments may also be submitted for the Board's consideration).
4. Adjourn or continue public hearing on the Management Plan.

At the conclusion of the hearing or any time or date thereafter, the proposed Management Plan may be adopted in the form presented or as amended based upon comments received from the public, the Texas Water Development Board, District staff, attorneys, consultants, or members of the Board of Directors without any additional notice.

Board Meeting

The regular Board Meeting will begin at 11:15 p.m. or upon adjournment of the above-noticed Public Hearing, whichever is later.

The Board of Directors may discuss, consider, and take all necessary action, including expenditure of funds, regarding each of the agenda items below:

Agenda:

1. Call to order, declare meeting open to the public, and take roll
2. Public Comment
3. Consider and act upon approval of Minutes of February 16, 2017, Board Meeting
4. Review and approval of monthly invoices
5. Receive monthly financial information
6. Consider and act upon a Resolution adopting the District Management Plan
7. Appointment of Permanent Rules and Bylaws Committee
8. Update and possible action regarding the process for the development of Desired Future Conditions (DFCs)
9. Consider and act upon compliance and enforcement activities for violations of District Rules
10. General Manager's report: The General Manager will update the Board on operational, educational and other activities of the District
11. Open forum / discussion of new business for future meeting agendas
12. Adjourn

Visioning Workshop

The Visioning Workshop will begin at 12:00 p.m. or upon adjournment of the above-noticed Board Meeting whichever is later.

¹*The Board may vote and/or act upon each of the items listed in this agenda.*

²*At any time during the meeting or work session and in compliance with the Texas Open Meetings Act, Chapter 551, Government Code, Vernon's Texas Codes, Annotated, the Red River Groundwater Conservation District Board may meet in executive session on any of the above agenda items or other lawful items for consultation concerning attorney-client matters (§551.071); deliberation regarding real property (§551.072); deliberation regarding prospective gifts (§551.073); personnel matters (§551.074); and deliberation regarding security devices (§551.076). Any subject discussed in executive session may be subject to action during an open meeting.*

³*Persons with disabilities who plan to attend this meeting, and who may need assistance, are requested to contact Velma Starks at (800) 256-0935 two (2) working days prior to the meeting, so that appropriate arrangements can be made.*

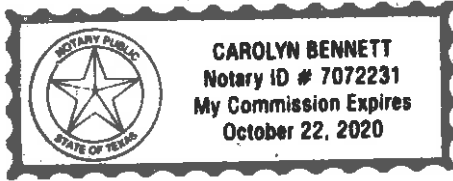
⁴*For questions regarding this notice, please contact Velma Starks at (800) 256-0935, at rrqcd@redriverqcd.org or at 5100 Airport Drive, Denison, TX 75020.*

This is to certify that I, Velma Starks, posted this agenda on the outdoor bulletin board of the Administrative Offices of the Greater Texoma Utility Authority, on the west side of the building, and on our website by 5:00 p.m. on March 10, 2017.

Velma Starks

Velma Starks

Sworn and subscribed to before me this 10 day of March 2016.



(SEAL)

Carolyn Bennett

Notary Public

Affidavit of Publication

STATE OF TEXAS)
COUNTY OF GRAYSON) SS:

**RED RIVER GROUND CONSERVATION DISTRICT
PO BOX 1214
SHERMAN TX 75091**

**Account # 91652
Ad Number 0000940079**

Dianne Harp, being 1st duly sworn, deposes and says: That (s)he is the Legal Clerk for the Herald Democrat, a daily newspaper regularly issued, published and circulated in the City of Sherman, County of Grayson, State of Texas, and that the advertisement,

**RED RIVER GROUNDWATER CONSERVATION DISTRICT NOTICE OF HEARING
ON DISTRICT MANAGEMENT PLAN MARCH 16, 2017 NOTICE IS HEREBY GIVEN
to all interested persons in Fa**

a true copy attached for, was published in said Herald Democrat in 1 edition(s) of said newspaper issued from 02/24/2017 to 02/24/2017, on the following days:

02 / 24 / 17

/s/ Dianne Harp
LEGAL ADVERTISEMENT REPRESENTATIVE

Subscribed and sworn to before me on this 6th day of March, 2017

Notary Jennifer S. Testerman



2500 West Morton Street
(903) 465-4714
Open: Mon/Tues,
Thurs/Fri 8am-12, 1pm-5
Wed. 8am-12 Noon

Special Notices

**31st ANNUAL NORTH TEXAS
FARM TOY SHOW**
Gainesville Civic Center
February 25, 2017
9am-3pm
Farm toys, custom trucks,
miscellaneous toys
214-914-4032

Clients of Ann Chaffin Account-
ing may pick up records Febru-
ary 20th-24th. Call (903)463-2000
for appointment. Unclaimed
documents will be destroyed
February 27th.

Legal Notices

Legal Notices

**RED RIVER GROUNDWATER
CONSERVATION DISTRICT
NOTICE OF HEARING ON
DISTRICT MANAGEMENT PLAN
MARCH 16, 2017**

NOTICE IS HEREBY GIVEN to all
interested persons in Parlin and
Grayson Counties, Texas:

That the Board of Directors of the
Red River Groundwater
Conservation District ("District")
will hold a public hearing to
discuss, consider, receive public
comments, and potentially act
upon adoption of the District
Management Plan.

The hearing will be held on
Thursday, March 16, 2017, at
11:00 a.m. at the Greater Texoma
Utility Authority office, located at
5100 Airport Drive, Denison,
Texas 75020. Comments on the
proposed Management Plan
may be presented in written or
verbal form at the hearing, and
persons interested in submitting
written comments on the
proposed Management Plan in
advance may do so by sending
comments to the District at P.O.
Box 1214, Sherman, Texas 75091.
Any person who desires to
appear at the hearing and
present comments may do so in
person, by legal representative,
or both. The hearing posted in
this notice may be recessed
from day to day or continued
where appropriate. At the
conclusion of the hearing or any
time or date thereafter, the
proposed Management Plan
may be adopted in the form
presented or as amended based
upon comments received from
the public, the Texas Water
Development Board, District
staff, consultants, or members
of the Board without any
additional notice.

A copy of the proposed
Management Plan will be
available 20 days before the
date of the hearing by
requesting a copy by email at
rrgcd@reddrivergcd.org, by
accessing the District's website
at www.reddrivergcd.org, or by
reviewing or copying the
proposed Management Plan in
person at 5100 Airport Drive,
Denison, TX 75020. The District is
committed to compliance with
the Americans with Disabilities
Act (ADA). Any person who
needs special accommodations
should contact District staff at
(800) 256-0935 at least 24 hours
in advance if accommodation is
needed. Any person who wishes
to receive more detailed

903-613-4909
12:30 PM
1700 Hwy 75 North
Sherman, TX 75090
Christopher I. Cornfort - ladder,
lawn tools, lamp, mattress, mini
refrigerator, computer
Magen I Boatright - boxes,
wheelchair, walkers, totes

Devon Self Storage
903-693-3215
1:00 PM
1720 Loy Lake Rd
Sherman, TX 75090

Nicolette Crabtree - computer
monitor, toys, bags of clothes,
stroller, tv stand
Donna Deaver - chairs, piano,
desk, microwave, vacuum,
couch
Teagan Wyatt - mattress, TV, TV
stand, suitcase
Lighting Enterprises - Freezer,
cabinet, box foam cups, foam
plates, cash register
Jason C Deaver - tree, frames,
boxes
Jamir Jones - sofa, chair, bags
Jerry Johnson - refrigerator, TV
stand, recliner, mattress,
suitcase
David Staggs - chair, couch,
filling cabinets, bags, totes,
books, suitcase, TV
Lisa Wrenn - pictures, dresser,
coffee table, computer stand
Shantae A. Rhodes - golf clubs,
bike, dryer, mattress, boxes,
dining table, couch, lamps
David White - mattress, lawn,
table, armoire, end table, chair,
desk, boxes
Seketra (Keke) Roberts - office
chairs, end table, boxes, washer,
dryer, bar stool

Larson Auctioneers LLC

**AN ORIGINAL APPLICATION
HAS BEEN MADE FOR MIXED
BEVERAGE RESTAURANT
PERMIT WITH FB, FOOD AND
BEVERAGE CERTIFICATE,
BEVERAGE CARTAGE, FOR
JASSO FAMILY
RESTAURANTS, LLC D/B/A
JALAPENOS OF VAN
ALSTYNE, LOCATED AT 946
W. VAN ALSTYNE PARKWAY
VAN ALSTYNE, TEXAS, 75495
GRAYSON COUNTY, TEXAS.
SAID APPLICATION HAS BEEN
MADE TO THE TEXAS
ALCOHOLIC BEVERAGE
COMMISSION IN
ACCORDANCE WITH THE
TEXAS ALCOHOLIC
BEVERAGE CODE. FAMILY
RESTAURANTS, LLC LIABILITY
LIMITED COMPANY (LLC)
MEMBER MANAGER ERIC
JASSO
MEMBER MANAGER MONICA
JASSO**

Notice of Public Sale

Seller reserves the right to
withdraw the property at any
time before the sale. Unit items
sold for cash to highest bidder.
Property includes household
items of tenant(s) unless
otherwise stated:

Kenneth Criger, Jr.
Brittany Hill
Brittany Hill
Amy Gleason
Tasgei Baker

The property is being sold to
satisfy a landlord's lien.

Auction:
Mandy's Storage
4316 Texoma Pkwy
Sherman, Texas 75090

Excellent Pay.
Fun Working Environment.
Apply in person
2130 Texoma
Parkway, Sherman.

**City of Gainesville
Job Announcement**

Open Date: 02/21/2017

**Police Officer
Police Department**

The City of Gainesville is
accepting applications for a full
time **CERTIFIED POLICE OFFICER**
position. Must be a U.S. Citizen
with education equivalent to the
completion of the twelfth grade
or GED. Texas certified peace
officers are eligible for a lateral
entry program. Testing will be
held on April 1, 2017 at
0900 hours.

See complete eligibility
requirements, obtain job
description and submit
an application packet at the
City of Gainesville Human
Resources Department
located at 200 S. Rusk
(South Entrance),
Gainesville, TX 76240
or visit our Website at
www.gainesville.texas/jobs.aspx
Resumes will be accepted with a
completed application packet.
Position closes
Monday, March 13, 2017.

**EQUAL EMPLOYMENT
OPPORTUNITY EMPLOYER**

CKJ TRUCKING LP
Now hiring CDL Drivers
(\$2000 Sign-On Bonus!)
Local driving, home daily,
now hiring Diesel Mechanics,
paid holidays,
paid vacation, Health,
dental, vision, & life
insurance, 401K available.
Drivers must have
2 years of experience.
Day & night shifts available.
To apply, (Drivers) call
972-908-7660 ext 127
or 903-327-2702
(Mechanics)
call 972-908-7660 ext #117
or 940-391-7239
Calls accepted between
8am-5pm daily ONLY!
OR apply online at
ckjtrucking.com

CLERICAL POSITION - Local office
is looking for an organized indi-
vidual with good phone and
communication skills. Basic
computer knowledge is a must.
Full or part-time available. Send
resume to Clerical, P. O. Box
3011, Sherman, Texas 75091-
3011.

**CORBY'S GRILL HIRING ALL
POSITIONS, ALL SHIFTS.
APPLY @ 411 HWY. 69 S,
WHITEWRIGHT**

Drivers Needed
Established carrier with
steady freight is looking to
hire Class A CDL drivers to
operate over dedicated lanes.
Applicants will need one
experience. Have a good MVR
and pass drug test. For more
information call Gene at
940-665-8917 8am to 5pm
Monday through Friday.

Experienced dental assistant
needed Mon-Thurs. Competitive
salary plus benefits. Fax resume
to 580-931-3390 or email
bullard@bullarddental.net

**Do you w
Do you have**

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WE WAN

**Expanding sales and
Sales Mana
and Saturday n
they canvass for**

**Advancement c
of an in
CONTACT**

**AFTER
JJC**

**FO
We work**

**Most Teens Earn \$
Transportation is Pr**

Work 3

Earn Cash Bon

Work with ot

Perfect first job i

Age

No Ex

**Call Today
Start Making**

903-7

Classifieds

- LINE ADS - ON LINE - UPDATED DAILY - FRIE

Visit our Web Site: www.heraldnet.com

Call: 903-893-8181 or 903-465-7171



Fax: 90

Announcements

Adoptions

ADOPTION ♡
A Loving Successful Professional
Energetic Family hopes to
Unconditionally LOVE & Support
1st baby, Expenses Paid
91-800-775-4013 ♡

Lost and Found

DENISON ANIMAL SHELTER

DOGS FOUND IN DENISON

FOUND 2/13/17

PITBULL TERRIER MIX
FEMALE, APPROX 1.5 YRS OLD
BROWN & WHITE

FOUND ON 2/15/17

LABRADOR
RETRIEVER/SHEPHERD MIX
MALE, APPROX 8 MOS OLD
WHITE & BROWN

TERRIER MIX
FEMALE, APPROX 1.5 YRS OLD
BRINDLE & WHITE

FOUND ON 2/16/17

TERRIER MIX
MALE, APPROX 2.5 YRS OLD
BLACK & WHITE

FOUND ON 2/17/17

LABRADOR RETRIEVER
MALE, APPROX 1 YR OLD
BLACK & WHITE

FOUND ON 2/18/17

SHEPHERD MIX
MALE, APPROX 6 MOS OLD
BRINDLE & WHITE

FOUND ON 2/19/17

CATAHOULA LEOPARD DOG MIX
MALE, APPROX 8 MOS OLD
SILVER & BLACK

FOUND ON 2/20/17

LHASA APSO MIX
FEMALE, APPROX 3.5 YRS OLD
WHITE

PIT BULL TERRIER MIX
FEMALE, APPROX 3 YRS OLD
BRINDLE & WHITE

Legal Notices

Information on this notice
should contact District staff at
(800) 256-0935.

END OF NOTICE

CITATION BY PUBLICATION

NOTICE TO DEFENDANT: You
have been sued. You may
employ an attorney. If you or
your attorney does not file a
written answer with the clerk
who issued this citation by 10:00
a.m. on the Monday next
following the expiration of forty-
two days after the date of
issuance of this citation and
petition, a default judgment may
be taken against you.

TO: THE UNKNOWN HEIRS AT LAW OF GERALD WAYNE ADDINGTON

You are hereby commanded to
appear by filing a written
answer to the **PLAINIFF'S
ORIGINAL PETITION AND
REQUEST FOR ENTRY UPON LAND**
at or before ten o'clock a.m. on
the Monday after the expiration
of 42 days after the date of
issuance of this citation, before
the Honorable 397th District
Court of Grayson County, Texas
at the Justice Center, 10:00 a.m.,
Monday, of said County in
Sherman, Texas on this the 20th
day of January, 2017. In this case,
numbered **CV-17-0117** on the
docket of said court, and styled:

**Home Investment Fund II, LP vs
Laura Addington, Elizabeth
Addington, and The Unknown
Heirs at Law of Gerald Wayne
Addington**

The names of the party to the
cause are as follows:

**Laura Addington, Elizabeth
Addington; The Unknown Heirs
at Law of Gerald Wayne
Addington**

A brief statement of the nature
of this suit is as follows, to-wit:

This lawsuit involves the real
property commonly known as
1202 North Pecan Street, Bells,
Texas 75414. Plaintiff seeks
reformation of a deed of trust
filed on the Property and entry
upon the Property.

ISSUED AND GIVEN UNDER MY
HAND AND SEAL OF SAID COURT
at Sherman, Texas, on this the
1st day of February, 2017.

**KELLY ASHMORE,
DISTRICT CLERK
GRAYSON COUNTY, TEXAS**

Emi Tobar
DEPUTY

Under the provisions of Chapter
59 of the Texas Property Code,
(Chapter 576 Acts of the 68th

Legal Notices

Date:
March 14, 2017
Time:
1:30 p.m.

**Chad Larson,
Auctioneer #17344**

To Whom It May Concern: The
Clara B. Memorial Foundation's
Inc. Annual Return is available
for inspection at the offices of
Sheila M. Simpson 1923 Avenue
K, Plano, Texas 75074. 972-424-
8113. The Annual Return of the
Clara B. White Memorial
Foundation, Inc. will be available
for inspection during regular
business hours by any citizen
who requests inspection within
180 days of the date of notice.
The Principal of the Clara B.
White Memorial Foundation, Inc.
is located at 7112 Ripley St.
McKinney, Texas 75069, 903-364-
2450. Principal Manager Patricia
C. Hubbard.

Employment

Help Wanted

An Experienced breakfast &
lunch cook needed. Waitstaff
full or part time. Well establish-
ed restaurant. We will train.
For interview call
903-463-6688.

**AVON
Reps Needed**
Make money, meet new people
and have fun.
Call Terri (903)819-9637

**Bi-Lo Wholesale (Denison) is
seeking Retail Cashier,
Warehouse Order Pullers &
Delivery Route Drivers. Retail
Cashiers must be good with the
public, able to use a computer
and able to stand eight hours
per day. Warehouse Order
Pullers must be in good health
and able to lift 50lbs. Route driv-
ers must have a good
driving record, a valid Texas
or Oklahoma driver's
license and able to lift 50lbs.
Experience is preferred,
but not required on all positions.
Part Time and Full Time
positions will be considered.
Apply in person at
610 S. Mirick Ave Denison,
No phone calls please.**

**CASHIER/COOKS 1ST QUICK
CHECK ALL SHIFTS APPLY @ 130
EAST VAN ALSTYNE PKWY VA, TX**

Help Wanted

**FEMALE SENIOR
CARE GIVERS NEEDED**
24 HOUR
LIVE-IN CARE
IN-HOME CARE FOR FEMALE
SENIORS
PHONE ANSWERED TUES-SAT.
8:00 am-6:30 pm
CALL (940)390-1910

**HVAC Residential new
construction installers needed.**
Experience helpful, but not
necessary. Full time with
benefits. McKinney.
Call Brent, 972-569-8339.

Inventory Control Coordinator
needed. Lifting up to 40 pounds
required. Will also perform
some light bookkeeping.
Must have 1 year verifiable
experience in Inventory Control.
Computer skills a must.
Email resume to:
Nathan.nunley@fourfeathersfarm.com

**The JALAPENO
TREE**
Mexican Restaurant
Now Accepting
APPLICATIONS

Apply in person
between 2pm and 4pm
Monday-Thursday @
3520 FM 120, Denison

**Truck Drivers needed: Builders
FirstSource, leading supplier of
quality building materials, is
currently seeking CDL Class A
truck drivers at our Sherman, TX
location. Flatbed trailer and
oversized load experience
preferred. Home nightly. Call for
more details (903)993-5329.
Apply at www.blr.com/careers
or in person at 200 Cody Ln.,
Sherman, TX 75092.**

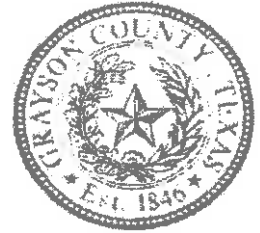
**Builders FirstSource, Inc. is an
Equal Opportunity/Affirmative
Action Employer. All qualified
applicants will receive consider-
ation for employment without
regard to race, color, religion,**

APPENDIX C

**Evidence that the District Coordinated Development of the Management
Plan with the Surface Water Entities**



**RED RIVER
GROUNDWATER CONSERVATION DISTRICT
FANNIN COUNTY AND GRAYSON COUNTY**



MEMO

TO: Surface Water Management Entities **DRS**
FROM: Drew Satterwhite, P.E., General Manager
DATE: April 21, 2017
SUBJECT: Red River Groundwater Conservation District Management Plan

The Red River Groundwater Conservation District's Management Plan, adopted at the District's Public Hearing held March 16, 2017, is available on the District website, www.redrivergcd.org. This copy is being made available for your review and files. The Red River Groundwater Conservation District is required to make this document available to "Political subdivisions as defined by Texas Water Code, Chapter 15, and identified from Texas Commission on Environmental Quality records which are granted authority to store, take, divert, or supply surface water either directly or by contract under Texas Water Code, Chapter 11, for use within the boundaries of a district."

DS:cb

Carolyn Bennett

From: Red River GCD <rrgcd@redrivergcd.org>
Sent: Friday, April 21, 2017 12:00 PM
To: 'Bob Tate'; 'Bonham, City of'; 'Bonham, City of'; 'Cheryl Reynolds'; 'City of Pilot Point'; citysecretary@southmaydtx.com; 'Curtis W Campbell'; 'David Howerton'; 'David Smith'; 'Denise Hickey'; 'Denise Smith'; 'Denton County MUD 6'; 'Donna R Loiselle'; 'George Olson'; 'Jaime Harris'; 'Jeff Bice'; 'Jerry Chapman'; 'Jim Parks'; 'Joe Shephard'; 'Karen Bomar'; 'Kevin Farley'; 'Mark Merrill'; 'Mark Newhouse'; 'Mark Newhouse'; 'Midway Water Utilities Inc.'; 'Mike Marter'; 'Mike Rickman'; 'Munson Point Property Owners Association'; 'North Collin WSC'; 'Northern Hills Development Co, Inc.'; 'Robert Hanna'; 'Southwest Fannin SUD'; swfannin@fanninelectric.com; 'Tena Brown'; 'Thompson Heights Development Co.'; 'Troy Vannoy'
Cc: c.bennett@redrivergcd.org
Subject: RE: Red River GCD Management Plan
Attachments: RRGCD Mangement Plan Memo.pdf

The Red River Groundwater Conservation District's Management Plan, adopted at the District's Public Hearing held March 16, 2017, is available on the District website, www.redrivergcd.org. This copy is being made available for your review and files. The Red River Groundwater Conservation District is required to make this document available to "Political subdivisions as defined by Texas Water Code, Chapter 15, and identified from Texas Commission on Environmental Quality records which are granted authority to store, take, divert, or supply surface water either directly or by contract under Texas Water Code, Chapter 11 for use within the boundaries of a district.

Click [HERE](#) for RRGCD Management Plan.

Drew Satterwhite, P.E., General Manager
Red River Groundwater Conservation District
PO Box 1214
Sherman, Texas 75091
(800) 256-0935
(903) 786-8211 fax
carmen@redrivergcd.org

Carolyn Bennett

From: Red River GCD <rrgcd@redrivergcd.org>
Sent: Friday, April 21, 2017 2:27 PM
To: ExecutiveDirector.info@ntmwd.com
Cc: c.bennett@redrivergcd.org
Subject: Red River GCD Management Plan
Attachments: RRGCD Mangement Plan Memo.pdf

The Red River Groundwater Conservation District's Management Plan, adopted at the District's Public Hearing held March 16, 2017, is available on the District website, www.redrivergcd.org. This copy is being made available for your review and files. The Red River Groundwater Conservation District is required to make this document available to "Political subdivisions as defined by Texas Water Code, Chapter 15, and identified from Texas Commission on Environmental Quality records which are granted authority to store, take, divert, or supply surface water either directly or by contract under Texas Water Code, Chapter 11 for use within the boundaries of a district.

Click [HERE](#) for RRGCD Management Plan.

Drew Satterwhite, P.E., General Manager
Red River Groundwater Conservation District
PO Box 1214
Sherman, Texas 75091
(800) 256-0935
(903) 786-8211 fax
carmen@redrivergcd.org

APPENDIX D

Red River GCD Temporary Rules

Red River Groundwater Conservation District

**Temporary Rules for Water Wells
in Fannin and Grayson Counties, Texas**

As Amended on January 1, 2017

Procedural History of Rules Adoption

These temporary rules of the Red River Groundwater Conservation District were initially adopted by the Board of Directors on August 29, 2011, at a duly posted public meeting in compliance with the Texas Open Meetings Act and following notice and hearing in accordance with Chapter 36 of the Texas Water Code. The temporary rules were subsequently amended, in accordance with all legal requirements on March 21, 2012, December 12, 2012, May 15, 2014, and on January 1, 2017.

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Red River Groundwater Conservation District

District Rules

PREAMBLE

The Red River Groundwater Conservation District ("District") was created in 2009 by the 81st Texas Legislature with a directive to conserve, protect and enhance the groundwater resources of Fannin and Grayson Counties, Texas. The District's boundaries are coextensive with the boundaries of Fannin and Grayson Counties, and all lands and other property within these boundaries will benefit from the works and projects that will be accomplished by the District.

The Mission of the Red River Groundwater Conservation District is to develop rules to provide protection to existing wells, prevent waste, promote conservation, provide a framework that will allow availability and accessibility of groundwater for future generations, protect the quality of the groundwater in the recharge zone of the aquifer, insure that the residents of Fannin and Grayson Counties maintain local control over their groundwater, and operate the District in a fair and equitable manner for all residents of the District.

The District is committed to manage and protect the groundwater resources within its jurisdiction and to work with others to ensure a sustainable, adequate, high quality and cost effective supply of water, now and in the future. The District will strive to develop, promote, and implement water conservation, augmentation, and management strategies to protect water resources for the benefit of the citizens, economy and environment of the District. The preservation of this most valuable resource can be managed in a prudent and cost effective manner through conservation, education, and management. Any action taken by the District shall only be after full considerations and respect has been afforded to the individual property rights of all citizens of the District.

SECTION 1. DEFINITION, CONCEPTS, AND GENERAL PROVISIONS

Rule 1.1 Definitions of Terms.

In the administration of its duties, the District follows the definitions of terms set forth in Chapter 36, Texas Water Code, and other definitions as follows:

- (1) "Agriculture" (or "agricultural") means any of the following activities:
1. cultivating the soil to produce crops for human food, animal feed, or planting seed, or for the production of fibers;
 2. the practice of floriculture, viticulture, silviculture, and horticulture, including the cultivation of sod, and the cultivation of plants in containers or non-soil media, by a nursery grower;
 3. raising, feeding, or keeping animals for breeding purposes or for the production of food or fiber, leather, pelts, or other tangible products having a commercial value;
 4. planting cover crops, including cover crops cultivated for transplantation, or leaving land idle for the purpose of participating in any governmental program or normal crop or livestock rotation procedure;
 5. wildlife management; and
 6. raising or keeping equine animals.
- (2) "Animal Feeding Operation" (AFO) means: (1) a lot or facility (other than an aquatic animal production facility) where animals have been, are, or will be stabled or confined and fed or maintained for a total of 45 days or more in any 12-month period, and where the animal confinement areas do not sustain crops, vegetation, forage growth, or postharvest residues in the normal growing season over any portion of the lot or facility; or (2) any other facility regulated as an AFO or as a Concentrated Animal Feeding Operation by the TCEQ.
- (3) "Aquifer" means a water bearing geologic formation in the District.
- (4) "As equipped" for purposes of determining the capacity of a well means visible pipes, plumbing, and equipment attached to the wellhead or adjacent plumbing that controls the maximum rate of flow of groundwater and that is permanently affixed to the well or adjacent plumbing by welding, glue or cement, bolts or related hardware, or other reasonably permanent means.

- (5) "Beneficial use" or "beneficial purpose" means use of groundwater for:
1. agricultural, gardening, domestic, stock raising, municipal, mining, manufacturing, industrial, commercial, or recreational purposes;
 2. exploring for, producing, handling, or treating oil, gas, sulfur, lignite, or other minerals; or
 3. any other purpose that is useful and beneficial to the user that does not constitute waste.
- (6) "Board" means the Board of Directors of the District.
- (7) "Capped well" means a well that is closed or capped with a covering capable of preventing surface pollutants from entering the well and sustaining weight of at least 400 pounds and constructed in such a way that the covering cannot be easily removed by hand.
- (8) "Closed-loop geothermal well" means a well used for domestic use purposes that recirculates water or other fluids inside a sealed system for heating or cooling purposes, and where no water is produced from the well or used for any other purpose of use.
- (9) "Contiguous" means property within a continuous perimeter boundary situated within the District. The term also refers to properties that are divided by a publicly owned road or highway or other easements if the properties would otherwise share a common border.
- (10) "District" means the Red River Groundwater Conservation District created in accordance with Section 59, Article XVI, Texas Constitution, Chapter 36, Texas Water Code, and the District Act.
- (11) "District Act" means the Act of May 25, 2009, 81st Leg., R.S., ch. 884, 2009 Tex. Gen. Laws 2313, codified at Tex. Spec. Dist. Loc. Laws Code Ann. ch. 8859 ("the District Act"), as may be amended from time to time.
- (12) "Domestic use" means the use of groundwater by an individual or a household to support domestic activity. Such use may include water for drinking, washing, or culinary purposes; and may be used for irrigation of lawns, or of a family garden and/or family orchard; for watering of domestic animals. Domestic use does not include water used to support activities for which consideration is given or received or for which the product of the activity is sold. Domestic use does not include use by or for a public water system. Domestic use does not include irrigation of crops in fields or pastures. Domestic use does not include water used for open-loop residential geothermal systems, but does include water for closed-loop residential geothermal systems.

- (13) "Effective date" means August 29, 2011, which was the original date of adoption of these Temporary Rules.
- (14) "Emergency purposes" means the use of groundwater to fight fires, manage chemical spills, and otherwise address emergency public safety or welfare concerns.
- (15) "Exempt well" means a new or an existing well that is exempt under Rule 2.1 from certain regulatory requirements in these rules.
- (16) "Existing well" means a well that was in existence or for which drilling commenced prior to April 1, 2012.
- (17) "General Manager" as used herein is the appointed chief administrative officer of the District, as set forth in the District's bylaws, or the District staff or other Board designee acting at the direction of the General Manager or Board to perform the duties of the General Manager.
- (18) "Groundwater" means water percolating below the surface of the earth.
- (19) "Groundwater reservoir" means a specific subsurface water-bearing stratum.
- (20) "Landowner" means the person who holds possessory rights to the land surface or to the withdrawal of groundwater from wells located on the land surface.
- (21) "Leachate well" means a well used to remove contamination from soil or groundwater
- (22) "Livestock" means, in the singular or plural, grass- or plant-eating, single- or cloven-hooved mammals raised in an agricultural setting for subsistence, profit or for its labor, or to make produce such as food or fiber, including cattle, horses, mules, asses, sheep, goats, llamas, alpacas, and hogs, as well as species known as ungulates that are not indigenous to this state from the swine, horse, tapir, rhinoceros, elephant, deer, and antelope families, but does not mean a mammal defined as a game animal in Section 63.001, Parks and Wildlife Code, or as a fur-bearing animal in Section 71.001, Parks and Wildlife Code, or any other indigenous mammal regulated by the Texas Department of Parks and Wildlife as an endangered or threatened species. The term "livestock use" does not include the use of water for any animal that is stabled, confined, or fed at a facility that is defined an Animal Feeding Operation.
- (23) "Maintenance Purposes" means the use of water to flush mains, fire hydrants or tanks as required by TCEQ.
- (24) "Meter" or "measurement device" means a water flow measuring device that can measure within +/- 5% of accuracy the instantaneous rate of flow and record the amount of groundwater produced from a well or well system during a measure of time, as specifically set forth under Section 8.

- (25) "Monitoring well" means a well installed to measure some property of the groundwater or the aquifer that it penetrates, and does not produce more than 5,000 gallons per year.
- (26) "New well" means a water well for which drilling commenced on or after April 1, 2012, or conversion of another type of well or artificial excavation to a water well, including but not limited to a well originally drilled for hydrocarbon production activities that is to be converted to a water well.
- (27) "Nursery grower" means a person who grows more than 50 percent of the products that the person either sells or leases, regardless of the variety sold, leased, or grown. For the purpose of this definition, "grow" means the actual cultivation or propagation of the product beyond the mere holding or maintaining of the item prior to sale or lease and typically includes activities associated with the production or multiplying of stock such as the development of new plants from cuttings, grafts, plugs, or seedlings.
- (28) "Penalty" means a reasonable civil penalty set by rule under the express authority delegated to the District through Section 36.102(b) of the Texas Water Code.
- (29) "Person" means an individual, corporation, Limited Liability Company, organization, government, governmental subdivision, agency, business trust, estate, trust, partnership, association, or other legal entity.
- (30) "Poultry" means chickens, turkeys, nonmigratory game birds, and other domestic nonmigratory fowl, but does not include any other bird regulated by the Parks and Wildlife as an endangered or threatened species. The term does not include any animal that is stabled, confined, or fed at a facility that is defined by Texas Commission on Environmental Quality rules as an Animal Feeding Operation or a Concentrated Animal Feeding Operation.
- (31) "Production" or "producing" means the act of extracting groundwater from an aquifer by a pump or other method.
- (32) "Public Water System" or "PWS" means a system for the provision to the public of water for human consumption through pipes or other constructed conveyances, which includes all uses described under the definition for "drinking water" in 30 Texas Administrative Code, Section 290.38. Such a system must have at least 15 service connections or serve at least 25 individuals at least 60 days out of the year. This term includes any collection, treatment, storage, and distribution facilities under the control of the operator of such system and used primarily in connection with such system, and any collection or pretreatment storage facilities not under such control which are used primarily in connection with such system. Two or more systems with each having a potential to serve less than 15 connections or less than 25 individuals but owned by the same person, firm, or corporation and located on adjacent land will be considered a public water system when the total potential service connections in the combined systems are 15 or greater or if the total number of individuals served by the combined systems total 25 or greater at least 60 days out of the year. Without excluding other meanings of the terms

"individual" or "served," an individual shall be deemed to be served by a water system if he lives in, uses as his place of employment, or works in a place to which drinking water is supplied from the system.

- (33) "Pump" means any facility, device, equipment, materials, or method used to obtain water from a well.
- (34) "Registrant" means a person required to submit a registration.
- (35) "Registration" means a well owner providing certain information about a well to the District, as more particularly described under Section 3.
- (36) "Rule" or "Rules" or "Temporary Rules" means these Temporary Rules of the District regulating water wells, which shall continue to be effective until amended or repealed.
- (37) "Substantially alter" with respect to the size or capacity of a well means to increase the inside diameter of the pump discharge column pipe size of the well in any way, modify the depth or diameter of a well bore, increase the size of the pump or pump motor on the well, or performing work on the well that involves reaming, setting casing, or grouting.
- (38) "TCEQ" means the Texas Commission on Environmental Quality, or its predecessor or successor agency.
- (39) "Tract" means a contiguous parcel of land under the ownership of a single entity, such as a corporation, partnership or trust, or an individual or individuals holding as joint owners or tenants in common.
- (40) "Transfer" means a change in a registration as follows, except that the term "transfer" shall have its ordinary meaning as read in context when used in other contexts:
- (a) ownership; or
 - (b) the person authorized to exercise the right to make withdrawals and place the groundwater to beneficial use.
- (41) "Waste" means one or more of the following:
- (a) withdrawal of groundwater from the aquifer at a rate and in an amount that causes or threatens to cause an intrusion into the aquifer unsuitable for agriculture, gardening, domestic, stock raising, or other beneficial purposes;
 - (b) the flowing or producing of water from the aquifer by artificial means if the water produced is not used for a beneficial purpose;
 - (c) the escape of groundwater from the aquifer to any other underground reservoir or geologic stratum that does not contain groundwater;

- (d) pollution or harmful alteration of groundwater in the aquifer by saltwater or by other deleterious matter admitted from another stratum or from the surface of the ground;
- (e) willfully or negligently causing, suffering, or allowing groundwater to escape into any river, creek, natural watercourse, depression, lake, reservoir, drain, sewer, street, highway, road, or road ditch, or onto any land other than that of the owner of the well unless such discharge is authorized by permit, rule, or other order issued by the Texas Commission on Environmental Quality under Chapters 11 or 26 of the Texas Water Code;
- (f) groundwater pumped for irrigation that escapes as irrigation tailwater onto land other than that of the owner of the well unless permission has been granted by the occupant of the land receiving the discharge;
- (g) for water produced from an artesian well, "waste" has the meaning assigned by Section 11.205, Texas Water Code;
- (h) operating a deteriorated well; or
- (i) producing groundwater in violation of any District rule governing the withdrawal of groundwater through production limits on wells, managed depletion, or both.

(42) "Well" means any artificial excavation located within the boundaries of the District dug or drilled for the purpose of exploring for or withdrawing groundwater from the aquifer.

(43) "Well owner" means the person who owns a possessory interest in: (1) the land upon which a well or well system is located or to be located; (2) the well or well system; or (3) the groundwater withdrawn from a well or well system.

(44) "Well system" means a well or group of wells connected by piping, storage, or that share or are tied to the same distribution system. Examples of a well system include, but are not limited to, a well or group of wells connected to the same ground storage tank, pond, or swimming pool.

(45) "Withdraw" means the act of extracting or producing groundwater by pumping or other method.

(46) "Year" means a calendar year (January 1 through December 31), except where the usage of the term clearly suggests otherwise.

Rule 1.2 Authority of District.

The Red River Groundwater Conservation District is a political subdivision of the State of Texas organized and existing under Section 59, Article XVI, Texas Constitution, Chapter 36, Texas Water Code, and the District Act. The District is a governmental agency and a body politic and corporate. The District was created to serve a public use and benefit.

Rule 1.3 Purpose of Rules.

These Temporary Rules are adopted under the authority of Sections 36.101 and 36.1071(f), Texas Water Code, and the District Act for the purpose of conserving, preserving, protecting, and recharging groundwater in the District in order to prevent subsidence, prevent degradation of water quality, prevent waste of groundwater, and to carry out the powers and duties of Chapter 36, Texas Water Code, and the District Act.

Rule 1.4 Use and Effect of Rules.

These rules are used by the District in the exercise of the powers conferred on the District by law and in the accomplishment of the purposes of the law creating the District. These rules may be used as guides in the exercise of discretion, where discretion is vested. However, under no circumstances and in no particular case will they or any part therein, be construed as a limitation or restriction upon the District to exercise powers, duties and jurisdiction conferred by law. These rules create no rights or privileges in any person or water well, and shall not be construed to bind the Board in any manner in its promulgation of the District Management Plan, amendments to these Temporary Rules, or promulgation of permanent rules.

Rule 1.5 Purpose of District.

The purpose of the District is to provide for the conservation, preservation, protection, recharging, and prevention of waste of groundwater, and of groundwater reservoirs or their subdivisions, consistent with the objectives of Section 59, Article XVI, Texas Constitution.

Rule 1.6 Construction.

A reference to a title or chapter without further identification is a reference to a title or chapter of the Texas Water Code. A reference to a section or rule without further identification is a reference to a section or rule in these Rules. Construction of words and phrases is governed by the Code Construction Act, Subchapter B, Chapter 311, Texas Government Code. The singular includes the plural, and the plural includes the singular. The masculine includes the feminine, and the feminine includes the masculine.

Rule 1.7 Methods of Service Under the Rules.

Except as provided in these rules, any notice or document required by these rules to be served or delivered may be delivered to the recipient or the recipient's authorized representative in person, by agent, by courier receipted delivery, by certified or registered mail sent to the recipient's last known

address, by fax transfer to the recipient's current fax number or by e-mail and shall be accomplished by 5:00 p.m. on the date which it is due. Service by mail is complete upon deposit in a post office depository box or other official depository of the United States Postal Service. Service by fax transfer is complete upon transfer, except that any transfer completed after 5:00 p.m. shall be deemed complete the following business day. If service or delivery is by mail and the recipient has the right or is required to do some act within a prescribed period of time after service, three days will be added to the prescribed period. If service by other methods has proved unsuccessful, service will be deemed complete upon publication of the notice or document in a newspaper of general circulation in the District.

Rule 1.8 Severability.

If a provision contained in these Temporary Rules is for any reason held to be invalid, illegal, or unenforceable in any respect, the invalidity, illegality, or unenforceability does not affect any other rules or provisions of these Temporary Rules, and these Temporary Rules shall be construed as if the invalid, illegal, or unenforceable provision had never been contained in these rules.

Rule 1.9 Regulatory Compliance; Other Governmental Entities.

All registrants of the District shall comply with all applicable rules and regulations of the District and of all other governmental entities. If the District Rules and regulations are more stringent than those of other governmental entities, the District Rules and regulations are applicable.

Rule 1.10 Computing Time.

In computing any period of time prescribed or allowed by these Rules, order of the Board, or any applicable statute, the day of the act, event, or default from which the designated period of time begins to run is not included, but the last day of the period so computed is included, unless it is a Saturday, Sunday, or legal holiday, in which event the period runs until the end of the next day which is neither a Saturday, Sunday, or legal holiday.

Rule 1.11 Time Limits.

Applications, requests, or other papers or documents required or allowed to be filed under these Rules or by law must be received for filing by the District within the time limit for filing, if any. The date of receipt, not the date of posting, is determinative of the time of filing. Time periods set forth in these rules shall be measured by calendar days, unless otherwise specified.

Rule 1.12 Amending of Rules.

The Board may, following notice and hearing, amend or repeal these rules or adopt new rules from time to time.

SECTION 2.
APPLICABILITY OF REGULATORY REQUIREMENTS;
EXEMPTIONS

Rule 2.1 Wells Exempt from Certain Fee Payment, Metering, and Reporting Requirements of These Temporary Rules.

- (a) The requirements of these Temporary Rules relating to the payment of Water Use Fees and Groundwater Transport Fees under Section 7, the requirement to install and maintain a meter under Section 8, and the requirement to report to the District the amount of water produced from a well under Section 3 do not apply to the following types of wells:
1. A well used solely for domestic use, livestock use, or poultry use.
 2. An existing well or new well that does not have the capacity, as equipped, to produce more than 40,000 gallons per day, or more than 27.7 gallons per minute.
 3. Leachate wells, monitoring wells, and piezometers.
- (b) For purposes of determining whether the exemption set forth under Subsection (a)(2) applies, the capacity of a well that is part of a well system shall be determined by taking the sum of the capacities of each of the individual wells, as equipped, in the system. If the total sum of the capacities is greater than 40,000 gallons per day, or greater than 27.7 gallons per minute, the well system and the individual wells that are part of it are not exempt from the fee payment, metering, and reporting requirements of these rules.
- (c) A well exempted under Subsection (a) will lose its exempt status if the well is subsequently used for a purpose or in a manner that is not exempt under Subsection (a)(2).
- (d) A well exempted under Subsection (a)(2) will lose its exempt status if, while the well was registered as an exempt well, the District determines that the well had the capacity, as equipped, to produce more than 40,000 gallons per day, or more than 27.7 gallons per minute. Such wells are subject to the fee payment, metering, reporting, and other requirements of these Temporary Rules, and may be subject to enforcement under Section 8.
- (e) The owner of an existing well that is exempt under this rule should nonetheless register the well with the District, as specifically described under Section 3. All new wells, whether exempt or not under this rule, are required to be registered with the District prior to drilling as set forth under Section 3.

Rule 2.2 Wells Subject to Fee Payment, Metering, and Reporting Requirements of These Temporary Rules.

All wells not described as exempt under Rule 2.1 are subject to the Water Use Fee and Groundwater Transport Fee payment (addressed in Section 7 of the Temporary Rules), metering, reporting, registration, and other requirements of these Temporary Rules. Such wells include all wells or well systems with a capacity, as equipped, to produce more than 40,000 gallons per day, or more than 27.7 gallons per minute, that are used in whole or in part for any purpose of use other than solely for domestic use.

Rule 2.3 Exemption from Certain Fees for Groundwater Used for Certain Emergency Purposes.

- (a) Groundwater produced within the boundaries of the District is exempt from the assessment of applicable Water Use Fees and Groundwater Transport Fees otherwise required by Section 7 if the groundwater is used by a fire department or an emergency services district solely for emergency purposes and the use is qualified under Subsection (b).
- (b) To qualify for the exemption provided for in Subsection (a), a fire department for emergency services district that uses groundwater produced from within the District, or a person that supplies groundwater produced from within the District to a fire department or emergency services district, shall submit to the District a Water Production Report that complies with Rule 3.10.

Rule 2.4 Exemption from Production Fees, Metering, and Reporting Requirements for Groundwater Used for Well Development.

Groundwater produced from a well during its development or rehabilitation, including groundwater used in pump tests, is exempt from the requirements relating to the payment of fees under Section 7, the requirement to install and maintain a meter under Section 8, and the requirement to report to the District the amount of water produced from a well under Section 3. However, use of the well must comply with those requirements before being placed into operation unless otherwise exempt under these rules.

SECTION 3.

REGISTRATIONS, RECORDS, REPORTS, AND LOGS; PERMIT NOT REQUIRED

Rule 3.1 Purpose and Policy.

The accurate and timely reporting to the District of activities governed by these Rules is a critical component to the District's ability to effectively and prudently manage the groundwater resources that it has been charged by law with regulating. The purpose of Section 3 is to require the submission, by the appropriate person or persons, of complete, accurate, and timely

registrations, records, reports, and logs as required throughout the District Rules. Because of the important role that accurate and timely reporting plays in the District's understanding of past, current and anticipated groundwater conditions within the District, the failure to comply with these rules may result in the assessment of additional fees, civil penalties, or other enforcement action by the District, as specifically set forth under Section 9.

Rule 3.2 Permit Not Required Under Temporary Rules.

No permit of any kind is required under these Temporary Rules. Notwithstanding Chapter 36, Water Code, a permit is not required under these Temporary Rules to drill, equip, operate, or complete a well, produce water from a well, or to substantially alter the size or capacity of a well. Permitting requirements will be developed and adopted by the District in the future after it has had a sufficient opportunity to develop a management plan and carefully consider various regulatory approaches and how such approaches may impact landowners and other water users in the District while achieving proper management of the groundwater resources. Permitting rules will be adopted only after ample opportunity has been afforded the public to participate in the development of such rules.

Rule 3.3 Well Registration.

- (a) The following wells must be registered with the District:
 - (1) all new wells drilled on or after April 1, 2012, including new wells exempt under Rule 2.1;
 - (2) all existing wells not exempt under Rule 2.1.
- (b) Test holes must be registered with the District in accordance with the terms of this rule. Test holes are not subject to registration fees charged by the District. A plugging report shall be submitted to the District within 30 days of the date the test hole is plugged in accordance with Rule 3.7(c).
- (c) Existing exempt wells should be registered to limit the location of future wells that could reduce the capacity of the existing exempt wells.
- (d) A person seeking to register a well shall provide the District with the following information in the registration application on a form provided by the District:
 - (1) the name and mailing address of the registrant and the owner of the property, if different from the registrant, on which the well is or will be located;
 - (2) if the registrant is other than the owner of the property, documentation establishing the applicable authority to file the application for well registration, to serve as the registrant in lieu of the property owner, and to construct and operate a well for the proposed use;
 - (3) a statement of the nature and purpose of the existing or proposed use of water

from the well;

- (4) the location or proposed location of the well, identified as a specific point measured by latitudinal, longitudinal, and elevation coordinates;
 - (5) the location or proposed location of the use of water from the well, if used or proposed to be used at a location other than the location of the well;
 - (6) the production capacity or proposed production capacity of the well, as equipped, in gallons per day, and the horsepower rating of the pump, as assigned by the pump manufacturer;
 - (7) a water well closure plan or a declaration that the applicant will comply with well plugging guidelines and report closure to the District;
 - (8) a statement that the water withdrawn from the well will be put to beneficial use; and
 - (9) any other information deemed reasonably necessary by the Board.
- (e) The timely filing of an application for registration shall provide the owner of a well described under Subsection (a)(2) with evidence that a well existed before April 1, 2012, for purposes of grandfathering the well from the requirement to comply with any well location or spacing requirements of the District, and any other entitlements that existing wells may receive under these Temporary Rules or under permanent rules adopted by the District. A well that is required to be registered under this Rule and that is not exempt under Rule 2.1 shall not be operated after April 1, 2012, without first complying with the metering provisions set forth under Section 8.
- (f) Once a registration is approved as administratively complete by the District under Rule 3.6(b) and the well registration is completed, which for new wells also includes receipt by the District of the well report required by Rule 3.7, the registration shall be perpetual in nature, subject to being amended or transferred and subject to enforcement for violations of these Rules.

Rule 3.4 Time Period for Registration of Existing Non-Exempt and Exempt Wells.

- (a) The owner of an existing well described under Rule 3.3(a)(2) must register the well with the District between April 1 and June 30, 2012, and must install a meter on the well as set forth under Section 8 of these rules before July 1, 2012. Failure of the owner of such a well to timely register or install a meter on the well under this Rule shall subject the well owner to enforcement under these Rules.
- (b) The owner of an existing well exempt under Rule 2.1 may register the well with the District after April 1, 2012, to provide the owner with evidence that the well existed before the adoption of these Temporary Rules for purposes of grandfathering the well from the requirement to comply with any well location or spacing requirements of the

District and any other entitlements that existing wells may receive under these Temporary Rules or under permanent rules adopted by the District.

Rule 3.5 Registration of New Wells or Alterations to Existing Wells Required Prior to Drilling or Alteration.

- (a) An owner or well driller, or any other person legally authorized to act on their behalf, must submit and obtain approval of a registration application and submit a well report deposit with the District before any new well, except leachate wells or monitoring wells, may be drilled, equipped, or completed, or before an existing well may be substantially altered beginning on or after April 1, 2012.
- (b) A registrant for a new exempt well has 360 days from the date of approval of its application for well registration to drill and complete the new well, and must file the well report with the District within 60 days of completion. However, such a registrant may apply for an extension not to exceed 12 months at no additional cost.
- (c) A registrant for a new non-exempt well may submit an application for well registration to drill and complete the new well for a period of time based on the size and complexity of the well not to exceed two (2) years from the date of approval of the application as administratively complete under Rule 3.6(b). The General Manager may approve, deny, or adjust the time period requested based on the size and complexity of the well as part of the General Manager's review of administrative completeness under Rule 3.6(b). The registrant must then drill and complete the well within the time period set forth in the well registration application. If more time is necessary to drill and complete the well than the time period set forth in the well registration application, the registrant may apply to the District for an extension of one (1) year for a fee of \$100 payable to the District.
- (d) If the well report is timely submitted to the District, the District shall return the well report deposit to the owner or well driller. In the event that the well report required under this rule and Rule 3.7 is not filed within the applicable deadlines set forth under Subsection (b) and (c) of this rule, the driller or owner shall forfeit the well report deposit and shall be subject to enforcement by the District for violation of this rule.
- (e) No well that is classified as non-exempt under Rule 2.1(a) may be modified, altered, or operated unless the well is first registered with the District or the well registration on file for the well is amended pursuant to Rule 3.9.
- (f) Notwithstanding any other rule to the contrary, the owner, driller, pump installer, or any other person authorized by the owner to complete or operate a new well, substantially alter any existing well, or modify, alter, or operate an existing non-exempt well are jointly responsible for ensuring that a well registration required by this section, or well registration amendment required by Rule 3.9, is timely filed with the District and contains only information that is true and accurate. Each will be subject to enforcement action if a registration or registration amendment required by this section is not timely filed by either, or by any other person legally authorized to act on his or her behalf.

Rule 3.6 General Provisions Applicable to Registrations.

- (a) Registration applications may be submitted to the District in person, by mail, by fax, or by internet when available by the District, using the registration form provided by the District.
- (b) A determination of administrative completeness of a registration application shall be made by the General Manager within five business days after the date of receipt of an application for registration, which for new wells must include receipt of the well report deposit and well registration fee. If an application is not administratively complete, the District shall request the applicant to complete the application. The application will expire if the applicant does not complete the application within 120 days of the date of the District's request. An application will be considered administratively complete and may be approved by the General Manager without notice or hearing if:
 - (1) it substantially complies with the requirements set forth under Rule 3.3(d), including providing all information required to be included in the application that may be obtained through reasonable diligence; and
 - (2) if it is a registration for a new well:
 - (A) includes the well report deposit and well registration fee; and
 - (B) proposes a well that complies with spacing, location, and well completion requirements of Section 4.

A person may appeal the General Manager's ruling by filing a written request for a hearing before the Board. The Board will hear the applicant's appeal at the next regular Board meeting. The General Manager may set the application for consideration by the Board at the next available Board meeting or hearing in lieu of approving or denying an application.

- (c) Upon approval or denial of an application, the General Manager shall inform the registrant in writing by regular mail of the approval or denial, as well as whether the well meets the exemptions provided in Rule 2.1 or whether it is subject to the metering, fee payment, and reporting requirements of these Rules.
- (d) An application pursuant to which a registration has been issued is incorporated in the registration, and the registration is valid contingent upon the accuracy of the information supplied in the registration application. A finding that false information has been supplied in the application may be grounds to refuse to approve the registration or to revoke or suspend the registration.
- (e) Submission of a registration application constitutes an acknowledgment by the registrant of receipt of the rules and regulations of the District and agreement that the registrant will comply with all rules and regulations of the District.

- (f) The District may amend any registration, in accordance with these Rules, to accomplish the purposes of the District Rules, management plan, the District Act, or Chapter 36, Texas Water Code.
- (g) If multiple wells have been aggregated under one registration and one or more wells under the registration will be transferred, the District will require separate registration applications from each new owner for wells over 40,000 gallons per day, or over 27.7 gallons per minute, retained or obtained by that person.
- (h) No person shall operate or otherwise produce groundwater from a well required under this section to be registered with the District before:
 - (1) timely submitting an accurate application for registration, or accurate application to amend an existing registration as applicable, of the well to the District; and
 - (2) obtaining approval from the District of the application for registration or amendment application, if such approval is required under these Rules.

Rule 3.7 Records of Drilling, Pump Installation and Alteration Activity, Plugging, and Capping.

- (a) Each person who drills, deepens, completes, or otherwise alters a well shall make, at the time of drilling, deepening, completing, or otherwise altering the well, a legible and accurate well report recorded on forms prescribed by the District or by the Texas Department of Licensing and Regulation. As part of the well report, an accurate drillers' log shall be kept of the water well in accordance with the rules of the Texas Department of Licensing and Regulation, and a copy of the log must be included with the well report and submitted to the District under the terms of this section.
- (b) The person who drilled, deepened, completed or otherwise altered a well pursuant to this rule shall, within 60 days after the date the well is completed, file the well report described in Subsection (a) with the District. If a registrant fails to timely submit the well report within 60 days as required by this subsection, then the well registration will not be considered complete.
- (c) Not later than the 30th day after the date a well is plugged, a driller, licensed pump installer, or well owner who plugs the well shall submit a plugging report to the District, which shall be substantially similar form to the Texas Department of Licensing and Regulation Form a004WWD (Plugging Report) and shall include all information required therein.
- (d) The District requires wells to be capped under certain conditions to prevent waste, prevent pollution, or prevent further deterioration of well casing. The well must remain capped until such a time as the condition that led to the capping requirement is eliminated or repaired. A well must be capped in accordance with this rule if the well pump equipment is removed from a well with the intention of re-equipping the well at a later date for future use; provided, however that the casing is not in a deteriorated condition that could result

in the commingling of water strata and degradation of water quality, in which case the well must be plugged or repaired in accordance with this rule. The cap must be capable of sustaining a weight of at least 400 pounds when installed on the well and must be constructed in such a way that the covering cannot be easily removed by hand. The driller, licensed pump installer, or well owner who caps a well shall submit to the District a well capping notice on a form provided by the District.

Rule 3.8 Transfer of Well Ownership.

- (a) Within 90 days after the date of a change in ownership of a well exempt under Rule 2.1, the new well owner shall notify the District in writing of the effective date of the change in ownership, the name, daytime telephone number, and mailing address of the new well owner, along with any other contact or well-related information reasonably requested by the General Manager. The new well owner may, in addition, be required to submit an application for registration of an existing well if a registration does not yet exist for the well.
- (b) Within 90 days after the date of a change in ownership of a well that is not exempt under District Rule 2.1 from the fee payment, metering, and reporting requirements of these rules, the new well owner (transferee) shall submit to the District, on a form provided by the District staff, a signed and sworn-to application for transfer of ownership.
- (c) If a registrant conveys by any lawful and legally enforceable means to another person the real property interests in one or more wells or a well system that is recognized in the registration so that the transferring party (the transferor) is no longer the "well owner" as defined herein, and if an application for change of ownership under Subsection (b) has been approved by the District, the District shall recognize the person to whom such interests were conveyed (the transferee) as the legal holder of the registration, subject to the conditions and limitations of these District Rules.
- (d) The burden of proof in any proceeding related to a question of well ownership or status as the legal holder of a registration issued by the District and the rights there under shall be on the person claiming such ownership or status.
- (e) Notwithstanding any provision of this Rule to the contrary, no application made pursuant to Subsection (b) of this Rule shall be granted by the District unless all outstanding fees, penalties, and compliance matters have first been fully and finally paid or otherwise resolved by the transferring party (transferor) for all wells included in the application or existing registration, and each well and registration made the subject of the application is otherwise in good standing with the District.
- (f) The new owner of a well that is the subject of a transfer described in this rule (transferee) may not operate or otherwise produce groundwater from the well after 90 days from the date of the change in ownership until the new owner has:
 - (1) submitted written notice to the District of the change in ownership, for wells described in Subsection (a); or

- (2) submitted to the District a completed application for transfer of ownership, for wells described in Subsection (b).

A new well owner that intends to alter or use the well in a manner that would constitute a substantial change from the information in the existing registration or that would trigger the requirement to register the well under these Rules must also submit and obtain District approval of a registration application or registration amendment application, as applicable, prior to altering or operating the well in the new manner.

Rule 3.9 Amendment of Registration.

A registrant shall file an application to amend an existing registration and obtain approval by the District of the application prior to engaging in any activity that would constitute a substantial change from the information in the existing registration. For purposes of this rule, a substantial change includes a change that would substantially alter the pump or well, a change in the type of use of the water produced, the addition of a new well to be included in an already registered aggregate system, a change in location of a well or proposed well, a change of the location of use of the groundwater, or a change in ownership of a well. A registration amendment is not required for maintenance or repair of a well if the maintenance or repair does not increase the designed production capabilities of the pump.

Rule 3.10 Water Production Reports.

- (a) Beginning in 2013, the owner of any non-exempt well within the District must submit, on a form provided by the District, a quarterly report, or an annual report for the system loss report required under Subsection (a)(7) only, containing the following:
 - (1) the name of the registrant;
 - (2) the well numbers of each registered well within the District owned or operated by the registrant;
 - (3) the total amount of groundwater produced by each well or well system during the immediately preceding reporting period;
 - (4) the total amount of groundwater produced by each well or well system during each month of the immediately preceding reporting period;
 - (5) the purposes for which the water was used;
 - (6) for water used at a location other than the property on which the well is located, and that is not used by a fire department or emergency services district for emergency purposes or by a public water system:
 - (A) the location of the use of the water; and

- (B) if the water was sold on a retail or wholesale basis, the name of the person to whom it was sold and the quantity sold to each person.
- (7) for water used at a location other than the property on which the well is located and that is used by a public water system, a description of identified system losses, including:
- (A) an estimate of the total quantity, reported in gallons or in percentages of total annual production, of water lost to system loss, if known;
 - (B) the sources of system losses reported under Subpart (A); and
 - (C) the methods, if any, employed to address the system losses reported under this subsection;
- (8) additionally, for fire departments, emergency services districts, and any person that provides groundwater produced from within the District to a fire department or emergency services district and that seeks a fee payment exemption under Rule 2.3:
- (A) the total amount of groundwater produced or used, as applicable, solely for emergency purposes during each month of the reporting period provided under this Rule; and
 - (B) the total amount of groundwater produced or used, as applicable, for any purpose other than emergency purposes during each month of the reporting period provided under this Rule.
- (b) There shall be four quarterly reporting periods each year: January 1 to March 31, April 1 to June 30, July 1 to October 31, and November 1 to December 31. The report for each quarter shall be due no later than 30 days after the last day of the applicable quarterly reporting period. To comply with this rule, the registrant of a well shall read each water meter associated with a well within 15 days before or after March 31, within 15 days before or after June 30, within 15 days before or after September 30, and within 15 days before or after December 31 each year and report the readings to the District on the form described in Subsection (a). Additionally, to comply with this rule, all applicable information required under Subsection (a) must be contained in the water production report filed with the District.
- (c) The report required by Subsection (a) must also include a true and correct copy of the meter log required by District Rule 8.5. Once the District makes on-line submission of water production reports and meter logs available by internet to well owners, all such reports and logs may be submitted via internet.

SECTION 4. SPACING AND LOCATION OF WELLS; WELL COMPLETION

Rule 4.1 Spacing and Location of Existing Wells.

Wells drilled prior to April 1, 2012, shall be drilled in accordance with state law in effect, if any, on the date such drilling commenced and are exempt from the spacing, location, and completion requirements of these rules to the extent that they were drilled lawfully.

Rule 4.2 Spacing, Location, and Standards of Completion for New Wells.

- (a) All new wells must comply with the spacing and location requirements set forth under the Texas Water Well Drillers and Pump Installers Administrative Rules, Title 16, Part 4, Chapter 76, Texas Administrative Code, unless a written variance is granted by the Texas Department of Licensing and Regulation and a copy of the variance is forwarded to the District by the applicant or registrant, and must be drilled and located in compliance with applicable rules and regulations of other political subdivisions.
- (b) After authorization to drill a new well has been granted by the District, the well may only be drilled at a location that is within ten (10) feet of the location specified in the registration.
- (c) Compliance with the spacing and location requirements of these rules does not necessarily authorize a person to drill a well at a specified location in the District. Agencies or other political subdivisions of the State of Texas that are located in whole or in part within the boundaries of the District may impose additional requirements related to the drilling or completion of water wells.
- (d) The owner and driller of a well are jointly responsible for ensuring that the well is drilled at a location that strictly complies with the location requirements of Subsection (b). If the board determines that a well is drilled at a location that does not strictly comply with the location requirements of Subsection (b), the Board may, in addition to taking all other appropriate enforcement action, require the well to be permanently closed or authorize the institution of legal action to enjoin any continued drilling activity or the operation of the well.
- (e) All new wells drilled on or after January 1, 2017 must be equipped with either one of the following water quality control devices for the purpose of preventing the siphoning of external water and contaminants into the well:
 - (1) a backflow prevention device installed above ground so that it is readily accessible for maintenance or replacement; or
 - (2) an air gap installed at the well discharge location.
- (f) Except as otherwise provided in Subsection (g) of this rule, new wells drilled on or after January 1, 2017 shall meet at least one of the following completion standards:

- (1) the well shall be completed in a manner that exposes fourteen (14) inches or six (6) pipe diameters, whichever is greater, of straight and unobstructed discharge pipe above ground so that the District's flow metering measurement device can measure the flow rate;
 - (2) provide a threaded tee above ground with valves arranged in a manner to divert 100% of the discharge to one side of the tee temporarily so that the District's flow metering device can measure the flow rate; or
 - (3) equip the well with a meter that is easily accessible and measures instantaneous flow rate.
- (g) The requirements of Subsection (f) of this rule do not apply if the well is exempt and used solely for domestic use, livestock use, or poultry use pursuant to Rule 2.1(a)(1).

Rule 4.3 Replacement Wells.

- (a) No person may replace an existing well without first having obtained authorization from the District. Authorization for the construction of a replacement well may only be granted following the submission to the District of an application for registration of a replacement well on a form provided by the District. The application for registration of a replacement well shall include a diagram of the property that depicts both the proposed replacement well and the well being replaced, and any other existing structures on the property.
- (b) Applications for registration of replacement wells submitted under this rule may be granted by the General Manager without notice or hearing. An applicant may appeal the General Manager's ruling by filing a written request for a hearing before the Board. The Board will hear such an appeal at the next available regular Board meeting or hearing called for that purpose.
- (c) A replacement well must be actually drilled and completed so that it meets the spacing requirement set forth in Rule 4.2(b) and is located on the same tract of land as the well being replaced. The replacement well and pump must not be larger in designed production capacity than the well and pump being replaced, unless the replacement well is exempt under Rule 2.1. The well owner must cease all production from the well being replaced immediately upon commencing production from the replacement well, and must plug the well being replaced within 90 days from the date that the replacement well is completed.

SECTION 5. REGULATION OF PRODUCTION; WASTE PROHIBITED

Rule 5.1 Temporary Production Limitations.

The maximum quantity of water that a person may withdraw from a well that is not exempt under Rule 2.1(a) is the amount of water the person produces and timely:

- (1) submits payment to the District for in accordance with the fee rate adopted by the District under Section 7; and
- (2) reports pumpage volumes to the District under Rule 3.10.

Rule 5.2 Regular Production Limitations.

In order to accomplish the purposes of Chapter 36, Texas Water Code, and the District Act, and to achieve the goals of the District Management Plan, the District may, after notice and hearing, establish groundwater production limitations for all wells when it adopts permanent rules for the District.

Rule 5.3 Waste Prohibited.

No person shall engage in any conduct subject to the District's regulatory jurisdiction that constitutes waste, as that term is defined herein. A retail public utility that owns and operates a water pipeline from which groundwater escapes is not engaged in conduct subject to the District's regulatory jurisdiction so long as the retail public utility is pursuing in good faith a maintenance plan to discover and repair leaks and to identify and replace deteriorated waterlines consistent with the accepted standards of retail public water utilities located within the District.

SECTION 6. TRANSPORTATION OF GROUNDWATER OUT OF THE DISTRICT

Rule 6.1 General Provisions.

- (a) A person who produces or wishes to produce water from a well not exempt under Rule 2.1(a) that is located or is to be located within the District and transport such water for use outside of the district must register the well and submit timely payment of the Groundwater Transport Fee to the District under Rule 7.2 for any water transported out of the District. The District may require the person to install any meters necessary to report the total amount of groundwater transported outside of the District for reporting purposes and for purposes of calculating the Groundwater Transport Fee.
- (b) The District may not, in a manner inconsistent with rules and fees applied to production and use occurring wholly within the boundaries of the District, regulate production of groundwater or assess fees against the transport of water produced in an area of a retail

public utility that is located inside the district boundaries and transported for use to an area that is within the same retail public utility but that is located outside the district boundaries.

Rule 6.2 Reporting.

A person transporting groundwater for use outside of the District and subject to the requirement to pay the Groundwater Transport Fee shall file periodic reports with the District describing the amount of water transported and used outside the District. The report shall be filed with the District in the same manner, for the same reporting periods, and by the same deadlines set forth for Water Production Reports under Rule 3.10. The report for groundwater transported shall be on the appropriate form provided by the District and shall state the following:

- (1) the name of the person;
- (2) the well registration numbers of each well from which the person has produced groundwater transported for use outside the District;
- (3) the total amount of groundwater produced from each well or well system during the immediately preceding reporting period;
- (4) the total amount of groundwater transported outside of the District from each well, well system or surface impoundment containing produced groundwater during each month of the immediately preceding reporting period;
- (5) the purposes for which the water was transported; and
- (6) any other information requested by the District.

SECTION 7. FEES AND PAYMENT OF FEES

Rule 7.1 Water Use Fees.

- (a) A water use fee rate schedule shall be established by Board resolution annually at least 60 days before the end of the calendar year. The Board may adopt a different water use fee rate for water used for agricultural purposes than for water used for non-agricultural purposes. The rate shall be applied to the groundwater pumpage in the ensuing calendar year for each well not exempt under Rule 2.1. The District will review the account of any person changing the use of a well from non-exempt to exempt or vice versa to determine if additional water use fees are due or if a refund of water use fees is warranted.
- (b) Wells exempt under Rule 2.1 shall be exempt from payment of water use fees. However, if exempt well status is withdrawn, the District may assess fees and penalties in accordance with the District Rules.

- (c) No later than 30 days prior to the end of the calendar year, beginning with calendar year 2012, the District shall send by regular mail or e-mail to the owner or operator of each registered well that is required to pay the Water Use Fee a reminder statement setting forth the water use fee rate applicable to the water produced in the ensuing year, setting forth deadlines for submission of fee payments and production reports of meter readings, and other information deemed appropriate by the District. The initial Water Use Fee for production during the period from July 1, 2012, to December 31, 2012, will be established by the Board no later than January 1, 2012.

Rule 7.2 Groundwater Transport Fees.

The District shall impose a Groundwater Transport Fee of 1.5 times the District's Water Use Fee rate for in-District use for groundwater produced in the District that is transported for use outside of the District, except as provided by Rule 6.1(b) and this rule. The procedures, requirements, and penalties related to payment of the Water Use Fee shall apply to payment of the Groundwater Transport Fee. Groundwater Transport Fees shall not be imposed on a water supplier that withdraws groundwater from a well located in the District and that distributes the water to any part of the territory within the water supplier's certificate of convenience and necessity (CCN) issued by the Texas Commission on Environmental Quality, or its predecessor or successor agency, that is outside the boundaries of the District. Groundwater Transport Fees shall also not be imposed on a person that produces groundwater from a well located in the District, but who uses the water outside the boundaries of the District, only if the property where the well is located and the water is used is contiguous and owned by the same person.

Rule 7.3 Payments of Water Use and Groundwater Transport Fees.

- (a) All fees for groundwater production or transport in a calendar year must be paid to the District based on quarterly production. All water production reports, monthly logs, and groundwater transport reports will be due no later than 30 days from the end of the applicable quarterly reporting period in accordance with Rule 3.10(b). The District will generate and mail all invoices for fee payment not later than the 45th day after the end of the quarterly reporting period. All payments that are due to the District must be paid no later than 75 days from the end of the applicable quarterly reporting period.
- (b) Any well that is subject to fee payment under this Rule and that provides water for both agricultural and non-agricultural purposes shall pay the water use fee rate applicable to non-agricultural purposes for all water produced from the well, unless the applicant can demonstrate through convincing evidence to the satisfaction of the District that a system is or will be in place so as to assure an accurate accounting of water for each purpose of use.
- (c) Notwithstanding anything to the contrary in these rules, the initial Water Use Fees and Groundwater Transport Fees to be submitted under Rules 7.1 and 7.2 shall be for groundwater produced or transported during the period of July 1 to December 31, 2012, which shall be due to the District no later than January 31, 2013. This subsection shall expire without need for further action by the Board on December 31, 2013.

Rule 7.4 Failure to Make Fee Payments.

- (a) Payments not received within 30 days following the date that Water Use Fees or Groundwater Transport Fees are due and owing to the District pursuant to Rule 7.3(a) will be subject to a late payment fee of fifteen percent (15%) of the total amount of water use fees due and owing to the District.
- (b) Persons failing to remit all Water Use Fees or Groundwater Transport Fees due and owing to the District within 60 days of the date such fees are due pursuant to Rule 7.3(a) shall be subject to a civil penalty not to exceed three times the amount of the outstanding fees due and owing, in addition to the late fee penalty prescribed in Subsection (a) of this Rule, and may be subject to additional enforcement measures provided for by these Rules or by order of the Board.

Rule 7.5 Failure to Submit Water Production Reports

- (a) Water Production Reports not received within 30 days after the last day of the applicable quarterly reporting period pursuant to Rule 3.10(b) will be subject to a late fee of fifty dollars (\$50) per billing account.
- (b) Persons failing to submit Water Production Reports within 60 days after the last day of the applicable quarterly reporting period pursuant to Rule 3.10(b) shall be subject to a civil penalty as set forth in the District's Enforcement Policy and Civil Penalty Schedule in Appendix A.

Rule 7.6 Returned Check Fee.

The Board, by resolution may establish a fee for checks returned to the District for insufficient funds, accounts closed, signature missing, or any other reason causing a check to be returned by the District's depository.

Rule 7.7 Well Report Deposit.

The Board, by resolution, may establish a well report deposit to be held by the District as part of the well registration procedures. The District shall return the deposit to the depositor if all relevant well reports are timely submitted to the District in accordance with these Rules. In the event the District does not timely receive all relevant well reports, or if rights granted within the registration are not timely used, the deposit shall become the property of the District.

Rule 7.8 Well Registration Fees.

The owner of any new well shall submit payment to the District of a \$100 non-refundable well registration fee per well, which is due by the same deadline established under these rules for registration of the well. The well registration fee must be received by the District in order for the District to find a registration application administratively complete. The purpose of the well registration fee is to cover the administrative costs to the District associated with registering the well and administering the rules of the District related to the well. The amount of the well

registration fee has been determined by the District to be less than the actual administrative costs to the District of registering the well and administering the rules of the District with respect to the well, even in light of anticipated revenues to be received from other revenue sources.

Rule 7.9 Enforcement.

After a well is determined to be in violation of these rules for failure to make payment of water use fees on or before the 60th day following the date such fees are due pursuant to Rule 7.3, all enforcement mechanisms provided by law and these Rules shall be available to prevent unauthorized use of the well and may be initiated by the General Manager without further authorization from the Board.

Rule 7.10 Meter Sealing Fee.

The Board, by resolution, may establish a fee to recover all or part of its costs for removing and reapplying a District seal and verifying relevant well and meter information in situations where a well owner or operator submits a request to move a meter from one well to another.

SECTION 8. METERING

Rule 8.1 Water Meter Required.

- (a) Except as provided in Rule 8.2, the owner of a well located in the District and not exempt under Rule 2.1 shall equip the well with a flow measurement device meeting the specifications of these Rules and shall operate the meter on the well to measure the flow rate and cumulative amount of groundwater withdrawn from the well. All meters that are existing at the time of the Effective Date of these rules, and at a minimum have the ability to measure the cumulative amount of groundwater withdrawn from the well, shall be considered existing and will not have to be replaced with meters that can also measure the flow rate, provided that the meter meets all other requirements herein. Except as provided in Rule 8.2, the owner of a new or existing well not exempt under Rule 2.1 that is located in the District shall install a meter on the well in compliance with the requirements herein prior to producing groundwater from the well on or after July 1, 2012.
- (b) All meters must be sealed in place by the District with a District seal. Except as provided by Rule 8.4, the meter must remain with the well except in cases where the well is modified or the meter no longer meets the accuracy standards set forth under this rule and Rule 8.3. In the event a well owner wants to move a meter from one well to another, the well owner must submit a request to the District to remove its meter seal and must pay to the District the meter sealing fee established under Rule 7.10. The District shall remove the seal within five business days of receiving a request from the well owner. The District may seal the well from which the meter was removed to prevent its operation without a meter, in addition to sealing the meter on the new well. The readings on the meter must

be recorded immediately prior to removal and at the time of reinstallation.

- (c) A mechanically driven, magnetic, or ultrasonic totalizing water meter is the only type of meter that may be installed on a well registered with the District unless an approval for another type of reliable meter or alternative measuring method is applied for and granted by the District. The totalizer must not be resettable by the registrant and must be capable of a maximum reading greater than the maximum expected annual pumpage. Battery operated registers must have a minimum five-year life expectancy and must be permanently hermetically sealed. Battery operated registers must visibly display the expiration date of the battery. All meters must meet the requirements for registration accuracy set forth in the American Water Works Association standards for cold-water meters as those standards existed on the date of adoption of these Rules. Meters must be able to measure instantaneous flow rate of the groundwater produced from the well, except as follows: a meter that was installed on an existing well before the effective date that is not capable of measuring the instantaneous flow rate will not have to be replaced, provided that the meter has the ability to measure the cumulative amount of groundwater withdrawn from the well and meets all other requirements herein.
- (d) All meters must be installed within 25 feet of the wellhead. The water meter must be installed according to the manufacturer's published specifications in effect at the time of the meter installation, or the meter's accuracy must be verified by the registrant in accordance with Rule 8.3. If no specifications are published, there must be a minimum length of five pipe diameters of straight pipe upstream of the water meter and two pipe diameter of straight pipe downstream of the water meter. These lengths of straight pipe must contain no check valves, tees, gate valves, back flow preventers, blow-off valves, or any other fixture other than those flanges or welds necessary to connect the straight pipe to the meter. In addition, the pipe must be completely full of water throughout the region. All installed meters must measure only groundwater.
- (e) Each meter shall be installed, operated, maintained, and repaired in accordance with the manufacturer's standards, instructions, or recommendations, and shall be calibrated to ensure an accuracy reading range of 95% to 105% of actual flow.
- (f) The owner of a well is responsible for the purchase, installation, operation, maintenance, and repair of the meter associated with the well.
- (g) Bypasses are prohibited unless they are also metered. This subsection shall not apply to any unmetered bypasses in existence on the effective date but shall apply to bypasses installed after that date. A person commits a major violation of these rules by using a bypass to avoid recording groundwater production on a well meter, which may also be subject to criminal prosecution by a local prosecuting authority.

Rule 8.2 Water Meter Exemption.

Wells exempt under Rule 2.1 shall be exempt from the requirement to obtain a water meter under Rule 8.1.

Rule 8.3 Accuracy Verification.

- (a) **Meter Accuracy to be Tested:** The General Manager may require the registrant, at the registrant's expense, to test the accuracy of a water meter and submit a certificate of the test results. The certificate shall be on a form provided by the District. The General Manager may further require that such test be performed by a third party qualified to perform such tests. The third party must be approved by the General Manager prior to the test. Except as otherwise provided herein, certification tests will be required no more than once every three years for the same meter. If the test results indicate that the water meter is registering an accuracy reading outside the range of 95% to 105% of the actual flow, then appropriate steps shall be taken by the registrant to repair or replace the water meter within 90 calendar days from the date of the test. The District, at its own expense, may undertake random tests and other investigations at any time for the purpose of verifying water meter readings. If the District's tests or investigations reveal that a water meter is not registering within the accuracy range of 95% to 105% of the actual flow, or is not properly recording the total flow of groundwater withdrawn from the well or wells, the registrant shall reimburse the District for the cost of those tests and investigations within 90 calendar days from the date of the tests or investigations, and the registrant shall take appropriate steps to bring the meter or meters into compliance with these Rules within 90 calendar days from the date of the tests or investigations. If a water meter or related piping or equipment is tampered with or damaged so that the measurement of accuracy is impaired, the District may require the registrant, at the registrant's expense, to take appropriate steps to remedy the problem and to retest the water meter within 90 calendar days from the date the problem is discovered and reported to the registrant.
- (b) **Meter Testing and Calibration Equipment:** Only equipment capable of accuracy results of plus or minus two percent of actual flow may be used to calibrate or test meters.
- (c) **Calibration of Testing Equipment:** All approved testing equipment must be calibrated every two years by an independent testing laboratory or company capable of accuracy verification. A copy of the accuracy verification must be presented to the District before any further tests may be performed using that equipment.

Rule 8.4 Removal of Meter for Repairs.

A water meter may be removed for repairs and the well remain operational. A water meter may also be removed if necessary to modify the well. A water meter may be removed provided the District is notified prior to the removal, and if the well is to remain operational, the repairs must be completed in a timely manner. If the meter on the well has already been sealed by the District, the District shall remove the seal within five business days of receiving a request from the well owner. The readings on the meter must be recorded immediately prior to removal and at the time of reinstallation. The record of pumpage must include an estimate of the amount of groundwater withdrawn during the period the meter was not installed and operating.

Rule 8.5 Water Meter Readings.

The registrant of a well not exempt under Rule 2.1 must read each water meter associated with the well and record the meter readings and the actual amount of pumpage in a log at least monthly. The logs containing the recordings shall be available for inspection by the District at reasonable business hours. Copies of the logs must be included with the Water Production Report required by District Rule 3.10, along with fee payments as set forth under Section 7. The registrant of a well shall read each water meter associated with a well within 15 days before or after March 31, within 15 days before or after June 30, within 15 days before or after September 30, and within 15 days before or after December 31 each year, as applicable to the respective immediately preceding quarterly reporting period, and report the readings to the District on a form provided by the District along with copies of the monthly logs and payment of all Water Use Fees by the deadlines set forth for fee payment under Rule 7.3.

Rule 8.6 Installation of Meters.

A meter required to be installed under these Rules shall be installed before producing water from the well on or after July 1, 2012.

Rule 8.7 Enforcement.

- (a) It is a major violation of these Rules to fail to meter a well and report meter readings in accordance with this Section. After a well is determined to be in violation of these rules for failure to meter or maintain and report meter readings, all enforcement mechanisms provided by law and these Rules shall be available to prevent unauthorized use of the well and may be initiated by the General Manager without further authorization from the Board.
- (b) After July 1, 2012, the District shall send owners of new or existing wells not exempt under Rule 2.1 who have failed to comply with the metering requirements set forth in this section a certified letter notifying the well owner of the non-compliance. Within 30 days of the date the certified letter was mailed from the District, the well owner must provide information to the District demonstrating that the well owner has taken steps to comply with the District's registration, metering, and fee payment rules, including past due fee payments under Rules 7.1 through 7.4. If the well owner fails to respond to the District and demonstrate progress towards compliance within 30 days of the date the District mailed the notification letter days, the well owner will receive a major violation according to the terms of the District's Enforcement Policy and Civil Penalty Schedule, Appendix A.

SECTION 9. INSPECTION AND ENFORCEMENT OF RULES

Rule 9.1 Purpose and Policy.

The District's ability to effectively and efficiently manage the limited groundwater resources within its boundaries depends entirely upon the adherence to the rules promulgated by the Board to carry out the District's purposes. Those purposes include providing for the conservation, preservation, protection and recharge of the groundwater resources within the District, to protect against subsidence, degradation of water quality, and to prevent waste of those resources. Without the ability to enforce these rules in a fair, effective manner, it would not be possible to accomplish the District's express groundwater management purposes. The enforcement rules and procedures that follow are consistent with the responsibilities delegated to it by the Texas Legislature through the District Act, and through Chapter 36 of the Texas Water Code.

Rule 9.2 Rules Enforcement.

- (a) If it appears that a person has violated, is violating, or is threatening to violate any provision of the District Rules, the Board may institute and conduct a suit in a court of competent jurisdiction in the name of the District for injunctive relief, recovery of a civil penalty in an amount set by District Rule per violation, both injunctive relief and a civil penalty, or any other appropriate remedy. Each day of a continuing violation constitutes a separate violation.
- (b) Unless otherwise provided in these rules, the penalty for a violation of any District rule shall be either:
 - (1) \$10,000.00 per violation; or
 - (2) A lesser amount, based on the severity of the violation, as set forth in an Enforcement Policy that may include a Civil Penalty Schedule, which is attached to these Rules as Appendix A and adopted as a Rule of the District for all purposes.
- (c) A penalty under this section is in addition to any other penalty provided by law and may be enforced by filing a complaint in a court of competent jurisdiction in the county in which the District's principal office or meeting place is located.
- (d) If the District prevails in a suit to enforce its Rules, the District may seek, in the same action, recovery of attorney's fees, costs for expert witnesses, and other costs incurred by the District before the court. The amount of attorney's fees awarded by a court under this Rule shall be fixed by the court.

Rule 9.3 Failure to Report Pumpage and/ or Transported Volumes.

The accurate reporting and timely submission of pumpage and/or transported volumes is necessary for the proper management of water resources in the District. Failure of a well owner required by these Temporary Rules to submit complete, accurate, and timely pumpage and transportation reports may result in:

- (1) the assessment of any fees or penalties adopted under Rule 9.2 for meter reading and inspection as a result of District inspections to obtain current and accurate pumpage volumes; and
- (2) additional enforcement measures provided by these Rules or by order of the Board.

Rule 9.4 District Inspections.

No person shall unreasonably interfere with the District's efforts to conduct inspections or otherwise comply with the requirements, obligations, and authority provided in Section 36.123 of the Texas Water Code.

Rule 9.5 Notices of Violation.

Whenever the District determines that any person has violated or is violating any provision of the District's Rules, including the terms of any rule or order issued by the District, it may use any of the following means of notifying the person or persons of the violation:

- (a) **Informal Notice:** The officers, staff or agents of the District acting on behalf of the District or the Board may inform the person of the violation by telephone by speaking or attempting to speak to the appropriate person to explain the violation and the steps necessary to satisfactorily remedy the violation. The information received by the District through this informal notice concerning the violation will be documented, along with the date and time of the call, and will be kept on file with the District. Nothing in this subsection shall limit the authority of the District to take action, including emergency actions or any other enforcement action, without first providing notice under this subsection.
- (b) **Notice of Violation:** The District may inform the person of the violation through a written notice of violation issued pursuant to this rule. Each notice of violation issued hereunder shall explain the basis of the violation, identify the rule or order that has been violated or is being violated, and list specific required actions that must be satisfactorily completed—which may include the payment of applicable civil penalties—to address each violation raised in the notice. Notices of violation issued hereunder shall be tendered by a delivery method that complies with District Rule 1.7. Nothing in this rule subsection shall limit the authority of the District to take action, including emergency actions or any other enforcement action, without first issuing a notice of violation.
- (c) **Compliance Meeting:** The District may hold a meeting with any person whom the District believes to have violated, or to be violating, a District Rule or District order to discuss each

such violation and the steps necessary to satisfactorily remedy each such violation. The information received in any meeting conducted pursuant to this rule subsection concerning the violation will be documented, along with the date and time of the meeting, and will be kept on file with the District. Nothing in this rule subsection shall limit the authority of the District to take action, including emergency actions or any other enforcement action, without first conducting a meeting under this subsection.

Rule 9.6 Show Cause Hearing.

- (a) Upon recommendation of the General Manager to the Board or upon the Board's own motion, the Board may order any person that it believes has violated or is violating any provision of the District's Rules a District order to appear before the Board at a public meeting called for such purpose and show cause why an enforcement action, including the initiation of a suit in a court of competent jurisdiction, should not be pursued by the District against the person or persons made the subject of the show cause hearing.
- (b) No show cause hearing under Subsection (a) of this Rule may be held unless the District first mails each person to be made the subject of the hearing, written notice not less than 20 days prior to the date of the hearing. Such notice shall include the following:
 - (1) the time and place for the hearing;
 - (2) the basis of each asserted violation; and
 - (3) the rule or order that the District believes has been violated or is being violated; and
 - (4) a request that the person cited duly appear and show cause why enforcement action should not be pursued.
- (c) The District may pursue immediate enforcement action against the person cited to appear in any show cause order issued by the District where the person so cited fails to appear and show cause why an enforcement action should not be pursued.
- (d) Nothing in this rule shall limit the authority of the District to take action, including emergency actions or any other enforcement action, against a person at any time regardless of whether the District holds a hearing under this rule.

SECTION 10. EFFECTIVE DATE

Rule 10.1. Effective Date.

These Rules take effect on August 29, 2011, which was the date of their original adoption. An amendment to these Rules takes effect on the date of its original adoption. It is the District's intention that the rules and amendments thereto be applied retroactively to activities involving the production and use of groundwater resources located in the District, as specifically set forth in these Rules.

APPENDIX A. Enforcement Policy and Civil Penalty Schedule.

Red River Groundwater Conservation District ENFORCEMENT POLICY AND CIVIL PENALTY SCHEDULE

General Guidelines

When the General Manager discovers a violation of the District Rules that either (1) constitutes a Major Violation, or (2) constitutes a Minor Violation that the General Manager is unable to resolve within 60 days of discovering the Minor Violation, the General Manager shall bring the Major Violation or the unresolved Minor Violation and the pertinent facts surrounding it to the attention of the Board. Violations related to water well construction and completion requirements shall also be brought to the attention of the Board.

The General Manager shall recommend to the Board of Directors an appropriate settlement offer to settle the violation in lieu of litigation based upon the Civil Penalty Schedule set forth below. The Board may instruct the General Manager to tender an offer to settle the violation or to institute a civil suit in the appropriate court to seek civil penalties, injunctive relief, and costs of court and expert witnesses, damages, and attorneys' fees.

I. Minor Violations

The following acts each constitute a minor violation:

1. Failure to timely file a registration on a new well that qualifies for an exemption under Rule 2.1.
2. Failure to conduct a meter reading within the required period.
3. Failure to timely notify District regarding change of ownership.
4. Failure to timely file a Well Report.
5. Failure to timely submit required documentation reflecting alterations or increased production.
6. Operating a meter that is not accurately calibrated.
7. Drilling an exempt or non-exempt well with an expired well registration.

CIVIL PENALTY SCHEDULE FOR MINOR VIOLATIONS

First Violation:

\$100.00

Second Violation: \$200.00

Third Violation: Major Violation

A second violation shall be any minor violation within 3 years of the first minor violation. A third violation shall be any minor violation following the second minor violation within 5 years of the first minor violation. Each day of a continuing violation constitutes a separate violation.

II. Major Violations

The following acts each constitute a major violation:

1. Failure to register a well or amend the registration of a well not exempt under Rule 2.1 where mandated by rules, including drilling, equipping, completing, altering, or operating a well without a compliant and approved registration.
2. Failure to timely meter a well when required.
3. Failure to submit accurate Water Production Report within 60 days of the date the fees are due.
4. Failure to submit accurate Groundwater Transport Report within the required period.
5. Drilling a well in a different location than authorized or in violation of spacing requirements.*
6. Failure to close or cap an open or uncovered well.
7. Failure to submit Water Use Fees within 60 days of the date the fees are due.**
8. Failure to timely submit Groundwater Transport Fees within 60 days of the date the fees are due.**
9. Committing waste.
10. Tampering with or disabling a required meter or tampering with a District seal.

CIVIL PENALTY SCHEDULE FOR MAJOR VIOLATIONS

First Violation:	\$500.00
Second Violation:	\$1,000.00
Third Violation:	Civil Suit for injunction, damages, and escalated penalties

A second violation shall be any major violation within 3 years of the first major violation of the same level. A third violation shall be any major violation following the second major violation within 5 years of the first major violation. Each day of a continuing violation constitutes a separate violation.

* In addition to the applicable penalty provided for in the Civil Penalty Schedule for Major Violations, persons who drill a well in violation of applicable spacing requirements may be required to plug the well.

** In addition to the applicable penalty provided for in the Civil Penalty Schedule for Major Violations, persons who do not submit all Water Use Fees and Groundwater Transport Fees due and owing within 60 days of the date the fees are due pursuant to Rule 7.3(a) will be assessed a civil penalty equal to three times the total amount of outstanding Water Use Fees that are due and owing.

III. Water Well Construction and Completion Requirements

Failure to use approved construction materials: \$500.00 and total costs of remediation, with costs of remediation of well to be borne by the well owner.

Failure to properly cement annular space: \$1,000.00 and total costs of remediation, with costs of remediation to be borne by well owner.

In addition to the civil penalties provided for in this schedule, persons who drill a well in violation of applicable spacing or completion requirements may be required to recomplete or reconstruct the well in accordance with the District's rules, or may be ordered to plug the well.

IV. Other Violations of District Rules Not Specifically Listed Herein

Any violation of a District Rule not specifically set forth herein shall be presented to the Board of Directors for a determination of whether the violation is Minor or Major, based upon the severity of the violation and the particular facts and issues involved, whereupon the procedures and the appropriate civil penalty amount set forth herein for Minor and Major Violations shall apply to the violation.

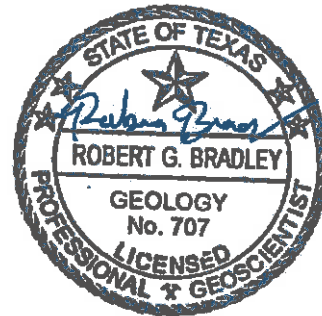
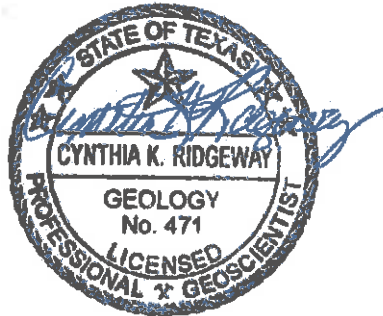
APPENDIX E

GAM Runs

GAM Run 10-063 MAG

by Mr. Wade Oliver and Mr. Robert G. Bradley, P.G.

Texas Water Development Board
Groundwater Availability Modeling Section
(512) 463-3132
December 14, 2011



Cynthia K. Ridgeway, the Manager of the Groundwater Availability Modeling Section and Interim Director of the Groundwater Resources Division, is responsible for oversight of work performed by employees under her direct supervision. The seal appearing on this document was authorized by Cynthia K. Ridgeway, P.G. 471 on December 14, 2011.

Robert G. Bradley, P.G. is responsible for the water budget approach for Comanche and Erath counties within Middle Trinity Groundwater Conservation District. The seal appearing on this document was authorized by Robert G. Bradley, P.G. 707 on December 14, 2011.

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EXECUTIVE SUMMARY:

In response to receiving the adopted desired future conditions for the Trinity Aquifer in Groundwater Management Area 8, the Texas Water Development Board completed Groundwater Availability Model (GAM) Run 08-84mag, which reported the “managed available groundwater” that achieves the adopted desired future conditions. Subsequent to the release of GAM Run 08-84mag, the Middle Trinity Groundwater Conservation District requested that the Texas Water Development Board reevaluate the “managed available groundwater” for Comanche and Erath counties. This resulted in the completion of Aquifer Assessment 09-07, which addressed these counties. In April 2011, the groundwater conservation districts in Groundwater Management Area 8 readopted the desired future conditions for the Trinity Aquifer previously adopted in September 2008.

This report, an update to GAM Run 08-84mag and Aquifer Assessment 09-07, incorporates the changes above and addresses the readopted desired future conditions. In addition, the pumping estimates previously reported as “managed available groundwater” in the above reports are reported here as “modeled available groundwater” to reflect changes in statute effective September 1, 2011. The modeled available groundwater for the Trinity Aquifer as a result of the desired future conditions adopted by the members of Groundwater Management Area 8 is approximately 261,000 acre-feet per year.

REQUESTOR:

Mr. Eddy Daniel of North Texas Groundwater Conservation District on behalf of Groundwater Management Area 8

DESCRIPTION OF REQUEST:

In a letter dated August 31, 2011, Mr. Eddy Daniel provided the Texas Water Development Board (TWDB) with the desired future conditions of the Trinity Aquifer adopted in a resolution, dated April 27, 2011, by the members of Groundwater Management Area 8. This resolution referenced the desired future conditions previously adopted for the aquifer on September 17, 2008 by the groundwater conservation districts within Groundwater Management Area 8. These are summarized in Table 1.

In response to receiving the initially adopted desired future conditions from September 2008, the Texas Water Development Board completed Groundwater Availability Model (GAM) Run 08-84mag, which reported the “managed available groundwater” that achieves the above desired future conditions (Wade, 2009). On June 12, 2009, the general manager and consultants for the Middle Trinity Groundwater Conservation District met with Texas Water Development Board staff to discuss issues they had concerning GAM Run 08-84mag. After discussion, staff reevaluated pumping estimates using a water-budget approach based on the desired future conditions for Comanche and Erath counties and released this analysis as Aquifer Assessment 09-07 on November 22, 2010 (Bradley, 2010). This report, an update to GAM Run 08-84mag and Aquifer Assessment 09-07, incorporates the two changes above. In addition, the pumping estimates previously reported as “managed available groundwater” in the above reports are

reported here as “modeled available groundwater” to reflect changes in statute effective September 1, 2011.

METHODS:

Groundwater Management Area 8 contains the Trinity Aquifer, a major aquifer in Texas as defined in the 2007 State Water Plan (TWDB, 2007). The location of Groundwater Management Area 8, the Trinity Aquifer, and the groundwater availability model cells that represent the aquifer are shown in Figure 1.

Modeled Available Groundwater and Permitting

As defined in Chapter 36 of the Texas Water Code, “modeled available groundwater” is the estimated average amount of water that may be produced annually to achieve a desired future condition. This is distinct from “managed available groundwater,” shown in the draft version of this report dated December 20, 2010, which was a permitting value and accounted for the estimated use of the aquifer exempt from permitting. This change was made to reflect changes in statute by the 82nd Texas Legislature, effective September 1, 2011.

Groundwater conservation districts are required to consider modeled available groundwater, along with several other factors, when issuing permits in order to manage groundwater production to achieve the desired future condition(s). The other factors districts must consider include annual precipitation and production patterns, the estimated amount of pumping exempt from permitting, existing permits, and a reasonable estimate of actual groundwater production under existing permits. The estimated amount of pumping exempt from permitting, which the Texas Water Development Board is now required to develop after soliciting input from applicable groundwater conservation districts, will be provided in a separate report.

PARAMETERS AND ASSUMPTIONS:

The groundwater availability model for the northern portion of the Trinity Aquifer was used for the results presented in this report outside of Comanche and Erath counties. In those counties, a water budget approach was used. The parameters and assumptions for developing the modeled available groundwater are described below:

Groundwater Availability Model for the Northern Portion of the Trinity Aquifer

- The results for modeled available groundwater presented here are based on the results reported as “managed available groundwater” in GAM Run 08-84mag (Wade, 2009) for all areas except Comanche and Erath counties. See GAM Run 08-84mag for a full description of the methods and assumptions associated with the model simulation. Because GAM Run 08-84mag presented constant pumping from 2000 to 2050, it was assumed for the purposes of this analysis that pumping from 2051 to 2060 was also constant at the same level. As summarized in Table 1, desired future conditions were defined by the groundwater conservation districts in Groundwater Management Area 8 for 2050. It is expected that pumping from 2051 to 2060 would cause additional

drawdown, but this analysis does not estimate drawdown in 2060. Pumping estimates for 2060 were important to include for purposes of regional water planning.

- Version 1.01 of the groundwater availability model for the northern portion of the Trinity Aquifer was used for this analysis. See Bené and others (2004) for assumptions and limitations of the model.
- The model includes seven layers which generally correspond to the Woodbine Aquifer (Layer 1), the Washita and Fredericksburg Groups (Layer 2), the Paluxy Formation (Layer 3), the Glen Rose Formation (Layer 4), the Hensell Formation (Layer 5), the Pearsall/Cow Creek/Hammitt/Sligo Members (Layer 6), and the Hosston Formation (Layer 7).
- The mean absolute error (a measure of the difference between simulated and measured water levels during model calibration) for the four main aquifers in the model (Woodbine, Paluxy, Hensell, and Hosston) for the calibration and verification time periods (1980 to 2000) ranged from approximately 38 to 75 feet. The root mean squared error was less than ten percent of the maximum change in water levels across the model (Bené and others, 2004).
- Average annual recharge conditions based on climate data from 1980 to 1999 were assumed for the first 47 years of the simulation. The last three years of the simulation drought-of-record recharge conditions were assumed, which were defined as the years 1954 to 1956.
- Groundwater conservation district boundaries were updated since the release of GAM Run 08-84mag. The results presented here correspond to the official district boundaries as of the date of this report.

Water Budget Approach for Comanche and Erath Counties

- The modeled available groundwater presented for Comanche and Erath counties is based on Aquifer Assessment 09-07 (Bradley, 2010). See Aquifer Assessment 09-07 for a full description of the methods and assumptions associated with the water budget calculations.
- The Hensell and Hosston members were grouped as the Twin Mountains Formation in Aquifer Assessment 09-07. To be consistent with the desired future conditions, however, it was necessary to split the pumping in Aquifer Assessment 09-07 into the Hensell and Hosston members. In Comanche County, 10 percent of the pumping in the Twin Mountains Formation was assigned to the Hensell member while 90 percent was assigned to the Hosston. In Erath County, 35 percent of the pumping in Aquifer Assessment 09-07 was assigned to the Hensell with the remaining 65 percent assigned to the Hosston. These percentages were developed after a preliminary review of available pumping information and discussion with Joe Cooper of Middle Trinity Groundwater Conservation District.

RESULTS:

The modeled available groundwater for the Trinity Aquifer in Groundwater Management Area 8 as a result of the desired future conditions is approximately 261,000 acre-feet per year between 2010 and 2060. This pumping has been divided by county, regional water planning area, and river basin for each decade between 2010 and 2060 for use in the regional water planning process (Table 2). These areas are shown in Figure 2.

Since the desired future conditions are specified for individual units of the Trinity Aquifer (Paluxy, Glen Rose, Hensell, and Hosston) based on the layering used in the model, the modeled available groundwater is shown for each unit in the subsequent tables. Tables 3, 4, 5, and 6 show the modeled available groundwater summarized by county in the Paluxy, Glen Rose, Hensell, and Hosston units of the Trinity Aquifer, respectively. Tables 7, 8, 9, and 10 show the modeled available groundwater summarized by regional water planning area for the same units, respectively. Tables 11, 12, 13, and 14 show the modeled available groundwater summarized by river basin for each of the above units, respectively. The modeled available groundwater summarized by groundwater conservation district is shown for the Paluxy, Glen Rose, Hensell, and Hosston units in tables 15, 16, 17, and 18, respectively. Notice that the pumping is totaled both excluding and including areas outside of a groundwater conservation district.

LIMITATIONS:

The groundwater model used in developing estimates of modeled available groundwater is the best available scientific tool that can be used to estimate the pumping that will achieve the desired future conditions. Although the groundwater model used in this analysis is the best available scientific tool for this purpose, it, like all models, has limitations. 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 develop estimates of modeled available groundwater is the need to make assumptions about the location in the aquifer where future pumping will occur. As actual pumping changes in the future, it will be necessary to evaluate the amount of that pumping as well as its location in the context of the assumptions associated with this analysis. Evaluating the amount and location of future pumping is as important as evaluating the changes in groundwater levels, spring flows, and other metrics that describe the condition of the groundwater resources in the area that relate to the adopted desired future condition(s).

Given these limitations, users of this information are cautioned that the modeled available groundwater numbers should not be considered a definitive, permanent description of the amount

of groundwater that can be pumped to meet the adopted desired future condition. 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 future groundwater pumping as well as whether or not they are achieving their desired future conditions. Because of the limitations of the model and the assumptions in this analysis, it is important that the groundwater conservation districts work with the TWDB to refine the modeled available groundwater numbers given the reality of how the aquifer responds to the actual amount and location of pumping now and in the future.

REFERENCES:

- Bené, J., Harden, B., O'Rourke, D., Donnelly, A., and Yelderman, J., 2004, Northern Trinity/Woodbine Groundwater Availability Model: contract report to the Texas Water Development Board by R.W. Harden and Associates, 391 p.
- Bradley, R.G., 2010, GTA Aquifer Assessment 09-07: Texas Water Development Board, GTA Aquifer Assessment 09-07 Report, 19 p.
- National Research Council, 2007, Models in Environmental Regulatory Decision Making. Committee on Models in the Regulatory Decision Process, National Academies Press, Washington D.C., 287 p.
- Texas Water Development Board, 2007, Water for Texas -- 2007---Volumes I-III; Texas Water Development Board Document No. GP-8-1, 392 p.
- Wade, S., 2009, GAM Run 08-84mag, Texas Water Development Board GAM Run 08-84mag Report, 37 p.

Table 1. Desired future conditions (in feet of drawdown) for each unit of the Trinity Aquifer adopted by members of Groundwater Management Area 8.

County	Average water level decrease (feet)			
	Paluxy	Glen Rose	Hensell	Hosston
Bell	134	155	286	319
Bosque	26	33	201	220
Brown	0	0	1	1
Burnet	1	1	11	29
Callahan	n/a	n/a	0	2
Collin	298	247	224	236
Comanche	0	0	2	11
Cooke	26	42	60	78
Coryell	15	15	156	179
Dallas	240	224	263	290
Delta	175	162	162	159
Denton	98	134	180	214
Eastland	0	0	0	0
Ellis	265	283	336	362
Erath	1	1	11	27
Falls	279	354	459	480
Fannin	212	196	182	181
Grayson	175	161	160	165
Hamilton	0	2	39	51
Hill	209	253	381	406
Hood	1	2	16	56
Hunt	286	245	215	223
Johnson	37	83	208	234
Kaufman	303	286	295	312
Lamar	132	130	136	134
Lampasas	0	1	12	23
Limestone	328	392	475	492
McLennan	251	291	489	527
Milam	252	294	337	344
Mills	0	0	3	12
Montague	0	1	3	12
Navarro	344	353	399	413
Parker	5	6	16	40
Red River	82	77	78	78
Rockwall	346	272	248	265
Somervell	1	4	53	113
Tarrant	33	75	160	173
Taylor	n/a	n/a	n/a	3
Travis	124	61	98	116
Williamson	108	88	142	166
Wise	4	14	23	53

Table 2. Modeled available groundwater in acre-feet for the Trinity Aquifer in Groundwater Management Area 8 by county, regional water planning area, and river basin.

County	Regional Water Planning Area	Basin	Year					
			2010	2020	2030	2040	2050	2060
Bell	G	Brazos	7,068	7,068	7,068	7,068	7,068	7,068
Bosque	G	Brazos	5,849	5,849	5,849	5,849	5,849	5,849
Brown	F	Brazos	28	28	28	28	28	28
		Colorado	2,017	2,017	2,017	2,017	2,017	2,017
Burnet	K	Brazos	2,723	2,723	2,723	2,723	2,723	2,723
		Colorado	823	823	823	823	823	823
Callahan	G	Brazos	1,792	1,792	1,792	1,792	1,792	1,792
		Colorado	1,985	1,985	1,985	1,985	1,985	1,985
Collin	C	Sabine	0	0	0	0	0	0
		Trinity	2,104	2,104	2,104	2,104	2,104	2,104
Comanche	G	Brazos	32,115	32,115	32,115	32,115	32,115	32,115
		Colorado	120	120	120	120	120	120
Cooke	C	Red	1,284	1,284	1,284	1,284	1,284	1,284
		Trinity	5,566	5,566	5,566	5,566	5,566	5,566
Coryell	G	Brazos	3,716	3,716	3,716	3,716	3,716	3,716
Dallas	C	Trinity	5,458	5,458	5,458	5,458	5,458	5,458
Delta	D	Sulphur	362	362	362	362	362	362
Denton	C	Trinity	19,333	19,333	19,333	19,333	19,333	19,333
Eastland	G	Brazos	4,489	4,489	4,489	4,489	4,489	4,489
		Colorado	231	231	231	231	231	231
Ellis	C	Trinity	3,959	3,959	3,959	3,959	3,959	3,959
Erath	G	Brazos	32,926	32,926	32,926	32,926	32,926	32,926
Falls	G	Brazos	169	169	169	169	169	169
Fannin	C	Red	617	617	617	617	617	617
		Sulphur	0	0	0	0	0	0
		Trinity	83	83	83	83	83	83
Franklin	D	Sulphur	0	0	0	0	0	0
Grayson	C	Red	7,722	7,722	7,722	7,722	7,722	7,722
		Trinity	1,678	1,678	1,678	1,678	1,678	1,678
Hamilton	G	Brazos	2,144	2,144	2,144	2,144	2,144	2,144
Hill	G	Brazos	3,086	3,086	3,086	3,086	3,086	3,086
		Trinity	61	61	61	61	61	61
Hood	G	Brazos	11,081	11,081	11,081	11,081	11,081	11,081
		Trinity	64	64	64	64	64	64
Hunt	D	Sabine	0	0	0	0	0	0
		Sulphur	0	0	0	0	0	0
		Trinity	551	551	551	551	551	551
Johnson	G	Brazos	4,940	4,940	4,940	4,940	4,940	4,940
		Trinity	7,931	7,931	7,931	7,931	7,931	7,931
Kaufman	C	Sabine	45	45	45	45	45	45
		Trinity	1,136	1,136	1,136	1,136	1,136	1,136

Table 2. Continued.

County	Regional Water Planning Area	Basin	Year					
			2010	2020	2030	2040	2050	2060
Lamar	D	Red	1,320	1,320	1,320	1,320	1,320	1,320
		Sulphur	2	2	2	2	2	2
Lampasas	G	Brazos	2,925	2,925	2,925	2,925	2,925	2,925
		Colorado	192	192	192	192	192	192
Limestone	G	Brazos	69	69	69	69	69	69
		Trinity	0	0	0	0	0	0
McLennan	G	Brazos	20,690	20,690	20,690	20,690	20,690	20,690
Milam	G	Brazos	288	288	288	288	288	288
Mills	K	Brazos	1,273	1,273	1,273	1,273	1,273	1,273
		Colorado	1,128	1,128	1,128	1,128	1,128	1,128
Montague	B	Brazos	0	0	0	0	0	0
		Red	129	129	129	129	129	129
		Trinity	2,545	2,545	2,545	2,545	2,545	2,545
Navarro	C	Trinity	1,873	1,873	1,873	1,873	1,873	1,873
Parker	C	Brazos	2,799	2,799	2,799	2,799	2,799	2,799
		Trinity	12,449	12,449	12,449	12,449	12,449	12,449
Red River	D	Red	263	263	263	263	263	263
		Sulphur	267	267	267	267	267	267
Rockwall	C	Sabine	0	0	0	0	0	0
		Trinity	958	958	958	958	958	958
Somervell	G	Brazos	2,485	2,485	2,485	2,485	2,485	2,485
Tarrant	C	Trinity	18,747	18,747	18,747	18,747	18,747	18,747
Taylor	G	Brazos	153	153	153	153	153	153
		Colorado	278	278	278	278	278	278
Travis	K	Brazos	8	8	8	8	8	8
		Colorado	3,882	3,882	3,882	3,882	3,882	3,882
Williamson	G	Brazos	1,514	1,514	1,514	1,514	1,514	1,514
		Colorado	68	68	68	68	68	68
	K	Brazos	157	157	157	157	157	157
		Colorado	61	61	61	61	61	61
Wise	C	Trinity	9,282	9,282	9,282	9,282	9,282	9,282
Total			261,061	261,061	261,061	261,061	261,061	261,061

Table 3. Modeled available groundwater for the Paluxy unit of the Trinity Aquifer summarized by county in Groundwater Management Area 8 for each decade between 2010 and 2060. Results are in acre-feet per year.

County	Year					
	2010	2020	2030	2040	2050	2060
Bell	96	96	96	96	96	96
Bosque	1,013	1,013	1,013	1,013	1,013	1,013
Brown	18	18	18	18	18	18
Burnet	182	182	182	182	182	182
Collin	1,762	1,762	1,762	1,762	1,762	1,762
Comanche	2,292	2,292	2,292	2,292	2,292	2,292
Cooke	3,528	3,528	3,528	3,528	3,528	3,528
Coryell	254	254	254	254	254	254
Dallas	433	433	433	433	433	433
Delta	0	0	0	0	0	0
Denton	9,822	9,822	9,822	9,822	9,822	9,822
Eastland	4	4	4	4	4	4
Ellis	400	400	400	400	400	400
Erath	13,614	13,614	13,614	13,614	13,614	13,614
Falls	0	0	0	0	0	0
Fannin	288	288	288	288	288	288
Grayson	4,708	4,708	4,708	4,708	4,708	4,708
Hamilton	291	291	291	291	291	291
Hill	1,254	1,254	1,254	1,254	1,254	1,254
Hood	942	942	942	942	942	942
Hunt	551	551	551	551	551	551
Johnson	9,493	9,493	9,493	9,493	9,493	9,493
Kaufman	102	102	102	102	102	102
Lamar	0	0	0	0	0	0
Lampasas	13	13	13	13	13	13
Limestone	0	0	0	0	0	0
McLennan	231	231	231	231	231	231
Milam	0	0	0	0	0	0
Mills	5	5	5	5	5	5
Montague	505	505	505	505	505	505
Navarro	413	413	413	413	413	413
Parker	9,800	9,800	9,800	9,800	9,800	9,800
Red River	473	473	473	473	473	473
Rockwall	958	958	958	958	958	958
Somervell	120	120	120	120	120	120
Tarrant	10,544	10,544	10,544	10,544	10,544	10,544
Travis	3	3	3	3	3	3
Williamson	11	11	11	11	11	11
Wise	2,559	2,559	2,559	2,559	2,559	2,559
Total	76,682	76,682	76,682	76,682	76,682	76,682

Table 4. Modeled available groundwater for the Glen Rose unit of the Trinity Aquifer summarized by county in Groundwater Management Area 8 for each decade between 2010 and 2060. Results are in acre-feet per year.

County	Year					
	2010	2020	2030	2040	2050	2060
Bell	880	880	880	880	880	880
Bosque	258	258	258	258	258	258
Brown	0	0	0	0	0	0
Burnet	205	205	205	205	205	205
Collin	0	0	0	0	0	0
Cornanche	0	0	0	0	0	0
Cooke	0	0	0	0	0	0
Coryell	784	784	784	784	784	784
Dallas	0	0	0	0	0	0
Delta	0	0	0	0	0	0
Denton	0	0	0	0	0	0
Eastland	0	0	0	0	0	0
Ellis	0	0	0	0	0	0
Erath	41	41	41	41	41	41
Falls	2	2	2	2	2	2
Fannin	0	0	0	0	0	0
Franklin	0	0	0	0	0	0
Grayson	0	0	0	0	0	0
Hamilton	46	46	46	46	46	46
Hill	10	10	10	10	10	10
Hood	4	4	4	4	4	4
Hunt	0	0	0	0	0	0
Johnson	24	24	24	24	24	24
Kaufman	0	0	0	0	0	0
Lamar	0	0	0	0	0	0
Lampasas	773	773	773	773	773	773
Limestone	4	4	4	4	4	4
McLennan	265	265	265	265	265	265
Milam	149	149	149	149	149	149
Mills	66	66	66	66	66	66
Montague	0	0	0	0	0	0
Navarro	0	0	0	0	0	0
Parker	192	192	192	192	192	192
Red River	0	0	0	0	0	0
Rockwall	0	0	0	0	0	0
Somervell	134	134	134	134	134	134
Tarrant	112	112	112	112	112	112
Travis	2,612	2,612	2,612	2,612	2,612	2,612
Williamson	760	760	760	760	760	760
Wise	5	5	5	5	5	5
Total	7,326	7,326	7,326	7,326	7,326	7,326

Table 5. Modeled available groundwater for the Hensell unit of the Trinity Aquifer summarized by county in Groundwater Management Area 8 for each decade between 2010 and 2060. Results are in acre-feet per year.

County	Year					
	2010	2020	2030	2040	2050	2060
Bell	1,099	1,099	1,099	1,099	1,099	1,099
Bosque	1,749	1,749	1,749	1,749	1,749	1,749
Brown	79	79	79	79	79	79
Burnet	690	690	690	690	690	690
Callahan	123	123	123	123	123	123
Collin	103	103	103	103	103	103
Comanche	2,995	2,995	2,995	2,995	2,995	2,995
Cooke	1,611	1,611	1,611	1,611	1,611	1,611
Coryell	1,765	1,765	1,765	1,765	1,765	1,765
Dallas	1,121	1,121	1,121	1,121	1,121	1,121
Delta	181	181	181	181	181	181
Denton	3,112	3,112	3,112	3,112	3,112	3,112
Eastland	79	79	79	79	79	79
Ellis	1,142	1,142	1,142	1,142	1,142	1,142
Erath	6,745	6,745	6,745	6,745	6,745	6,745
Falls	22	22	22	22	22	22
Fannin	203	203	203	203	203	203
Grayson	2,345	2,345	2,345	2,345	2,345	2,345
Hamilton	1,109	1,109	1,109	1,109	1,109	1,109
Hill	933	933	933	933	933	933
Hood	3,595	3,595	3,595	3,595	3,595	3,595
Hunt	0	0	0	0	0	0
Johnson	1,065	1,065	1,065	1,065	1,065	1,065
Kaufman	240	240	240	240	240	240
Lamar	661	661	661	661	661	661
Lampasas	885	885	885	885	885	885
Limestone	15	15	15	15	15	15
McLennan	4,190	4,190	4,190	4,190	4,190	4,190
Milam	36	36	36	36	36	36
Mills	946	946	946	946	946	946
Montague	362	362	362	362	362	362
Navarro	256	256	256	256	256	256
Parker	1,441	1,441	1,441	1,441	1,441	1,441
Red River	19	19	19	19	19	19
Rockwall	0	0	0	0	0	0
Somervell	741	741	741	741	741	741
Tarrant	2,535	2,535	2,535	2,535	2,535	2,535
Travis	156	156	156	156	156	156
Williamson	415	415	415	415	415	415
Wise	1,480	1,480	1,480	1,480	1,480	1,480
Total	46,244	46,244	46,244	46,244	46,244	46,244

Table 6. Modeled available groundwater for the Hosston unit of the Trinity Aquifer summarized by county in Groundwater Management Area 8 for each decade between 2010 and 2060. Results are in acre-feet per year.

County	Year					
	2010	2020	2030	2040	2050	2060
Bell	4,993	4,993	4,993	4,993	4,993	4,993
Bosque	2,829	2,829	2,829	2,829	2,829	2,829
Brown	1,948	1,948	1,948	1,948	1,948	1,948
Burnet	2,469	2,469	2,469	2,469	2,469	2,469
Callahan	3,654	3,654	3,654	3,654	3,654	3,654
Collin	239	239	239	239	239	239
Cornanche	26,948	26,948	26,948	26,948	26,948	26,948
Cooke	1,711	1,711	1,711	1,711	1,711	1,711
Coryell	913	913	913	913	913	913
Dallas	3,904	3,904	3,904	3,904	3,904	3,904
Delta	181	181	181	181	181	181
Denton	6,399	6,399	6,399	6,399	6,399	6,399
Eastland	4,637	4,637	4,637	4,637	4,637	4,637
Ellis	2,417	2,417	2,417	2,417	2,417	2,417
Erath	12,526	12,526	12,526	12,526	12,526	12,526
Falls	145	145	145	145	145	145
Fannin	209	209	209	209	209	209
Franklin	0	0	0	0	0	0
Grayson	2,347	2,347	2,347	2,347	2,347	2,347
Hamilton	698	698	698	698	698	698
Hill	950	950	950	950	950	950
Hood	6,604	6,604	6,604	6,604	6,604	6,604
Hunt	0	0	0	0	0	0
Johnson	2,289	2,289	2,289	2,289	2,289	2,289
Kaufman	839	839	839	839	839	839
Lamar	661	661	661	661	661	661
Lampasas	1,446	1,446	1,446	1,446	1,446	1,446
Limestone	50	50	50	50	50	50
McLennan	16,004	16,004	16,004	16,004	16,004	16,004
Milam	103	103	103	103	103	103
Mills	1,384	1,384	1,384	1,384	1,384	1,384
Montague	1,807	1,807	1,807	1,807	1,807	1,807
Navarro	1,204	1,204	1,204	1,204	1,204	1,204
Parker	3,815	3,815	3,815	3,815	3,815	3,815
Red River	38	38	38	38	38	38
Rockwall	0	0	0	0	0	0
Somervell	1,490	1,490	1,490	1,490	1,490	1,490
Tarrant	5,556	5,556	5,556	5,556	5,556	5,556
Taylor	431	431	431	431	431	431
Travis	1,119	1,119	1,119	1,119	1,119	1,119
Williamson	614	614	614	614	614	614
Wise	5,238	5,238	5,238	5,238	5,238	5,238
Total	130,809	130,809	130,809	130,809	130,809	130,809

Table 7. Modeled available groundwater for the Paluxy unit of the Trinity Aquifer summarized by regional water planning area in Groundwater Management Area 8 for each decade between 2010 and 2060. Results are in acre-feet per year.

Regional Water Planning Area	Year					
	2010	2020	2030	2040	2050	2060
B	505	505	505	505	505	505
C	45,317	45,317	45,317	45,317	45,317	45,317
D	1,024	1,024	1,024	1,024	1,024	1,024
F	18	18	18	18	18	18
G	29,628	29,628	29,628	29,628	29,628	29,628
K	190	190	190	190	190	190
Total	76,682	76,682	76,682	76,682	76,682	76,682

Table 8. Modeled available groundwater for the Glen Rose unit of the Trinity Aquifer summarized by regional water planning area in Groundwater Management Area 8 for each decade between 2010 and 2060. Results are in acre-feet per year.

Regional Water Planning Area	Year					
	2010	2020	2030	2040	2050	2060
B	0	0	0	0	0	0
C	309	309	309	309	309	309
D	0	0	0	0	0	0
F	0	0	0	0	0	0
G	4,016	4,016	4,016	4,016	4,016	4,016
K	3,001	3,001	3,001	3,001	3,001	3,001
Total	7,326	7,326	7,326	7,326	7,326	7,326

Table 9. Modeled available groundwater for the Hensell unit of the Trinity Aquifer summarized by regional water planning area in Groundwater Management Area 12 for each decade between 2010 and 2060. Results are in acre-feet per year.

Regional Water Planning Area	Year					
	2010	2020	2030	2040	2050	2060
B	362	362	362	362	362	362
C	15,589	15,589	15,589	15,589	15,589	15,589
D	861	861	861	861	861	861
F	79	79	79	79	79	79
G	27,514	27,514	27,514	27,514	27,514	27,514
K	1,839	1,839	1,839	1,839	1,839	1,839
Total	46,244	46,244	46,244	46,244	46,244	46,244

Table 10. Modeled available groundwater for the Hosston unit of the Trinity Aquifer summarized by regional water planning area in Groundwater Management Area 8 for each decade between 2010 and 2060. Results are in acre-feet per year.

Regional Water Planning Area	Year					
	2010	2020	2030	2040	2050	2060
B	1,807	1,807	1,807	1,807	1,807	1,807
C	33,878	33,878	33,878	33,878	33,878	33,878
D	880	880	880	880	880	880
F	1,948	1,948	1,948	1,948	1,948	1,948
G	87,271	87,271	87,271	87,271	87,271	87,271
K	5,025	5,025	5,025	5,025	5,025	5,025
Total	130,809	130,809	130,809	130,809	130,809	130,809

Table 11. Modeled available groundwater for the Paluxy unit of the Trinity Aquifer summarized by river basin in Groundwater Management Area 8 for each decade between 2010 and 2060. Results are in acre-feet per year.

River Basin	Year					
	2010	2020	2030	2040	2050	2060
Brazos	23,223	23,223	23,223	23,223	23,223	23,223
Colorado	193	193	193	193	193	193
Red	4,943	4,943	4,943	4,943	4,943	4,943
Sabine	4	4	4	4	4	4
Sulphur	267	267	267	267	267	267
Trinity	48,052	48,052	48,052	48,052	48,052	48,052
Total	76,682	76,682	76,682	76,682	76,682	76,682

Table 12. Modeled available groundwater for the Glen Rose unit of the Trinity Aquifer summarized by river basin in Groundwater Management Area 8 for each decade between 2010 and 2060. Results are in acre-feet per year.

River Basin	Year					
	2010	2020	2030	2040	2050	2060
Brazos	4,263	4,263	4,263	4,263	4,263	4,263
Colorado	2,753	2,753	2,753	2,753	2,753	2,753
Red	0	0	0	0	0	0
Sabine	0	0	0	0	0	0
Sulphur	0	0	0	0	0	0
Trinity	310	310	310	310	310	310
Total	7,326	7,326	7,326	7,326	7,326	7,326

Table 13. Modeled available groundwater for the Hensell unit of the Trinity Aquifer summarized by river basin in Groundwater Management Area 8 for each decade between 2010 and 2060. Results are in acre-feet per year.

River Basin	Year					
	2010	2020	2030	2040	2050	2060
Brazos	29,030	29,030	29,030	29,030	29,030	29,030
Colorado	585	585	585	585	585	585
Red	3,129	3,129	3,129	3,129	3,129	3,129
Sabine	9	9	9	9	9	9
Sulphur	182	182	182	182	182	182
Trinity	13,309	13,309	13,309	13,309	13,309	13,309
Total	46,244	46,244	46,244	46,244	46,244	46,244

Table 14. Modeled available groundwater for the Hosston unit of the Trinity Aquifer summarized by river basin in Groundwater Management Area 8 for each decade between 2010 and 2060. Results are in acre-feet per year.

River Basin	Year					
	2010	2020	2030	2040	2050	2060
Brazos	87,971	87,971	87,971	87,971	87,971	87,971
Colorado	7,254	7,254	7,254	7,254	7,254	7,254
Red	3,263	3,263	3,263	3,263	3,263	3,263
Sabine	32	32	32	32	32	32
Sulphur	182	182	182	182	182	182
Trinity	32,107	32,107	32,107	32,107	32,107	32,107
Total	130,809	130,809	130,809	130,809	130,809	130,809

Table 15. Modeled available groundwater for the Paluxy unit of the Trinity Aquifer summarized by groundwater conservation district (GCD) in Groundwater Management Area 8 for each decade between 2010 and 2060. Results are in acre-feet per year. UWCD refers to Underground Water Conservation District. WD refers to Water District.

Groundwater Conservation District	Year					
	2010	2020	2030	2040	2050	2060
Central Texas GCD	182	182	182	182	182	182
Clearwater UWCD	96	96	96	96	96	96
Fox Crossing WD	5	5	5	5	5	5
Middle Trinity GCD	17,173	17,173	17,173	17,173	17,173	17,173
North Texas GCD	15,112	15,112	15,112	15,112	15,112	15,112
Northern Trinity GCD	10,544	10,544	10,544	10,544	10,544	10,544
Post Oak Savannah GCD	0	0	0	0	0	0
Prairielands GCD	11,267	11,267	11,267	11,267	11,267	11,267
Red River GCD	4,996	4,996	4,996	4,996	4,996	4,996
Saratoga UWCD	13	13	13	13	13	13
Southern Trinity GCD	231	231	231	231	231	231
Upper Trinity GCD	13,806	13,806	13,806	13,806	13,806	13,806
Total (excluding non-district areas)	73,425	73,425	73,425	73,425	73,425	73,425
No District	3,257	3,257	3,257	3,257	3,257	3,257
Total (including non-district areas)	76,682	76,682	76,682	76,682	76,682	76,682

Table 16. Modeled available groundwater for the Glen Rose unit of the Trinity Aquifer summarized by groundwater conservation district (GCD) in Groundwater Management Area 8 for each decade between 2010 and 2060. Results are in acre-feet per year. UWCD refers to Underground Water Conservation District. WD refers to Water District.

Groundwater Conservation District	Year					
	2010	2020	2030	2040	2050	2060
Central Texas GCD	205	205	205	205	205	205
Clearwater UWCD	880	880	880	880	880	880
Fox Crossing WD	66	66	66	66	66	66
Middle Trinity GCD	1,083	1,083	1,083	1,083	1,083	1,083
North Texas GCD	0	0	0	0	0	0
Northern Trinity GCD	112	112	112	112	112	112
Post Oak Savannah GCD	149	149	149	149	149	149
Prairielands GCD	168	168	168	168	168	168
Red River GCD	0	0	0	0	0	0
Saratoga UWCD	773	773	773	773	773	773
Southern Trinity GCD	265	265	265	265	265	265
Upper Trinity GCD	201	201	201	201	201	201
Total (excluding non-district areas)	3,902	3,902	3,902	3,902	3,902	3,902
No District	3,424	3,424	3,424	3,424	3,424	3,424
Total (including non-district areas)	7,326	7,326	7,326	7,326	7,326	7,326

Table 17. Modeled available groundwater for the Hensell unit of the Trinity Aquifer summarized by groundwater conservation district (GCD) in Groundwater Management Area 8 for each decade between 2010 and 2060. Results are in acre-feet per year. UWCD refers to Underground Water Conservation District. WD refers to Water District.

Groundwater Conservation District	Year					
	2010	2020	2030	2040	2050	2060
Central Texas GCD	690	690	690	690	690	690
Clearwater UWCD	1,099	1,099	1,099	1,099	1,099	1,099
Fox Crossing WD	946	946	946	946	946	946
Middle Trinity GCD	13,254	13,254	13,254	13,254	13,254	13,254
North Texas GCD	4,826	4,826	4,826	4,826	4,826	4,826
Northern Trinity GCD	2,535	2,535	2,535	2,535	2,535	2,535
Post Oak Savannah GCD	36	36	36	36	36	36
Prairielands GCD	3,881	3,881	3,881	3,881	3,881	3,881
Red River GCD	2,548	2,548	2,548	2,548	2,548	2,548
Saratoga UWCD	885	885	885	885	885	885
Southern Trinity GCD	4,190	4,190	4,190	4,190	4,190	4,190
Upper Trinity GCD	6,878	6,878	6,878	6,878	6,878	6,878
Total (excluding non-district areas)	41,768	41,768	41,768	41,768	41,768	41,768
No District	4,476	4,476	4,476	4,476	4,476	4,476
Total (including non-district areas)	46,244	46,244	46,244	46,244	46,244	46,244

Table 18. Modeled available groundwater for the Hosston unit of the Trinity Aquifer summarized by groundwater conservation district (GCD) in Groundwater Management Area 8 for each decade between 2010 and 2060. Results are in acre-feet per year. UWCD refers to Underground Water Conservation District. WD refers to Water District.

Groundwater Conservation District	Year					
	2010	2020	2030	2040	2050	2060
Central Texas GCD	2,469	2,469	2,469	2,469	2,469	2,469
Clearwater UWCD	4,993	4,993	4,993	4,993	4,993	4,993
Fox Crossing WD	1,384	1,384	1,384	1,384	1,384	1,384
Middle Trinity GCD	43,216	43,216	43,216	43,216	43,216	43,216
North Texas GCD	8,349	8,349	8,349	8,349	8,349	8,349
Northern Trinity GCD	5,556	5,556	5,556	5,556	5,556	5,556
Post Oak Savannah GCD	103	103	103	103	103	103
Prairielands GCD	7,146	7,146	7,146	7,146	7,146	7,146
Red River GCD	2,556	2,556	2,556	2,556	2,556	2,556
Saratoga UWCD	1,446	1,446	1,446	1,446	1,446	1,446
Southern Trinity GCD	16,004	16,004	16,004	16,004	16,004	16,004
Upper Trinity GCD	17,464	17,464	17,464	17,464	17,464	17,464
Total (excluding non-district areas)	110,686	110,686	110,686	110,686	110,686	110,686
No District	20,123	20,123	20,123	20,123	20,123	20,123
Total (including non-district areas)	130,809	130,809	130,809	130,809	130,809	130,809

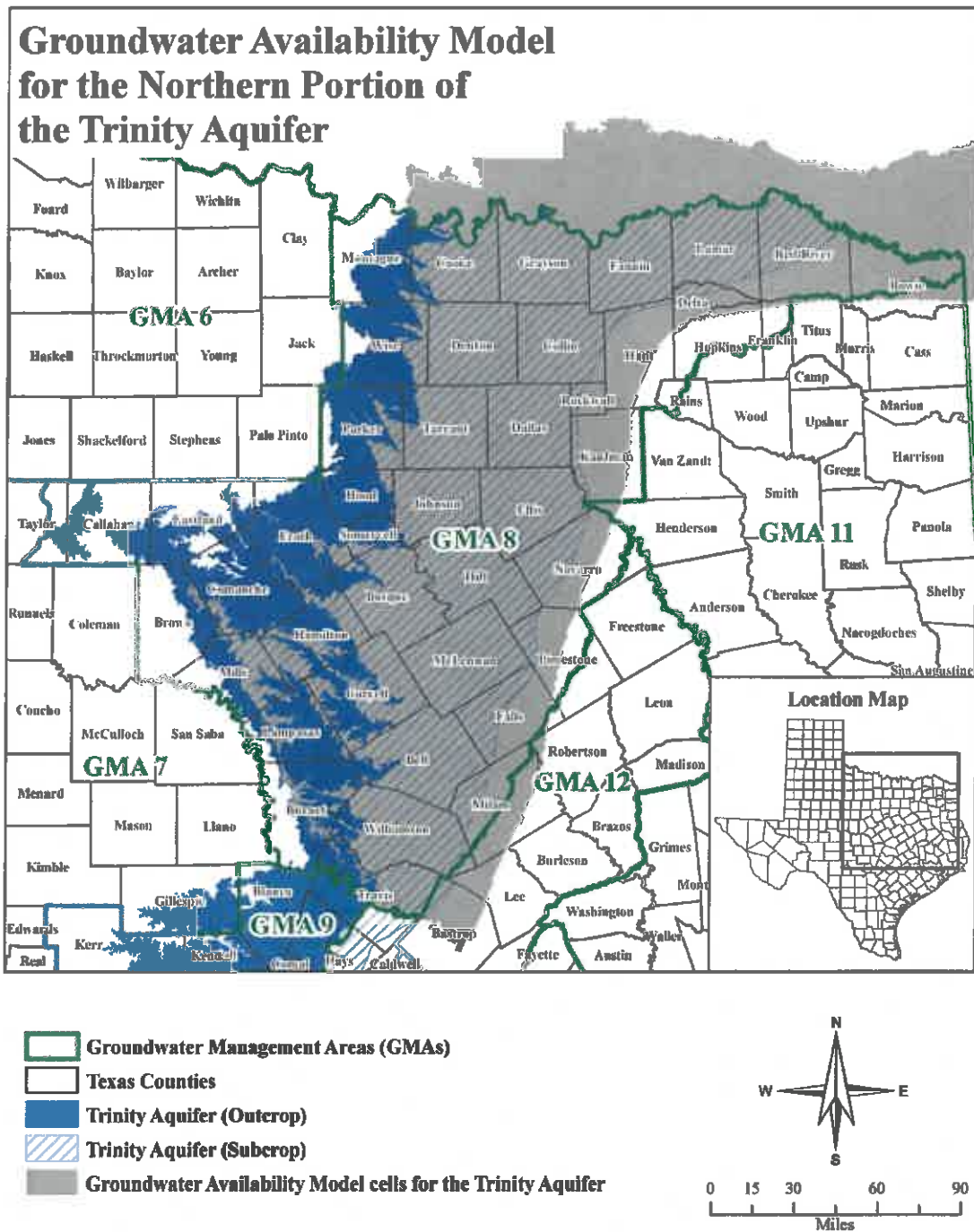


Figure 1. Map showing the areas of the groundwater availability model representing the northern portion of the Trinity Aquifer and the boundary of Groundwater Management Area 8.

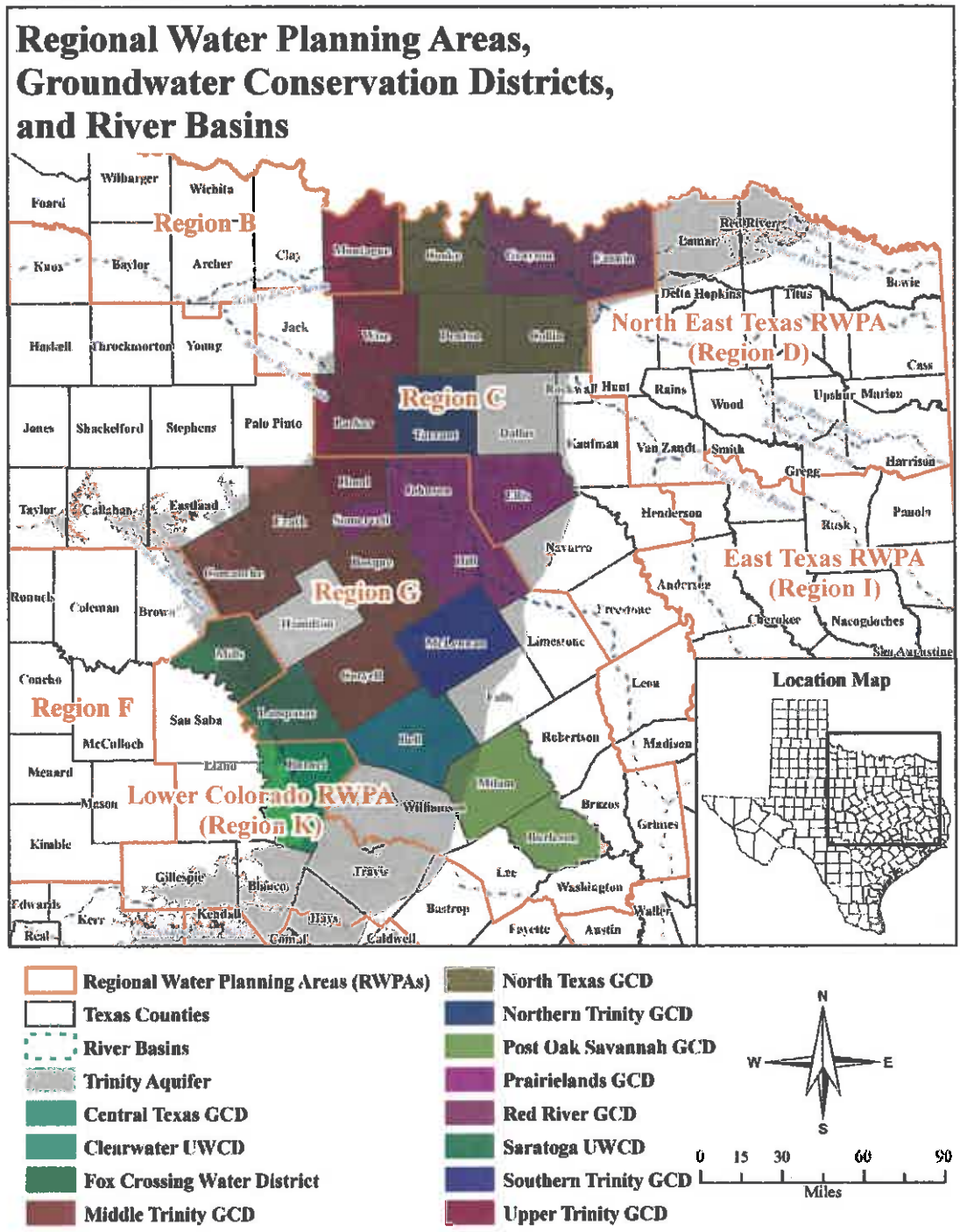
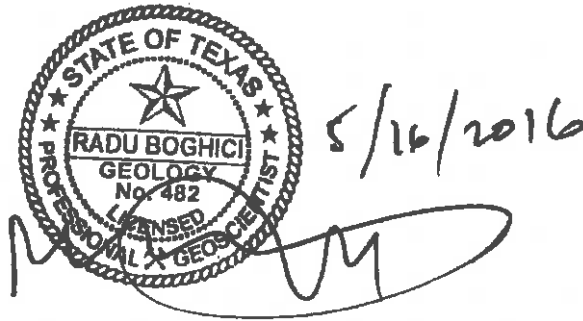


Figure 2. Map showing regional water planning areas (RWPAs), groundwater conservation districts (GCDs), counties, and river basins in and neighboring Groundwater Management Area 8.

GAM RUN 16-005: RED RIVER GROUNDWATER CONSERVATION DISTRICT MANAGEMENT PLAN

Radu Boghici, P.G.
Texas Water Development Board
Groundwater Division
Groundwater Availability Modeling Section
(512)463-5808
May 16, 2016



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GAM RUN 16-005: RED RIVER GROUNDWATER CONSERVATION DISTRICT MANAGEMENT PLAN

Radu Boghici, P.G.
Texas Water Development Board
Groundwater Division
Groundwater Availability Modeling Section
(512)463-5808
May 16, 2016

EXECUTIVE SUMMARY:

Texas State Water Code, Section 36.1071, Subsection (h) (Texas Water Code, 2015), 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. Information derived from groundwater availability models that shall be included in the groundwater management plan includes:

- The annual amount of recharge from precipitation, if any, to the groundwater resources within the district;
- 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
- The annual volume of flow into and out of the district within each aquifer and between aquifers in the district.

This report—Part 2 of a two-part package of information from the TWDB to the Red River Groundwater Conservation District—fulfills the requirements noted above. Part 1 of the two-part package is the Estimated Historical Water Use/State Water Plan data report. The district will receive this data report from the TWDB Groundwater Technical Assistance Section. Questions about the data report can be directed to Mr. Stephen Allen, stephen.allen@twdb.texas.gov, (512)463-7317.

The groundwater management plan for the Red River Groundwater Conservation District should be adopted by the district on or before April 4, 2017 and submitted to the Executive Administrator of the TWDB on or before May 4, 2017. The current management plan for the Red River Groundwater Conservation District expires on July 3, 2017.

This report discusses the methods, assumptions, and results from a model run using version 2.01 of the groundwater availability model for the northern portion of the Trinity and Woodbine aquifers (Kelley and others, 2014). This model run replaces the results of GAM Run 10-032 (Hassan, 2010). GAM Run 10-032 was completed using version 1.01 of the groundwater availability model for the northern portion of the Trinity and Woodbine aquifers (Bené and others, 2004). Table 1 and Table 2 summarize the groundwater availability model data required by statute. Figure 1 and Figure 2 show the area of the model from which the values in the table were extracted. If after review of the figures Red River 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 for the northern portion of the Trinity and Woodbine aquifers was used for this analysis. The water budget for the Red River Groundwater Conservation District was extracted for selected years of the historical model period (1980 to 2012) using ZONEBUDGET Version 3.01 (Harbaugh, 2009). The average annual water budget values for recharge, surface-water outflow, inflow to the district, and outflow from the district for the Trinity Aquifer and Woodbine Aquifer within the district are summarized in this report.

PARAMETERS AND ASSUMPTIONS:

Trinity Aquifer and Woodbine Aquifer

- We used version 2.01 of the updated groundwater availability model for the northern portion of the Trinity and Woodbine aquifers. See Kelley and others (2014) for assumptions and limitations of the model.
- The groundwater availability model for the northern portion of the Trinity and Woodbine aquifers contains eight layers: Layer 1 (the surficial outcrop area of the units in layers 2 through 8 and units younger than Woodbine Aquifer), Layer 2 (Woodbine Aquifer and pass-through cells), Layer 3

(Washita and Fredericksburg, Edwards (Balcones Fault Zone), and pass-through cells), and Layers 4 through 8 (Trinity Aquifer).

- Perennial rivers and reservoirs were simulated using MODFLOW-NWT river package. Ephemeral streams, flowing wells, springs, and evapotranspiration in riparian zones along perennial rivers were simulated using MODFLOW-NWT drain package. For this management plan, groundwater discharge to surface water includes groundwater leakage to all of the river and drain boundaries except for the groundwater loss along the riparian zone.
- The model was run with MODFLOW-NWT (Niswonger and others, 2011).

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 Trinity and Woodbine aquifers located within the district and averaged over the duration of the calibration and verification portion of the model run in the district, as shown in Table 1 and Table 2.

- 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.
- Surface-water outflow—the total water discharging from the aquifer (outflow) to surface-water features such as streams, reservoirs, and drains (springs).
- Flow into and out of district—the lateral flow within the aquifer between the district and adjacent counties.
- Flow between aquifers—the net vertical flow between aquifers or confining units. This flow is controlled by the relative water levels in each aquifer or confining unit and aquifer properties of each aquifer or confining unit that define the amount of leakage that occurs. Please note that the model assumes no cross-formational flow at the base of the Trinity Aquifer. Therefore, no cross-formational flow between the Trinity Aquifer and underlying hydrogeologic units was calculated by the model.

The information needed for the district's management plan is summarized in Table 1 and Table 2. 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 TRINITY AQUIFER THAT IS NEEDED FOR RED RIVER GROUNDWATER CONSERVATION DISTRICT'S GROUNDWATER MANAGEMENT PLAN. ALL VALUES ARE REPORTED IN ACRE-FEET PER YEAR AND ROUNDED TO THE NEAREST 1 ACRE-FOOT.

<i>Management Plan requirement</i>	<i>Aquifer or confining unit</i>	<i>Results</i>
Estimated annual amount of recharge from precipitation to the district	Trinity Aquifer	428
Estimated annual volume of water that discharges from the aquifer to springs and any surface-water body including lakes, streams, and rivers	Trinity Aquifer	258
Estimated annual volume of flow into the district within each aquifer in the district	Trinity Aquifer	10,839
Estimated annual volume of flow out of the district within each aquifer in the district	Trinity Aquifer	4,454
Estimated net annual volume of flow between each aquifer in the district	From overlying younger units to Trinity Aquifer	1,682

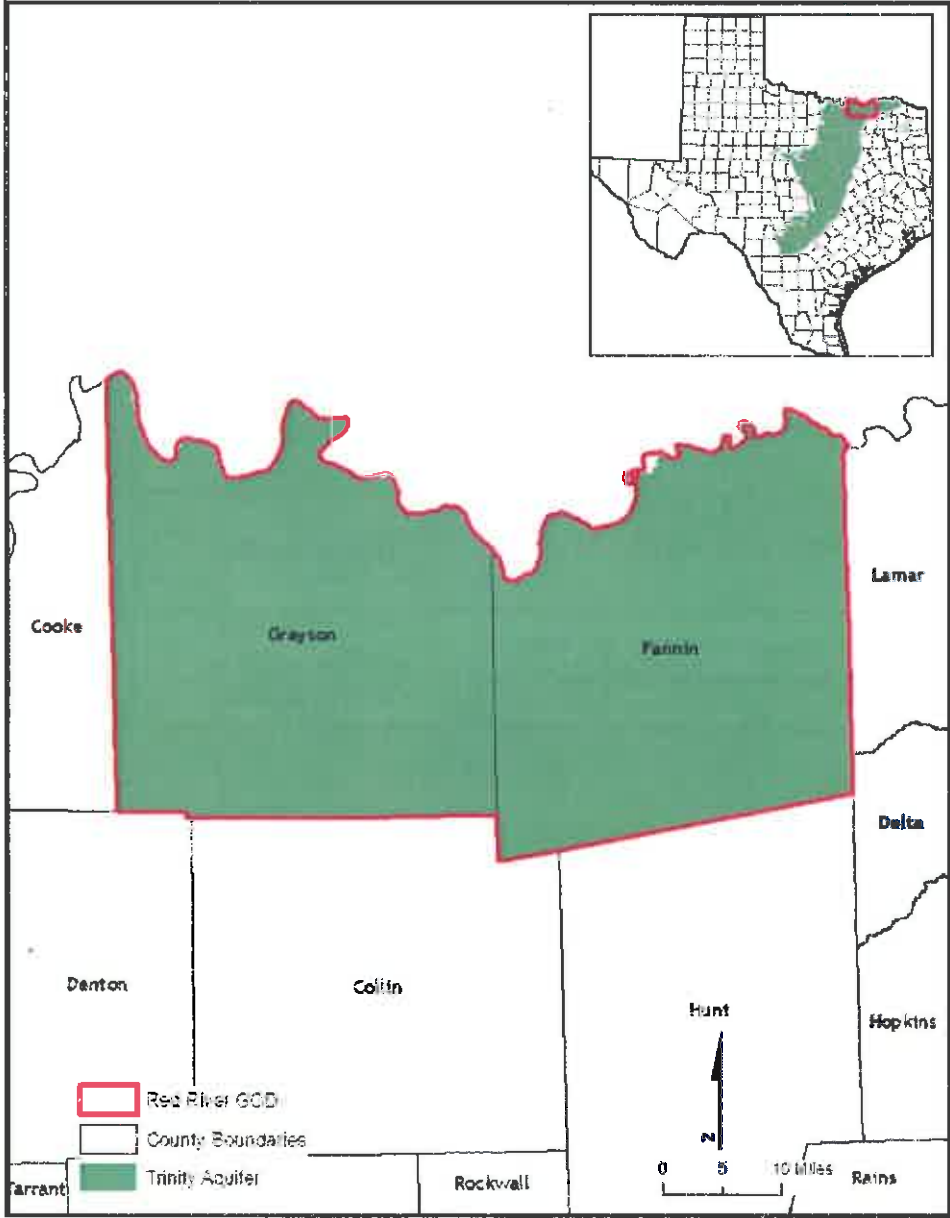


FIGURE 1: AREA OF THE GROUNDWATER AVAILABILITY MODEL FOR THE TRINITY AQUIFER FROM WHICH THE INFORMATION IN TABLE 1 WAS EXTRACTED FOR THE RED RIVER GROUNDWATER CONSERVATION DISTRICT (GCD).

TABLE 2: SUMMARIZED INFORMATION FOR THE WOODBINE AQUIFER THAT IS NEEDED FOR RED RIVER GROUNDWATER CONSERVATION DISTRICT'S GROUNDWATER MANAGEMENT PLAN. ALL VALUES ARE REPORTED IN ACRE-FEET PER YEAR AND ROUNDED TO THE NEAREST 1 ACRE-FOOT.

<i>Management Plan requirement</i>	<i>Aquifer or confining unit</i>	<i>Results</i>
Estimated annual amount of recharge from precipitation to the district	Woodbine Aquifer	73,888
Estimated annual volume of water that discharges from the aquifer to springs and any surface-water body including lakes, streams, and rivers	Woodbine Aquifer	46,096
Estimated annual volume of flow into the district within each aquifer in the district	Woodbine Aquifer	3,889 ¹
Estimated annual volume of flow out of the district within each aquifer in the district	Woodbine Aquifer	5,349 ²
Estimated net annual volume of flow between each aquifer in the district	From Woodbine Aquifer to younger units	16,622
	From Woodbine Aquifer to Washita and Fredericksburg confining units	2,616

¹ The estimated volume of flow from the brackish portion of the Woodbine Formation into the Woodbine Aquifer in southeast Fannin County is 114 acre-feet per year and was not included in the management plan requirement results.

² The estimated volume of flow from the Woodbine Aquifer into the brackish portion of the Woodbine Formation in southeast Fannin County is 198 acre-feet per year and was not included in the management plan requirement results.

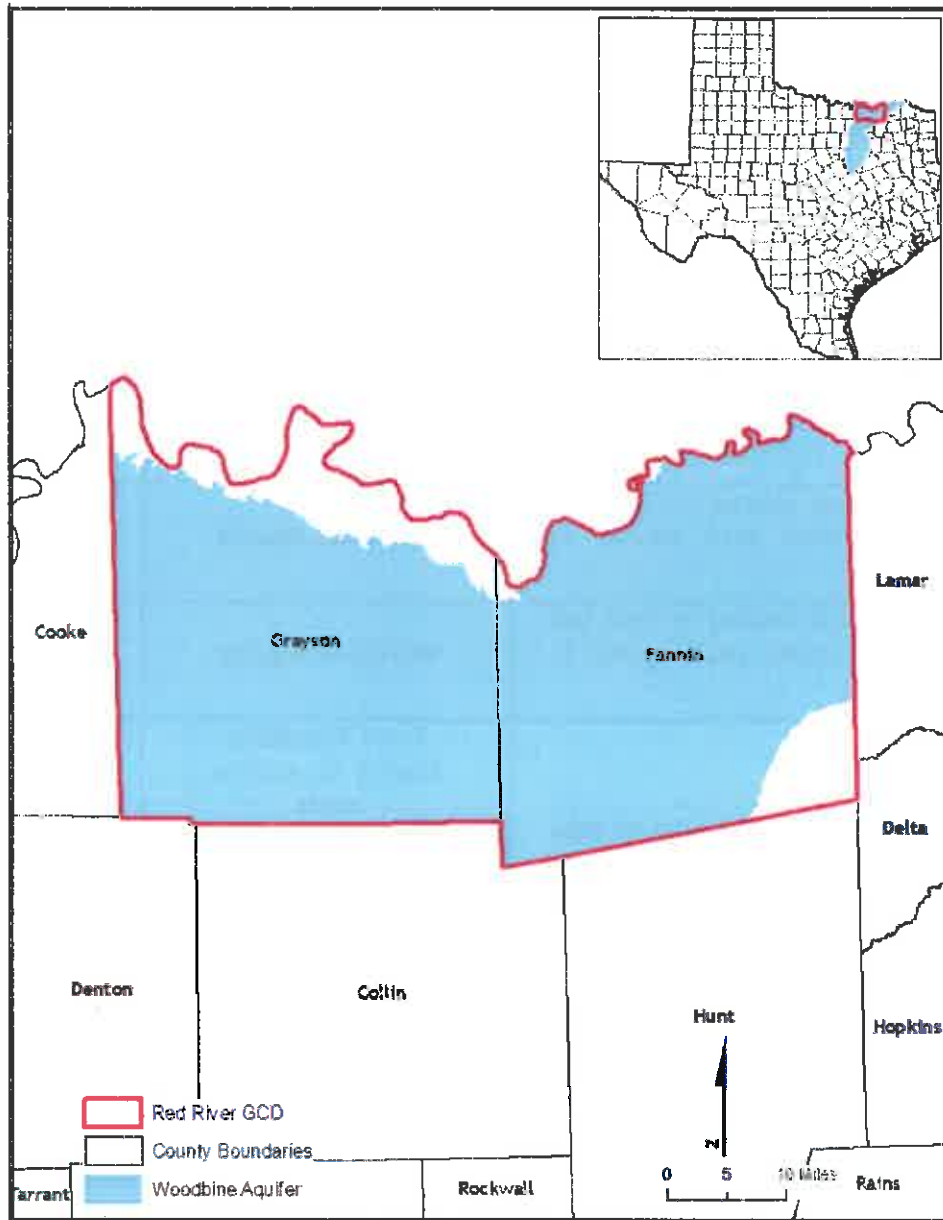


FIGURE 2: AREA OF THE GROUNDWATER AVAILABILITY MODEL FOR THE WOODBINE AQUIFER FROM WHICH THE INFORMATION IN TABLE 2 WAS EXTRACTED FOR THE RED RIVER GROUNDWATER CONSERVATION DISTRICT (GCD).

LIMITATIONS:

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

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

A key aspect of using the groundwater model to evaluate historic groundwater flow conditions includes the assumptions about the location in the aquifer where historic pumping was placed. Understanding the amount and location of 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.

REFERENCES:

Bené, J., Harden, B., O'Rourke, D., Donnelly, A., and Yelderman, J., 2004, Northern Trinity/Woodbine Groundwater Availability Model: contract report to the Texas Water Development Board by R.W. Harden and Associates, 391 p., http://www.twdb.texas.gov/groundwater/models/gam/trnt_n/TRNT_N_Model_Report.pdf.

Hassan M. M., 2010, GAM Run 10-032: Texas Water Development Board GAM Run 10-004 Report, 6 p., <http://www.twdb.texas.gov/groundwater/docs/GAMruns/GR10-032.pdf>.

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.

Kelley, V.A., Ewing, J., Jones, T.L., Young, S.C., Deeds, N., and Hamlin, S., 2014, Updated Groundwater Availability Model of the Northern Trinity and Woodbine Aquifers - Draft Final Model Report (May 2014), 984 p.

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

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

Texas Water Code, 2015, <http://www.statutes.legis.state.tx.us/docs/WA/pdf/WA.36.pdf>.

APPENDIX F

Estimated Historical Water Use and 2017 State Water Plan Datasets

Estimated Historical Water Use And 2017 State Water Plan Datasets:

Red River Groundwater Conservation District

by Stephen Allen
Texas Water Development Board
Groundwater Division
Groundwater Technical Assistance Section
stephen.allen@twdb.texas.gov
(512) 463-7317
April 12, 2017

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 4/12/2017. 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) or Rima Petrossian (rima.petrossian@twdb.texas.gov or 512-936-2420).

Estimated Historical Water Use

TWDB Historical Water Use Survey (WUS) Data

Groundwater and surface water historical use estimates are currently unavailable for calendar year 2016. TWDB staff anticipates the calculation and posting of these estimates at a later date.

FANNIN COUNTY

All values are in acre-feet

Year	Source	Municipal	Manufacturing	Mining	Steam Electric	Irrigation	Livestock	Total
2015	GW	2,721	0	0	0	508	1,242	4,471
	SW	1,493	0	153	0	11,217	138	13,001
2014	GW	2,615	0	0	0	1,578	1,356	5,549
	SW	1,447	0	224	0	11,374	151	13,196
2013	GW	3,158	0	0	0	676	1,364	5,198
	SW	1,594	0	505	0	12,081	150	14,330
2012	GW	3,326	0	0	0	2,757	1,092	7,175
	SW	1,517	5	449	0	10,818	121	12,910
2011	GW	3,607	0	0	0	743	1,272	5,622
	SW	1,764	12	574	0	6,013	141	8,504
2010	GW	3,269	0	2	319	1,090	1,259	5,939
	SW	1,540	0	428	65	8,800	140	10,973
2009	GW	3,010	0	2	373	1,888	1,445	6,718
	SW	1,475	0	127	307	14,346	160	16,415
2008	GW	3,140	0	2	486	0	1,321	4,949
	SW	1,603	0	132	285	9,153	147	11,320
2007	GW	2,945	0	1	373	0	1,705	5,024
	SW	1,620	0	0	0	4,324	188	6,132
2006	GW	3,377	0	6	80	0	1,495	4,958
	SW	1,596	5	0	281	5,567	166	7,615
2005	GW	2,986	0	19	71	322	1,539	4,937
	SW	1,632	5	0	0	5,907	171	7,715
2004	GW	2,677	0	7	243	921	86	3,934
	SW	1,564	5	8	1	78	1,418	3,074
2003	GW	2,592	0	0	259	1,132	88	4,071
	SW	1,733	5	24	0	6,506	1,449	9,717
2002	GW	2,553	0	0	261	1,862	70	4,746
	SW	1,772	5	50	302	5,585	1,140	8,854
2001	GW	2,947	0	0	405	1,848	73	5,273
	SW	2,000	39	84	2,363	5,543	1,194	11,223
2000	GW	2,800	0	0	503	1,158	125	4,586
	SW	1,758	58	75	3,194	3,450	1,143	9,678

Estimated Historical Water Use and 2017 State Water Plan Dataset:

Red River Groundwater Conservation District

April 12, 2017

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GRAYSON COUNTY

All values are in acre-feet

Year	Source	Municipal	Manufacturing	Mining	Steam Electric	Irrigation	Livestock	Total
2015	GW	8,802	769	104	0	2,003	323	12,001
	SW	8,688	1,350	26	1,948	274	971	13,257
2014	GW	8,759	758	229	0	2,632	305	12,683
	SW	7,891	617	57	0	611	915	10,091
2013	GW	9,405	1,029	42	0	3,533	267	14,276
	SW	7,907	1,019	10	0	619	804	10,359
2012	GW	11,392	1,183	76	0	7,589	223	20,463
	SW	8,779	861	17	0	707	667	11,031
2011	GW	10,935	696	22	0	3,668	319	15,640
	SW	14,594	557	57	0	750	958	16,916
2010	GW	9,818	1,649	18	0	1,690	314	13,489
	SW	7,250	978	48	0	450	940	9,666
2009	GW	9,979	1,171	15	0	222	293	11,680
	SW	7,397	435	39	0	1,326	877	10,074
2008	GW	10,324	993	12	0	0	281	11,610
	SW	8,358	436	31	0	394	844	10,063
2007	GW	10,078	904	0	0	616	536	12,134
	SW	7,231	919	0	0	327	1,608	10,085
2006	GW	10,649	1,234	0	0	334	360	12,577
	SW	9,844	1,008	0	0	937	1,080	12,869
2005	GW	9,542	1,290	0	0	1,911	353	13,096
	SW	9,182	2,227	0	0	311	1,058	12,778
2004	GW	9,579	1,193	0	0	1,546	70	12,388
	SW	9,583	800	0	0	144	1,212	11,739
2003	GW	9,770	1,937	0	0	1,733	70	13,510
	SW	8,708	1,016	0	0	467	1,212	11,403
2002	GW	9,720	1,780	0	0	1,738	68	13,306
	SW	14,584	1,061	0	0	237	1,196	17,078
2001	GW	10,478	2,728	0	0	1,720	71	14,997
	SW	10,203	2,110	0	0	234	1,242	13,789
2000	GW	10,602	3,030	0	0	2,972	130	16,734
	SW	9,479	2,704	0	0	410	1,167	13,760

Estimated Historical Water Use and 2017 State Water Plan Dataset:

Red River Groundwater Conservation District

April 12, 2017

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Projected Surface Water Supplies TWDB 2017 State Water Plan Data

FANNIN COUNTY

All values are in acre-feet

RWPG	WUG	WUG Basin	Source Name	2020	2030	2040	2050	2060	2070
C	BONHAM	RED	BONHAM LAKE/RESERVOIR	2,024	2,492	2,636	2,665	2,747	2,813
C	COUNTY-OTHER, FANNIN	RED	BONHAM LAKE/RESERVOIR	299	443	365	352	289	240
C	COUNTY-OTHER, FANNIN	RED	RED RUN-OF-RIVER	15	14	15	15	14	14
C	COUNTY-OTHER, FANNIN	RED	SULPHUR RUN-OF-RIVER	36	36	38	37	36	35
C	COUNTY-OTHER, FANNIN	SULPHUR	BONHAM LAKE/RESERVOIR	29	47	69	91	68	57
C	COUNTY-OTHER, FANNIN	SULPHUR	RED RUN-OF-RIVER	1	2	3	4	4	4
C	COUNTY-OTHER, FANNIN	SULPHUR	SULPHUR RUN-OF-RIVER	4	4	7	10	9	9
C	COUNTY-OTHER, FANNIN	TRINITY	BONHAM LAKE/RESERVOIR	71	117	43	21	31	30
C	COUNTY-OTHER, FANNIN	TRINITY	RED RUN-OF-RIVER	4	4	2	1	2	2
C	COUNTY-OTHER, FANNIN	TRINITY	SULPHUR RUN-OF-RIVER	9	9	4	2	4	5
C	IRRIGATION, FANNIN	RED	RED RUN-OF-RIVER	4,281	4,281	4,281	4,281	4,281	4,281
C	IRRIGATION, FANNIN	SULPHUR	RED RUN-OF-RIVER	81	81	81	81	81	81
C	IRRIGATION, FANNIN	TRINITY	RED RUN-OF-RIVER	251	251	251	251	251	251
C	LIVESTOCK, FANNIN	RED	RED LIVESTOCK LOCAL SUPPLY	725	725	725	725	725	725
C	LIVESTOCK, FANNIN	RED	SULPHUR LIVESTOCK LOCAL SUPPLY	202	202	202	202	202	202
C	LIVESTOCK, FANNIN	RED	TRINITY LIVESTOCK LOCAL SUPPLY	45	45	45	45	45	45
C	LIVESTOCK, FANNIN	SULPHUR	RED LIVESTOCK LOCAL SUPPLY	202	202	202	202	202	202
C	LIVESTOCK, FANNIN	SULPHUR	SULPHUR LIVESTOCK LOCAL SUPPLY	57	57	57	57	57	57
C	LIVESTOCK, FANNIN	SULPHUR	TRINITY LIVESTOCK LOCAL SUPPLY	13	13	13	13	13	13
C	LIVESTOCK, FANNIN	TRINITY	RED LIVESTOCK LOCAL SUPPLY	46	46	46	46	46	46
C	LIVESTOCK, FANNIN	TRINITY	SULPHUR LIVESTOCK LOCAL SUPPLY	13	13	13	13	13	13
C	LIVESTOCK, FANNIN	TRINITY	TRINITY LIVESTOCK LOCAL SUPPLY	3	3	3	3	3	3

Estimated Historical Water Use and 2017 State Water Plan Dataset:

Red River Groundwater Conservation District

April 12, 2017

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Projected Surface Water Supplies

TWDB 2017 State Water Plan Data

RWPG	WUG	WUG Basin	Source Name	2020	2030	2040	2050	2060	2070
C	MANUFACTURING, FANNIN	RED	BONHAM LAKE/RESERVOIR	88	96	82	66	60	55
C	MINING, FANNIN	RED	RED RUN-OF-RIVER	55	55	55	55	55	55
C	MINING, FANNIN	SULPHUR	RED RUN-OF-RIVER	17	17	17	17	17	17
C	STEAM ELECTRIC POWER, FANNIN	RED	TEXOMA LAKE/RESERVOIR NON-SYSTEM PORTION	6,363	6,363	6,363	6,363	6,363	6,363
Sum of Projected Surface Water Supplies (acre-feet)				14,934	15,618	15,618	15,618	15,618	15,618

GRAYSON COUNTY

All values are in acre-feet

RWPG	WUG	WUG Basin	Source Name	2020	2030	2040	2050	2060	2070
C	COUNTY-OTHER, GRAYSON	RED	RANDELL LAKE/RESERVOIR	57	57	57	57	58	59
C	COUNTY-OTHER, GRAYSON	RED	TEXOMA LAKE/RESERVOIR NON-SYSTEM PORTION	5,057	4,827	4,432	3,929	3,358	3,642
C	COUNTY-OTHER, GRAYSON	TRINITY	RANDELL LAKE/RESERVOIR	3	3	3	3	2	1
C	COUNTY-OTHER, GRAYSON	TRINITY	TEXOMA LAKE/RESERVOIR NON-SYSTEM PORTION	246	240	225	238	105	65
C	DENISON	RED	RANDELL LAKE/RESERVOIR	604	541	481	430	352	268
C	DENISON	RED	TEXOMA LAKE/RESERVOIR NON-SYSTEM PORTION	5,920	5,905	5,947	6,038	6,177	6,330
C	HOWE	RED	CHAPMAN/COOPER LAKE/RESERVOIR NORTH TEXAS MWD SYSTEM	0	1	2	2	3	3
C	HOWE	RED	LAVON LAKE/RESERVOIR NORTH TEXAS MWD SYSTEM	0	1	4	5	6	7
C	HOWE	RED	TEXOMA LAKE/RESERVOIR NORTH TEXAS MWD SYSTEM	0	2	3	4	5	6
C	HOWE	TRINITY	CHAPMAN/COOPER LAKE/RESERVOIR NORTH TEXAS MWD SYSTEM	1	3	4	6	7	9

Estimated Historical Water Use and 2017 State Water Plan Dataset:

Red River Groundwater Conservation District

April 12, 2017

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Projected Surface Water Supplies

TWDB 2017 State Water Plan Data

RWPG	WUG	WUG Basin	Source Name	2020	2030	2040	2050	2060	2070
C	HOWE	TRINITY	LAVON LAKE/RESERVOIR NORTH TEXAS MWD SYSTEM	1	4	10	12	16	18
C	HOWE	TRINITY	TEXOMA LAKE/RESERVOIR NORTH TEXAS MWD SYSTEM	1	4	7	10	13	15
C	IRRIGATION, GRAYSON	RED	RED RUN-OF-RIVER	593	593	593	593	593	593
C	IRRIGATION, GRAYSON	RED	TEXOMA LAKE/RESERVOIR NON-SYSTEM PORTION	82	81	81	82	82	82
C	IRRIGATION, GRAYSON	TRINITY	RED RUN-OF-RIVER	498	498	498	498	498	498
C	IRRIGATION, GRAYSON	TRINITY	TEXOMA LAKE/RESERVOIR NON-SYSTEM PORTION	68	69	69	68	68	68
C	LIVESTOCK, GRAYSON	RED	RED LIVESTOCK LOCAL SUPPLY	439	439	439	439	439	439
C	LIVESTOCK, GRAYSON	RED	TRINITY LIVESTOCK LOCAL SUPPLY	248	248	248	248	248	248
C	LIVESTOCK, GRAYSON	TRINITY	RED LIVESTOCK LOCAL SUPPLY	248	248	248	248	248	248
C	LIVESTOCK, GRAYSON	TRINITY	TRINITY LIVESTOCK LOCAL SUPPLY	140	140	140	140	140	140
C	MANUFACTURING, GRAYSON	RED	CHAPMAN/COOPER LAKE/RESERVOIR NORTH TEXAS MWD SYSTEM	6	5	5	5	5	4
C	MANUFACTURING, GRAYSON	RED	LAVON LAKE/RESERVOIR NORTH TEXAS MWD SYSTEM	14	12	10	9	9	10
C	MANUFACTURING, GRAYSON	RED	RANDELL LAKE/RESERVOIR	732	795	855	905	983	1,067
C	MANUFACTURING, GRAYSON	RED	RED RUN-OF-RIVER	30	30	30	30	30	30
C	MANUFACTURING, GRAYSON	RED	TEXOMA LAKE/RESERVOIR NON-SYSTEM PORTION	3,601	3,699	3,577	3,281	2,775	2,089
C	MANUFACTURING, GRAYSON	RED	TEXOMA LAKE/RESERVOIR NORTH TEXAS MWD SYSTEM	11	9	8	8	8	8
C	MANUFACTURING, GRAYSON	TRINITY	CHAPMAN/COOPER LAKE/RESERVOIR NORTH TEXAS MWD SYSTEM	0	0	0	0	0	0

Estimated Historical Water Use and 2017 State Water Plan Dataset:

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Projected Surface Water Supplies

TWDB 2017 State Water Plan Data

RWPG	WUG	WUG Basin	Source Name	2020	2030	2040	2050	2060	2070
C	MANUFACTURING, GRAYSON	TRINITY	LAVON LAKE/RESERVOIR NORTH TEXAS MWD SYSTEM	0	0	0	0	0	0
C	MANUFACTURING, GRAYSON	TRINITY	RANDELL LAKE/RESERVOIR	4	4	4	5	5	5
C	MANUFACTURING, GRAYSON	TRINITY	RED RUN-OF-RIVER	0	0	0	0	0	0
C	MANUFACTURING, GRAYSON	TRINITY	TEXOMA LAKE/RESERVOIR NON-SYSTEM PORTION	18	19	18	16	14	11
C	MANUFACTURING, GRAYSON	TRINITY	TEXOMA LAKE/RESERVOIR NORTH TEXAS MWD SYSTEM	0	0	0	0	0	0
C	MARILEE SUD	TRINITY	TEXOMA LAKE/RESERVOIR NON-SYSTEM PORTION	105	100	89	78	60	42
C	MINING, GRAYSON	RED	TEXOMA LAKE/RESERVOIR NON-SYSTEM PORTION	100	100	100	100	100	100
C	POTTSBORO	RED	TEXOMA LAKE/RESERVOIR NON-SYSTEM PORTION	362	441	458	419	357	288
C	SHERMAN	RED	TEXOMA LAKE/RESERVOIR NON-SYSTEM PORTION	5,086	5,124	5,485	6,067	6,982	7,610
C	STEAM ELECTRIC POWER, GRAYSON	RED	TEXOMA LAKE/RESERVOIR NON-SYSTEM PORTION	3,698	3,698	3,698	3,698	3,698	3,698
C	STEAM ELECTRIC POWER, GRAYSON	TRINITY	TEXOMA LAKE/RESERVOIR NON-SYSTEM PORTION	2,465	2,465	2,465	2,465	2,465	2,465
C	VAN ALSTYNE	TRINITY	CHAPMAN/COOPER LAKE/RESERVOIR NORTH TEXAS MWD SYSTEM	0	9	16	22	126	141
C	VAN ALSTYNE	TRINITY	LAVON LAKE/RESERVOIR NORTH TEXAS MWD SYSTEM	0	19	33	47	261	292
C	VAN ALSTYNE	TRINITY	TEXOMA LAKE/RESERVOIR NORTH TEXAS MWD SYSTEM	0	16	27	39	220	247

Estimated Historical Water Use and 2017 State Water Plan Dataset:

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Projected Surface Water Supplies TWDB 2017 State Water Plan Data

Sum of Projected Surface Water Supplies (acre-feet)	30,438	30,449	30,369	30,244	30,516	30,846
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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.

FANNIN COUNTY

All values are in acre-feet

RWPG	WUG	WUG Basin	2020	2030	2040	2050	2060	2070
C	BONHAM	RED	2,024	2,506	3,393	4,598	5,663	6,883
C	COUNTY-OTHER, FANNIN	RED	1,098	1,031	1,045	1,400	2,989	4,757
C	COUNTY-OTHER, FANNIN	SULPHUR	107	109	197	361	703	1,142
C	COUNTY-OTHER, FANNIN	TRINITY	261	271	122	85	318	604
C	ECTOR	RED	87	92	96	101	109	118
C	HICKORY CREEK SUD	SULPHUR	27	29	30	32	35	38
C	HICKORY CREEK SUD	TRINITY	2	2	2	2	2	2
C	HONEY GROVE	RED	61	62	61	60	60	60
C	HONEY GROVE	SULPHUR	213	218	213	211	211	211
C	IRRIGATION, FANNIN	RED	7,703	7,703	7,703	7,703	7,703	7,703
C	IRRIGATION, FANNIN	SULPHUR	146	146	146	146	146	146
C	IRRIGATION, FANNIN	TRINITY	452	452	452	452	452	452
C	LADONIA	SULPHUR	120	144	155	175	210	209
C	LEONARD	RED	3	3	3	4	4	4
C	LEONARD	SULPHUR	7	7	7	8	8	9
C	LEONARD	TRINITY	321	342	358	374	405	439
C	LIVESTOCK, FANNIN	RED	1,243	1,243	1,243	1,243	1,243	1,243
C	LIVESTOCK, FANNIN	SULPHUR	347	347	347	347	347	347
C	LIVESTOCK, FANNIN	TRINITY	78	78	78	78	78	78
C	MANUFACTURING, FANNIN	RED	88	97	106	114	124	135
C	MINING, FANNIN	RED	97	97	97	97	97	97
C	MINING, FANNIN	SULPHUR	31	31	31	31	31	31
C	NORTH HUNT SUD	SULPHUR	36	39	42	44	48	52
C	SAVOY	RED	88	92	94	98	106	115
C	SOUTHWEST FANNIN COUNTY SUD	RED	363	386	405	426	507	598
C	SOUTHWEST FANNIN COUNTY SUD	TRINITY	18	19	20	21	26	30
C	STEAM ELECTRIC POWER, FANNIN	RED	6,363	11,474	11,910	12,443	13,092	13,775
C	TRENTON	RED	1	1	2	3	3	4
C	TRENTON	TRINITY	130	178	607	1,038	1,384	1,729

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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.

RWPG	WUG	WUG Basin	2020	2030	2040	2050	2060	2070
C	WHITEWRIGHT	RED	2	2	2	2	2	2
Sum of Projected Water Demands (acre-feet)			21,517	27,201	28,967	31,697	36,106	41,013

GRAYSON COUNTY

All values are in acre-feet

RWPG	WUG	WUG Basin	2020	2030	2040	2050	2060	2070
C	BELLS	RED	175	199	223	254	588	783
C	COLLINSVILLE	TRINITY	233	285	338	401	513	666
C	COUNTY-OTHER, GRAYSON	RED	2,619	2,517	2,431	2,391	3,388	5,698
C	COUNTY-OTHER, GRAYSON	TRINITY	127	125	123	145	106	103
C	DENISON	RED	6,641	7,251	7,868	8,629	10,158	12,688
C	GUNTER	TRINITY	355	473	624	776	930	1,085
C	HOWE	RED	77	86	95	105	116	128
C	HOWE	TRINITY	210	232	257	285	316	346
C	IRRIGATION, GRAYSON	RED	1,325	1,442	1,559	1,677	1,795	1,912
C	IRRIGATION, GRAYSON	TRINITY	1,113	1,212	1,311	1,409	1,508	1,607
C	KENTUCKY TOWN WSC	RED	184	213	242	278	348	434
C	KENTUCKY TOWN WSC	TRINITY	183	211	240	276	345	431
C	LIVESTOCK, GRAYSON	RED	932	932	932	932	932	932
C	LIVESTOCK, GRAYSON	TRINITY	526	526	526	526	526	526
C	LUELLA SUD	RED	346	384	424	474	531	595
C	LUELLA SUD	TRINITY	54	60	66	74	83	92
C	MANUFACTURING, GRAYSON	RED	4,880	5,302	5,700	6,035	6,551	7,111
C	MANUFACTURING, GRAYSON	TRINITY	25	27	29	30	33	36
C	MARILEE SUD	TRINITY	405	399	387	386	380	379
C	MINING, GRAYSON	RED	79	91	107	123	142	163
C	POTTSBORO	RED	491	621	751	977	1,624	2,921
C	SHERMAN	RED	10,543	10,881	11,928	13,741	17,732	24,800
C	SOUTH GRAYSON WSC	TRINITY	408	424	478	495	511	526
C	SOUTHMAYD	RED	97	103	110	119	159	238
C	SOUTHWEST FANNIN COUNTY SUD	RED	178	259	338	431	585	766
C	STEAM ELECTRIC POWER, GRAYSON	RED	3,698	7,627	7,627	7,627	7,627	7,627

Estimated Historical Water Use and 2017 State Water Plan Dataset:

Red River Groundwater Conservation District

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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.

RWPG	WUG	WUG Basin	2020	2030	2040	2050	2060	2070
C	STEAM ELECTRIC POWER, GRAYSON	TRINITY	2,465	5,084	5,084	5,084	5,084	5,084
C	TIOGA	TRINITY	119	124	131	139	444	608
C	TOM BEAN	RED	27	30	33	36	44	65
C	TOM BEAN	TRINITY	195	215	235	261	315	473
C	TWO WAY SUD	RED	440	550	661	791	1,048	1,309
C	TWO WAY SUD	TRINITY	258	322	387	464	613	767
C	VAN ALSTYNE	TRINITY	517	608	700	811	2,337	3,243
C	WHITESBORO	RED	202	197	193	193	241	312
C	WHITESBORO	TRINITY	267	261	257	256	319	414
C	WHITEWRIGHT	RED	218	212	208	208	220	233
C	WHITEWRIGHT	TRINITY	2	2	2	2	2	2
C	WOODBINE WSC	TRINITY	9	10	11	12	13	14
Sum of Projected Water Demands (acre-feet)			40,623	49,497	52,616	56,853	68,207	85,117

Projected Water Supply Needs

TWDB 2017 State Water Plan Data

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

FANNIN COUNTY

All values are in acre-feet

RWPG	WUG	WUG Basin	2020	2030	2040	2050	2060	2070
C	BONHAM	RED	0	-14	-757	-1,933	-2,916	-4,070
C	COUNTY-OTHER, FANNIN	RED	0	191	137	-239	-1,907	-3,739
C	COUNTY-OTHER, FANNIN	SULPHUR	0	21	27	-61	-447	-896
C	COUNTY-OTHER, FANNIN	TRINITY	0	51	16	-15	-201	-474
C	ECTOR	RED	0	-5	-9	-14	-22	-31
C	HICKORY CREEK SUD	SULPHUR	18	7	-4	-11	-19	-24
C	HICKORY CREEK SUD	TRINITY	1	0	0	0	-2	-2
C	HONEY GROVE	RED	0	-1	0	1	1	1
C	HONEY GROVE	SULPHUR	0	-5	0	2	2	2
C	IRRIGATION, FANNIN	RED	1	1	1	1	1	1
C	IRRIGATION, FANNIN	SULPHUR	0	0	0	0	0	0
C	IRRIGATION, FANNIN	TRINITY	0	0	0	0	0	0
C	LADONIA	SULPHUR	0	-24	-35	-55	-90	-89
C	LEONARD	RED	0	0	0	-1	-1	-1
C	LEONARD	SULPHUR	0	-1	-1	-1	-1	-2
C	LEONARD	TRINITY	0	-20	-36	-53	-84	-118
C	LIVESTOCK, FANNIN	RED	0	0	0	0	0	0
C	LIVESTOCK, FANNIN	SULPHUR	0	0	0	0	0	0
C	LIVESTOCK, FANNIN	TRINITY	0	0	0	0	0	0
C	MANUFACTURING, FANNIN	RED	0	-1	-24	-48	-64	-80
C	MINING, FANNIN	RED	-42	-42	-42	-42	-42	-42
C	MINING, FANNIN	SULPHUR	-14	-14	-14	-14	-14	-14
C	NORTH HUNT SUD	SULPHUR	16	0	0	0	0	0
C	SAVOY	RED	0	-4	-6	-10	-18	-27
C	SOUTHWEST FANNIN COUNTY SUD	RED	33	-31	-82	-129	-231	-336
C	SOUTHWEST FANNIN COUNTY SUD	TRINITY	2	-2	-4	-7	-12	-17
C	STEAM ELECTRIC POWER, FANNIN	RED	200	-4,911	-5,347	-5,880	-6,529	-7,212
C	TRENTON	RED	0	0	-2	-3	-3	-4
C	TRENTON	TRINITY	0	-48	-476	-907	-1,253	-1,598
C	WHITEWRIGHT	RED	1	1	1	1	1	1
Sum of Projected Water Supply Needs (acre-feet)			-56	-5,123	-6,839	-9,423	-13,856	-18,776

Estimated Historical Water Use and 2017 State Water Plan Dataset:

Red River Groundwater Conservation District

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Projected Water Supply Needs TWDB 2017 State Water Plan Data

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

GRAYSON COUNTY

All values are in acre-feet

RWPG	WUG	WUG Basin	2020	2030	2040	2050	2060	2070
C	BELLS	RED	0	-24	-48	-79	-413	-608
C	COLLINSVILLE	TRINITY	9	-43	-96	-159	-271	-424
C	COUNTY-OTHER, GRAYSON	RED	3,973	3,844	3,533	3,057	1,532	-475
C	COUNTY-OTHER, GRAYSON	TRINITY	194	191	180	184	47	-9
C	DENISON	RED	4	-684	-1,319	-2,040	-3,508	-5,969
C	GUNTER	TRINITY	0	-118	-269	-421	-575	-730
C	HOWE	RED	-1	-3	-5	-9	-14	-22
C	HOWE	TRINITY	1	-7	-15	-27	-42	-59
C	IRRIGATION, GRAYSON	RED	1,343	1,225	1,107	991	873	756
C	IRRIGATION, GRAYSON	TRINITY	1,128	1,030	932	832	733	634
C	KENTUCKY TOWN WSC	RED	250	222	192	156	86	0
C	KENTUCKY TOWN WSC	TRINITY	248	219	191	155	86	0
C	LIVESTOCK, GRAYSON	RED	51	51	51	51	51	51
C	LIVESTOCK, GRAYSON	TRINITY	30	30	30	30	30	30
C	LJELLA SUD	RED	249	210	171	120	63	0
C	LJELLA SUD	TRINITY	38	33	26	19	10	0
C	MANUFACTURING, GRAYSON	RED	721	456	-5	-584	-1,529	-2,691
C	MANUFACTURING, GRAYSON	TRINITY	4	3	0	-4	-7	-13
C	MARILEE SUD	TRINITY	105	106	107	97	86	68
C	MINING, GRAYSON	RED	43	31	15	-1	-20	-41
C	POTTSBORO	RED	0	-51	-164	-429	-1,138	-2,504
C	SHERMAN	RED	-85	-385	-1,071	-2,302	-5,378	-11,818
C	SOUTH GRAYSON WSC	TRINITY	204	161	80	42	5	-30
C	SOUTHMAYD	RED	64	58	51	42	2	-77
C	SOUTHWEST FANNIN COUNTY SUD	RED	16	-21	-67	-132	-265	-431
C	STEAM ELECTRIC POWER, GRAYSON	RED	0	-3,929	-3,929	-3,929	-3,929	-3,929
C	STEAM ELECTRIC POWER, GRAYSON	TRINITY	0	-2,619	-2,619	-2,619	-2,619	-2,619
C	TIOGA	TRINITY	0	-5	-12	-20	-325	-489
C	TOM BEAN	RED	0	-3	-6	-9	-17	-38
C	TOM BEAN	TRINITY	0	-20	-40	-66	-120	-278

Estimated Historical Water Use and 2017 State Water Plan Dataset:

Red River Groundwater Conservation District

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Projected Water Supply Needs TWDB 2017 State Water Plan Data

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

RWPG	WUG	WUG Basin	2020	2030	2040	2050	2060	2070
C	TWO WAY SUD	RED	0	-109	-218	-348	-604	-865
C	TWO WAY SUD	TRINITY	0	-63	-128	-204	-353	-506
C	VAN ALSTYNE	TRINITY	0	-21	-54	-98	-685	-1,435
C	WHITESBORO	RED	34	38	42	42	-6	-77
C	WHITESBORO	TRINITY	44	51	55	56	-7	-102
C	WHITEWRIGHT	RED	60	66	70	70	58	45
C	WHITEWRIGHT	TRINITY	1	1	1	1	1	1
C	WOODBINE WSC	TRINITY	0	-1	-2	-3	-4	-5
Sum of Projected Water Supply Needs (acre-feet)			-86	-8,106	-10,067	-13,483	-21,829	-36,244

Projected Water Management Strategies

TWDB 2017 State Water Plan Data

FANNIN COUNTY

WUG, Basin (RWPG)

All values are in acre-feet

Water Management Strategy	Source Name [Origin]	2020	2030	2040	2050	2060	2070
BONHAM, RED (C)							
CONSERVATION - BONHAM	DEMAND REDUCTION [FANNIN]	7	17	34	61	94	138
CONSERVATION, WATER LOSS CONTROL - BONHAM	DEMAND REDUCTION [FANNIN]	28	10	0	0	0	0
NTMWD - LOWER BOIS D'ARC CREEK RESERVOIR	LOWER BOIS D ARC LAKE/RESERVOIR [RESERVOIR]	0	0	0	416	1,741	3,013
NTMWD UNALLOCATED SUPPLY UTILIZATION	BONHAM LAKE/RESERVOIR [RESERVOIR]	0	15	757	1,456	1,081	919
		35	42	791	1,933	2,916	4,070
COUNTY-OTHER, FANNIN, RED (C)							
CONSERVATION - FANNIN COUNTY	DEMAND REDUCTION [FANNIN]	4	6	11	19	50	95
CONSERVATION, WATER LOSS CONTROL - FANNIN COUNTY	DEMAND REDUCTION [FANNIN]	5	5	0	0	0	0
NTMWD - LOWER BOIS D'ARC CREEK RESERVOIR	LOWER BOIS D ARC LAKE/RESERVOIR [RESERVOIR]	0	0	0	342	1,298	2,977
NTMWD UNALLOCATED SUPPLY UTILIZATION	BONHAM LAKE/RESERVOIR [RESERVOIR]	0	3	105	118	793	897
		9	14	116	479	2,141	3,969
COUNTY-OTHER, FANNIN, SULPHUR (C)							
CONSERVATION - FANNIN COUNTY	DEMAND REDUCTION [FANNIN]	0	1	2	5	12	23
CONSERVATION, WATER LOSS CONTROL - FANNIN COUNTY	DEMAND REDUCTION [FANNIN]	1	1	0	0	0	0
NTMWD - LOWER BOIS D'ARC CREEK RESERVOIR	LOWER BOIS D ARC LAKE/RESERVOIR [RESERVOIR]	0	0	0	88	305	715
NTMWD UNALLOCATED SUPPLY UTILIZATION	BONHAM LAKE/RESERVOIR [RESERVOIR]	0	0	20	31	187	215
		1	2	22	124	504	953
COUNTY-OTHER, FANNIN, TRINITY (C)							
CONSERVATION - FANNIN COUNTY	DEMAND REDUCTION [FANNIN]	1	2	1	1	5	12
CONSERVATION, WATER LOSS CONTROL - FANNIN COUNTY	DEMAND REDUCTION [FANNIN]	1	1	0	0	0	0

Estimated Historical Water Use and 2017 State Water Plan Dataset:

Red River Groundwater Conservation District

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Projected Water Management Strategies

TWDB 2017 State Water Plan Data

WUG, Basin (RWPG)

All values are in acre-feet

Water Management Strategy	Source Name [Origin]	2020	2030	2040	2050	2060	2070
NTMWD - LOWER BOIS D'ARC CREEK RESERVOIR	LOWER BOIS D ARC LAKE/RESERVOIR [RESERVOIR]	0	0	0	21	138	378
NTMWD UNALLOCATED SUPPLY UTILIZATION	BONHAM LAKE/RESERVOIR [RESERVOIR]	0	1	12	7	84	114
		2	4	13	29	227	504

ECTOR, RED (C)

CONSERVATION - ECTOR	DEMAND REDUCTION [FANNIN]	0	1	1	1	2	2
CONSERVATION, WATER LOSS CONTROL - ECTOR	DEMAND REDUCTION [FANNIN]	0	0	0	0	0	0
NTMWD - LOWER BOIS D'ARC CREEK RESERVOIR	LOWER BOIS D ARC LAKE/RESERVOIR [RESERVOIR]	0	46	50	55	62	71
		0	47	51	56	64	73

HICKORY CREEK SUD, SULPHUR (C)

CONSERVATION - HICKORY CREEK SUD	DEMAND REDUCTION [FANNIN]	0	0	0	0	0	0
CONSERVATION, WATER LOSS CONTROL - HICKORY CREEK SUD	DEMAND REDUCTION [FANNIN]	0	0	0	0	0	0
DRILL NEW WELLS (HICKORY CREEK SUD, WOODBINE, SABINE)	WOODBINE AQUIFER [HUNT]	0	0	4	11	19	24
		0	0	4	11	19	24

HICKORY CREEK SUD, TRINITY (C)

CONSERVATION - HICKORY CREEK SUD	DEMAND REDUCTION [FANNIN]	0	0	0	0	0	0
CONSERVATION, WATER LOSS CONTROL - HICKORY CREEK SUD	DEMAND REDUCTION [FANNIN]	0	0	0	0	0	0
DRILL NEW WELLS (HICKORY CREEK SUD, WOODBINE, SABINE)	WOODBINE AQUIFER [HUNT]	0	0	0	0	2	2
		0	0	0	0	2	2

HONEY GROVE, RED (C)

CONSERVATION - HONEY GROVE	DEMAND REDUCTION [FANNIN]	0	0	1	1	1	1
CONSERVATION, WATER LOSS CONTROL - HONEY GROVE	DEMAND REDUCTION [FANNIN]	4	4	0	0	0	0
NTMWD - LOWER BOIS D'ARC CREEK RESERVOIR	LOWER BOIS D ARC LAKE/RESERVOIR [RESERVOIR]	0	41	54	52	52	52
		4	45	55	53	53	53

Estimated Historical Water Use and 2017 State Water Plan Dataset:

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Projected Water Management Strategies

TWDB 2017 State Water Plan Data

WUG, Basin (RWPG)

All values are in acre-feet

Water Management Strategy	Source Name [Origin]	2020	2030	2040	2050	2060	2070
HONEY GROVE, SULPHUR (C)							
CONSERVATION - HONEY GROVE	DEMAND REDUCTION [FANNIN]	1	2	2	3	4	4
CONSERVATION, WATER LOSS CONTROL - HONEY GROVE	DEMAND REDUCTION [FANNIN]	15	15	0	0	0	0
NTMWD - LOWER BOIS D'ARC CREEK RESERVOIR	LOWER BOIS D ARC LAKE/RESERVOIR [RESERVOIR]	0	144	187	185	184	184
		16	161	189	188	188	188
LADONIA, SULPHUR (C)							
ANRA-COL - LAKE COLUMBIA	COLUMBIA LAKE/RESERVOIR [RESERVOIR]	0	0	0	0	0	3
CONSERVATION - LADONIA	DEMAND REDUCTION [FANNIN]	0	1	2	2	4	4
CONSERVATION, WATER LOSS CONTROL - LADONIA	DEMAND REDUCTION [FANNIN]	1	1	0	0	0	0
DWU - MAIN STEM REUSE	INDIRECT REUSE [DALLAS]	0	0	1	6	9	8
LAKE PALESTINE	PALESTINE LAKE/RESERVOIR [RESERVOIR]	0	1	3	6	8	6
REMOVAL OF CHAPMAN SILT BARRIER	CHAPMAN/COOPER LAKE/RESERVOIR NON-SYSTEM PORTION [RESERVOIR]	0	0	0	1	1	1
SULPHUR BASIN SUPPLY	MARVIN NICHOLS LAKE/RESERVOIR [RESERVOIR]	0	0	0	0	0	17
SULPHUR BASIN SUPPLY	WRIGHT PATMAN LAKE/RESERVOIR [RESERVOIR]	0	0	0	0	3	6
UNM-ROR-NECHES RUN OF RIVER	NECHES RUN-OF-RIVER [ANDERSON]	0	0	0	0	3	3
UTRWD - CONTRACT RENEWAL WITH COMMERCE FOR LAKE CHAPMAN WATER	INDIRECT REUSE [HOPKINS]	0	0	0	1	1	2
UTRWD - CONTRACT RENEWAL WITH COMMERCE FOR LAKE CHAPMAN WATER	CHAPMAN/COOPER LAKE/RESERVOIR NON-SYSTEM PORTION [RESERVOIR]	0	0	1	2	2	4
UTRWD - RALPH HALL RESERVOIR AND REUSE	INDIRECT REUSE [FANNIN]	0	1	5	9	12	11
UTRWD - RALPH HALL RESERVOIR AND REUSE	RALPH HALL LAKE/RESERVOIR [RESERVOIR]	0	4	11	20	35	20

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Water Management Strategy	Source Name [Origin]	2020	2030	2040	2050	2060	2070
UTRWD UNALLOCATED SUPPLY UTILIZATION	INDIRECT REUSE [HOPKINS]	0	3	4	5	7	7
UTRWD UNALLOCATED SUPPLY UTILIZATION	CHAPMAN/COOPER LAKE/RESERVOIR NON-SYSTEM PORTION [RESERVOIR]	0	6	8	10	14	12
UTRWD UNALLOCATED SUPPLY UTILIZATION	RAY ROBERTS-LEWISVILLE-GRAPEVINE LAKE/RESERVOIR SYSTEM [RESERVOIR]	0	19	24	29	39	33
		1	36	59	91	138	137

LEONARD, RED (C)

CONSERVATION - LEONARD	DEMAND REDUCTION [FANNIN]	0	0	0	0	0	0
CONSERVATION, WATER LOSS CONTROL - LEONARD	DEMAND REDUCTION [FANNIN]	0	0	0	0	0	0
NTMWD - LOWER BOIS D'ARC CREEK RESERVOIR	LOWER BOIS D'ARC LAKE/RESERVOIR [RESERVOIR]	0	1	1	3	2	3
		0	1	1	3	2	3

LEONARD, SULPHUR (C)

CONSERVATION - LEONARD	DEMAND REDUCTION [FANNIN]	0	0	0	0	0	0
CONSERVATION, WATER LOSS CONTROL - LEONARD	DEMAND REDUCTION [FANNIN]	0	0	0	0	0	0
NTMWD - LOWER BOIS D'ARC CREEK RESERVOIR	LOWER BOIS D'ARC LAKE/RESERVOIR [RESERVOIR]	0	3	4	4	5	5
		0	3	4	4	5	5

LEONARD, TRINITY (C)

CONSERVATION - LEONARD	DEMAND REDUCTION [FANNIN]	1	2	4	5	7	9
CONSERVATION, WATER LOSS CONTROL - LEONARD	DEMAND REDUCTION [FANNIN]	2	2	0	0	0	0
NTMWD - LOWER BOIS D'ARC CREEK RESERVOIR	LOWER BOIS D'ARC LAKE/RESERVOIR [RESERVOIR]	0	144	189	204	233	265
		3	148	193	209	240	274

MANUFACTURING, FANNIN, RED (C)

NTMWD - LOWER BOIS D'ARC CREEK RESERVOIR	LOWER BOIS D'ARC LAKE/RESERVOIR [RESERVOIR]	0	1	24	48	64	80
		0	1	24	48	64	80

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Water Management Strategy	Source Name [Origin]	2020	2030	2040	2050	2060	2070
MINING, FANNIN, RED (C)							
NTMWD - ADDITIONAL LAKE LAVON	LAVON LAKE/RESERVOIR NORTH TEXAS MWD SYSTEM [RESERVOIR]	10	5	4	4	2	2
NTMWD - LOWER BOIS D'ARC CREEK RESERVOIR	LOWER BOIS D ARC LAKE/RESERVOIR [RESERVOIR]	7	27	24	25	17	10
NTMWD - MAIN STEM PUMP STATION	INDIRECT REUSE [COLLIN]	23	9	5	3	0	0
NTMWD - OKLAHOMA	OKLAHOMA RUN-OF- RIVER [OKLAHOMA]	0	0	0	0	0	5
NTMWD - TEXOMA BLENDING	TEXOMA LAKE/RESERVOIR NORTH TEXAS MWD SYSTEM [RESERVOIR]	0	0	8	8	10	7
NTMWD - TOLEDO BEND PHASE I	TOLEDO BEND LAKE/RESERVOIR [RESERVOIR]	0	0	0	0	9	10
REMOVAL OF CHAPMAN SILT BARRIER	CHAPMAN/COOPER LAKE/RESERVOIR NORTH TEXAS MWD SYSTEM [RESERVOIR]	2	1	1	2	1	0
SULPHUR BASIN SUPPLY	MARVIN NICHOLS LAKE/RESERVOIR [RESERVOIR]	0	0	0	0	0	6
SULPHUR BASIN SUPPLY	WRIGHT PATMAN LAKE/RESERVOIR [RESERVOIR]	0	0	0	0	3	2
		42	42	42	42	42	42
MINING, FANNIN, SULPHUR (C)							
NTMWD - ADDITIONAL LAKE LAVON	LAVON LAKE/RESERVOIR NORTH TEXAS MWD SYSTEM [RESERVOIR]	3	1	1	1	1	0
NTMWD - LOWER BOIS D'ARC CREEK RESERVOIR	LOWER BOIS D ARC LAKE/RESERVOIR [RESERVOIR]	3	10	8	9	6	5
NTMWD - MAIN STEM PUMP STATION	INDIRECT REUSE [COLLIN]	8	3	2	1	0	0
NTMWD - OKLAHOMA	OKLAHOMA RUN-OF- RIVER [OKLAHOMA]	0	0	0	0	0	1
NTMWD - TEXOMA BLENDING	TEXOMA LAKE/RESERVOIR NORTH TEXAS MWD SYSTEM [RESERVOIR]	0	0	3	3	3	2
NTMWD - TOLEDO BEND PHASE I	TOLEDO BEND LAKE/RESERVOIR [RESERVOIR]	0	0	0	0	3	3

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Water Management Strategy	Source Name [Origin]	2020	2030	2040	2050	2060	2070
SULPHUR BASIN SUPPLY	MARVIN NICHOLS LAKE/RESERVOIR [RESERVOIR]	0	0	0	0	0	2
SULPHUR BASIN SUPPLY	WRIGHT PATMAN LAKE/RESERVOIR [RESERVOIR]	0	0	0	0	1	1
		14	14	14	14	14	14

NORTH HUNT SUD, SULPHUR (C)

CONSERVATION - NORTH HUNT SUD	DEMAND REDUCTION [FANNIN]	0	0	0	0	0	0
CONSERVATION, WATER LOSS CONTROL - NORTH HUNT SUD	DEMAND REDUCTION [FANNIN]	0	0	0	0	0	0
		0	0	0	0	0	0

SAVOY, RED (C)

CONSERVATION - SAVOY	DEMAND REDUCTION [FANNIN]	0	1	1	1	2	2
CONSERVATION, WATER LOSS CONTROL - SAVOY	DEMAND REDUCTION [FANNIN]	0	0	0	0	0	0
NTMWD - LOWER BOIS D'ARC CREEK RESERVOIR	LOWER BOIS D'ARC LAKE/RESERVOIR [RESERVOIR]	0	31	43	47	54	63
		0	32	44	48	56	65

SOUTHWEST FANNIN COUNTY SUD, RED (C)

CONSERVATION - SOUTHWEST FANNIN COUNTY SUD	DEMAND REDUCTION [FANNIN]	1	2	4	6	9	12
CONSERVATION, WATER LOSS CONTROL - SOUTHWEST FANNIN COUNTY SUD	DEMAND REDUCTION [FANNIN]	2	2	0	0	0	0
NTMWD - LOWER BOIS D'ARC CREEK RESERVOIR	LOWER BOIS D'ARC LAKE/RESERVOIR [RESERVOIR]	0	195	231	264	353	449
SOUTHWEST FANNIN CO SUD ADDITIONAL GROUNDWATER (WITH TRANSMISSION FACILITIES)	WOODBINE AQUIFER [GRAYSON]	0	58	53	49	45	43
		3	257	288	319	407	504

SOUTHWEST FANNIN COUNTY SUD, TRINITY (C)

CONSERVATION - SOUTHWEST FANNIN COUNTY SUD	DEMAND REDUCTION [FANNIN]	0	0	0	0	0	1
CONSERVATION, WATER LOSS CONTROL - SOUTHWEST FANNIN COUNTY SUD	DEMAND REDUCTION [FANNIN]	0	0	0	0	0	0
NTMWD - LOWER BOIS D'ARC CREEK RESERVOIR	LOWER BOIS D'ARC LAKE/RESERVOIR [RESERVOIR]	0	10	11	13	18	22

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Water Management Strategy	Source Name [Origin]	2020	2030	2040	2050	2060	2070
SOUTHWEST FANNIN CO SUD ADDITIONAL GROUNDWATER (WITH TRANSMISSION FACILITIES)	WOODBINE AQUIFER [GRAYSON]	0	3	3	2	2	2
		0	13	14	15	20	25
STEAM ELECTRIC POWER, FANNIN, RED (C)							
FANNIN COUNTY SEP - CONNECT TO AND PURCHASE WATER FROM LAKE TEXOMA	TEXOMA LAKE/RESERVOIR NON- SYSTEM PORTION [RESERVOIR]	0	9,000	9,000	9,000	9,000	9,000
		0	9,000	9,000	9,000	9,000	9,000
TRENTON, RED (C)							
CONSERVATION - TRENTON	DEMAND REDUCTION [FANNIN]	0	0	0	0	0	0
CONSERVATION, WATER LOSS CONTROL - TRENTON	DEMAND REDUCTION [FANNIN]	0	0	0	0	0	0
NTMWD - LOWER BOIS D'ARC CREEK RESERVOIR	LOWER BOIS D ARC LAKE/RESERVOIR [RESERVOIR]	0	0	2	3	3	4
		0	0	2	3	3	4
TRENTON, TRINITY (C)							
CONSERVATION - TRENTON	DEMAND REDUCTION [FANNIN]	0	3	15	35	51	70
CONSERVATION, WATER LOSS CONTROL - TRENTON	DEMAND REDUCTION [FANNIN]	1	1	0	0	0	0
NTMWD - LOWER BOIS D'ARC CREEK RESERVOIR	LOWER BOIS D ARC LAKE/RESERVOIR [RESERVOIR]	0	89	506	917	1,247	1,574
TRENTON NEW WELLS IN WOODBINE AQUIFER	WOODBINE AQUIFER [FANNIN]	0	25	25	25	25	25
		1	118	546	977	1,323	1,669
WHITEWRIGHT, RED (C)							
CONSERVATION - WHITEWRIGHT	DEMAND REDUCTION [FANNIN]	0	0	0	0	0	0
CONSERVATION, WATER LOSS CONTROL - WHITEWRIGHT	DEMAND REDUCTION [FANNIN]	0	0	0	0	0	0
GTUA - GRAYSON COUNTY WSP	TEXOMA LAKE/RESERVOIR NON- SYSTEM PORTION [RESERVOIR]	0	0	0	0	1	1
		0	0	0	0	1	1
Sum of Projected Water Management Strategies (acre-feet)		131	9,980	11,472	13,646	17,429	21,659

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GRAYSON COUNTY

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Water Management Strategy	Source Name [Origin]	2020	2030	2040	2050	2060	2070
BELLS, RED (C)							
BELLS NEW WELL IN WOODBINE AQUIFER	WOODBINE AQUIFER [GRAYSON]	0	145	145	145	145	145
CONSERVATION - BELLS	DEMAND REDUCTION [GRAYSON]	1	1	2	3	10	16
CONSERVATION, WATER LOSS CONTROL - BELLS	DEMAND REDUCTION [GRAYSON]	1	1	0	0	0	0
GTUA - GRAYSON COUNTY WSP	TEXOMA LAKE/RESERVOIR NON-SYSTEM PORTION [RESERVOIR]	0	22	46	76	403	592
		2	169	193	224	558	753
COLLINSVILLE, TRINITY (C)							
CONSERVATION - COLLINSVILLE	DEMAND REDUCTION [GRAYSON]	1	2	3	5	9	13
CONSERVATION, WATER LOSS CONTROL - COLLINSVILLE	DEMAND REDUCTION [GRAYSON]	1	1	0	0	0	0
GTUA - GRAYSON COUNTY WSP	TEXOMA LAKE/RESERVOIR NON-SYSTEM PORTION [RESERVOIR]	0	40	93	154	262	411
		2	43	96	159	271	424
COUNTY-OTHER, GRAYSON, RED (C)							
CONSERVATION - GRAYSON COUNTY	DEMAND REDUCTION [GRAYSON]	9	17	25	32	56	114
CONSERVATION, WATER LOSS CONTROL - GRAYSON COUNTY	DEMAND REDUCTION [GRAYSON]	13	13	0	0	0	0
GTUA - GRAYSON COUNTY WSP	TEXOMA LAKE/RESERVOIR NON-SYSTEM PORTION [RESERVOIR]	12	841	1,136	1,443	1,899	3,106
		34	871	1,161	1,475	1,955	3,220
COUNTY-OTHER, GRAYSON, TRINITY (C)							
CONSERVATION - GRAYSON COUNTY	DEMAND REDUCTION [GRAYSON]	0	1	1	2	2	2
CONSERVATION, WATER LOSS CONTROL - GRAYSON COUNTY	DEMAND REDUCTION [GRAYSON]	1	1	0	0	0	0
GTUA - GRAYSON COUNTY WSP	TEXOMA LAKE/RESERVOIR NON-SYSTEM PORTION [RESERVOIR]	1	42	57	87	59	56
		2	44	58	89	61	58

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WUG, Basin (RWPG)	Water Management Strategy	Source Name [Origin]	2020	2030	2040	2050	2060	2070
DENISON, RED (C)								
	CONSERVATION - DENISON	DEMAND REDUCTION [GRAYSON]	88	157	236	288	372	508
	CONSERVATION, WATER LOSS CONTROL - DENISON	DEMAND REDUCTION [GRAYSON]	144	397	395	433	510	637
	DENISON UNALLOCATED SUPPLY UTILIZATION	TEXOMA LAKE/RESERVOIR NON-SYSTEM PORTION [RESERVOIR]	0	2,191	2,140	2,101	4,281	6,454
			232	2,745	2,771	2,822	5,163	7,599
GUNTER, TRINITY (C)								
	CONSERVATION - GUNTER	DEMAND REDUCTION [GRAYSON]	1	3	6	10	16	22
	CONSERVATION, WATER LOSS CONTROL - GUNTER	DEMAND REDUCTION [GRAYSON]	2	17	0	0	0	0
	GTUA - GRAYSON COUNTY WSP	TEXOMA LAKE/RESERVOIR NON-SYSTEM PORTION [RESERVOIR]	0	97	263	411	559	708
	GUNTER NEW WELLS	TRINITY AQUIFER [GRAYSON]	50	100	100	100	100	100
			53	217	369	521	675	830
HOWE, RED (C)								
	CONSERVATION - HOWE	DEMAND REDUCTION [GRAYSON]	0	1	1	1	2	2
	CONSERVATION, WATER LOSS CONTROL - HOWE	DEMAND REDUCTION [GRAYSON]	0	0	0	0	0	0
	NTMWD - ADDITIONAL LAKE LAVON	LAVON LAKE/RESERVOIR NORTH TEXAS MWD SYSTEM [RESERVOIR]	0	0	1	1	1	1
	NTMWD - LOWER BOIS D'ARC CREEK RESERVOIR	LOWER BOIS D ARC LAKE/RESERVOIR [RESERVOIR]	1	2	2	4	5	6
	NTMWD - MAIN STEM PUMP STATION	INDIRECT REUSE [COLLIN]	0	0	1	1	0	0
	NTMWD - OKLAHOMA	OKLAHOMA RUN-OF-RIVER [OKLAHOMA]	0	0	0	0	0	2
	NTMWD - TEXOMA BLENDING	TEXOMA LAKE/RESERVOIR NORTH TEXAS MWD SYSTEM [RESERVOIR]	0	0	1	2	3	3
	NTMWD - TOLEDO BEND PHASE I	TOLEDO BEND LAKE/RESERVOIR [RESERVOIR]	0	0	0	0	3	4

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WUG, Basin (RWPG)

All values are in acre-feet

Water Management Strategy	Source Name [Origin]	2020	2030	2040	2050	2060	2070
SULPHUR BASIN SUPPLY	MARVIN NICHOLS LAKE/RESERVOIR [RESERVOIR]	0	0	0	0	0	3
SULPHUR BASIN SUPPLY	WRIGHT PATMAN LAKE/RESERVOIR [RESERVOIR]	0	0	0	0	1	1
		1	3	6	9	15	22

HOWE, TRINITY (C)

CONSERVATION - HOWE	DEMAND REDUCTION [GRAYSON]	1	1	3	4	5	7
CONSERVATION, WATER LOSS CONTROL - HOWE	DEMAND REDUCTION [GRAYSON]	1	1	0	0	0	0
NTMWD - ADDITIONAL LAKE LAVON	LAVON LAKE/RESERVOIR NORTH TEXAS MWD SYSTEM [RESERVOIR]	0	0	1	2	2	2
NTMWD - LOWER BOIS D'ARC CREEK RESERVOIR	LOWER BOIS D'ARC LAKE/RESERVOIR [RESERVOIR]	0	4	8	15	15	13
NTMWD - MAIN STEM PUMP STATION	INDIRECT REUSE [COLLIN]	0	1	1	1	0	0
NTMWD - OKLAHOMA	OKLAHOMA RUN-OF-RIVER [OKLAHOMA]	0	0	0	0	0	6
NTMWD - TEXOMA BLENDING	TEXOMA LAKE/RESERVOIR NORTH TEXAS MWD SYSTEM [RESERVOIR]	0	0	2	4	9	8
NTMWD - TOLEDO BEND PHASE I	TOLEDO BEND LAKE/RESERVOIR [RESERVOIR]	0	0	0	0	8	12
REMOVAL OF CHAPMAN SILT BARRIER	CHAPMAN/COOPER LAKE/RESERVOIR NORTH TEXAS MWD SYSTEM [RESERVOIR]	0	0	0	1	0	1
SULPHUR BASIN SUPPLY	MARVIN NICHOLS LAKE/RESERVOIR [RESERVOIR]	0	0	0	0	0	8
SULPHUR BASIN SUPPLY	WRIGHT PATMAN LAKE/RESERVOIR [RESERVOIR]	0	0	0	0	3	3
		2	7	15	27	42	60

IRRIGATION, GRAYSON, RED (C)

CONSERVATION, IRRIGATION - GRAYSON COUNTY	DEMAND REDUCTION [GRAYSON]	0	2	5	7	9	10
		0	2	5	7	9	10

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Water Management Strategy	Source Name [Origin]	2020	2030	2040	2050	2060	2070
IRRIGATION, GRAYSON, TRINITY (C)							
CONSERVATION, IRRIGATION - GRAYSON COUNTY	DEMAND REDUCTION [GRAYSON]	0	2	4	5	7	9
		0	2	4	5	7	9
KENTUCKY TOWN WSC, RED (C)							
CONSERVATION - KENTUCKY TOWN WSC	DEMAND REDUCTION [GRAYSON]	1	2	3	4	6	9
CONSERVATION, WATER LOSS CONTROL - KENTUCKY TOWN WSC	DEMAND REDUCTION [GRAYSON]	1	1	0	0	0	0
GTUA - GRAYSON COUNTY WSP	TEXOMA LAKE/RESERVOIR NON-SYSTEM PORTION [RESERVOIR]	0	0	48	47	44	42
		2	3	51	51	50	51
KENTUCKY TOWN WSC, TRINITY (C)							
CONSERVATION - KENTUCKY TOWN WSC	DEMAND REDUCTION [GRAYSON]	0	1	2	3	6	8
CONSERVATION, WATER LOSS CONTROL - KENTUCKY TOWN WSC	DEMAND REDUCTION [GRAYSON]	1	1	0	0	0	0
GTUA - GRAYSON COUNTY WSP	TEXOMA LAKE/RESERVOIR NON-SYSTEM PORTION [RESERVOIR]	0	0	47	46	44	41
		1	2	49	49	50	49
LUELLA SUD, RED (C)							
CONSERVATION - LUELLA SUD	DEMAND REDUCTION [GRAYSON]	1	3	4	6	9	12
CONSERVATION, WATER LOSS CONTROL - LUELLA SUD	DEMAND REDUCTION [GRAYSON]	2	2	0	0	0	0
GTUA - GRAYSON COUNTY WSP	TEXOMA LAKE/RESERVOIR NON-SYSTEM PORTION [RESERVOIR]	0	0	169	167	251	248
		3	5	173	173	260	260
LUELLA SUD, TRINITY (C)							
CONSERVATION - LUELLA SUD	DEMAND REDUCTION [GRAYSON]	0	0	1	1	1	2
CONSERVATION, WATER LOSS CONTROL - LUELLA SUD	DEMAND REDUCTION [GRAYSON]	0	0	0	0	0	0
GTUA - GRAYSON COUNTY WSP	TEXOMA LAKE/RESERVOIR NON-SYSTEM PORTION [RESERVOIR]	0	0	26	26	39	38
		0	0	27	27	40	40

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Water Management Strategy	Source Name [Origin]	2020	2030	2040	2050	2060	2070
MANUFACTURING, GRAYSON, RED (C)							
CONSERVATION, MANUFACTURING - GRAYSON COUNTY	DEMAND REDUCTION [GRAYSON]	0	11	121	174	186	202
GTUA - GRAYSON COUNTY WSP	TEXOMA LAKE/RESERVOIR NON-SYSTEM PORTION [RESERVOIR]	60	270	606	1,115	1,997	3,091
NTMWD - ADDITIONAL LAKE LAVON	LAVON LAKE/RESERVOIR NORTH TEXAS MWD SYSTEM [RESERVOIR]	1	2	2	2	2	1
NTMWD - LOWER BOIS D'ARC CREEK RESERVOIR	LOWER BOIS D'ARC LAKE/RESERVOIR [RESERVOIR]	1	8	9	11	9	7
NTMWD - MAIN STEM PUMP STATION	INDIRECT REUSE [COLLIN]	2	3	2	1	0	0
NTMWD - OKLAHOMA	OKLAHOMA RUN-OF-RIVER [OKLAHOMA]	0	0	0	0	0	3
NTMWD - TEXOMA BLENDING	TEXOMA LAKE/RESERVOIR NORTH TEXAS MWD SYSTEM [RESERVOIR]	0	0	3	4	5	4
NTMWD - TOLEDO BEND PHASE I	TOLEDO BEND LAKE/RESERVOIR [RESERVOIR]	0	0	0	0	5	6
REMOVAL OF CHAPMAN SILT BARRIER	CHAPMAN/COOPER LAKE/RESERVOIR NORTH TEXAS MWD SYSTEM [RESERVOIR]	0	0	0	0	0	1
SULPHUR BASIN SUPPLY	MARVIN NICHOLS LAKE/RESERVOIR [RESERVOIR]	0	0	0	0	0	4
SULPHUR BASIN SUPPLY	WRIGHT PATMAN LAKE/RESERVOIR [RESERVOIR]	0	0	0	2	2	1
		64	294	743	1,309	2,206	3,320
MANUFACTURING, GRAYSON, TRINITY (C)							
CONSERVATION, MANUFACTURING - GRAYSON COUNTY	DEMAND REDUCTION [GRAYSON]	0	0	1	1	1	1
GTUA - GRAYSON COUNTY WSP	TEXOMA LAKE/RESERVOIR NON-SYSTEM PORTION [RESERVOIR]	0	1	3	3	10	16
		0	1	4	4	11	17

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Water Management Strategy	Source Name [Origin]	2020	2030	2040	2050	2060	2070
MARILEE SUD, TRINITY (C)							
CONSERVATION - MARILEE SUD	DEMAND REDUCTION [GRAYSON]	1	3	4	5	6	8
CONSERVATION, WATER LOSS CONTROL - MARILEE SUD	DEMAND REDUCTION [GRAYSON]	2	2	0	0	0	0
GTUA - GRAYSON COUNTY WSP	TEXOMA LAKE/RESERVOIR NON-SYSTEM PORTION [RESERVOIR]	0	3	14	24	40	57
		3	8	18	29	46	65
MINING, GRAYSON, RED (C)							
GRAYSON COUNTY MINING NEW WELL IN TRINITY AQUIFER	TRINITY AQUIFER [GRAYSON]	0	0	0	41	41	41
		0	0	0	41	41	41
POTTSBORO, RED (C)							
CONSERVATION - POTTSBORO	DEMAND REDUCTION [GRAYSON]	2	4	16	28	59	116
CONSERVATION, WATER LOSS CONTROL - POTTSBORO	DEMAND REDUCTION [GRAYSON]	2	2	0	0	0	0
DENISON UNALLOCATED SUPPLY UTILIZATION	TEXOMA LAKE/RESERVOIR NON-SYSTEM PORTION [RESERVOIR]	0	51	102	141	203	272
GTUA - GRAYSON COUNTY WSP	TEXOMA LAKE/RESERVOIR NON-SYSTEM PORTION [RESERVOIR]	0	0	47	260	876	2,116
		4	57	165	429	1,138	2,504
SHERMAN, RED (C)							
CONSERVATION - SHERMAN	DEMAND REDUCTION [GRAYSON]	140	236	358	458	651	992
CONSERVATION, WATER LOSS CONTROL - SHERMAN	DEMAND REDUCTION [GRAYSON]	53	53	0	0	0	0
GTUA - GRAYSON COUNTY WSP	TEXOMA LAKE/RESERVOIR NON-SYSTEM PORTION [RESERVOIR]	0	97	713	1,844	4,728	10,826
		193	386	1,071	2,302	5,379	11,818
SOUTH GRAYSON WSC, TRINITY (C)							
CONSERVATION - SOUTH GRAYSON WSC	DEMAND REDUCTION [GRAYSON]	1	3	5	6	9	11
CONSERVATION, WATER LOSS CONTROL - SOUTH GRAYSON WSC	DEMAND REDUCTION [GRAYSON]	2	2	0	0	0	0

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All values are in acre-feet

Water Management Strategy	Source Name [Origin]	2020	2030	2040	2050	2060	2070
GTUA - GRAYSON COUNTY WSP	TEXOMA LAKE/RESERVOIR NON-SYSTEM PORTION [RESERVOIR]	70	66	63	58	54	49
		73	71	68	64	63	60

SOUTHMAYD, RED (C)

CONSERVATION - SOUTHMAYD	DEMAND REDUCTION [GRAYSON]	0	1	1	2	3	5
CONSERVATION, WATER LOSS CONTROL - SOUTHMAYD	DEMAND REDUCTION [GRAYSON]	0	0	0	0	0	0
GTUA - GRAYSON COUNTY WSP	TEXOMA LAKE/RESERVOIR NON-SYSTEM PORTION [RESERVOIR]	0	0	49	48	72	95
SOUTHMAYD NEW WELL IN WOODBINE	WOODBINE AQUIFER [GRAYSON]	0	0	0	0	0	77
		0	1	50	50	75	177

SOUTHWEST FANNIN COUNTY SUD, RED (C)

CONSERVATION - SOUTHWEST FANNIN COUNTY SUD	DEMAND REDUCTION [GRAYSON]	1	2	4	6	10	15
CONSERVATION, WATER LOSS CONTROL - SOUTHWEST FANNIN COUNTY SUD	DEMAND REDUCTION [GRAYSON]	1	1	0	0	0	0
NTMWD - LOWER BOIS D'ARC CREEK RESERVOIR	LOWER BOIS D'ARC LAKE/RESERVOIR [RESERVOIR]	0	131	192	268	407	574
SOUTHWEST FANNIN CO SUD ADDITIONAL GROUNDWATER (WITH TRANSMISSION FACILITIES)	WOODBINE AQUIFER [GRAYSON]	0	39	44	49	53	55
		2	173	240	323	470	644

STEAM ELECTRIC POWER, GRAYSON, RED (C)

TEXOMA RAW WATER TO GRAYSON CO. SEP	TEXOMA LAKE/RESERVOIR NON-SYSTEM PORTION [RESERVOIR]	0	3,929	3,929	3,929	3,929	3,929
		0	3,929	3,929	3,929	3,929	3,929

STEAM ELECTRIC POWER, GRAYSON, TRINITY (C)

TEXOMA RAW WATER TO GRAYSON CO. SEP	TEXOMA LAKE/RESERVOIR NON-SYSTEM PORTION [RESERVOIR]	0	2,619	2,619	2,619	2,619	2,619
		0	2,619	2,619	2,619	2,619	2,619

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Water Management Strategy	Source Name [Origin]	2020	2030	2040	2050	2060	2070
TIOGA, TRINITY (C)							
CONSERVATION - TIOGA	DEMAND REDUCTION [GRAYSON]	0	1	1	2	7	12
CONSERVATION, WATER LOSS CONTROL - TIOGA	DEMAND REDUCTION [GRAYSON]	1	1	0	0	0	0
GTUA - GRAYSON COUNTY WSP	TEXOMA LAKE/RESERVOIR NON-SYSTEM PORTION [RESERVOIR]	0	4	11	18	318	477
		1	6	12	20	325	489
TOM BEAN, RED (C)							
CONSERVATION - TOM BEAN	DEMAND REDUCTION [GRAYSON]	0	0	1	1	2	3
CONSERVATION, WATER LOSS CONTROL - TOM BEAN	DEMAND REDUCTION [GRAYSON]	0	2	7	8	9	14
GTUA - GRAYSON COUNTY WSP	TEXOMA LAKE/RESERVOIR NON-SYSTEM PORTION [RESERVOIR]	0	2	4	7	13	33
		0	4	12	16	24	50
TOM BEAN, TRINITY (C)							
CONSERVATION - TOM BEAN	DEMAND REDUCTION [GRAYSON]	1	4	6	9	11	19
CONSERVATION, WATER LOSS CONTROL - TOM BEAN	DEMAND REDUCTION [GRAYSON]	1	17	50	56	68	101
GTUA - GRAYSON COUNTY WSP	TEXOMA LAKE/RESERVOIR NON-SYSTEM PORTION [RESERVOIR]	0	12	31	51	96	241
		2	33	87	116	175	361
TWO WAY SUD, RED (C)							
CONSERVATION - TWO WAY SUD	DEMAND REDUCTION [GRAYSON]	1	4	7	11	18	27
CONSERVATION, WATER LOSS CONTROL - TWO WAY SUD	DEMAND REDUCTION [GRAYSON]	3	3	0	0	0	0
GTUA - GRAYSON COUNTY WSP	TEXOMA LAKE/RESERVOIR NON-SYSTEM PORTION [RESERVOIR]	0	103	211	337	586	838
		4	110	218	348	604	865
TWO WAY SUD, TRINITY (C)							
CONSERVATION - TWO WAY SUD	DEMAND REDUCTION [GRAYSON]	1	2	4	6	10	15

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Water Management Strategy	Source Name [Origin]	2020	2030	2040	2050	2060	2070
CONSERVATION, WATER LOSS CONTROL - TWO WAY SUD	DEMAND REDUCTION [GRAYSON]	1	1	0	0	0	0
GTUA - GRAYSON COUNTY WSP	TEXOMA LAKE/RESERVOIR NON-SYSTEM PORTION [RESERVOIR]	0	60	124	198	343	491
		2	63	128	204	353	506

VAN ALSTYNE, TRINITY (C)

CONSERVATION - VAN ALSTYNE	DEMAND REDUCTION [GRAYSON]	2	4	7	11	39	65
CONSERVATION, WATER LOSS CONTROL - VAN ALSTYNE	DEMAND REDUCTION [GRAYSON]	3	3	0	0	0	0
NTMWD - ADDITIONAL LAKE LAVON	LAVON LAKE/RESERVOIR NORTH TEXAS MWD SYSTEM [RESERVOIR]	0	2	5	8	39	44
NTMWD - LOWER BOIS D'ARC CREEK RESERVOIR	LOWER BOIS D'ARC LAKE/RESERVOIR [RESERVOIR]	0	9	27	53	256	303
NTMWD - MAIN STEM PUMP STATION	INDIRECT REUSE [COLLIN]	0	3	6	6	1	0
NTMWD - OKLAHOMA	OKLAHOMA RUN-OF-RIVER [OKLAHOMA]	0	0	0	0	0	134
NTMWD - TEXOMA BLENDING	TEXOMA LAKE/RESERVOIR NORTH TEXAS MWD SYSTEM [RESERVOIR]	0	0	9	18	149	173
NTMWD - TOLEDO BEND PHASE I	TOLEDO BEND LAKE/RESERVOIR [RESERVOIR]	0	0	0	0	144	258
NTMWD UNALLOCATED SUPPLY UTILIZATION	INDIRECT REUSE [COLLIN]	0	0	0	0	0	47
NTMWD UNALLOCATED SUPPLY UTILIZATION	INDIRECT REUSE [DALLAS]	0	0	0	0	0	67
NTMWD UNALLOCATED SUPPLY UTILIZATION	CHAPMAN/COOPER LAKE/RESERVOIR NORTH TEXAS MWD SYSTEM [RESERVOIR]	0	0	0	0	0	26
NTMWD UNALLOCATED SUPPLY UTILIZATION	LAVON LAKE/RESERVOIR NORTH TEXAS MWD SYSTEM [RESERVOIR]	0	0	0	0	0	53
NTMWD UNALLOCATED SUPPLY UTILIZATION	TEXOMA LAKE/RESERVOIR NORTH TEXAS MWD SYSTEM [RESERVOIR]	0	0	0	0	0	46

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Water Management Strategy	Source Name [Origin]	2020	2030	2040	2050	2060	2070
REMOVAL OF CHAPMAN SILT BARRIER	CHAPMAN/COOPER LAKE/RESERVOIR NORTH TEXAS MWD SYSTEM [RESERVOIR]	0	0	0	2	8	9
SULPHUR BASIN SUPPLY	MARVIN NICHOLS LAKE/RESERVOIR [RESERVOIR]	0	0	0	0	0	169
SULPHUR BASIN SUPPLY	WRIGHT PATMAN LAKE/RESERVOIR [RESERVOIR]	0	0	0	0	49	57
		5	21	54	98	685	1,451

WHITESBORO, RED (C)

CONSERVATION - WHITESBORO	DEMAND REDUCTION [GRAYSON]	1	1	2	3	4	6
CONSERVATION, WATER LOSS CONTROL - WHITESBORO	DEMAND REDUCTION [GRAYSON]	1	1	0	0	0	0
GTUA - GRAYSON COUNTY WSP	TEXOMA LAKE/RESERVOIR NON-SYSTEM PORTION [RESERVOIR]	0	0	0	0	2	71
		2	2	2	3	6	77

WHITESBORO, TRINITY (C)

CONSERVATION - WHITESBORO	DEMAND REDUCTION [GRAYSON]	1	2	3	3	5	9
CONSERVATION, WATER LOSS CONTROL - WHITESBORO	DEMAND REDUCTION [GRAYSON]	1	1	0	0	0	0
GTUA - GRAYSON COUNTY WSP	TEXOMA LAKE/RESERVOIR NON-SYSTEM PORTION [RESERVOIR]	0	0	0	0	2	93
		2	3	3	3	7	102

WHITEWRIGHT, RED (C)

CONSERVATION - WHITEWRIGHT	DEMAND REDUCTION [GRAYSON]	1	1	2	3	4	5
CONSERVATION, WATER LOSS CONTROL - WHITEWRIGHT	DEMAND REDUCTION [GRAYSON]	1	1	0	0	0	0
GTUA - GRAYSON COUNTY WSP	TEXOMA LAKE/RESERVOIR NON-SYSTEM PORTION [RESERVOIR]	0	0	48	47	94	93
		2	2	50	50	98	98

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Water Management Strategy	Source Name [Origin]	2020	2030	2040	2050	2060	2070
WHITEWRIGHT, TRINITY (C)							
CONSERVATION - WHITEWRIGHT	DEMAND REDUCTION [GRAYSON]	0	0	0	0	0	0
CONSERVATION, WATER LOSS CONTROL - WHITEWRIGHT	DEMAND REDUCTION [GRAYSON]	0	0	0	0	0	0
GTUA - GRAYSON COUNTY WSP	TEXOMA LAKE/RESERVOIR NON-SYSTEM PORTION [RESERVOIR]	0	0	0	0	1	1
		0	0	0	0	1	1
WOODBINE WSC, TRINITY (C)							
CONSERVATION - WOODBINE WSC	DEMAND REDUCTION [GRAYSON]	0	0	1	1	1	1
CONSERVATION, WATER LOSS CONTROL - WOODBINE WSC	DEMAND REDUCTION [GRAYSON]	0	0	0	0	0	0
GAINESVILLE UNALLOCATED SUPPLY UTILIZATION	HUBERT H MOSS LAKE/RESERVOIR [RESERVOIR]	0	1	1	2	3	4
		0	1	2	3	4	5
Sum of Projected Water Management Strategies (acre-feet)		693	11,897	14,453	17,598	27,415	42,584